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≡ MECHANICS, SCIENCE.

VOL. LV11. NO. 11.

Saturday, December 8, 1900.

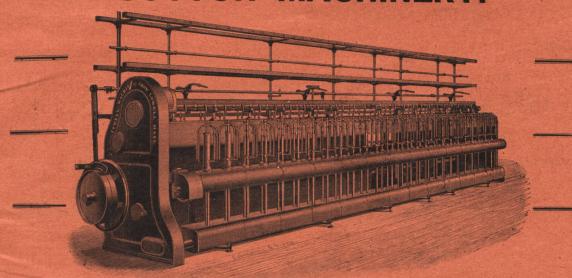
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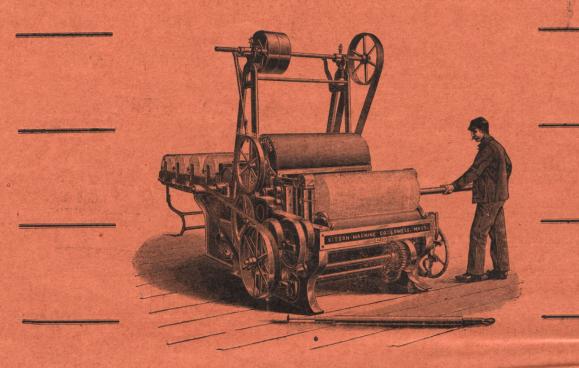
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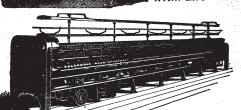
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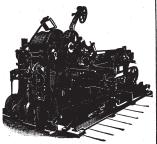
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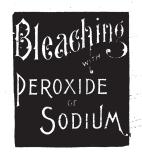
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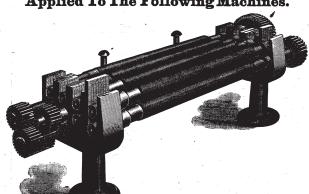
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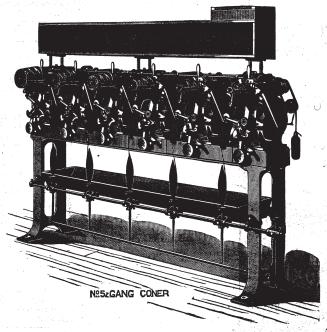
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NORTHERN INDUSTRIAL NEWS.

MAINE

The Sanford mills, Sanford, are installing new machinery.

The Penobscot Woolen Company, Dexter, is increasing the capacity of its mill by installing new machinery.

The new storehouse of the Wassockeag woolen mill, Dexter, is rapidly nearing completion and will soon be ready for occupancy.

The weavers at the Coburn woolen mill, Skowhegan, are at work getting out samples of light-weight goods, and the work will soon be changed from heavy to lightweight work.

NEW HAMPSHIRE.

A new team generating plant is being put in the Sugar River mill, at Newport.

Owing to the heavy demand for liven yarns and towels, the American Flax Company, Meredith, will enlarge its plant.

The Cheshire mills, Harrisville, are having a new waterwheel and penstock put in at the ruins of the Harris mill, and will run a cable to the lower mill wheel to incresse the power.

The woolen mill at Claremont, recently purchased by A. Roberts & Co., of Haverhill, Mass., is rapidly being put into good running condition, and will soon start making samples.

VERMONT.

J. C. Parker Company, Quechee, is installing new machinery in the mill.

F. S. Mackenzie's mill at Woodstock, started recently after a shut-down of about one month and a half, during which time much needed repairs were made. The mill has been built one story higher, and a new dam and stone abutments have been rected.

MASSACHUSETTS.

The Byfield woolen mill, Byfield, is being operated until 9 o'clock evenings and reports a good demand for its product.

The Peabody cotton mill No. 1, Newburyport, has shut down for an indefinite period, due to the high price of raw material.

The four departmen's of the Beaver Brook mills, Dracut, which were idle last week, started up Monday, and are now running in full.

Charles L. Lovering has been appointed treasurer of the Merrimack Manufecturing Company, Lowell, and Huntsville, Ala., in place of Mr. Stockton, resigned.

The Hargraves mills corporation, Fall River, was fined \$25 by the Watuppa Weter Board, Monday, for using water from a hydrant for other than fire purposes.

The Clinton Worsted Company, Clinton, has installed three new combers and other machinery in its mill. The company reports a good demand for its product.

The Meyer Thread Company, Springfield, may seek a location elsewhere. The company finds its present quarters inadequate, and has several quotations under consideration.

The auction sale of the Reynolds new mill at Monson took place last week. The bids started at \$12,000 and was run up to \$14,250, and was purchased by A. D. Ellis, of Monson.

Last weck water was pumped to the new reservoir of the Fiskdale mills. Fiskdale, for the first time and the new hydrants and hose were tested to a pressure of 100 pounds per square inch.

A large force of men from the Mason Machine Works, Taunton, are engaged in setting up the 400 looms in the new weave shed of the Stafford mills, Fall River. The plant will probably be started in part by the office, Nov. 21, 1900: Annual meeting held first of the year.

The Metallic Drawing Roll Company, Indian Orchard, is supplying the rolls for the machinery to be installed in the new mill of the Indian Orchard Company, Springfield. The company is also very busy on other large orders for mills in New Eogland and the south.

The shares of the American Woolen Company have been admitted to the unlisted department of the Boston Stock Exchange, The company was incorporated in March, 1899, under the laws of New Jersey. The authorized capital stock is \$40,000,000 common and \$25,000,000 preferred stock. The amount issued is \$29,501,100 common and \$20,000,000 preferred.

The woolen mills of Sales & Jenks' Manufacturing Company, Warren, which were closed a week ago, have again shut down temporarily. The duliness of the wool market is the cause of the shu'down. William A. Jenks treasurer of the company, received several orders from commission houses in New York last week, but they are for late delivery.

The Stafford Mills. Fall River, filed the following certificate October 23, 1900: Pres., R. T. Davis; Treas, F. W. Brightman. Assets—Real estate, \$384 590; Machinery, \$560,000; debts receivable, \$35,002; stock in process, \$340,142; miscellaneous, \$130,933; total, \$1,450,668. Liabilities—Capital stock, \$1,000,000; debts, \$326,308; balance profit and loss, \$124,850; total, \$1,450,668.

The Union Cotton Manufacturing Company, Fall River, filed the following certificate of condition Oct. 24, 1900: Pres., F. L. Hathaway; Treas., Thomas E. Brayton. Assets—Real estate, \$300,000; machinery, \$800,000; debts receivable, \$98,787; stock in process, \$128,902; total, \$1,227,088. Liabilities—Capital stock, \$1,200,000; reserve for depreciation, \$127,088; total, \$1,227,088.

The convention of the National Federation of Textile Operatives of America will be held at Washington, D. C., on Dec. 17. Most of the unions in the North, and the different local and national unions, have selected their delegates. It is expected that the outcome of the meeting will be the complete consolidation of all the textile workers in the country, and the question of union labor in Southern mills will probably be discussed.

Richa d Borden Manufacturing Company, Fall River, Thomas J. Borden president, R. B. Borden treasurer, fixed capital \$800,000, capital pair in \$800,000, has filed the following statement of conditions: Assets—R.al estate and machinery, 1900, \$955,697.50; 1899, \$911,220.34. Cash and debts receivable, 1900, \$167.283 99; 1899, \$50,184 22. Merchandise, stock in process, etc., 1900, \$145,905.02; 1899, \$187,557.65. Total for 1900, \$1.288,886.51; for 1899, \$148,962 21. Liabilities—Capital stock, 1900, \$300,000. Balance, profit and loss, 1900, \$468,886.51; for 1899, \$348,962 21. Total for 1900, \$1,288,886.51; for 1899, \$1,148,962.11.

The loomfixers' strike of the Hathaway and Acushnet mills, New Bedford, is no nearer a settlement than a week ago, and the effect on the weavers is daily growing more and more apparent. At last Saturday's meeting of the strikers there was a full attendance, as it was pay day. Incidental to the meeting a committee was appointed to wait upon the weavers who are engaged in fixing and prevail upon them to quit the work. The delegation from the National Loomfixers' Union, which went to Treasurer Knowles, Tuesday, to talk over the strike situation, failed to see him, as he declined to talk with the delegates. As a result of his action the delegation approved the action of the loomfixers going out, a departure from the usual custom, which requires the sanction of the national board.

The Cornell mills, Fall River have filed plenty of work on hand.

the following certificate in the secretary's office, Nov. 21, 1900. Annual meeting held Nov. 13, 1900. President, John D. Flint; treasurer, Fred E. Waterman. Directors—Edw. S. Adams, Stephen A Jenks and James F. Jackson. Fixed capital, \$400,000; capital pald in, \$400 000. Asse s—Real-estate: Buildings, \$200,000; machinery. \$300,000. Other assets, viz.: Cash and debts receivable, \$36 077.61; manufactures, merchandise, material and stock in process, \$128 681.84; tot-1, \$664,759.45. Liabilities: Capital stock, \$400,000; debts, \$40.000; balance profit and los, \$224,759.45; total, \$664,759.45. Among the shareholders are: Melvina J. Bodze, %; D. H. Cornell, 60; Samuel W. Flint, 110; John D. Flint, 370; LeRoy Fales, 162; George B. Haines, 74; Stephen A. Jenks, 161; Albert A. Jenks, 128; Edward Kendall, 114; George L. Littlefield, 120; William H. Parker, 100; Charles E. Riley, 157; Fred E Waterman, 80.

The Hathaway Manufacturing Company, of New Bedford, has filed the following certificate in the secretary's office Nov. 20 1900. Annual meeting held Nov. 8, 1900. President, Thomas S. Hathaway; tressurers Joseph F. Knowles. Directors, Edw. L. Anthony, Thomas E. Brayton, W. W. Crapo and Thomas L. Knowles. Fixed capital, \$800,000; capital paid in, \$800,000. Assets—Real estate: Lend and water power, \$500-000. Other assets, viz.: Cash and debts receivable, \$259,372.37; manufactures, merchandise, material and stock in process, \$60,460.46; total, \$1,036,696.29. Liabilities—Capital stock, \$800,000. Reserves: Balance profit and loss, \$150,000; reserve for depreciation, \$86,896.29; total, \$1,036,696.29. Among the shareholders are: Thomas F. Knowles, 1000; Charles D. Prescott, 160; William W. Crapo, 320; Horatio Hathsway, 1940; Sauel H. Cook. 200; Edward D. Mandell, 500; Emily H. Bourne, 250; Hannah H. Abbe, 250; Hetty H. R. Greene, 450.

The following certificate of condition has been filed with the Commissioner of Corporations: Hargrave mills, Fall River, certificate filed in the Secretary's office Nov. 20, 1900. Annual meeting held Oct. 25, 1900. 20, 1800. Annual meeting neid Oct. 20, 1800. President, Leontine Lincoln; treasurer. Seth A. Borden; directors, John D. Flint, George C. Silsbury, S. A. Jenks, Fred W. Easton and W. L. Parker. Fixed capital, \$800,000; capital paid in, \$800,000. Ass Real estate, land, water power, buildings and machinery, \$960,000; other assets, viz., cash and debts receivable, \$104,990.57; manufactures, merchandise, material and maturetures, merchantos, machanas, stock in process, \$399,147.90; total, \$1,464,-138.56. Liabilities—Capital stock, \$800,000; debts, \$590,586.56; balance, profit and loss, \$73,559.90; total, \$1,464,138.56. Among the shareholders are: Adolph Bernheimer, 100; Seth A. Borden, 361; Susan B. Borden, 472; W. B. M. Chace & Co., 153; Benjamin F. Covel, 74: T. D. Covel, 85: W. P. Demnsey 150; Thomas L. Doyle, 100; Charles H. Dring, 142; Leroy Fales, 169; Warren R. Fales, 176; John D. Flint, 105; Robert S. Goff, 78; Harriet F. Hathaway, 106; Amos M. Jackson, 68; Stephen A. Jenks, 50; Henry Lincoln estate, 114; George L. Lit-tlefield, 201; Emeline F. R. Mason, 110; P. P. Morris, 120; William H. Parker, 350; Charles E. Riley, 60.

RHODE ISLAND.

The Lippitt woolen mill, Woonsocket, was shut down all of last week.

The Rodman Manufacturing Company's mills at Allenton and Lafayette were closed down last week to give the help a vacation.

William Gregory's two mills at Wickford were shut down last week, during which time needed repairs were made to the mills.

A new boiler is being put in the Stone worsted mills, Burrilville. This plant has been running in full for some time and has plenty of work on band The committee of the Allen Print Works, Providence, has decided to run out the stock of print cloths on hand and shut down the plant indefinitely.

Many of the mills in Olneyville, which shut down Wednesday for over Thanksgiving, did not resume operations until Monday, when all started in full.

The United States Rubber Company's knit boot mill at Woonsocket, which hes been shut down for several months started up Monday morning, and present indications are that it will run steadily for nearly a year. The knitting department will also be run in full, as well as the felting department.

The Lawton Spinning Company. Woonsock t, has been sued for \$5000 damages by Joseph Theroux, who claims that on Octber 11, as he was on an elevator in the defendant's mills, the cable parted, precipitating him downward 40 feet, with the result that his chest and leg were injured permanently. He alleges that the cable was defective and was not located in the centre of the elevator.

The Guerin Spinning Company's mill, Woonsocket, is being operated night and day, and business is so brisk that the company has decided to have a large addition built. The new structure will be 150x75 feet, and will be of stone and the remainder of the building will be wood. The proposed addition will be situated to the resr of the present mill. The work will commence at once and will be rushed to a speedy completion.

CONNECTICUT.

The Windham Company and the Willimantic cotton mills, Willimantic, report business very good at present, and both companies are compelled to operate their plants evenings.

NEW YORK.

The Eureka Mill, Waterford, resumed operations Monday after a few days' suspension.

Van Brocklin & Stover's knitting mill, Amsterdam, has resumed operations after a week's shut-down.

The product of the Seneca Woolen Mills, Seneca Falls, will bereafter be sold th ough A. D. Juillard & Co., of New York.

The Waterford Knitting Company, Waterford, closed its plant last Saturday for one week, in order to take the annual inventory.

The carpet mills of S. Sanford & Sons, st Amsterdam, were closed recently, owing to a mishap to the power plant. The plant resumed work in full last week.

A. F. Montague, J. P. Burns, of New York, and W. J. Montarue, of Cortland, have incorporated under the name of A. F. Montague & Co., and will deal in silks, velvets, etc., in New York city. The company has a capital of \$60 000.

The Ring Frame Thread Protector Company, Amsterdam, was incorporated recently by J. H. Giles, W. B. Charles, H. B. Crane, C. S. Nisbet, J. H. Hanson and M. E. Schellbauer, Jr., all of Amsterdam. The company is capitalized at \$10,000 and will engage in the manufacture of textile machinery appliances.

NEW JERSEY.

The Pioneer Silk Company, with large mills in Paterson and in Allentown, Pa., which failed recently, resumed operations in full Monday. The mills at Patterson employ 500 hands and as many more in Allentown. Members of the firm will give out no statement, but it is generally believed that they have secured an extension from their creditors.

STEAM & ELECTRICAL **ENGINEERING**

We are always glad to receive correspondence from our readers on steam engineering, and to publish the same on this page; but do not hold ourselves responsible for any tews which may be expressed. If any of our readers have any questions which they may desire answered we shall be pleased to publish the question with the answer. Each correspondent must send his name and address, which, unless otherwise expressed will be held confidentially by us. We wish engineers in sending us indicator cards to analyze, which we are always glad to do for them, would send us at least four, and taken, if possible, under different loads and springe, and not to trace the lines over. All the data should be marked on the back of the card. We can then give them more satisfactory attention.

GAS ENGINES.

A New Principle in Their Design.

[Paper read by C. E. SARGENT before the A. S. M. E.]

While the gas engine has become such an important prime mover that it is looked on and is, today, a most formidable rival of the steam engine, it has certain disadvantages as a power generator which are not only recognized by its devotees and manufacturers, but are considered inherent and beyond elimination by many of those who have given the internal combustion engine a great amount of study. To over-come these disadvantages, eradicate the defects, improve the efficiency, and design an engine which would meet the requirements of prime movers, and one that would not only be simple and cheap to construct, but one which could be easily maipulated and controlled by the average engineer, has been the object of the author, and the result the subject of this paper.

In order thoroughly to understand the disadvantages of modern gas engines, it is ecessary to consider the cycle and operation of the working parts. As it is not in our province to criticise what is recognized as being the best warranted by the state of the art, we will refer only in general to the shortcomings of the modern gas engine of the four-cycle type, bywbich is meant any engine with one or more cylinders fitted with trunk pistons, working on the Beau de Rochas or Otto cycle, in which the piston acts during the first, or forward, stroke (towards the crank) as a pump, drawing in the charge of air or of a combustible mix-ture; compressing same on the second, or back, stroke completing the first revolution of the crank shaft; performing work during inflammation, the forward stroke of the second revolution; and exhausting the burnt products during the back stroke of the second revolution. Such is the opera-tion of the modern gas engine, with a few possible exceptions which will not be considered herein. Engines working in this way have been in successful operation enty years; yet that there is large room for improvement no one denies. But, on the contrary, authorities on the subject say that the mechanical and thermal results are very inefficient, and anticipate improvements which will improve the mechanical as well as the thermal efficiency.

In specifying the disadvantages of a single cylinder gas engine, we find that, on account of but one impulse being obtained for every two revolutions of the crank shaft, the working parts must be sufficiently heavy and strong for the three idle strokes as for the impulse stroke; therefore, the engine is practically four times as heavy per horse power as it would be if the impulse were received every stroke of the piston. No compression is possible on the forward stroke, and, as compression takes place every other revolution only on the back stroke, a heavy frame and foundation are necessary to prevent injurious vibration. In order to absorb the inertia of the recip-rocating parts and to improve the regulation, some manufacturers put two, three, or even four cylinders side by side, thus get-ting as many impulses in the cycle of two revolution as there are cylinders, and, by transmitting the strains through the crank shaft, as many compressions as there are es. An engine working under these conditions may run very smoothly, be in running balance, and give excellent results from a mechanical standpoint. With a single-cylinder, single-acting engine, to get regulation equal to an engine getting an impulse every stroke, it is necessary to have a flywheel of four times the capacity.

GOVERNING.

When a single-cylinder engine is govered by missing an explosion, an impulse may be obtained in every fourth or sixth revolution, and, on account of the burnt

products having been cleared out, when the engine does take an explosive charge, the first impulse, after skipping a charge, is very severe, giving a much higher initial pressure than the ordinary impulse, which, though it may be conducive to economy gas, is not conducive to the longevity of the engine. With a "hit and miss" governor, there is greater economy, because the compression is practically uniform; but with this kind of governing the engine is constantly racing, and, though it may be adjusted to vary not over 2 per cent. in revolutions between full and no load, its angular velocity is always increasing or decreasing, as a look through a vibrating tachometer at the flywheel of this kind of an engine will impress you. A better method of governing is by varying the mean effective pressure by throttling the fresh charge. A regula-tion sufficiently close for electric lighting, even with a single-cylinder engine having sufficient flywheel capacity, may be obtained in this way, but at the expense of thermal efficiency.

STARTING.

As all gas engines which are sufficiently economical for practical purposes must compress the combustible charge before ignition, and, consequently, before any work is given out or stored in the flywheels, the starting of the internal combustion engine has been one of the greatest troubles to overcome. It is accomplished in small sizes by man-power storing up energy in the fly-wheels, or by compressing the entire charge with a windlass; while in larger sizes, compressed air, with its necessary reservoirs, pipes and pumps are used. Many start the engine with a charge of gunpowder or combustible mixture of gas and air, giving from a standing position, such a shot that the inertia stored up will compress the next charge and keep the engine going. Nearly every manufacturer has a perfect starter, yet, where compression must take place before ignition, the difficulties encountered in always getting an engine to go are evident. Such are some of the thermal and mechanical disadvantages of the modern gas engine.

IDEAL METHOD.

In accounting for the heat in the internal ombustion engine, we have: First. Heat converted into work

Third, Heat released in exhaust.

Second, Heat imparted to water jacket.

As the sum of the three is constant in order to make the first as large as possible, it is necessary to reduce the second and third. As the cylinder walls must be sufficiently cool for proper lubrication, we cannot expect to reduce this loss materially, yet by improving the conditions the best possible efficiency may be obtained. The transmission of heat from the burning charge of the cylinder walls depends, for one thing, on the ratio of surface exposed to the unit of volume. The reason that compression is necessary for high efficiency, and that the efficiency increases with compression is, that while the volume remains constant the cooling surface for radiation diminishes. It is impossible to get any more heat out of the gas than there is in it, and with complete combustion there is just as much heat released in a non-compression engine of the Lenoir type as in the Diesel motor, and the only reason why the latter shows such excellent efficiency is because the compression is so high that the surface of radiation during inflammation is com paratively small. Time is another factor in the transmission of heat from the burning charge. If the engine is put on centre, so that it eannot be moved, and no heat can be turned into work, and the charge exploded in the compression chamber, the pressure should fall to the same pressure it had be-fore ignition took place, in about one and one-half seconds, which shows that high-piston speed is essential in a gas engine, as well as in the steam engine, for economy The quicker we can expand the burning gas the less heat will go into the jacket and nore into work.

The transmission of heat from the burning charge to the water jacket depends also upon the difference between the mean temperature of the gases during the working stroke and that of the cylinder walls, so that the lower the terminal temperature, other things being equal, the lower the mean temperature and less heat will be lost. We see, then, that the loss of heat to the water jacket depends on the ratio of the

volume of explosive mixture to the surface which confines it, to the piston speed, and to the average temperature of the burning gases, none of which have been neglected in the designs presented. The prime object in bringing out a new design of gas engines was to get a more complete expansion of the gases during the working stroke. It is evident that if a cylinder full of combustible mixture is compressed, ignited, and ed to expand to its original volume (a cylinder full) and then released, the terminal pressure and temperature will be considerably higher than when compression began, while if this expansion could continue until the pressure and temperature were the same as before compression, the only loss would be the amount of heat absorbed by the water jacket.

GENERAL CONCLUSIONS.

As the mean effective pressure of an engine utilizing only about one-half a cylinder full of combustible mixture is about 60 per cent. of that of the ordinary gas engine, the cylinder capacity of an engine maintaining a higher efficiency by greater expansion must be nearly twice the capacity of the ordinary gas-engine c linder for the same power developed; yet the same could be said of a steam engine utilizing the expansion of the steam compared to one without cut-off. However, as but one crank and lighter flywheels and double-acting cylinders can be used, it is probable that an engine of this type would not weigh more 'or the same output then the ordinary single-acting engines now on the market.

One of the disadvantages of the modern internal combustion engine advanced when comparing this type of motor with the steam engine is that it cannot be overloaded, and that its range of economy is greatly restricted. If a motor is giving out its full power and more is added, the motor will stop, as there can be no reserve when each induction stroke takes a cylinder full of explosive mixture. On the other hand, the engine must not run below its rated capacity, or the efficiency will be greatly impaired.

In other words, the economical range of the modern gas engine is at full load, for reasons heretofore pointed out. But if, instead of taking a cylinder full of combustile mixture as our unit of fresh charge, we design the engine so that two-fifths or thereabouts of a cylinder full of combusti-ble mixture is sufficient for the average load, with the principle utilizing the charge and governing pointed out, we will have a much greater range in which the engine may be worked without an appreciable loss in efficiency.

As the compression changes only one-half as fast as the cut-off with a chance of load, we can have a reserve of power even if we do release considerably above atmospheric pressure, so long as compression es not go sufficiently high to cause prem ature ignition. Of course, leading such an engine beyond its normal capacity may even lower the efficiency, as in a steam engine, but sometimes the ability to carry an overload for a short time far outweighs the necessary loss.

The method of retaining the products of combustion to reduce the clearance and thereby raise the compression during light loads may be considered inadvisible some authorities, yet others show by ex-periments that the inert gas has no inju-rious effect on the incoming charge, except possibly to make it a slower burning mixture, which, on account of our method ignition, has no deleterious effect. With a fixed point of ignition and a slower inflammation as the load decreases, a limit to the piston speed is reached, and is given by some authors as 600 feet per minute. is evident that the quicker we can expand the gases the more heat will be turned into work, and the less will be transmitted to cylinder walls; therefore, if we can advance the time of ignition, so that the maximum pressure takes effect at the beginning of the stroke, the piston speed may be materially increased and the jacket losses minimized.

While no exhaustive tests have been made determine the actual thermal effic of the engine under different conditions and loads, a comparison of the amount of gas used per brake horse power with that of the ordinary gas engine shows a consider-ably higher efficiency, and the writer hopes the results of an actual test may be present ed to the Society at its next meeting.

From a mechanical standpoint, very little

improvement could be desired. The 101x19' engine which developed 50-horse power with illuminating gas, running at a piston speed of 200 feet per minute, either light or loaded, produced no perceptible vibration, though it was not anchored to the foundation, but merely rested on the wooden wedges used for levelling up the engine.

As the cams and rollers are always in contact, no noise arises from the cams striking the rollers, and though the poppet valves are incline to rattle when seating, a proper adjustment of the air pressure by the pet cock in dash-pot guide will almost entirely overcome the noise.

The worm gears necessary for driving the

cam shaft must run in oil to be efficient, and in doing so are noiseless, and make an ideal pump for circulating the oil to the engine bearings.

While the length of the engine is considerable, it is no more than that of tandem compound steam engines of the same stroke, and the height is such that no ladders or galleries are necessary for indicating or making accessible the working parts. The engine from which the half-tone illustra-tions were taken is fitted with a permanent reducing motion of such a design that pressing a spring starts the indicator drum and pulling a string stops it.

No oil is thrown from the moving parts and the working parts are not exposed to the evil effects of dust and dirt.

While the author may have dwelt too long on some prints and neglected others, it is hoped that the ideas presented, the advantages gained by their fulfillment, and the means adopted for carrying them out, may be of interest to the Society.

THE GASENGINE.

Its Heat Efficiency as Modified by Point of ignition.

Paper Read by C. V. KERR, Before the A. S. M. E. 1

In the gas engine laboratory of the Armour Institute of Technology there is installed for experimental purposes a fourcycle single-cylinder gas engine, built by he Fairbanks Morse Company, and rated at 7-brake horse power. The cylinder is 63 inches in diameter, the piston stroke 12 inches, the clearance about 35 per cent., and the normal speed 240 revolutions per min-The engine is controlled by a centrifugal governor acting on the hit-and-miss principle. The ordinary poppet valve is used, and both the hot tube and the electric igniter are available.

The brake horse power developed is measured by a form of rope brake consisting of narrow wooden cleats stapled to a thin wire tiller rope, supported by a stand resting on platform scales. The brake pulley is water cooled. The power developed in the oylinder is measured by a special gas engine indictor, actuated by a pantograph reducing motion. The number of explosions is recorded by a box counter, operated by the gas inlet valve rod, which secures a count of the admissions of gas. The engine speed is obtained either by speed counter or tachometer.

The quantity of gas used is measured by The quantity of gas used is measured by a wet-test gas meter, readable to 0.002 cubic foot. The heating power is determined by combustion in the Junker calorimeter. When the hot tube igniter is in service, the meter for the calorimeter is used on the hot tube connection, so that the amount of gas going to the cylinder may be known. larger meter of the ordinary type serves to determine the proportions of air and gas actually used. The air was at first drawn through this meter; but later a blower was installed to force it through and deliver it to the engine at more nearly ordinary pres-

During the spring of 1897, N. M. Loney and J. J. Wheeler made a series of tests with this plant to determine the heat efficiency of the engine from no load to full load. The mixture used was 6.6 cubic feet of air with 1 cubic foot of natural gas. The heating power of the gas, as determined on different days during the tests, varied from 811 to 867 British thermal units. The jacket water was kept at 160° F. The tube igniter was used, as the earlier form of electric igniter run by a battery was found unreliable. The indicated horse power ranged from 38 to 11. The compression pressure was about 60 pounds, and the explosion pressure about 240 pounds. The heat efficiency, as fixed by the ratio of the heat equivalent of work done in the cylinder to the heating power of the gas, was nearly constant throughout the range of load at 22

The difficulty of securing and maintain ing a temperature of hot tube giving a desired card led to fitting the engine, in the early part of the present year, with a mechanically operated electric igniter. This igniter is operated from an inclined cam on the large gear, from which motion is conveyed to a spring catch attached to an oscillating electrode. Platinum points are provided on the movable, as well as on the insulated electrode, so that corrosion does not quickly affect the sparking points. As the igniter is mechanically operated, the time of separating the points is fixed for a given set of conditions, and the charge in the cylinder is always ignited at a desired piston position.

This device was so made that it can be adjusted to produce a spark in the cylinder at every second revolution for any piston position between 4½ inches before the end the stroke and an equal distance after it. The adjustment can be made while the engine is running within limits set by the load carried. This enables the use of very early ignition after the engine reaches its

A series of tests were therefore arranged to ascertain this point of ignition, which would give the maximum heat efficiency for a given load with all variables, except point of ignition, constant. The programme of tests was carried out by L. C. Bradley, C. A. Garcelon and C. S. Longnecker during the spring term of the present year.

A few preliminary runs settled the posi-tion of the gas valve for best air mixture; the temperature of jacket water at 170° F.; and the loads to be carried, 0, 25, 5.0 brake borse power. For each load the point of ignition was made as early and as late as the engine would maintain spred. The ignite was set to pass a spark at a certain piston position, and an bour's run was made with indicator cards, readings of gas meter and explosion counter taken at frequent intervals. The sparking current for the igniter was taken from a 110 volt main. Six lamps were used in parallel to give sufficient current, and a spark coil to increase the spark. This arrangement proved en-tirely reliable, and the lamps gave visible

vidence of the working of the igniter.

The load to be carried by the Prony brake was estimated for the standard speed, and the scale beam was maintained in even balance throughout the runs. The water used to absorb the heat developed at the brake was allowed to boil away from the inner surface of the pulley at atmospheric press-

About noon of each day, while running the engine, the Junker calorimeter used to ascertain the heating power of the Usually five tests were made, and the average taken as the calorific power of the gas for that day. The range of values obtained at each series of tests was always mall, but there was considerable variation in average values from day to day.

For a brake load of 25 borse power the greatest efficiency is found again with ignition at $(+\frac{1}{2})$, while the maximum explosion pressure is found still earlier at $(+\frac{1}{2})$. With a brake load of 5.0 horse power, the maximum efficiency is found with ignition at the dead point; but the highest explosion pressure is for ignition at $(+\frac{1}{2})$, and the maximum pressure is not located. A wider range of ignition could not be secured with this brake load, and a series of runs with higher brake load was not attempted.

One curious result is brought out by the

curves of indicated horse power. The mechanical efficiency of the engine tends to increase slightly, as the ignition occurs later. Probably not so much energy is spent in friction at the main bearings. So far as the heat efficiencies at brake and in cylinder are concerned, it is evident that ignition should never be later than at the dead point.

The time of the explosion, as measured by the interval between ignition and maximum pressure, is unexpectedly constant at 0.03 econds for ignition before the dead point. For later ignition there is a decided tend-ency to increase the time of combustion. This fact may explain why the heat efficiency drops off with the earlier ignition. even though the explosion pressure is higher. The time of combustion being constant, the higher the pressure and temperature reached the larger the proportion

of heat transmitted to the jacket water. Such conclusions apply strictly only to

the gas engine of the size and make under test, with certain conditions constant With different proportions of gas and air with another kind of gas, or with a less positive sparking device, quite different re sults might possibly be reached. But in this case the conditions were so chosen that the results were expected to show the best performance of the engine.

AN AMERICAN CENTRAL VALVE ENGINE.

[Pap er read by E. T. ADAMS before the A. S. M. E.]

A hollow piston red with a valve therein is the essential feature of all central valve engines. The idea of this combination is very old. It was old in this country when Peter Willans took it up in England and made it, literally and figuratively, the central festure of the Willans engine. How-ever, no matter to whom may be due the barren honor of having originated the idea, the brilliant success of Peter Willans made the "central valve" his own, and to him should be accorded the honor pertaining thereto.

Commercially, Willan's success is represented by sales aggregating 320,000-horse power, chiefly in units of 100 to 300-horse power; but from an engineering stand-point the measure of his success and the convincing proof of Peter Willan's genius is that he could take this engine, so complex in detail, with its multiplicity of cylinders and its extremely high rotative speed, and actually make it the standard of excollence in the home of the ponderous, slow-going Cornish engine, and among a people so conservative, so opposed to innovation, as our steady-going brethren in Great Britain.

In America, the Willans engine, in spite of its admittedly high record for economy, has been received somewhat coldly. It is manufactured, under license from the English builders, by the Bullock Manufactur-ing Company, of Chicago, and those who knew the late M. C. Bullock, member of this Society, can testify that its failure could not be due either to lack of proper enterprise on his part, or to lack of that superfine workmanship which the Willens design makes the sine qua non of the practical operation of the Willans engine.

The engine whose valve gear is here de-

scribed represents an effort to work up the old central valve idea in a form which shall retain the high economy of the English design, but which shall also meet existing American conditions and conform to safe American practice. This has led to so much that is broadly new, and to combinations so widely different from those adopted by Willans, that the title, "An American Central Valve Engine," is entirely justified.

It seems desirable to divide the description of this engine into two parts:

1. A general statement of the conditions controlling design, with an outline of the essential features of the type of engine

which is thereby indicated.

2. A brief description of the valve gear of an American central valve engine.

The conditions to be met are assumed to be the usual conditions existing in small isolated lighting and power installations, as typified, for example, by the power plant of a modern office building, and accompanying design has been worked out on the theory that the essential features of the engine best adapted to this class of service should be as follows:

MODERATE SPEED.

Both relative and absolute; that is, any engine should be capable of being operated with safety at a speed 40 to 50 per cent. in excess of its rated speed; and for the service here specified the absolute or rated speed should not exceed 200 to 300 revolutions per minute, depending on the size of the unit. The latter condition tends to reduce danger of vibration, while the former tends to lower cost for attend-ance, depreciation and repairs, and in a way may be regarded as insurance against care less design, bad workmanship, or too high rating.

A VERTICAL ENGINE,

Because it requires less floor space, and avoids the tendency of piston and valve to wear down and cause leakage, which is so frequently a source of trouble in horizontal engines. This also involves the proposi-tion that a vertical piston valve, of fixed travel, properly fitted with rings, and working on a seat so designed that "shoulders" cannot be formed, can be made tight initially, and will remain tight, and is by far the most satisfactory and Over 20,000 of our HUMIDIFIERS IN operation.

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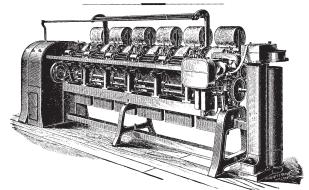
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A SINGLE-ACTING ENGINE.

This, if the engine is to be vertical, is enforced by the limited head room usually available. In some designs it is desirable, in that it makes all parts of the engine so easily accessible; but it is perhaps chiefly desirable since it makes it possible to pre-vent any reversal of stress on the pins and hearings, thus insuring an engine that will be noiseless, no matter how s vice domanded, or how limited the opportunity for adjustment.

A CENTRAL VALVE ENGINE.

because it allows ample port opening w it very low clearance: because it affords practically perfect drainage of the cylinder at all times, is simple, compact, accessible, d allows the lowest possible number of high-speed moving parts.

A COMPOUND ENGINE,

provided that the gain in economy shall justify the expense. Now, the assumed conditions indicate that the engine must be non-condensing, that the load will be variable, that the steam pressure will be low, and that for many months in the year the exhaust can be utilized in the heating system. All these factors are usually urged a

efficient valve, aside from a poppet or a indicating the use of a simple engine. It Corliss valve, now in use. showing of non-condensing compound en-gines under variable load is due very large-ly to faulty steam d's'ribution. This trouble is not inherent in the type, and can be avoided. At the usual pressurer, 80 to 125, avoided. At the usual pressures, 80 to 120, now classed as "low," the range in temperature is still very great, and should certainly be divided when possible. How far down the scales of pressures this may profitably be carried is indicated by the gain in economy secured in the so-called "Cornish cycle" by guarding the cyclinder from the small drow in temperature corresponding to small drop in temperature corresponding to the difference between the terminal pressure and the back pressure. During the months when the exhaust can be used for heating. there will be long periods in spring and fall when the supply from a simple engine will exceed the demand, and it is an unfortunate fact that the periods of maximum demand for heat and maximum demand for power are usually at opposite ends of the day. In another design the cost of a com-pound engine will be only slightly greater than the cost of a simple engine, and, as compared with the usual design of simple automatic engine, should require from 30 to 50 per cent. less steam, with proportionate decrease in fuel required.

MARKET REPORTS. WOOL

Prices quoted at the leading seaboard markets.

ohio, Pennsylvania and W Virginia.

No.1 fleece28	(a) 29	Unwshd. fine18	@19
X25	@ 26	Unmer20	@21
XX28	@29	Delaine fine28	@29
		%-blood24	@25

New York and Michigan.

No. 127	@28	Coarse unw20	@21
No. 227	@28	Coarse was25	@26
X22	@ 23	Unmer19	@20
Delaine fine24	@ 25	Unwashed16	@17

Kentucky, Indiana and Missouri.

%-blood comb?3	@24	%-blood cloth23	@24
%-blood comb23	@24	Coarse cloth20	@21
1/4-blood cloth28	@		

Texas.

Sp. med. 12 mos16	@17	Fall fine12	@13	
Sp. fine 12 mos18	@18%	Georgia22	@23	
Sp. fine 6 to 818	@19			
Sp. med. 6 to 816	@17			

Territory.

Idaho:		Dakota:	
Fine14 @	@15	Medium20	@21
Fine medium 15	@16	Fine medium17	@18
Medium18 @	@19	Fine12	@13
Utah:		Montana:	
Medium 19 (@ 20	Medium18	@19
Fine medium16	@17	Average	@17
Fine14***	@15	Fine17	@18
		Low18	@1
Wyoming:		Colorado:	
Medium 20	@21	Medium15	@1
Fine medium16	@17	Fine medium14	@1
Fine14	@15	Fine11	@1
Territ	ory	(Scoured).	
	Star	nle.	

Fine	Medium47	@49	

California. Sprg. north......16 Fall north......13 @17 @17 Sprg. south 12 @18 @14 Fall south 10 @11

		`		
East No. 114	@15	Medium Valley 21	@22	
do No. 213	@14	Heavy Valley 22	@23	
do No.3	@12	Fine Valley21	@22	

Pulled (Scoured).

2
? Combing42 @45
1 Fine combing!5 @58
8 West def40 @42

A "stralian:			
Good com' ing?5	@36	Canada comb'g30	@32
Choice37	@28	S. A. pulled 34	@ 37
Clothing35	@37	Montevideo25%	@27
X-bred31	@33	C and N25	@ 28
English:			
Scoured 28	@		
Unwashed	@23		

Carpet Wools

Aleppo12 @	1816	E. India12 @141/2
Angora13 @	181/2	Georgian183, @141/2
Bagdad20 @	231/2	Joria28 @30
Bokhaha18 @	16∜	Kandahar 25 @27
Calmuc10 @	14%	Karadi16 @18
Camel's Hair13 @	14%	Khorassan 1316 @ 20
ChinaIr½7		Moseul121/20191/
Cordova14 @		Oporto19 @19
Crimean12 @:		Salonica131/914
Damascus121/3@1	181/2	Scotch High14 @151/2
Donskoi141/4@	22	Valparaiso121/2@131/2

Sales for (899-1900.

	1899	1900
January.	12,335,000	14.270,000
February.	16,025,000	13,691,500
Mareb.	16,196,500	13,063,500
April.	28,044,000	8,943,000
May.	19,768,000	15,293,500
June.	30,528,5(0)	8,167,500
July.	£5,991 500	8,550,500
August.	18,867,000	14,658,000
September.	37,313,000	8,677,000
October.	40,104,500	17,1 3,500
November.	51,172,500	18,837,000
December.		
1st. week.	6,879,000	8,510,000

BOSTON.

Market Continues Quiet - Weather Most Unsatisfactory - Dealers Quite Firm-Prices Unchanged.

The local wool market has had another very quiet week of it, and the prospects of this continuing for some weeks seems quite promising at the present time. The weather has been most unsatisfactory, and, although the present writing finds it a little more favorable, there is nothing to warrant a

person's expecting a long cold snap, and until such a cold turn comes there is but little chance of wool being sold in any large quantities.

The mills are much disappointed over the condition of affairs. Orders have not been coming in to them as was expected would be the case about this time, and the outlook is not at all promising. The retail and wholesale houses are complaining about the weather, and do not hope to do much of a business until there is a decided change toward a period of cold.

Deslers are holding up very bravely, and do not seem to show much weakness. are keeping prices firm and it is but very seldom that a dealer can be found who will make concessions. They are expecting a good business in the near future, and some of them can be found who are sanguine enough of the future talk higher ones. do not look for any advances for some time

A good amount of territorial wool has changed hands during the past week. In all, the sales amounted to 1,685,000 pounds. A good amount of Montana fine medium has sold at cost, 47@48c clean. Soft spots are not much in evidence and the market shows very fair steadiness. Expectation of higher prices is noticeable in some instances; but the general trade looks more for a steady market.

Oregon wool is rather quiet but steady, and efforts to get more than 15 cents are unsuccessful. A sale of 100,000 pounds, reported this week, is said to have been on the basis of 43 cents, which is a pretty full cost. A fair range is 46@48 cents, except for choice staple.

There has been a fair call for Texas wools the past week. Good spring has been sold at 14@15 cents and fall at 13 cents. For year's growth the scoured cost is figured at 47@48 cents, with eight month's at 43 cents.

California wools are less active, although a fair amount has been picked up, including spring and fall. The scoured cost of good northern ranges from 47 to 48 cents, and most southern wools are offered at 45 cents for eight months.

Pulled wools continue to move with considerable freedom, and values are held steady at last week's quotations. On a scoured basis extra is quoted at 55@58c; fine A at 53@55c; A super at 47@48c; B super at 38@40c; C super at 30@32c; combing at 50@53c for fine, and 40@42c for medium and California at 53@54c for finest, and 50@52c for seconds.

Scoured wools are in lighter request, and but little business is doing. The week's transactions amount to 127,000 pounds at a variety of prices as to quality and grade. Considerable imedium sold at 43@44c. Low scoured sold down to 30 cents.

Some foreign wools are selling, but the demand is moderate, and it is only lots here and there that are taken.

Australian wool has moved quite freely and the total sales amount to 120,000 pounds. The market is steady and we quote 73@75c clean for superfine combing, 65@70c for average combing, with choice clothing at 82@ 85c. Considerable carpet wools has been sold. We quote Aleppo washed white at 19@20c, colored at 14@15c, and greasy at 121@13c.

UNWASHED-The sales inc'ude 20,000 lbs UNWASHED—The sates include 20,000 lbs
4 and \$ blood unwashed, 23(234c; 18,000 lbs
Ohio unwashed delaine, 204(221c; 40,000 lbs
medium unwashed, pt. 40,000 lbs fine unwashed, pt. Total, 128,000 lbs.

CLLED—The sales include 76,000 lbs

pulled, p t.

SCOURED-The sales include 43,000 lbs scoured 32@48c; 84,000 do, pt. Total 127,000

TERRITORY-The sales include 95,000 lbs Territory, 15@16e; 100,000 do, basis scoured, 45@47e; 1,040,000 do, pt; 200,000 Montana, basis scoured, 48e; 250,000 do, pt. Total,

TEXAS—The sales include 112,000 lbs Texas spring, 14@15½c; 280,000 do, p t. Total, 392,000 lbs.

OREGON-The sales include 100,000, lbs Oregon, p t. CALIFORNIA-The sales include 200,000 lbs

California. p t. Unclassified-The sales include 355,000

lbs unclassified, pt.
FOREIGN—The sales include 120,000 lbs. Australian, pt; 100,000 lbs. South American cross-bred, pt; 145,000 lbs. carpet, pt; 12,000 lbs. French scoured, pt; total, 377,

The sales of the week, as far as they can be ascertained, are as follows:

100,000 lbs Oregon	p t.
392,000 lbs Texas	. 14 @15%
1,685,000 lbs Territory	. 15 @48 彎
127,500 lbs scoured	
355,000 lbs unclassified	p t.
128,000 lbs unwashed and unmerchantable	
76,000 lbs pulled	
200,000 lbs California	p t.
3,163,000 (bs domestic	
277 000 the foreign	

3,540,(00) hs domestic and foreign, against 6,879,000 for the corresponding week of last year.

1	Receipts.	
No. bales.	This week.	Week in 1899
Domestic	4,253	14,494
Foreign	2,243	2,671
Total	7,496	17,165
		Correspona
No. bales. 8	Since Jan. 1, 1900.	ing time '95
Domestic	445,137	643,600
Foreign	97,608	82,749
Tota1	542,745	726,849
	Sales.	
No. pounds.	This week.	Week in 1899.
Domestic	3,163,000	6,624,000
Foreign	877,000	255,006
Total	3,540,000	6,879,000

PHILADELPHIA.

Market Continues Quiet - Weather Very Much Against Good Sales—Heavy-Weight Season Looked For-

ward To - Dealers Hopeful.

The local wool market has experienced another very quiet week of it, and the expected brisk trade is still another week be-hind its schedule. It is now a matter of much speculation as to how many more weeks it will be before this business starts up and reaches the point it should reach. one seems to know just how long it will be; but all are hoping that it will not be much

The weather continues very bad, and it is to this more than anything else that the market for the raw staple has been so quiet.
The woolen mil's bave been much disappointed over orders. Their light weight season was not nearly as heavy as was expected would be the case and they received but very few duplicate orders. The weather has been so warm and stormy that the retail houses have not disposed of much of their stocks and this has kept them back from placing more orders with the mills. A few sharp, clear cold days, would do much for this market and until this does come we do not look for much if any improvement in it.

Dealers continue hopeful, although there is no denying the fact that some of them are very desirous of making sales. It is surprising how they have held out, and even now it is very hard to get them to shade prices in the least. They are very hopeful of the future, and do not appear at all inclined to reduce their prices at present.

Domestsc wools have shown rather light activity during the current week, and the sales have been of small size. Unwashed wools have again shown the most activity of the domestic lines. One lot of 40,000 pounds & blood sold at 221 cents a pound pounds § blood sold at 22; cents a pound which is a cent and a quarter better than the price of a week ago. A lot of 75,000 pounds ‡ blood sold at 233 cents a pound, A lot of 1,000 pounds fine sold at 173 cents the pound. A lot of 5000 pounds ‡ blood

the pound. A lot of sow pounds 3 blook sold at 234 cents the pound.

Territorial wools have had another quiet week of it. The sales have continued of small proportions, but with the outlook very good. Dealers are holding prices firm and stocks are of small proportions. One lot of 25,000 pounds was sold for 17½ cents in the grease, with another of 20,000 pounds fine middling going at 17 cents the pound.

Scoured and pulled wools have reported a quiet business doing, with sampling and inquiring liberal, but sales very limited. A lot of 15,000 pounds scoured sold at 424 cents a pound. A lot of 5000 pounds scoured wools changed hands at 424 cents a pound, with another of 35,000 pounds going at 42 cents a pound. Dealers continue to show firmness in regard to prices, and those that have ruled during the cur rent week are fully as good as those noted a week ago.

California, Oregon and Texas wools have all continued to note a quiet business doing, with prices firmly held. Dealers'

supplies are still light, and they are doing business with much firmness. One lot of 7,000 pounds spring California eight months sold at 54 cents a pound.

Foreign wools have shown about the same activity. Carpet wools have again noted the most business doing, and the sales in them have been of fair size. Prices rule firm and dealers are hopeful of the future. One lot of 50,000 pounds carpet sold at 144 cents the pound. Some Australian and China wools changed hands at fair

NEW YORK.

Quiet Continues to Rule - Sales Light -Dealers Quite Firm - Weather Bad - Outlook Im-

proving.

The quiet which has ruled in this market during the past few months seems to show no let-up and the week now under review is much the same as its predecssors. The sales have been light and there has been but little talk of sales. Sampling and inquiring have not been at all large, and the out-look is not over bright. There is one thing that this market must have and that is more seasonable weather. The present weather is anything but conducive of large seles, and until there is a decided change there cannot be much of an improvement in the sales of wool.

The mills are now getting ready to take stock, and as the year draws to a close and the between-seasons period comes in there is a disposition in many quarters to defer operations until January, or the requirements for the coming heavy-weight season can be more clearly determined. Prices are firm but no higher here, although Western owners of wool are evidently still hopeful of an advance, which we do not believe will materialize for some months.

Pulled wools have noted a much quieter business doing during the current week. Sales have been of small size, flith prices ruling firm. One lot of 3,000 pounds pulled, scoured basis, sold at 394 cents a pound. Another lot of 9,000 pounds A super, scoured basis, sold at 46 cents a pound. A lot of 51,000 pounds C supers sold at 31½ cents the pound, with another lot of 3,500 pounds fine combing going at 51 cents the pound.

Territorial wools bave noted a very quiet demand, with the sales once more too small to note. Prices show no quotable changes, and are firmly held. The stock on hand continues low, with the wool coming into the local market quite slowly.

California and Oregon wools report better

conditions with the former fairly active. Some 50,000 pounds of them have been sold, and prices continue to be very well sustained, with dealers firm. Texas wools have shown some improved activity, with

sales of fair size and at old figures.

Foreign wools have noted but a quiet business doing at good figures. Carpet wools continue fairly active. Other lines of foreign wool continue rather quiet, with sampling and inquiring better and the ont-look bright. Prices continue firm. One lot of 30,000 pounds carpet wool sold at 10@12 cents a pound.

Compressed air motors are being used in place of horse traction for the propulsion of the vehicles belonging to the Compagnie Generale des Omnibus of Paris. The station for accommodating the necessary compressing plant is to be erected at Billancourt. The plant will develop 5000 to 7000 horse power, and the air will be stored in the main receivers at a pressure of 1400 pounds to the square inch. From these receivers the compressed air will be conveyed to the distributing stations in weldless steel pipes from two inches to four inches in diameter, laid along the roadway. In order to reduce the possibility of extensive leakage, through imperfect joints, the pipes have been manufactured in 64-foot lengths. Each car carries eight receivers with a total capacity of 88.27 cubic feet, which is estimated to be sufficient to enable the car to run a journey of 7½ miles without recharging, and they can be re-charged in three minutes. Before the air passes into the motor cylinders it is heated by means of a small coke fire. Fifty-two passengers form the complement of two cers, accommodated upon two decks.

PERSONALS.

NORTHERN.

F. White is now boss carder at the Bradford Hat Factory, Bradford.

R. Cardow has been engaged as boss dver at the Assabet mills, Maynard.

John Gebbens has accepted the place of boss wet finisher for the Byfield Woolen Company, Byfield.

Miss Minnie Quirk has severed her connection with the Portland Silk Company, Middletown, Conn.

Miss Mary Gorman, cloth inspector for the Portland Sllk Company, Middletown, Conn., has resigned.

E. Davis, of Warren, Maine, is the I overseer of dyeing for the Standish Worsted Company, Plymouth.

Joseph Launday has taken charge of the mule room in the Riverside Woolen Mills, Montmorency, P. Q.

Harold Holson succeeds F. W. Hicks as boss carder at the Riverside Woolen Mills, Montmorency, P. Q.

G. T. Law, employed at the Kerr thread mill, Fall River, had his hand badly crushed by machinery last week.

Harry Pickard, Jr., has resigned his po sition at the Manville mill, Manville, R. I., to accept a place in Hopedale.

J. Dickens, of Woonsocket, R. I., has been engaged as boss carder at the Meek woolen mills, Bonapart, Iowa,

Ernest Aspinwall has taken the position of overseer of spinning at the Cheney silk mill, South Manchester, Conn.

Harry Page, formerly boss carder of the Lancaster Cotton Mills, Clinton, has been succeeded by G. B. Sunderland.

D. A. Morrell is boss weaver at the mills of the Exeter Manufacturing Company Exeter, N. H., in place of Clarence Horne, resigned.

J. W. Danne, who recently resigned his position of overseer of carding at the Ipswich Mills, Inswich, has been succeeded by Charles Prew.

John Millstop, loom fixer at the Portland Silk Company's mills, Middletown, Conn., has resigned, and has taken a position in Paterson, N. J.

J. Miner is boss weaver at the Hope mill, Pawtucket, R. I. He was formerly employed at the Rodman Manufacturing Company's mills, Lafayette.

William Watson, employed as a card grinder at the Hargraves mills, Fall River, sceived a severe largeration of his left hand while at work last week.

Alphonso Pearson, second hand of the weave room, No. 1, in the Laconia mills, Biddeford, Me., gave the operatives in his room a reception Thanksgiving eve.

Gus Nordon has resigned the position of hoss dyer at the mill of Cole, Senior & Co., Medway, and has accepted a place in Law-He is succeeded in Medway by George Chester.

Thomaa West has accepted a lucrative position at the Winnepaunk Mills Company, Norwalk, Conn. Mr. West was at one time superintendent of the Riverside woolen mills, Lebanon, N. H.

Gen. William F. Draper, ex-United States ambassador to Italy, has presented an ex-cellent life-sized picture of himself, sumptu-ously framed, to Valencia council, Knights of Columbus of Milford.

Emil Hirth, employed at the Rock mill, Rockville, Conn., received a wound in his left hand by the accidental discharge of a gun while hunting last week, necessitating the amputation of the thumb.

J. A. McLane, boss carder at the Hargraves mill No. 2, Fall River, has taken a similar place at the Parker mill No. 2, Fall River, succeeding John McGage, who is now filling Mr. McLane's former position at the Hargraves mills.

Edwin Tanner, overseer in the Bennett mills, New Bedford, has changed rooms in the establishment, and his help in both rooms signalized the event by making him a surprise visitation, and presenting bim a handsome roll-top desk and chair.

While on her way to the Aberfoyle Mills, Chester, Penn., where she is employed, Miss Susie Wilson was attacked by an unknown man. He first called to her to wait; then running up, seized her. Miss Wilson, although badly frightened, managed to release herself and went home and notified her father, who started on a search for the man.

James McGoran, a young man employed in the finishing department of the Sayles bleachery, Salylesville, R. I., sustained a very painful and serious injury to his left arm Saturday afternoon. In some manner the arm was drawn in between the rollers of the machine upon which he was at work, and before the machine could be stopped the flesh of the forearm was badly torn and lacerated.

Eugene Manville has brought suit against the Amoskeag corporation, Manchester, N. H., for \$3000, for injuries alleged to have been received in the company's Jefferson mill last June. Manville, who is but 14 years of age. had his right arm caught between a belt and a pulley. The grounds on which the suit is brought allege that the minor was given insufficient instruction in regard to his work and the negligence of a superior servant.

Howard Stockton has resigned as treasurer of the Merrimack Mills, of Lowell and Huntsville, Ala. His resignation was prewednesday of last week. His successor has not been appointed. Mr. Stockton continues as treasurer of the Essex Comnany. He has been treasurer of the Merrimack Mills for about ten years, or since his retirement as president of the American Bell Telephone Company.

Miss Agnes G. Moran and Michael T O'Malley, overseer of carding in the Troy mills, Fall River, both well known and popular residents of that city, were married last week at the home of the bride's parents, where the reception was held. The newly married couple left for Boston in the afternoon, and then went to Philadelphia. On their return they will live at 126 Buffington street, Fall River, Mr. and Mrs. O'Malley received many very handsome and useful gifts, to which the employes in the card of the Troy mill contributed very liberally.

E. T. Marr, foreman at the new storehouse of the Washington mills, Lawrence was the victim of a very serious and what may prove to be a fatal accident Tuesday ing. Shortly after 7 o'clock, Tuesday, Mr. Marr stepped on a plank which spanned the elevator well of the new storehouse now under construction to give orders to some of his men below. He is a very heavy man, and without an instant's warning the plank gave away under his weight. His body shot downward, and with great force came in contact with the bottom of the elevator well, in the basement. He was picked up by some of the workmen and was taken to the hospital in an ambulance, where he now is, suffering from a badly injured back and internal injuries.

Mr. and Mrs. David Duff, of 240 Baker street. Fall River, celebrated the 25th aniversary of their marriage last week, when many relatives and friends called upon them and brought numerous useful and ornamental articles of silverware as mementoes of the occasion. After receiving the congratulations of their visitors, the host and his guests sat down to a turkey supper, and afterwards spent the evening in social enjoyment until about midnight, when the guests took their departure. Mr. Duff, who is overseer of the beaming department in the Barnaby mill. Fall River, is a native of Scotland, and in 1875 was married to Cecilia Ray. He came to this country about fifteen years ago, and went to work in the Barnaby mill. He has held his present place about nine years.

SOUTHERN.

J. T. Wills has taken the position of boss weaver at the Rome Cotton Mills, Rome,

W. W. Polk, of Langley, S. C., is now master mechanic end engineer at the McColl Mills, McColl, S. C.

K. Little, loom fixer at the Rome Cotton

Mills, Rome, Ga., has resigned to accept a of Trinity Episcopal Church of Pawtucket, place in Hickory, N.C. and was a member of many fraternal orders.

B. A. Pipkin is the new treasurer of the Edna cotten mills, Reidsville, N. C., in place of George A. Howell, resigned.

J. A. Hudson has been appointed overseer of the spinning, spooling and twisting departments at the Whittier Cotton Mills, Atlanta, Ga.

William Hinchliffe, formerly of the Aragon mills, Aragon, Ga., is now superintendent of the Whitney Manufacturing Company, Whitney, S. C.

C. P. Emery, assistant superintendent of Lynchburg Cotton Mills, Lynchburg Va., has resigned to become superintendent of a large mill in North Carolina.

P.S. West has accepted the superintendency of the Dublin cotton mills. Dublin. He is at present filling a similar place at the Eufaula cotton mills, Eufaula, Ala.

A. W. Dimick, formerly acting as agent of the Indian Head cotton mills, Cordova, Ala., is now superintendent of the Fisher Manufacturing Company, Fisherville, Mass.

B. H. Baker, who recently resigned the position of engineer of the Dixie cotton mills, Lagrange, Ga., has been succeeded by J. S. Hicks, formerly engineer for the Hogansville mills, Hogansville, Ga.

OBITUARIES.

James Dunkerley, an old resident of Fall River, died last week at the age of 72 years Deceased had resided in that city for a great many years, and at one time was loomfixer in the Troy mill. Later he engaged in the variety store business, which he kept going until three years ago, when failing health compelled him to retire. He leaves three sons and one daughter.

Miss Elizabeth Draper, aged 15 years, died very suddenly Tuesday afternoon at the home of her parents in Pawtucket, R. I. Miss Draper was employed in the Lorraine Mills, and Monday evening worked until 9 o'clock. She was taken ill Tuesday afternoon, and a few minutes after the arrival of the doctor she died. Heart disease was pronounced as the cause of her death.

Halcyon Skinner, of Yonkers, N. Y., was killed by a N. Y. Central train, Wednesday of last week, just in back of his residence Mr. Skinner was over 70 years old. In 1849 he invented a loom the bobbins of which were so carried that figures instead of stripes could be woven in all the higher grades of carpets. His next invention was a drum for carrying the yarns, and then came a loom for weaving axminster carpets.
In 1877 he patented a loom for weaving mouquettes. This he improved from time to time, until today one man can run two looms and turn out 30 times as much carpet as he could in 1877. In 1881 he invented a body brussels lcom.

Eastwoods Eastwood, mayor of Central Falls, died at his home in that city, Saturday, after an illness of several weeks, due to blood poisoning. Mr. Esstwood's malady followed the cutting of a co n with a razor The injury caused no trouble at first, but a day or two after it happened began to show alarming symptoms. Eastwoods Eastwood was born at Clitheroe, Lancaster, Eng., in December, 1834, and was the last member of the family of John and Jane Eastwood. He came to this country when about 20 years of age, and in 1864 located at Central Falls. For some years he was engaged in various pursuits, and then entered the textile supplies firm of Robert Clews & Co., of which concern he was a member at the time of his death. Mr. Eastwood was a member of the town council of Lincoln, a member of the board of sewer commissioners and of the Central Falls fire district; also a member of the General Assembly from Central Falls in 1893-94-95, declining a further nomination. He was elected alderman from ward 1 in 1896, and was chosen mayor in November, 1899, and had just been re-elected for his recond term. Mr. Eastwood was exceedingly liberal, his charities being freely bestowed to all in need who made application. Probably no man in the city was more universally liked or respected, and he was forced, as a Republican, to accept public office because of public demand. He was senior warden

AN AMERICAN CENTRAL VALVE ENGINE.

(CONTINUED FROM PAGE 209.)

COMBINED THROTTLING AND VARIABLE CUT-OFF.

With variable load, maximum economy will be secured by a combination of throttling control for light loads, and variable iff to allow capacity for heavy overload.

This description of some of the essential features of this engine, and the reasons for their adoption, leads up to the following brief description of the valve gear and system of regulation.

THE VALVE GEAR.

When the low-pressure crank is on its upper centre, and the main valve is open by the lead, the course of the steam is from above the cylinder head down through the hollow piston rod and the ports in the main valve to the upper side of the piston. On the return stroke the valve will open a passage between the two sides of the piston, and the exhaust simply passes from the space above the piston to the space below it. On the low-pressure side the latter is in communication with the exhaust: on the high-pressure side it forms part of the receiver. The main valve is a balanced piston valve, driven by fixed eccentrics on the crank pin, hence the valve has a motion relative to the hollow piston rod, which is proportional to the throw of the eccentric, and both valve and rod have a motion relative to the frame proportional to the length of the crank. The former motion controls admission, release, and compression; the latter, as will probably be shown, controls cut-off.

The main valve is designed chieffy with eference to the clearance. The main valve is designed to release very late in the stroke, and to compress to usual receiver pressure, hence the main valve will have a fixed cut-off at \(\frac{3}{4} \) stroke or later. This, however, is merely a secondary cut-off, a safeguard against leakage through to the exhaust. Cut-off proper takes place at practically full piston speed, when the ports in the main valve run behind the stationary cut-off sleeve, and variation in cutoff is secured by adjusting the height of this sleeve. Evidently the cut-off sleeve has this in common with the ordinary throttle valve. It is stationary when the load is constant, and only needs adjustment when there is a change in load. Hence the two may be controlled by the same regulator, and if they shall be so combined and adjust. ed that fixed cut-off shall never be earlier, and the throttling action of the valve shall never extend later than that point of cut-off which affords maximum economy, say one-quarter stroke, we secure the ideal system of steam distribution for an engine subjected to variable load, with the further practical advantage of a high-speed engine without any high-speed rocker arms and other flying parts in its regulator connec-

As is to be expected in any departure from beaten paths, many interesting prob-lems have arisen in the development of this design, practically all of which have been omitted here, in accordance with the belief that the general engineering propositions laid down at the outset are of more general interest than the details of any particular engine. It is always true that how or by whom any work shall be done is ever of less importance than the result to be attained.

And in brief the result here sought may be called the reconstruction of the simple automatic engine. I he time has come when it should be radically changed or should be replaced by something better. In every essential part, save only in regulation, it fails fo satisfy the conditions with which it is confronted. Its steam consumption in the cylinder is perhaps moderate enough, but the leakage direct to the exhaust is enormous. Its first cost is perhaps low enough, but its cost at the end of ten years is beyond all reason. In its day it was perhaps good enough, but that day is now past, and the time is ripe for the substitution of a type free from the restrictions imposed by early mistakes, and by the traditions of its past, for a new and better type to meet the new demands of a new century. HALF WOOL RAGS

Dyeing Them for Shoddy Manufacture.

As an introduction to the main part of my subject it may be as well to say some thing about shoddy yarn itself, as many people have erroneous ideas about it. Shoddy must not be confounded with mungo, which has not been previously worked up into garments. Shoddy is made from old garments and coverings of every kind, stockings, jackets, and what not, and the wool is mixed with from 30 to 40 per cent. of cotton. The finer kinds of shoddy are chiefly used for clothing with a cotton warp. The inferior kinds are employed for

portieres, curtains, and similar articles.

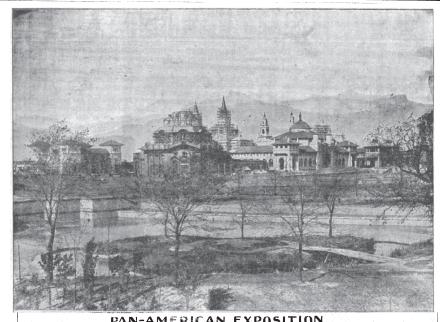
The first thing to be done is to sort the rags into colors which can remain, such as blues, greens, browns, reds and blacks, and those which are parti-colored, faded, or for other reasons must be dyed again. The light-colored ones can, however, be dyed with dark shades if rags already of those colors are not at hand in the quantities required. All that can be used in the original colors should be carefully set aside, to save the expense of redyeing and the lessening of suitability for spinning. It goes without saying that the sorting of old rags, stockings, etc., although of the greatest importance to the shoddy manufacturer, is very often a most unpleasant and even dangerous task.

The sorted rags and old articles are now washed if necessary. The washing consists in soaking in a bath of ammonia or soda for about three-quarters of an hour at 145° F. and then wringing and rinsing. If soda is used, care must be taken to wring and rinse quickly and immediately the soaking is over, or the rags will be decidedly weakened. The water should contain 2 per cent. of ammonia. If it becomes necessary to redye dark stuff they must be discharged, and this can be done at the same time as the washing by doing the soaking at 190° F. and using 6 to 7 per cent. of ammonia in-stead of 2; 2 to 3 per cent. of soda can also

The washed stuff is now sorted into loose and close pieces. The former can be dyed straight away, but the latter must be torn up to enable the dye to penetrate them.

Three distinct dyeing processes are em-ployed—dyeing with substantive dyes in a single bath, dyeing with basic dyes in three baths (tannin, antimony, and dye), and dyeing with acid and basic colors in four baths, first in an acid bath for the wool then, after rinsing, three baths for the cotton, consisting of a tannin bath, followed by a metallic mordant, and the dyebath last of all. The second and third methods, although laborious, give the brightest colors, and also those least fast to washing. Hence they are only used for curtains. tablecloths, and similar articles, which have to be brilliant in appearance, and do not have to undergo much washing. For clothing, the first and simplest method is generally adopted. Even those rags which have been passed by the sorters as of one color are not good for clothing, as the dyes are mostly very unfast to washing. Light colors are difficult to dye well on rags, as they are never quite white, and it is usually too expensive to bleach them.

The dyebath is made up of dye. 2 per cent of borax and 50 per cent. of crystallized or 25 per cent. of calcined Glauber's sait. The borax is necessary to prevent the wool from taking up the dye too fast, and so producing want of uniformity. For the same reason too high a temperature should be avoided. It is best to enter at about 145° F., raise slowly to a few degrees below the boiling point, and keep there for 40 or 45 minutes until the cotton is dark enough and then boil up gently to dye the wool. The principle of this method, which is very successful, is to allow the cotton plenty of time to get dyed before the bath is boiled up Then the affinity of the wool insures its getting enough coloring matter. If in spite of all precautions the cotton is too light at the finish it can be shaded with many sub-stantive dyes which have greater affinity for cotton than for wool, such as Diamine Fast Yellow A, Diamine Orange G and D, Diamine Brown V, Diamine Pure Blue, Diamine Brown V, Diamine Black SOOO (Cassella), Mikado dyes, Direct Blue, Eboli Green, Toledo Blue V (Muhlheim), Columbia Blue G and R, Congo Fast Blue B and R, Zambesi Blue BX, Curcumine S, Columbia Brown and Green, Zambesi Blue G and Zambesi Black B (Berlin A. G.), Direct Yellow R, Chloramine Orange, Chloramine Yellow, Benzo Pure Biue, Diazo Black



PAN-AMERICAN EXPOSITION.

JTH, SHOWING WATER GARDENS IN FOREGROUND, GRAPHIC ARTS
THE LEFT, TEMPLE OF MUSIC IN CENTER AND MACHINERY BUILDING BEYOND BUILDING AT

BHN, Benzo Chrome Brown B, Heliotrope, Pluto Black G. Direct Black V f (Bayer).

Heating must be suspended while the cotton is being shaded, to provent the wool from snatching the color. If the wool has already got enough, borax or soda must always be added before shading the cotton. For shading the wool itself, if necessary, there are many dyes available, such as Indian Vellow G. Croceine Orange and Scarlet, Rhodamine B, Acid Green 3B, Sulphon-ezurine D, Sulphocyanine GR and 5R, Sulphon Brown R, Sulphon Black, Wool B ue N, Atkati Violet LR, N w Victoria Blue B (Bayer), Troppoline, Indian Yellow, Orange ENZ. Croceine AZ, Alkali Blue, Alkali Violet, Lanacyl Blue, Naphthol Black (Cas-Vilet, Lanaeyi Blue, Naphunoi Bitek (Usseula), Acid Blue SC, Orange A, Domingo Green and Black, Azo R.d B (Muhlhein), Poncesu 3RB, Wool Blue 2B, Azo Acid Y Ilow, Mandarin, Guinea Violet and Green, and Weol Black (Berliner A.G.) Croceine Orange, Acid Green 3B, Orange ENZ Orange A, Az) Red, Mandarin and Guinea Green are the worst of this list, because they are not very fast to washing. They can, of course, be used for articles which will not have to be washed. The following is an account of the best dyes for

producing the shades mentioned:

Canery Yellow on white or pale drab
rags: Thiazal Yellow (Bayer), Thiaflavin rags: 101-201 X-110W (Dayer), Inian vin Green and Direct Black C (Munitiem), Dia(Cassella), Alkali Y-llow G (Dah land Co.)
Guiden yellow on white or pele duab rags:
Chrysophenine (Bayer, Muniheim, Berlin),
Diamine Guid Y-llow mixed with Diamine
Fast Y-llow A (Cassella), Alkali Y-ell w R
Black on dark parti-colored rags: Pluto
Black Ba and Half Wool Black (Bayer),

Orange on white or pale drab rags: Diamine Orange B (Casselia), Toluylenc Orange
G, Pluto Orange G, Congo Orange R (Baycer), Chrysophenine and B ne purpurine 4B
thiring with Alkali Blue or New Victoria (Bayer, Muhlheim, Berlin), Orange TA Blue.
(Bayer), Alkali Yellow and Alkali Purpur-

ine 4B (Dabl).

Scarlet on white, pale drab, or pale red rags: Benzopurpurine 4B and Chrysoph n ine (Cassella, Bayer), Alkali Purple Red 4B, and Alkali Yellow (Dahl).

Red on white, pale drab, or pile red rags: Diamine Scarlet (Cussella), Banzopurpurine 4B (Bayer, Mubheim, Bartin), Alkali Purple Red 4B (Dahl).

Dark Red on pale drab, pale red, or faded dark drab rags: Hessian Purple N (Muhlheim, Bayer), Diamine Fast Red F (Cassella), Alkali Purple Red 4B, and Half Wool Bordeaux 271 (Dahl).

Bordeaux on pale red, pale drab, or faded dark drab rags: Congo Corinth G and B (Bayer, Mublheim, Berlin), Diamine Bordeaux B and S (Cassella), Half Wool Bor-

Dark Brown on dark drab or parti-colored rags: Benzo Chrome Brown and Pluto Oxydiamine Black SOOO (Cassella) Congo Orange, Pegu Brown, and Direct Black C (Muhlheim), Columbia Browna nd Zam-

besi Black B (Berlin A.G.), Alkali Yellow Half Wool Bordeaux and Half Wool Black 279 (Dahi).

Gendarme Blue on pale blue, pale drab, or pale sate rags; Chicago Blue 6H, and Alkali Blue (Berlin), Direct Blue B, and Alkali Blue (Muhlheim), Brilliant Benzo Blue, Pure Blue, and Alkali Blue (Bayer), Diamine Pure Blue FF, and Alkakli Blue (Cassella), Half Wool Blue B 274, and Alkali Blue (Dahl), New Victoria Blue B (Bayer).
Violet on pale drab, pale blue or pale slate

rags: Diamine Blue 3R, Diamine Pure Blue FF and Alkali on Formyl Violet (Cassella), Azo Blue, Diazo Black B and Alkali Violet LR (Bayer), Toledo Blue, Congo Corinth B and Alkaline Blue R (Muhlheim,), Chicago Blue 4R and Guinea Violet 4B (Berlin A.G.). Half Wool Violet B and R 273 (Dahl).

Dark blue on pale blue, dark blue, pale

drab, pale red, palejor dark slate, or faded dark drab rags: Diamine Blue BX, Oxydismine Black and Lanreyl (Cassella). Diazo Black B, Pluto Black BS and Sulpho cyanine (Bayer,) Eboli Blue B, Toledo Blue V, Direct Black C and Acid Blue SC (Muhlheim), Columbia Blue, Zumbes Black B and Alkali Blue (Berlin), Half Wool Blue 273 and Half Wool Black 279.

Green on pale green, pale drab, faded dark drab, pale blue, or pale slate rags: Eboli Green and Direct Black C (Muhlheim), Dia-

Half Wool Black G 279 (Dahl), Direct Black Eboli Blue and Green (Muhlheim), Zambesi

For deep blue, dark parti-colored rags can be dyed with a neutral blue or violet wool dye, adding when the cotton is dyed a black dye for the wool with the usual precautions ove mentioned.

Black rags with white stitches in them are treated in a short lukewarm bath, to which are added 50 to 70 per cent. Glauber's salt, and a cotton-dye, such as Direct Black 21370 (Bayer). The bath can be used again, adding, however, each time, 1 per cent. of soda, well as the necessary dye and Glauber's t. The soda is to neutral ze acid left in salt. the bath by the preceding batches of rags.

SHEEP AND GOAT SKINS The Different Kinds Bred in Spain.

By CONSUL-GENERAL J. G. LAY.

There are several kinds of sheep bred in Black BS (Bayer), Diamine Brown M and Spain, but the most valuable, on account of the excellent quality of the skins, are those found in the provinces of Murcia and Catalonia and in the district known as La

Mancha, in New Castille; also those in the province of Extremadura, which, however, are esteemed more for their fine wool than for the pelt. It is a notable fact that the finer the wool the poorer the skin for tanning purposes.

It is in Extremadura that the celebrated Merino sheep are bred. Merino wool was at one time considered the finest obtainable in Europe, but, like many other natural sources of wealth in Spain, sheep farming has suffered from lack of enterprise and energy. Spanish sheep are white, except-ing those of La Mancha, which are black.

Sheep are there classified under the heads of lambs and sheep or ewes. Until the animal is one year old, it is sold as a lamb. The skin of the lamb is used for making gloves and is classified as "firsts" and "seconds," according to the fineness of the grain and the number of defects in the skin. The skin of the Extramadura sheer is unsuitable for gloves and can only be used for inferior articles.

In Millau and St. Julien, in France, in England, and also in parts of Germany, there are large tanneries devoted to the preparation of the skins imported from Murcia, Catalonia and La Mancha. These tanneries, either directly or through com mission firms, send a large proportion of their output to the United States, which is an important market for glove skins.

When the animal is more fully grown, its skin can no longer be used for making gloves, and it is then applied to the manufacture of fancy goods, bookbinding, etc. Sheepskins are prepared in two ways: when tanned with sumac they are used for making cigar cases, pocketbooks, purses, etc.; but when required for leggings, aprons used by agricultural laborers, harness, or anything that must be subjected to wear and tear, the skins are oak tanned. The former—i. e., those prepared with sumac are extensively exported from Spain to Germany, whereas the latter find, or used to find, a good market in Cuba, Porto Rico and the Philippines.

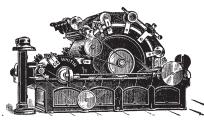
The manner in which the skin is removed from the carcass is as follows: A small hole is made in one of the hind legs of the animal: a strong pair of bellows is then in-serted into this little aperture and the air is blown in until the carcass is well swollen. The belly is then slit open from end to end and the skin carefully removed, if necessary with the help of a knife. The skins are collected by men who devote themselves exclusively to this work. After being exposed to the sun until a slight crust is formed on the flesh side, they are stretched on ropes in the shade until completely dried, and are then ready for export.

These are produced in large quantities in the vicinity of Badejoz and generally in all the south of Spain. The skin of the very young kid is used only for ladies' fine gloves and is prepared principally at Anno-

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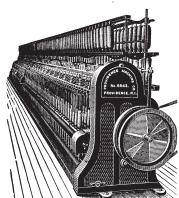


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also find a market in the United States in a prepared state; but with this sole exception the entire supply of Spanish kid and goat skins is exported in the raw state to the United States for tanning into fine shoe leather, etc. This trade appears to be in the hands of French commission merchants, and I see no reason why our importers should not have their own buying agents in this country and secure their supplies at a much lower price. I shall be glad to give being stacked. For eany firm the names of reliable agents who balled in small presses.

nay and Grenoble, in France. These skins would execute their buying orders in the same way as is now done for the French middlemen.

The business is done here by direct contracts with the butchers, and also with sundry "collectors." These go around regularly to all the villages and bring the skins to the dealers in the towns. In order to preserve the skins from damage by moths in summer dealers use naphthalene, which they sprinkle over them while they are being stacked. For export the skins are

The natural condition of the water which supplies this System is of no consequence whatever, for all water which is used is filtered through a Loomis-Manning filter, so that the System in all cases is supplied with water which is absolutely pure. There is no waste water, as only the water which is absorbed by the air of the rooms is used.

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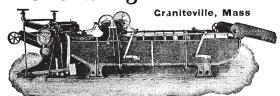
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BOSTON JOURNAL OF COMMERCE

AND TEXTILE INDUSTRIES.

SATURDAY, DEC. 8, 1900.

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W. I. HOLMES, Treasurer.

[ENTERED AS SECOND-CLASS MATTER.]

Subscribers who fail to receive their copies of the BOSTON JOURNAL OF COM-MERCE and TEXTILE INDUSTRIES are requested to notify us, and duplicate copies will be promptly forwarded.

CONTENTS.

Pag	
Northern Industrial News 207	I
Steam and Electrical Engineering 208	3
Gas Engines.	
The Gas Engine.	
An American Central Valve Engine.	
Wool Markets 210)
Boston Philadelphia. New York.	
Personals 21	1
H If Wool Rags 215	2
Sheep and Goat Skins 21	2
Editorial 21	4
Better Cotton.	
Mistaken Ideas.	
Textile Designing.	
Mixing Cotton.	
Foreign Yarn and Cloth Markets 21	5
Cotton Seeds	5
Financial 216	6
Cotton Chats	6
Cotton.	
Weaving Cotton.	
Differential Motion Cones.	
Cotton Magufacturing in China.	
Woolen Chats	
Finishing of Woolens.	
Weaving Carpets.	
Woolen Piece Goods.	
Woolen Goods.	
Southern Industrial News 21	R
Dyeing and Bleaching	n
An Indian Dyer.	•
Papers Read at A. M. S. E. Meeting.	
Dves and Chemicals	n
Insurance	
Boller Insurance.	•
New England Exchange Raises Rates.	
Woolen and Worsted Yarn22.	•
Woolen and Worsted Rags22	
Cotton Yarns and Warps22	
Market Reports. Miscellaneous 22:	
Alcohol Cotton Waste, Hemp and Jute	
Starch, Tallow, Paper Stock	•
	0
Cotton	
Eveners	

Better Cotton.

With the increased demand for cotton goods of a finer grade and the southern mills paying more and more attention to them, we find the mills looking for finer grades of cotton from which to manufactnrer the cloth. Today the mill that desires to make the finest lines of cotton goods are forced to buy Sea Island or Egyptian cot-We have not got a single truly American cotton that can be used to spin good varns above 80's. Sea Island cotton can be used for yarns as fine as 400's, and Egyptian can easily be spun to 180's; but when we come to the best grade of what is classed as true American cotton, it is hard for the spinner to go over 75's to 80's.

Many efforts have been made to grow a finer grade of cotton. A man in Texas undertook to find some Egyptian cotton in that State. We had the pleasure of examining samples of it, and although it was but the first year's growth, it was a simple matter to detect that its grade was not up to that of the cotton as grown in Egypt. It

that set by it at home. Many efforts have been made in this country to get a cotton with a longer and better staple than that but up to the present time these efforts have not met with much success.

The United States Department is now engaged in a series of experiments with a view to producing a specie of hybrid cotton that will have a staple of a finer quality and greater length. The experiments are being carried on at Charleston, S. C. The object of the tests is to produce a cotton that will have a staple as long and firm as Sea Island and one that can be grown in the cotton belt. Tests are also being made with all varieties of Egyptian cotton. The department is very reticent in regard to the success of its experiments, but it is rumored, with how much truth we cannot say, that the tests are meeting with fair success and should they be as successful as is hoped will be the case, our Southern planters will be able to produce a cotton that will have a staple the equal of any now being grown in Egypt or any foreign country.

From what we have been able to learn, we ascertain that the new variety of hybrid cotton will not only have a longer and finer grade staple than our upland cotton, but that it will also possess several other advantages over our present staple. It is reported that these plants possess much more vigor than do the present ones. That the bolls have much more cotton in them, and that these bolls are much easier to pick. All of these advantages, if correct, should make the cotton the superior of the present Egyptian v rieties.

At the present time the majority of our mills have to content themselves with a pretty poor quality of cloth. Some of it is not more than inch staple, and the spinning of it has become quite an art. It has often been claimed that the most successful mill was the one that could use the poorest grade of cotton for a fine grade of cloth. While there is much truth in it, it cannot be said that such is always the case. There are quite a number of mills in this country that use Egyptian cotton almost entirely. If these mills could only buy an American cotton the equal of that they are using, they would be able to make a much more profitable showing than is the case today.

As time goes on the tendency toward finer lines grows more and more pronounced. The south is paying more attention to it, as well as the north. With our high-priced labor, the mills of this country cannot afford to pay so much attention to the manufacture of cheap lines. They must leave them to the countries where the labor is cheap. There is much more profit for them in the manufacture of finer grades, and while we would not have them abandon the manufacture of the lower grades, we would urge upon them the manufacturing of finer grades in larger amounts; and if the experiments now being conducted by the Department of Agriculture are as successful as is now hoped will be the case, they will be able to obtain a high grade of cotton at their very doors for use in the manufacture of such goods.

Mistaken Ideas.

The question of "Trusts" and the evil which accompanies them has long been before the public, and there was but one topic, Free Silver, that received as much attention during the late political campaign as did this one. The followers of Bryan did all in their power to make this one of the leading issues of the day, and while the Republican party regarded it as a minor issue, President McKinley in his letter of acceptance showed that he was very much opposed to all Trusts that affected the best interests of the laboring classes

In its issue of November 26th the Atlanta Constitution publishes a "special" from Columbus, Ga., which shows a pitiful state o affairs in that city. According to this article the batting and wadding trust has forced the wadding mill, which had been planned seems to be impossible for a planter to for that city and was already partially

keep the standard of a foreign cotton up to built, to sell out to it, and has in this way taken from the city an industry that "would have given employment to a considerable number of operatives, and would now possessed by our "Upland" cotton; have been the means of turning loose several hundred dollars weekly into the channels of trade."

It certainly is to be regretted that the projected wadding mill was not completed and that its operation has been prevented by the so-called "batting and wadding trust;" but we certainly cannot agree with our Southern contemporary in its views either as regards the trust or the result. We do not doubt but that the trust approached the organizers of this mill and that, through coercion and money, persuaded them to give up their projected mill. We know of several instances of a similar character, and we can go still further and say that we know of capitalists who have organized companies and started the building of factories for the very purpose of selling out to a "trust."

In such a case as the one cited here with the trust is not the one to criticize. It is but natural that the trust should take every means in its power to protect its business, and no one can fairly blame it for securing the cessation of this new project. The ones, in our opinion, who are the most to blame are those who, having undertaken the project, abandoned it through coercion and financial inducements. So far as we can ascertain the trust was the one to suffer the most in this deal. It had to pay the organizers for their labor and in return for this financial outlay received nothing.

It is not our intention to defend the Trusts. There is nothing farther from our thought. We believe that trusts and combinations which have for their object the control of their trade are bad and should be destroyed; but we do not look upon them as does our Southern contemporary. The formation of Trusts is but the natural outgrowth of our financial and economical conditions, and their downfall will be brought about, not by political methods and party opposition, but by natural causes. Although the general public has not paid much attention to them in the past, they have existed for many years. The past two years have witnessed many new ones, and it is the rapidity with which they have multiplied during that time that has attracted the public's attention.

The general public has it in its power to destroy the trusts, and it remains for it to exercise that power. We knew of several cases where the public has used that power, and if more would only use it, it would be a matter of but a short time before the Great Question would be a matter of the past. We know of a manufacturing concern which was on the verge of financial ruin when several of its competitors combined, forming a trust, and ever since that day the company has done a handsome business. Had it not been for the combination this company could not have lasted another year. We also know of a cotton duck mill that has made larger profits since the formation of the cotton duck trust than was the case before. We know of trusts that have lost customers which they had before they combined, these customers now buying of outside houses.

If the buying public should purchase its goods from single concerns, it would soon settle the trust question. So long as they receive the public's patronage it will be impossible to prevent their operations; unless the public encourage 'outside" houses. Our Southern friend is taking the wrong view of the matter. The promoters and builders of the wadding mill at Columbus were well paid for their trouble, and that, too, at the expense of the trust. Now let some other capitalists take up the projecting of a mill at that place. If they do we can assure them that they will either get well paid for their trouble by the trust, or that they will be able to operate their mill with profit to themselves as well as the operatives of that locality.

Textile Designing.

The past few years have witnessed a great glance. Manufacturers should give it more

advancement in the education of the people of this country in the matter of art in the home and dress, as well as in one's general surroundings. The exhibitions of arts, crafts, etc., that are held annually in our larger cities, the lectures on artistic designs and decorations, the magazines and periodicals, the schools and clubs, have all done much toward advancing the development of artistic beauty.

I The people have now been educated up to such a state that they are better able to realize the difference between the good and the bad in all kinds of works. There never was a time in the history of the country when the general buying public payed as much attention to the true artistic merit of an article, which they are about to purchase, as is the case today. Heretofore they have been governed by the styles and fads, and while, even now, they are to some extent governed by them, they are paying much more attention to the artistic merit and the time, when they will be wholly governed by it, is not far distant.

What has been the result of this change? Nothing more nor less than the demand for foreign-made goods. This advancement in the purchasing of goods of higher artistic merit has forced purchasers to seek the goods of other countries. It is to be regretted that the artistic advancement on the part of our textile manufacturers has not kept pace with that of the buying public. There has been a good advance in the manufacturing line; but it is far behind that of the buying public, and until it reaches it. our best purchasers will be compelled to purchase foreign-made goods.

We do not mean to say that our textile manufacturers do not produce any goods of true artistic merit. Such is not the case. There are some very handsome textiles manufactured in this country; but, alss, they are much in the minority. Some of the goods turned out in this country have been, from an artistic point of view, almost disgraceful. There is, no doubt, a great call for "fad" gooods which are entirely lacking in artistic merit; butthere re many thousands of dollars spent for foreign goods a year on account of their artistic qualities which might be spent for American-made goods if our manufacturers would only make such.

Manufacturers would not find it a very difficult task to produce cloths with designs of great artistic merit. What they most need to strive for are harmony and simplicity. They could do no better than study Nature and take her as an example. There they will find all the fundamental and underlying principles of good designs. Textile designers who copy nature truly will never make mistakes in harmony and arrangement of color, as she never does. Nature's natural forms furnish the best material for the basis of units of all designs. A designer who takes the material that nature furnishes, and uses it in goods that it will be appropriate to, cannot fail to produce a design that will have much artistic merit. Natural forms cannot be represented in their natural state in any kind of goods; but must be used simply as a basis of material, and must always be conventionalized.

A thing that the designer too often neglects to consider is the appropriateness of a design to a line of goods. Oftentimes he seems to think that any design can be made to fit any class of goods; but such is not the case. A design that would be appropriate for a dainty silk or muslin dress goods will not be suitable for a heavy woolen dress goods. For the first class, dainty simple conventionalized flower forms are very nice; but they would be entirely out of place on the latter goods. Designings for wall coverings should be very different from those for floor coverings, and vet we have seen designs for portiers that were no more fitted for such goods than for a muslin dress. It is so with every class of goods. The material and purpose of each should be considered first of all, and then the nature of the design, arrangement and coloring.

This matter is one of more importance than one would think was the case at first

they can catch a valuable high-priced trade which is now buying foreign made goods. today. This is a very valuable trade, and one which our manufacturer should exert his utmost endeavor to acquire. If he will try to improve his production, he will soon produce as artistic goods as can be made in any part of the world.

Mixing Cotton.

There is probably no part of the operating of a Southern cotton mill that is at one and the same time so condusive of economical results and receives so little attention as does that of the proper preparation of cotton for use. It may seem strange to many of the readers of this article that this subject need to be spoken of, but nevertheless, it has been our experience that many of our Southern cotton mills entirely disregard the matter which we refer to. We have seen many cases where the cotton has been opened and the contents of one bale used without giving it a chance either to expand or to become acclimated so to speak.

Before a bale of cotton is used it should be opened several days. It should be spread out on the floor and allowed to become dry and exposed to the air. Many mills seem entirely to disregard this important feature, and as a result they experience a harder time in the manipulation of the staple. It does not do the opener any good to fill it with cotton which has just been taken from the bale, and the picker laps are not in such good condition when the cotton is used in this way, as is the case when it is allowed to expand for a day or so. The cotton when first opened is in a hard and melted condition, which works detrimentally where the cotton is used at once. It opened and spread out for about twenty-four hours it will be found that the cotton can be worked much more easily, and that the laps are much better in quality.

Another process that is too often neglected, and one that is as important and almost a part of the former, is the mixing of the staple. Many southern mills entirely discard such a process. They seem to feel that as they are employing the same kind of cotton there is no necessity for mixing the bales. Such is a very wrong idea, and any mill that has been operating by it should at once discard it. Because the cotton is all of one variety is no sign that its staples are of the same length or that the amount of moisture is the same. Staples vary very much in length, and it is surprising how much more moisture one bale of cotton can have than another. The mixing of cotton from several bales, even though they be filled with the same kind of cotton, will bring very beneficial results. It will make the average lengths of the staple much evener and the moisture will be lessened.

If our cotton mills are successfully to competee with those of the world, they must employ every possible means of minimizing their ruuning expenses and increasing the quality of their production. While the matter of opening and mixing of the staple does not seem to be a very important one, it is, and much better results may be obtained by?paying more attention to them

attention than they do today. By so doing than are now being obtained in many of connection. There are outstanding loans our cotton mills as they are being run

FOREIGN YARN AND CLOTH MARKET.

MANCHESTER, Nov. 27-Market conditions here continue to improve. There is an increase of inquiry and some actual business is noticeable in several sections Progress, however, is irregular, and it is not easy to estimate the volume of transac-

The hardening in cotton brought out orders, but buyers have been holding back while makers are more independent. Many buyers are skeptical regarding the reports of frosts in Texas, especially in view of easier cotton in New York. Although inquiries were numerous, com-

paratively few offers were acceptable to the producers. Prices were irregular. In some in tences advances were obtained, but in

others reduced rates were offered.

Orders for India were placed wherever manufacturers would accept low prices, but the orders wired were usually too low. Calcutta offered a very quiet outlet. Inquiry for China is improving.

COTTON SEED.

Effort Being Made to Compel Gulf Road to Adopt New Mileage Rate.

The Attorney General of Mississippi has filed a mandamus in chancery to compel the Gulf and Ship Island road to adopt the new mileage tariff on cotton seed promulnew mileage tariff on conton social paragrated by the Railroad Commission. This between the other gated by the Kanfood Commission. The Mississippi railroads and the Railroad Commission into the Federal courts. The injunction suits filed by the Illinois Central and Yazoo and Mississippi Valley Railroads will be heard in the Federal court next

The Attorney General is understood to have arranged a plea that the State court has no jurisdiction, as a Federal question is involved.

A meeting for the examination of the affairs of William Browne & Sons and Phœnix mills will be held at the office of Richard S. Hunter, referee in bankruptcy, 308 Chestnut street, Philadelphia, Tuesday, December 11, 1900, at 3 o'clock P. M. B.i.i.

A Prosperous Philadelphia Concern. [

J. E. Rhoads & Sons, manufacturers of leather belting and belt preservers, and extensive dealers in all kinds of rubber goods, report that they are having a handsome business. The true merit of the goods manufactured by this firm are too well known to need further mention here. Their belt preserver is of great value, and the sales of it show that it is fully appreciated by belt users.

FINANCIAL.

The Boston money market is in a very mixed condition. The tone, the last few days, has been much firmer, though the market is very unsettled. Call money is firmer and it is the concensus of opinion that whatever streng'h is witnessed the next few weeks will be more pronounced in this



TRANSMISSION ROPE MAKERS.

Send for "A LITTLE BLUE BOOK ON ROPE TRANSMISSION."

at 3 per cent., but new money is mostly

quoted at 4@4½ per cent.
In New York money on call ranges from 4 to 5 per cent. Time money is not quite so plentiful as it has been of late, although rates are unchanged. Rates are 4 per cent. for 60 to 90 days, 61 for four months and 41@5 for 6 months.

DIVIDENDS

The following mill dividends are announced:

Amory Manufacturing Company, Manchester, N. H., 3 per cent., semi-annual.

Appleton Company, Lowell, 6 per cent., semi-annual.

Stark mills, Manchester, N. H., 3 per cent., semi-annual.

Wamsutta mills, New Bedford, 11 per cent., quarterly.

	Increase.	Decrease.
187,563,000		000,000a
5,868,000		7,000
140,356,000		3,419,000
65, 55,000		2,000,000
50,572,000		2,303,000
13,869,000		1,195,000
15,635,000		553,000
297,750		500
9,272,050		466,000
13,003,000		551,000
1,674,429		817,571
9,971,429		2,103,571
	5,868,000 140,356,000 65,155,000 50,572,010 13,869,000 15,635,000 297,750 9,272,030 13,003,000 1,674,429	\$187,563,000 5,863,000 140,356,000 65,45,000 65,45,000 13,664,000 15,650,000 267,755 9,272,0.0 13,003,000 15,033,000

U. S. GOVERNMENT BONDS.

	Bid.	Asked
4s, reg., 1907	114%	1151/4
4s, coupon, 1907 1	1.15%	1161/2
4s, reg., 1925	138%	139
4s, coupon, 1925 I	135%	139
5s, reg., 1904	:13	113 %
5s, coupon, 1904	113	113%
3s, reg., 1908-18	109%	110%
3s, coupon, 1908-18 I	109%	110%
28, reg 1	01%	105
4s coupon	105	105%

STOCKS OF NEW ENGLAND ROADS.

Boston and Albany	250
Boston and Lowell	248
Boston and Maine	196
Boston and Providence	005
Eastern R. R. 6s	113%
Fitchburg pref	1381/2
Fitchburg common	
Maine Central	161
New York and New England 6s	109
New York and New England 7s	113%
N. Y., N. H. & H	211%
Old Colony	202
Rutland 6s	

FALL RIVER MILL STOCKS.

Reported by G.M. Haffards & Co., Bankers and Brokers 64 Bedford street, Fall River.

	Par.	Bid.	Aske t.	Sa'e
American Liner Co	100	921/2	97	***
Arkwright Mills	100		92	
Barnaby Mfg. Co	100			
Barnard Mfg. Co	100		1071/2	107
Border City Mfg. Co	100	116	٠	117
Bourne Mills	100			
Chace Mills	100			
Conanicut Mills	100			
Cornell	100			
Crystal Spring Bleachery	100		***	
Davoi Mills	100		110	
Fall River Manufactory.				
Fall River Merino Co	100	***		***
Fall River Spool Bobbin	Co 100			***
Flint Mills	100	105		
Grantte Wills				
Hararaves Mills	100	103%		
Kerr Thread Co	100	***		
King Philip Mills	100	•••		
Laurel Lake Mills	100	131		135
Merchants' Mfg. Co	100	105	110	1075
Mechanics Mills			95	2017
Metacomet Mfg. Co			50	
Narragausett Mills	100			
Osborn Mills	100		97%	974
Parker Milis	100		105	105
Pocasset Mfg. Co			115	
Richard Borden Mfg. Co				
Robeson Mills				
Sagamore Mfg. Co	100			
Seaconnet Mills	100		98	97
Shove Mills				
Slade Mills			85	
Stafford Mills			110	110
Stevens Mfg. Co			••	
Tecumseh Mills				
Troy C. & W. Manufact-				
Union Mtg. Co			1321/4	183
Wampanoag Mills			98	
Weetamoe Mills			65	
			*-	•••

NEW BEDFORD MILL STOCKS.

Acush.et	100	822
Bristol Mfg Co	100	92
City Mfg. Co	100	116
Dartmouth	100	136
Grinnnell new	100	125
Hathaway Mfg. Co	100	14914
Pierce	100	147
Potomska	100	951%
Wamsutta	100	106%
Whitman	100	112%

NEW ENGLAND MILL STOCKS.

Name.		Par.	Sale.
American Hosiery	Co., N. Britain, Conn	100	••••
American Woolen	Co., Boston, pref	. 100	78%
	Co., Boston, com		21%
	fanchester, N. H		45
Amoskeag, Manch	ester, N. H	1000	1725
Androscoggin, Lev	viston, Me		125
	Mass	100	107½ 108
	ce, Mass	100	54%
	e, Mass	100	135
	le (new) Clinton, Mass		831/6
	88		817
	Mass	1000	350
	Bondsville, Mass	700	975
	ring Co, Bristol, Conn		95
	unswick, Me	100	68%
	e, Mass	100	87
	. н	100	26
	Tass	100	18
	ston, Me	1(0	25
Cocheco, Dover, N	(. н	500	287
	[ass	100	175
Dwight, Chicopee,	Mass	500	1005
Edwards, Augusta	, Me	100	100%
Essex, Lawrence,	Mass	100	150%
	, Mass		3636
	isnerville, Mass		100
Frankan, Lewisto	ц, М		101
Great Falls, Somer	sworth, N. H	100	1503
Hamilton, Lowell,	M.ss	1000	855
Hamilton Woolen	Co., Amesbury, Mas	100	46
	o., Thompsonville, C		75
	B		39
	N. H		1020
	ter, Mass		344
	rd, Me		786
	, Mass		150%
	ville, Me		95
	dass		682½ 75
Lowell Bleachery	, Lowell, Mass	. 100	84
Lowell Hoslery, L	owel, Mass	. 500	780
Lyman Holyoke	hop, Lowell, Mass	. 100	68%
Manchester Manch	Mass chester, N. H	. 100	97½
	well, Mass		10034
	a		106%
	ll, Mass		108%
	l, Mass		tiy9
	mont, N. H		1150
Nashua, Nashua,	N. H	. 500	670
	, Mass		6034
N. E. Cotton Yarı	Co	. 100	161
Newmarket Mfg.	Co., Newmarket, N. I	1 500	200
Norway Plains, R	ochester, N. H	. 500	820
	g Co., Ware, Mass		2000
Pacific, Lawrence	, Mass	. 1000	1950
Pepperell, Biddef	ord, Me	. 100	259
Pembroke, Sunco	ok, N. H	. 100	26
Salmon Fails, Sal	mon Falls, N. H	. 800	178
	., Lowell, Mass		120
Stark, Mancheste	r, N, H	. 1000	980
	k, Lowell, Mass		155
do. rights	••••	. 11	9%
Thorndike Mig.	Jo., Lowell, Mass	. 1000	1087 /4
Webster, Suncool	, N. H	. 100	26
willimantic (Con	n.) Linen Co		25
"ork, Saco, Me	••••••	. 700	830
-		-	

SOUTHERN MILL STOCKS

	Factory stock. Par.	Bid.	Ask
	Abbeville Cotton Mills 100 00	96 00	100 00
	Aiken Mfg Co 100 00	95 00	98 00
	Anderson Cotton Mill 100 00	130 00	150 00
	Arkwright Cotton Mills 100 00	122 00	126 00
	Augusta Factory 100 00	82 00	88 00
	Avondaie Mills 100 60	80 00	84 00
	Belton Cotton Mills 100 00	104 00	105 00
	Bennetsville Mfg Co 100 00	105 00	112 00
	Cannon Mfg Co 100 00	181 00	190 00
	Clifton Factory 100 00	180 00	190 00
	Courtenay Mfg Co 100 00	118 00	120 00
	Darlington Mfg Co 100 00	95 00	99 0 0
	Delga_o Mills 10 00	100 00	102 (0
	Dilling Cotton Mills 100 00	100 00	165 00
	Eagle & Phoenix Mfg Co 100 00	104 00	107 00
	Edna Cotton Mills 100 00	120 00	125 00
	Enoree Mtg Co 100 00	120 00	126 00
	Enterprise Mfg Co 100 00	100 L0	103 00
	F. W. Poe Mfg Co 100 00	120 00	125 00
	Gaffn.y Mfg Co 100 00	122 00	125 00
	Graniteville Mfg Co 160 00	160 00	167 00
	Granby Mills 100 00	100 00	102 00
	Greenwood Cotton Mills, 100 00	10236	104 00
	Grendel Mills 100 00	101 00	10834
	Hend, rson Cotton Mills 100 00	120 00	125 00
	Henr etta Mills 100 00	135 00	205 00
	Indian Head Mills of Alabama, 100 00	100 00	103 00
	John P King Mfg Co 100 00	100 00	108 00
•	Langley Factory 100 00	117 00	120 00
	Laurens Cotton Mills 100 00	140 00	145 00
	Lockhart Mills 100 00	109 00	11236
	Loray Mills 100 (0	99 00	160 00
•	Lynchburg Cotton Mill Co 100 00	125 00	150 00
	do preferred 100 00	145 00	150 CO
	Mills Mfg Co	92 00	96 00
	McColl Mfg Co 100 00	120 00	125 00
	Modena Cotton Mills 100 00	142 00	145 00
	Morris Cotton Milis 100 00	110 00	115 00
	Newberry Cotton Mills 100 00	115 00	122 00
	Orr Mfg Co 100 00	103 00	106 00
	Odeli Mfg Co 100 00	110 00	114 60
	Pacolet Factory 100 00	250 00	275 00
	Pelzer Factory 100 00	182 00	187 00
	Piedmont Factory 100 00	175 00	180 03
	Union Cotton Mills 100 06	134 00	138 00
	Warren Mfg. Co., preferred 160 00	104 00	107 00
	Warren Mfg. Co., common 100 00	88 00	90 00
	Mi cellaneous:		
	Charleston Bridge Co 25 00	7 00	7 50

CANADIAN MILLS.

able F I Co.....

.... 50 00 50 00

Name.	Par.	Sal
Canadian Colored Cotton Co	100	90
do (bonds)	100	99
Dominion Cotton Co	100	92
do (bonds)	100	110
Merchants' Cotton Co	100	128
Montmorency Cotton Co	100	110
Montreal Cotton Co	100	185

CHATS. COTTON

The name, address and "nom de plume" must annear upon each letter or "Chat" when sent to us, otherwise t will not appear. This will insure accuracy and save much time by reference. Correspondents will write with ink, and on one side of the paper only.

Method of Cultivation—Ginning—Baling— Structure of Fiber.

Editor Cotton Chats:

METHOD OF CULTIVATION.

The method of cultivation and time of pick ing vary widely, depending on the location This variation is due to differences in soil. temperature and climatic conditions. The grower begins his planting just as soon as there ceases to be any danger from frost.

There are two distinct periods in the life

of the plant. The first being from planting to midsummer. During this time moisture sunshine and cultivation, are wanted in plenty. The second period is the midsummer to picking. During this time the ground is not cultivated, but is allowed to harden. This is the time when the planter wants the weather to be dry and hot. The seeds are dropped or drilled near together in long rows, three to four feet apart. The rows generally follow the side of the hills in a horizontal directiot so as to prevent the rain washing them out. It takes the plant four or five days to get above ground, and as soon as the plant gives evidence of strength, the rows are chopped into hills 8 to 10 feet apart. The weaker plants are then pulled from thase hills. Constant cultiva-tion is required until the plants begin to flower, 75 to 80 days after planting. From the time the first blossom appears until the arrival of killing frosts, it is continually flowering.

When the blossoms first appear, they are creamy white in color, theo red and then blue. They drop off on the third day, and then the boll begins to form. It attains its full growth in from six to eight (weeks, at which time it bursts open and exposes 3 to 5 cells. These cells contain the seeds which are attached to fibres. The pickers get from 40 to 50 cents a hundred weight for their labor. There are two to four pick

GINNING AND BALING.

The object of ginning is to remove the fibre from the seeds. As the cotton is picked, about two-thirds of it is seeds and the remaining third fiber. At the present time there are two kinds of gins in general use, the saw gin and the roller gin.

In this country the roller gin is used most

for ginning Sea Island cotton, although each year sees it more extensively used for ginning other kinds of cotton. This kind of gin has a table on which the cotton is fed to a leather roller made of walrus hide. On the face of this roller, at the place where the seeds are delivered, is a steel blade set close enough to the roller to prevent the seed from passing between it and the roll.

This roller revolves toward the blade, or doctor, as it is technically called, and being rough on the surface, draws the fibres under the doctor. After the fibres have been engaged and drawn under the revolving roll, the seeds fall through holes in the feeding table and the fibers that have been brushed from them are received on the other side of the roll. This gin is very easy on the fiber; but its production is much less than that of the saw gin. It is suited for smooth seeded cotton only.

The saw gin is the one in most general use in this country. It was invented by Eli Whitney in 1794. It consists of a box into which the cotton is fed. One side of this box is a grate made of steel bars. Notched steel disks project through the slots in the grate, these are the saws. Each gin has from 60 to 80 of these saws, which are arranged on a shaft with collars between

When operating, these saws make about 400 revolutions a minute, engaging the fibers, they pull them through the grate, allowing the seed to fall as soon as they are separated from the fibers. The fibers cling to the saws and are removed by brushes and thrown against condensing cages which deliver them. The saws are divided into two sets. A 60 saw gin with the saws revolving at rate of 400 will gin about six bales a day.

If the gin is crowded, it will cause neps.

After the cotton has been ginned, it is baled. The screw press is the oldest method

gin and ties weigh from 25 to 30 nounds. The new bales are the lap and Lowrey.

STRUCTURE OF FIBER.

There are three kinds of fibers in every lot of cotton: ripe, half-ripe and unripe. A perfect fiber has four partr:

- 1. Outer membrane.
- 2. Celulose which is 85% of the fiber
- 3. Central spiral deposit of hard substance

4. Central secretion, forming pith.
A varnish like substance covers the fiber. This varnish amounts to two per cent of the fiber in weight, and is called cotton wax. It is this wax that makes cotton slow to absorb moisture, and which, when removed, makes absorbant cotton. The ripe fiber looks like a colapsed, twisted tube with corded and corrugated edges when looked at through a microscope. This twist is peculiar to cotton and is very valuable in its manipulation. These convolutions are more or less absent in unripe fibers. They may be detected by the eye through the glossy appearance. The unripe fibers are short and weak and of little use. The value of cotton is determined by the length, strength and finess of the staple. The fibers vary in length and diameter.

The following table gives the principle characteristics of the leading varieties of VARIETY, | L'GTH. | DIA. | NOS. | REMARKS.

SEA ISLAND.						
Sea Island	1.8	1-1570	100-400	Finest grown	1	
Florida	1.6	1-1570	-240	(long silky staple.	ē	
Fijit.	1.6	1-1570	-200	Many unripe fib's		
Pervian.	1,5	1-150	-150	Inf. to others.	1	
		EGYPT:	IAN.		t	
Gallini	1.5	1-1500	-180	Fine and strong	1	
Brown	1.4	1-1486	80-1:0	Strong and clean.	2	
White	1.2	1-1400	-70	Soft,not very "	:	
		AMERIC	CAN.		1	
Gulf	1@1%	1-1320	30-60	Soft, strong white	€	
Texas	1	1-1810	20-50	Inferior to Gulf	1	
Upland	1	1-1310	-60	[Deeper color.		
Mobile	.98	1-1800	-36	Most used here	ì	
		PERUV	IAN.			
Rough	1 25	11-18 0 (49-70	Strong and wiery	8	
Red	1.24	1-1300	80-6)	Weaker.	1	
Smooth	1.10	1-1300	30-50	Resembles Gulf.		
	,	BRAZII	IAN.	,	,	
D					3	
Pernams	1,3	1-1250	-70	Harsh, wiery and	1	
Maranham	1.2	1- 250	-60	strong. Used in	1	
Paraiba	1.15	1-1150	-50	hosiery mostly.		
		INDIA	LN.		,	

NINETY-EIGHT.

DIFFERENTIAL MOTION CONES.

"Oblivion" to "Worm Gear."

Editor Cotton Chats:

Lengths and diameters in inch

"Oblivion" will have something further to say in reference to concave convex cones when "Worm Gear" has produced any new feature that he has not repeated so often, or when he has shown that a continuous increasing proportionate system, as the winding on of yarn or roving on a bobbin requires as he claims from correct inverse proportion, deviates from a true proportion and produces a deviation from the inclined plane, properly speaking, makes a curve and eventually gets back again onto the same inclined plane. Will he please show how it is that if it is required to deviate, from the nature of the case, why it should not, as I stated before, produce an evolute or involute curve and not get back, after a concave or convex curve has been produced on to the same inclined plane. Give us an explanation of this apparent parradox in his system of mathematics.

OBLIVION.

WEAVING COTTON.

Faults in the Woven Fabrics.

F. W. H. in Cotton Factory Times.

The reputation which certain firms have obtained for excellence in their production of certain classes of cloth has not been acof study, care, and effort, and when once obtained this reputation is one of the most obtained this reputation is one of the most upon the style or quality of the cloth as to important assets of the concern. A weaving the method of setting the loom. Heavy firm that is well known, say for T cloths, cloths often require the shedding of the

This bale is 54 feet long by 27 feet wide and easily obtain a better price than other firms weighs 500 to 550 pounds, of which the bag- who may be just commencing the manufacture of a similar grade of goods. Generally speaking, cloths made in England are of a good quality, especially those for home markets; but too many spinners and man-ufacturers have the habit of bundling up all their inferior yarns and fabrics for export. This fault is also very prevalent in Bombay, which until lately did a good trade with China in yarns, etc., it being customary for those yarns which were too bad for the patient Hindoo to weave to be realed and hundled for the (thecther) reeled and bundled for the Chinee."

In the plain cloth trade this reputation for quality may be and is sometimes lost owing to competition in trade, or the prospect of a 10 per cent. dividend, which tempts the manufacturer to substitute size for cotton, and Surat for Orleans. In the fancy cloth trade fashion has much to answer for as regards the short-lived reputations of certain firms and districts. For instance, when velveteens are much worn Bury and Oldham are happy, but when dress goods of a lighter texture are fashionable, then Bolton, Preston and other fancy weaving districts are busy.

One of the principal requirements of a

good cloth is good cotton. American mills have a certain advantage over Lancashire mills weaving domestics and other medium plain goods in their proximity to their cotton fields, and in being further from Indian. This accounts for the reputation of American drills in many markets. Yarns made from American cotton are more elastic than either Egyptian or Indian, though Egyptian has a finer and longer staple. This elasticity is of very great importance in the spinning, preparation, and weaving processes, and also sometimes in the subsequent bleaching and finising operations. elastic yarn requires fewer stoppages for breakages in the winding, warping, sizing, and weaving rooms, and not only so, but there is not the same length of varn to be allowed for milling up as in the case of more brittle or less elastic yarns.

An important item in the weaving of a good cloth is a good size. All single yarns require slashing or sizing, and there are perhaps more differences in practice in this operation than in any other in the trade. This branch of the industry is one of the most important, and, in fact, in plain weaving is the most important part of the trade. On the continent, sizing is considered scientific art; but too often in Lancashire it is a department that is managed by very unscientific methods, resulting in the production of brittle or sticky yarns. The subject of cotton sizing is of so much importance that it has been proposed to treat it as a separate branch of the examinations held by the city and guilds of London Institute. The composition of size and the proper proportion of the various ingredients are not the only matters requiring expert knowledge; but the management machine is also very important. Owing to the increased speed of the looms, and in some cases to the sizing machines being too few for the number of looms, the slashers run too quickly, which causes the yarn to be wound on the beam in a damp condition. which makes the ends adhere to each other, making what is known as a sticky warp.

The proper setting of the loom is also a necessary feature in the production of a perfect cloth. The loom is too often treated as a clumsy machine, requiring little care, and, therefore, getting it. The old plain loom was to a considerable extent made of string or cord, and in many mills today, where supplies or stores are scanty, the overlookers sometimes resort to peculiar means of keeping looms at work. Cord is, no doubt, very useful in its place, but when it is substituted for picking bands it must be considered a false economy, except when the cords are found to be more durable than bands. Very old looms are very expensive as regards wear and tear of working parts etc., and economy would be considered more effectively if the old machinery was

When the loom runs steadily the yarn is more free from breakages, and, therefore, from floats. The cloth is also more level. quired suddenly, but is the result of years the selvages are firmer, healds last longer, of study, care, and effort, and when once and production is increased. Much depends uilts, towels, or any other specialty, can healds to be sooner than light goods, and

in the case of plains the cloth should b well covered. It is difficult, if not impossi ble, to produce a cloth having a good cove using a poor yarn, as a considerabl strain has to be put upon the lower shed

which an inferior yarn cannot stand.

A good cloth also necessitates a good weaver-one who gives his whole attention to his work, and keeps constant watch over the yarn, and especially that part of the yarn between the healds and the fell of the cloth.

COTTON MANUFACTURING IN CHINA,

The Spinning Industry of Hongkong

The last general meeting of the sha-al polders of the Hongkong Cotton Spinning. Weaving and Dyeing Company, Ltd., was the 3rd of October. The meeting was held at the offices of the general manwas held at the offices of the general managers, Messrs. Jardine, Matheson & Co. The Hon. J. J. Keswick presided. There were also present the Hon. C. P. Chater, C. M. G., the Hon. R. M. Gray, Messrs. A. Haupt, J. McKie (Secretary), A. Shaw, (Manager), T. F. Hough, Erich George, R. H. Potts, J. Y. V. Vernon, Gershom Stewart, G. H. Mitchell, T. S. Forest, Mehta, Byramjee, Ho Fook, Ho Kom Hong, Ho U Shang, Leung Til Shan, Fok Tsan-Kang. Shang, Leung Tit Shan, Fok TsangKang, Chan Ku, and Chan Chau Nam. The chairman read the following report,

which will be of much interest to our cotton manufacturers:
Gentlemen,—The report and accounts of

the company have been in your hands for some ten days, and with your consent I will not trespass on your time, but consider them as read. Referring to the Balance Sheet of the Company, I shall make special reference later on to the most important item therein, which, of course, is the indebteuness to Messrs. Jardine, Matheson & Co., of \$1,529,943 98, while on the debit side of the account the only other entry calling for explanation is accounts payable, \$5,223,-78, which I shall explain includes \$3,171.59 for wages and salaries due as on August 15th, but not paid at that date. With regard to the assets I may say that our stocks of yarn, cotton, cotton in process and mill stores have been carefully taken and mod-erately valued on today's current quotations, rather than on what to day's higher replacing costs would represent.

Turning to working account, we have a

loss of \$69,637.79, which however, includes a sum of \$24,797 94 transferred from construction account, an item, of course, that would not occur again. In connection with this account, I m y say that the operations of the Company have been attended by most unfortunate circumstances in every one of the three prominent features which affect such an enterprise, viz., cost of cotton, state of consuming markets, and labor supply. Taking the first two considerations together, I cannot more clearly explain the difficulties of the situation against which we have had to contend than by mentioning that whereas we began by purchasing cotton at \$16.25 per picul, a partial failure of the Iudian crop resulted in famine prices being established and our having to pay as high as \$30 per picul in March last, while the demoralized state of commerce in the Shan-tung province, in which markets our yarns had become well and favorably known, had resulted in our selling price for a bale of three piculs falling from \$102.50 in March to \$87 today. Briefly, the cost of three piculs of cotton had advanced \$42, while three piculs of varn had declined \$15.

These are phenomenal fluctuations which, under the ordinary laws of supply and demand, cannot continue to prevail, and with the prospects of present weather reports from India favoring a more bountiful cotton crop, a cessation of rebellion in the north, and a return in commerce to its normal condition, we may reasonably hope to see markets assimilate to a remunerative basis. The question of labor supply has caused the management grave anxiety, deaths from plague epidemic having been numerous, and the panic caused thereby, together with the alarm created among the younger hands by police house-to-house inspection, resulted in such an exodus that at one time we were reduced to running 10,one time we were reduced to running 10, one of the work of the working, we seriously contemplated closing the mill. Fortunately since that point matters in this connec-

CONTINUED ON PAGE 221.

WOOLEN CHATS.

Contributions for this department are solicited from practical men, on wool, its use in manufacturing; on woolen machinery, its use and improvement; on the management of help in and pertaining to mills, or any observation or experience that will benefit the woolen manufacturer or the help employed in the production

FINISHING OF WOOLENS.

Selection of Stock, Construction of the Fabric, Etc.-Their Influence.

The selection and manipulation of the stock, as well as the construction of th ric in the loom, has very much to do with the finish of the goods, and the designer who is familiar with the finishing, as well as other departments of the work, and especially who has a correct knowledge of cause and effect as demonstrated between the construction and finish of the fabric, is far better equipped for the work than he otherwise

It is a lamentable fact that a failure to secure a good finish, and a consequent disappointment to the manufacturer, is sometimes the result of ignorance in this particular, and not infrequently the finisher is held responsible for results, the cause of which is in the work done before the cloth

There is a laudable, though misdirected, ambition among some of the young weavers of today who, having become familiar with and possibly expert in their line of work, become possessed with the idea that a course at the textile school will fully equip them for the position of designer or superintendent.

We would not discourage this ambition. nor underestimate the worth of the instruction given in the school; and it is an en-couraging sign, that the schools do not confine themselves wholly to weaving; yet there is much to learn, coming through practical experience on a variety of work in the mill, which it is nearly impossible for the school to impart. We would not, as already stated, undervalue the instruction obtained at the textile school; but we be-lieve that he who has first schooled himself by some experience in the different departments of the mill, and especially in the finishing room, will be by far the best equipped for the business.

The selection and combination of stock adapted for the goods to be made is a matter of much importance. Heavy felted goods for steam finish, cassimeres, cheviots, and serges, as well as other kinds of goods, require stock specially adapted for each, and what would be the best for one kind would be entirely out of place for the other.

Then when it comes to the use of shoddy, great care should be exercised, both as to quantity and quality. A little change or variation in the shoddy used is liable to make a decided change in the finish of the goods on account of the variation in the fulling capacity of the stock.

Owing to the oily state of the shoddy, one

is more liable to be deceived regarding its quality. In fact, it is a "trick" of some shoddy men to add extra oil to stock that is especially dry and brash, and devoid of fulling quality, in order that it may feel soft and agreeable.

Whatever the wool that is used may be, it, of course, possesses its original quality as to its felting capacity. But there is always a chance for a question as to stock that has been once used.

If the shoddy should be inferior in this respect, there is a danger of its ceasing to full before the goods are ready to come from the fulling mills, and the result will be a constant chafing and loss of stock, and a consequent inferior felt upon the goods.

It would be impossible to begin to give definite instructions upon all these points, but we bring them up as being of great importance and likely to have their effect upon the finished fabric in a degree that calls for special care.

While upon the subject of the use of

shoddy, or, in fact, of any low stock used as a matter of economy, we wish to speak of the too common practice of using a better grade of cloth in samples than is subse-quently used in the goods. We call to mind one case in particular, where the manufacturer sought to cheapen his goods after the samples had been shown and orders taken.

Of course the buyer, having reference samples, could very readily discover the

trick; and, in fact, had there been no referestantly familiar knowledge of finishing, may ence samples, the change in the goods was find it helpful to the general interest of the so marked that it would have been dismillin many ways. "F.O." covered. No manufacturer can afford to practice this method. If the goods are to be low grade, show the samples to represent them; keep them up to standard, and, above all, don't expect the finisher to rectify errors or overcome the effects of unwise variations made in the stock used.

Another matter of equal importance, and coming more especially under the supervision of the designer, is the construction of the cloth in the loom. This is, in fact, the designer's business. While the selection and mixing of the stock may fall to another, if a designer is employed it is he who does the preliminary work of laying out and directing in the construction of the fabric. The size of the yarn to be used, the number of ends and the width to be laid in the loom, are largely dependent upon the weave, whether plain, twill, close or open.

The designer is supposed to know the number of ends that will go within a given width and the number of picks, etc., to produce a desired fabric. But the weaving is not all, and it is quite possible for the warp to be laid so that it will weave fairly well, and yet not be adapted for the best results in finishing. If there should be an insufficient number of ends in the warp, then the goods will full too quickly, and come out slazy and soft. On the other hand, too many ends tends to the necessity of over-fulling, and the goods will be stiff and boardy and likely to mill marks lengthwise of the cloth. And if this defect is very marked, the goods will sometimes cease to full, and chafe, and become tender in the milling, for which the finisher is powerless to apply a remedy.

The writer calls to mind an instance where the layout in the loom was not correct, there being too much warp for the weave, and the result was that the cloth had received all the fulling possible, when it was yet four inches too wide. The stock being of extra fine quality, the continued tendency for the filling to shrink after the warp threads had been brought as closely together as their size and the weave would permit, caused it to full itself tender. This was an extreme case, and showed a great lack of good judgment in the planning of the work. But from this to the opposite extreme there are many chances to err, and cause a corresponding unfavorable effect upon the finishing and the final excellence of the fabric. Another thing that often causes trouble in the finishing room, and in many cases perplexes both the finisher and and his employer, is the frequent change made in the oil used upon the stock in the preparatory process of picking.

It is sometimes the case that the manufacturer does not fully realize the importance of uniformity. This is a matter of which, above all others it may be said, it is best to "let well enough alone," especially if you have a fairly good article at a fair price. There are wool oils and wool oils, and the tendency of some manufacturers to be constantly trying to find something b ter or cheaper is always met by the persist-ent "oil man." But the manufacturer never realizes its cost, or knows the hours of anxiety the finisher spen s in trying to solve the problem, as he contends with difficulties which he cannot understand, but would be made clear to him if he could be informed that he is contending with the

kind is introduced without his knowledge, it is not at all surprising if he is puzzled to know why there is trouble, and with prob-ably the two kinds coming along at the same time, it renders it doubly perplexing to understand why some pieces are right and others wrong. A good, reliable oil that works well all around should not be put sside for something "just as good" to save a cent, unless there is some probability that it will be better in the end; and then it will be well for the finisher to know of the change, and if he finds a variation in his results on account of it, he can the

the designer and superintendent, who has a one bath with such dyes as will leave the

WEAVING CARPETS.

Those of the Savonnerie Class.

The weaving of carpets differs entirely from that of tapestry, the tissue produced by the artists of the Savonnerie being a pile, the weft of which is wool and the warp of very strong hempen threads. The looms are the same as for tapestry, although of larger dimensions—ore has just been put up that is 12 m. (nearly 40 feet) long-and the artist, placed in front of his loom, works on the right (face) side of the work having the copy (modé!e) above him, while the wool employed general consists of five threads, having different tones, but equal value, that

For making the stitch the weaver, having chosen his spool, takes with the fingers of his left hand the weft thread on which he has to commence, and draws it slightly towards him, while passing behind it the spool with wool thread which he holds in the right hand, and he then draws towards bim, by means of the lisse or string in the form of a ring, the next west thread, placed little behind the first, surrounding the latter with a slip knot, which he draws tight. Between these two passes the warp forms in front of the west a ring, the amplitupe of which depends upon the height of the pile, and a round iron rod, terminating in a blade, inserted in this ring, occu-pies a horizontal position, and becomes charged in succession with a series of woo rings formed by repeating the stitch, each knot being pressed down and tightened upon the tissue with the thumb and fore-

The act of withdrawing the tranche-fil, as it is called, from left to right cuts the wool rings, and when a row of stitches is thus made for a certain length, they are joined together by two very strong hempen threads, passed between the two sheets (nappes) of the west and superposed at the points. This would not suffice, however, to form a strong fabric, but it is necessary to tie together the fabric, but it is necessary to the together the threads of the w.ft with another bempen thread forming the warp. For placing it in the tissue the weaver brings the hind threads forward, passes the warp between the two rows of threads, presses it down with the comb, and then ellows the hind threads to the results a believe the second of threads to return to their position, taking care to allow this warp sufficient slack to permit its following all the inflections of the west threads. In this manner the stiches are fixed, as it were, when the weaver presses down with the comb the stitches and the hempen threads, which latter enter into the fabric, becoming quite hidden therein.

The ends of the wool thread are then picked apart by means of the needle (aguille) in order that the contours may be well defined, after which the ends of the wool threads, previously cut by the tranche-fil, are sheared, and then, by means of scissors, with curved-or rather cranked-handles guided by a small board, the artist again shears the pile with great regularity, when he is able to judge of the effect produced by his work. In the kind of mossic thus formed, of which the colored particles are the ends of infinitely small wool threads. the material is seen in section, instead of results of half a dozen kinds of oil that is lengthwise, as in tapestry, and as the work coming through the works.

Coming through the works.

When the finisher gets his soap and method of securing on a safe basis, to convelve file, which should be borne in mind tend with one kind of oil, and a cheaper when choosing subjects for reproduction, because the least pressure may put the lines out of form

WOOLEN PIECE! GOODS. Two-Color Effects on Them

It was formerly only possible to produce parti-colored effects on goods of pure wool by weaving together yarns previously dyed of different colors. Even now this is by far the principal method. So much trouble, however, is involved in it that unceasing attempts have been made to find a simpler his results on account of it, he can the way, and they have, at least with some more readily and intelligently adapt his much-used articles, met with success. The work to the new order of things. work to the new order of things.

The finisher has to meet and contend with the results of all the mistakes made viz., to mix mordanted with unmordanted in subsequent work upon the goods, and wool, and then to dye the finished fabric in

raw wool either white or of a different color from the mordanted material. The principle can be applied to cotton. Instead of mordanting the wool its affinity for dyes can be increased by chlorinating or by mercerization, so that diamine colors of acid dyes can be used as well as adjective colors. It is, however, very difficult to reg ulate the action on the wool, so that it is very hard to secure uniformity. The time or exposure to the lye or chlorine, and the concentration and temperature of the bath are factors of great importance. Where two lots of wool treated in different chlorine or lye baths met, there is often a change in color where there should not be, and the goods are hence made unsaleable. The chemical action of the soda, Ive is also to be feared. Very strong lye acting for a certain time strengthens the wool, it is true, but weak lye weakens it greatly or dissolves it altogether. The washing, after the action of the lye, requires great care and must be very rapid and thorough. The use of glycerine diminishes these dangers, but apprecia-bly heightens the cost of production. It is also to be noted that these difficulties do not occur in the use of mordants of chrome ir n, copper, or alumina, which allows uniform dyeing, although they present other

difficulties of their own.

A patent has been taken out by Felix Meyer of Aix for preparing the wool before-hand in the loose state, instead of, as heretofore, in the yarn, and the so called Universal yarns are produced in this way. They are either mixtures of mordanted and unmordanted single fibres, or of mordanted and unmordanted yarns. The latter are used for mixed fabrics, and the former for jaspe and mouline fabrics. The chief advantage at-tending the use of these Universal yarns is that the weaver is not obliged to keep a stock of colored yarns, so that he loses nothing by his stock lying idle or becoming out of date. The spinner, too, need only keep mordanted and unmordanted wool. The finished fab-

ric can be dyed at ray time.

The new yarns will not permit of every effect, but of a large number of the most current patterns, and their introduction is, certainly, an important step in advance.

WOOLEN GOODS.

Sulphuring Them in the Wet Way.

To get a fine white wool, the raw material must be selected already nearly white, and free from specks. The processes which it undergoes need careful supervision, espe-cially the milling. There are three processes in use: 1st, bleaching with sulphurous acid and permanganate; 2nd, bleaching with sulphurous acid elone; 3rd, bleaching with peroxide of hydrogen. Electric bleaching is not used for animal fibres. The writer gets the best results with the first of the above

The vessels used must be entirely of wood without any metal, and no wood can be used that contains tannin. American pine is very good. For 40 kg. of goods two chests are required, each 4 ft. square and 40 inches. deep. One has a well-fitting cover, and is used only for bleaching. For 40 kg. of goods take 400 grammes of permanganate of potash, dissolve in 3 to 5 litres of warm water, and put into the coverless chest through a very fine hair sieve. The goods are then worked in the solution for half an hour, after first soaking them in water. They are then of a light brick red color, and are hung up and well drained. They are then worked with sulphurous acid solution in the other chest, and become white like magic. When this has hap-pened, all air bubbles are pressed out, so that the wool will lie wholly immersed. The cover is put on, and the chest is left for 12 to 18 hours. The goods are then worked again for a few minutes, taken out and

If a bluish or a reddish tint is to be visible the goods are now taken to a washing machine, which is only used for white goods, and treated with 1-4 to 1 2 a gramme of neutral Aniline Blue, or Methyl Violet 6B. When the color is right, wring and dry at the lowest possible temperature, for high temperatures spoil the lustre and clearness of the white very decidedly. If the goods are to be pure white they have a bath of chalk and water after coming from the bleaching chest, and are then toned with blue or vlolet. The baths in the two chests can be reinforced and used again.

SOUTHERN INDUSTRIAL NEWS.

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PAWTUCKET. R. I.

NORTH CAROLINA.

G. G. Walker of New York, intends to establish a silk mill at Greensboro.

Seven thousand new mule spindles a being installed in the Raleigh hosiery mill,

The Wake Forest cotton mill, Wake Forest, is going up rapidly, and will soon be ready for the machinery.

Work on the new Neuse River cotton mills, Raleigh, is progressing rapidly, and the mills will soon be ready for occupancy.

The Putnam Textile Company, Roanoke Rapids, has been incorporated, and will at once commence the erection of a two-story building 320x106 feet, to be installed with the most improved machinery for manufac-turing damask. Gustavus Millhiser, of Richmond, Va., and S. L. Patterson, of Roanoke Rapids, are at the head of the con-cern. The location has been secured and the contracts for necessary buildings have been awarded. This plant will be operated by water power, and, when in full operation, will employ about 350 hands.

SOUTH CAROLINA.

The DeKalb Cotton Mill, Camden, is going up rapidly and will soon be com-

At the recent annual meeting of the Spartan cotton mills, Spartan burg, all the officers were re-elected for the ensuing year. A semi-annual dividend of 5 per cent. was declared. The mill has had a very prosperous season, and has been running all the time. The treasurer's report was very satisfac-

The Tucapau Mills addition, Tucapau, is nearly completed, and the 12,000 spindles equipment will soon be installed. The present mill of the company, containing 12,000 spindles, which has been running night and day for some time past, will disntinue night work when the new mill is

The Inman Cotton Mills, Inman, have made application for a charter. The new company is capitalized at \$200,000, and has the following incorporators: R. H. F. Chap-man, A. H. Twitchell, T. C. Duncan, J. R. Gibson and J. A. Chapman. Work on the erection of a large factory, to contain 10,000 spindles and about 300 looms, will be com-

GEORGIA.

The Tifton knitting mills, Tifton, are rapidly going up and it is expected that the plant will be in operation by Feb. 1.

A 5000-spindle cotton mill is to be erected at Dublin by the Dublin Cotton Mill Company, of which William Pritchett is presi-

The new cotton mill of the Pelham Manufacturing Company, Pelham, is completed, and its 3800 spindles and 100 looms have been put in operation.

The machinery is rapidly being placed in nosition at the Tifton cotton mills. Tifton. and it is expected to have the plant in opera tion by January 1.

George C. Smith of Milledgeville, contemplates the establishment of a co mill at that place and is looking for information regarding the machinery.

The knitting mill for the B. L. Battle Manufacturing Company, Warrenton, has been completed at a cost of \$25,000, and will soon commence operations in full.

A cotton mill company is being organized at Tallapoosa. The interested parties are J. M. McBride, C. B. Hitchcock, W. W. Summerlin and J. C. Tumbin, who intend to invest \$50,000 in the enterprise.

The Wool Extract and Merino Company, Chattanooga, has been incorporated with a capital stock of \$20,000, and will engage in the manufacture of wool shoddy.

Eighteen new knitting machines have been installed in the Knoxville knitting mills, Knoxville, thus increasing the daily capacity of hosiery by about 75 dozen pairs.

LOUISTANA.

At the annual meeting of the members of the New Orleans Cotton Exchange, which was held Monday, these officers and directors were elected to serve for the ensuing year: S. P. Walmsley, president; E. Bornemann, vice president; J. H. Abraham, treasurer. Directors—M. E. Duquesnay, C. L. DeFuentes, Edmund J. Glenny, Thomas Holford, H. C. Ludlow, H. R. Labouisse, William Overton, Maurice Stern, Edward Sevilla, Sol. Wexer, Robert T. Hardie, C. P. Ellis. The annual report, the thirtieth in the history of the Exchange, gives the membership at 442, the largest since 1890. The trade in spot cotton amounted to about 1,200,000 bales. The business in contracts for speculation and investment ranks with the largest since the inauguration of the institution, and in the conduct of the future business the New Orleans market stands the peer of any in the world. The treasurer's report shows a gross money movement through his hands of \$162.878. In the superintendent's office the movement both ways on account of margins has exceeded \$12,000,000. Among matters claiming attention is the establishment of a clearing house for future contracts.

VIRGINIA.

Considerable new machinery has been ville, are completed, and finstalled in the Norfolk Silk Company's ready for occupancy soon. mill at Lambert's Point.

The capital stock of the Danville knitting mills, Danville, will be increased and a new dyehouse will be erected.

W. Cabell Bruce of Baltimore, Md., will evelop the water power at Brookneal and fill erect a cotton mill there. the R. I. Berdan Company, silk dyers, of Paterson. The liabilities are said to be \$8000 and assets \$6000. develop the water power at Brookneal and will erect a cotton mill there.

The National Twist Company, Washing ton, D. C., has arranged for the location of a knitting mill in Portsmouth. The plant will employ 300 hands and will make hosiery.

DELAWARE.

mington, has been incorporated with a capital stock of \$50,000. The company will engage in the manufacture of underwear, and has the following incorporators: C. P. Wentz E. T. Craven, P. H. Coyne, all of Scranton Pa.

MARYLAND.

The textile mill of Deibert & Wilson, Ellston, started up Monday in full in all departments. The mill will manufacture damasks.

TEXAS.

W. J. Boone, G. E. Bennett, and associates, are interested in a company forming at Fort Worth for the erection of a cotton mill.

Work on the Bonham Cotton Mill, Bonham, is progressing favorably, and the work of installing the machinery will soon commence. T. L. Clark has been appointed superintendent.

The management of the Gonzales Cotton Mills, Gonzales, will commence at once the erection of the necessary buildings for its plant, and intends to have the mill in operation by March 1, 1901.

The plant of the Corsicana Cotton Mill Company, Corsicana, has been completed, and was started the first of this week. The mill has 5,000 spindles and other machinery making coarse goods, but the company con-templates changing to fine goods in the spring. The company is capitalized at \$100,000 and John Taylor is general manager.

ALABAMA.

The machinery is being installed in the Athens cotton mill. Athens, and the plant will probably be started with the new year.

The Lowe Cotton Mill Company, Huntsville, has contracted for thirty operatives' cottages. The contract price is \$17,000.

A \$100,000 knitting mill will soon be established at Huntsville by northern capitalists. The Thompson Land and Investment Company is interested.

The Opelika cotton mill, Opelika, is nearing completion, and the equipment of 5000 spindles and other machinery is being put in position.

The one hundred new cottages for the Dallas Manufacturing Company, Hunts-ville, are completed, and forty more will be

NEW JERSEY.

F. E. Low has been appointed receiver for

PENNSYLVANIA.

The capacity of Thomas Kitson & Sons woolen mill has been increased by the addition of new machinery.

The Pottstown Manufacturing Company, The Imperial Underwear Company, Wil
the specific through the find the first through the first throug

The product of John Dobson's Old Town mill, Falls of Schuylkill, formerly sold direct, will be sold through W. Stursberg, Schell & Co., of New York city.

Frank Wellbacher, a silk ribbon manufecturer of Allentown, has assigned to Isaac A. Hall for the benefit of his creditors. The assets, including the mill property, amount to \$130,000. The liabilities are in the neighborhood of \$130,000, and consist of mortgages for \$50,000 and \$75,000 in notes held by New York parties. The assignment was due to the demands of brokers for the payment of money due and loaned on manufactured goods. Mr. Weilbacher before going to Allentown operated a silk mill in Brooklyn, N. Y., but through induce-ments offered by the citizens, he removed to Allentown. The lack of demand for ribbons was the principal cause of the failure.

WESTERN.

The Buell Manufacturing Company's large plant at St. Joseph, Mo., is under-going extensive repairs. A new mill is being put up and will be equipped with machinery which will greatly increase the output of the plant.

The Provo woolen mills, Provo, Utah, are running to the limit of their capacity. Large orders have been booked from eastern dealers. The management of the mills states that they can dispose of all the Utah goods that can be furnished them.

CANADA.

The new mill of the Riverside Manufacturing Company, Ltd., Montmorency, P. Q., is rapidly nearing completion, and it is expected to be in operation by next February.

The Christmas Lippincott.

The Christmas number of the "New Lippincott" Magazine publishes complete Amelia E. Barr's latest and best novel, en-titled "Souls of Passage," Miss Agnes Repplier contributes a charming essay called "As Advertised." "As Others See Us," by George Hibbard, is a bright little one-act drama, which may be played by one actor. "The Bluffing of Johnny Crapaud," by Patrick Vaux, is a vigorous and unique sea story. Evelyn Sharp, whose fairy tales are popular with old and young, contributes "The Little Queen and the Gardener," which is delicate, fascinating and unforgettable. Two particularly important papers are by Lieutenant John Morris Elliott, U.S. N., and by Henry Charles Lea, LL.D. Lieutenant Elliott's article is descriptive of the United States Naval War College at New-port, R. I. Mr. Lee investigates a subject vital to all Freemasons under the title, "An Anti-Masonic Mystification." Christmas Anti-Masonic Mystincation." Curistmas thoughts are expressed in verse by William Hurd Hillyer, Ella Gilbert Ives, Clarence Urmy, Charles W. Stevenson, Arthur Ketchum, and Susie M. Best. The "Walnuts and Wine" Department bristles with merry jest and funny happenings in prose and verse.

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The Religion of a Gentleman

"The Religion of a Gentleman" is the title of a book on this subject from the pen title of a book on this subject from the pen of Charles F. D. le, the well-known author of "The Coming People," "Luxury and Sacrifice," etc. It is putting it very middly when we say that this last work is the best that has yet come from the pen of Mr. Dole. In many ways the "Religion of a Gentleman" is one of the most remarkable books of this day. Mr. Dole is a free thinker, and in this book he sets forth his views in a very simple and intensely interesting way. His interpretations of religion and how people should believe are the best that we ever remember reading. The work is certainly deserving of much praise and should be read by every one, young or old. In the preface Mr. Dole says: "Almost since I was a boy it has been the wish of my life that I might be able to make the statement of religion in such a way as to commend the subject and make it attractive to the young," and he certainly has here succeeded in accomplishing his wish. We know of no book that would be so fitti g a Christmas gift to young or old as "The Religion of a Gentleman." It is published by Thomas Y. Crowell & Co., New York, N. Y.

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E A. MACDONALD, Mayor. Toronto, Canada, November 22, 1900

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An Indian View of Him and His Work.

The Indian dyer offers one of the most instructive "awful examples" of native craftsmanship to be found in this country. He belongs to a period that dates back many centuries, and his methods are so ingrained that he is the despair of the industrial reformer. His methods deal with scraps and handfuls, a single piece of cloth—a bundle of yarn. His pigments are pounded barks, chips of wood, and mineral oxides aided by natural salts: his measure of quantity a handful, and he attaches a solemu signifi-cance to the quality of the well water he uses, although he cannot tell anything of its constitution. It is almost needless to say that he cannot dve any two articles. whether they be cloth or parcels of yarn, exactly of the same shade. His work is very poorly paid, and yet he has no notion of economy of materials. The inability of the Indian dyer to produce the same shade twice in succession may be observed in every Indian-made carpet having a colored Each parcel of yarn recognizable on the surface of the carpet, and it seems never to have occurred to the weaver to mix all the shades so as to have a uniform ground effect. The buyer recognizes the carpet to be genuine by this irreg ularity of shade, and thus a peculiarity that would, in any other country, cause a serious reduction in price, is actually regarded as a point of merit.

So much for the caprice of fashion. The Indian cotton manufacturer was not long in discovering that his profits might be enhanced by the introduction of dveing. and forthwith colors became a feature in the product of our mills. The mill owners could not at first see the need of spending money on specially trained dyers, when the country contained so many men of the trade; but it was soon apparent that the pot-dyer was a very expensive servant in a mill where uniformity of work was an absolute necessity. There were endless disputes about goods delivered, or about to be delivered, which could only be ended by a sacrifice of part of their value. The mill owners were now prepared to appreciate the services of the English dyer, who, by simply adhering to the business as he was taught, produced the desired colors with uniformity. Then came the technical schools, which were to save the cost of foreign assistants and open a new field of usefniness to educated Indian youths. We have recently been enquiring into the results of this movement as far as it concerns the dyeing industry, and we learn that although the native youth can take his schooling and pass his examination, he has an almost incorrigible habit of neglecting the exact details of regular duty of any kind. He will delegate his most important duties to a workman, and he often maniests a singular inability to convert the laboratory process into a commercial process, that is to say, to devise apparatus of a suitable kind for a dyeworks. There was not long since a dyeing and bleaching department attached to a Bombay mill, which was, no doubt, arranged by some one who called himself a dyer. There was no building, a shady tree provided the roof, which was supplemented for rainy weather by a tarpaulin. There were some zinc baths by way of vats, and a bucket or two. Water was heated by means of a steam pipe projecting from an adjoining wall. There may have been a thermometer, but we did not hear of it. After each operation the remaining dve liquor was thrown away, just as might be done in the smallest village when the dver had dved a single article and had no immediate use for the remaining

In Europe no proprietor of a factory would allow a dyeworks to be laid out as above described. He knows enough of how it ought to be built; here it is different. A laboratory experiment is made to establish the result of some chemical or mechanical operation, but it does n testablish the cost price of work in a factory. Materials are thrown away after use which would be economized in industrial operation. The student dver has much to learn when he leaves the laboratory for the dychouse. For example, a lot of yarn may take up two-fifths of the dye from a bath, and if the bath is thrown away the whole of the dyeing material must be charged to the yarn, although only two- institute a fifths are utilized. The bath has lost so operating.

much of water and a certain proportion of chemicals. It will not dye another lot of exactly the same shade as the first, and the water is reduced in temperature. The dyer must be able to restore the bath to its first condition, so as to continue the process and produce exectly the same shade; and finally, when the job is done, the remains of the bath where thrown away is a very small loss, as it may be divided into the whole lot that has been treated.

Accuracy in weighing and measuring is of the greatest importance in the result of dyeing. When the crude materials of the jungle are used, weighing and measuring do not always insure uniformity, for barks and woods do not always contain the same amount of pigment. The same may be said of earths. The chemically prepared dyes now so largely used in India are much more certain in their effects; but, being much more concentrated than the jungle dyes, care in their use is absolutely necessary. Many Indian dyers waste as much of their material as would represent the whole profit of the European dyer. They will even attempt to bleach cloths containing a colored heading. A few of the dyers who have had a chemical training have done well, and are making a useful career: but a great many more seem to answer to the descriptions of "youths with a mouthful of chemical formulas and a head that is empty." What is the reason of this? These young men come apparently from the same classes that produce some of the smartest brokers in the world. Is there some inherent defect in the men, or is the fault due to the method of their education?-[Indian Textile Journal.

Papers Read at A. S. M. E. Meeting. The following is a list of the papers to be

ad at this meeting:

"Tests of Centri'ugal Pumps," by W. B. Gregory.
"Hardness, or the Workability of Metals,"

by William J. Keep.
"New Principle of Gas Engine Design,"

by Charles E. Sargent. "Heat Efficiency of the Gas Engine as Modified by Point of Ignition," by C. V.

"Power and Light for the Machine Shop

and Foundry," by Forrest R. Jones.
"Mechanical Integrator used in Connection with a Spring Dynamometer," by Max H. Wickhorst.

"Apparatus for Dynamically Testing Steam Engine Indicators," by Carleton A.

"Tests of the Boilers of the Purdue Locomotive," by W. F. M. Goss.

"A New Recording Air Pyrometer," by W. H. Bristol.

"Comparative Value of Different Arrangements of Suction Air Chambers on Pumps," by Meriam F. Wheeler.
"Note on Centrifugal Fans for Cupolas

and Forges," by William Sangster.
"Power Plant of the Massachusetts Gen-

eral Hospital," by F. W. Dean. The Construction of Contracts," by Regi-

nald P. Bolton. "An American Central Valve Engine," by E. T. Adams.

"Comparison of Rules for Calculating the Strength of Steam Boilers," by H. de B. Parsons.

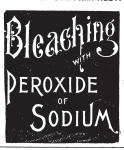
"A Record of the Early Period of High Speed Engineering," by Charles,". Porter. "Steam Engine of Maximum Simplicity and of Highest Thermal Efficiency," by

Robert H. Thurston.

An entirely new departure in the method of furnishing power to mining companies for the purpose of running hoists, pumps, drills and other machinery, says Electricity, will characterize the extensive power plant to be erected at Post Falls, Wash, by the new company which has been organized at Spokane. The power house will contain dynamos capable of generating 12,000, with four units of 3000 horse power each Thirty thousand volts will be the pressure regularly maintained on the power line. An immense central plant will be installed at Gem, Idaho, which will generate many thousand horse power of compressed air. This compressed air will then be piped to the mines for the purpose of running their machinery, and, beside being a new feature in furnishing power, it will also institute a great reduction in the cost of

IFTYOU DON'T KNOW ALL ABOUT IT, WRITE FOR OUR PAMPHLET:

THE ROESSLER & HASSLACHER CHEMICAL



104 William Street. New York.

PEROXIDE WORKS

NIAGARA FALLS, N.Y.

KROUT & FITE MFG., COMPANY.

Manufacturers of

SILK and COTTON NARROW FABRICS.

Spool Tapes a Specialty

Office and Mill, Allegheny Ave.. and Emerald Street. PHILADI LPHIA, PA.

MERCERIZED YARN.

ABEGG & RUSCH

ABERFOYLE MFG. CO, MERCERIZED cotton yarns

both warps and skeins in all numbers 92 Grand St., . . . New York. Wite direct to mills at CHESTER. PA

ORSWELL MILLS, FITCHBURG, MASS. Cotton Fine

In Chains, Ball Warps, Skeins, Single or Twisted, on Cones, Cops, Spools, Carded or Combed.

DYES AND CHEMICALS.

The situation in the market for chemicals remain unchanged. In the alkalies, etc., there continues a fairly active business, but in the balance of the list trade improves slowly and barely exceeds jobbing propor-The dyestuff market is dull and featureless and little business is being transacted.

We quote as follows:

Dves. Acids.

ACIUS.	
Acetate	
Albumen.	
Blood 15 @20 Egg57 @65	
Aulline.	
Salt	1
Alizarine.	
Extract 13 @ 45 Mordant 6% @ 14	
Alum.	
Lump 1 75@1.85 Ground 1 85@1 95	1
Aloes.	
Cape 8 @ 9 Curacoa 3½@ 4¼	
Arsenic.	
Red Saxon 75/@ 8 White 41/2 43/4 Red Silesian 75/@ 8	5
Bleaching Powders.	1
American @ English 1 87½@ 2 10 Continental 1.85 @ 1.90 German 1 87½@ 2 00	
Borax.	-
Crystals 7½@ 8 Powdered 7½ @ 7½	,
Brimstone.	
Crude 2nds21 00 @23 00 Urude 3ds19 0) @21	1
Bichromate Potash.	•
American 8½ @ 8½ Scotch 8½@ 8½	
Barwood. Camwood.	
Per pound 2 @ 21/4 Per pound 6 @ 8	(
Cochineal.	1
Honduras: Teneriffe 28 @ 31	
6ilver 30 @ 33 Black 28 @ 31¼	
Cutch.	
Bale 5 @ 6 Refined 5 @ 10	1
Base 5 @ b Renned 5 @ 10	

Jamaica...... 1%@ 1% Cuban...... 1%@

Cube 1.... 61/2@ 7 Cube 2.....

Gambier.

Indigo.

Bengal:

AYKROYD'S - MERCERIZED - YARNS

— Supplied In Any Form.

WE GUARANTEE EVENNESS IN MERCERIZING
THUS INSURING EVENNESS IN DYEING.
ABSOLUTELY FAST COLORS.
STOCKS ON HAND UP TO 2-140;
WM. M. CROWE, AGENT FOR U.S. & CAMADA.
Telephone 312 Spring
477 BROOME STREET,
Hardi, Von Bernath & CO.

	OUT NEW TORK
Logwood.	Red Sanders.
Per peund 1%@ 1	% Per pound 2%@ 3
s	пшае.
Sicily \(\psi\) ton; No. 155 00 \(\partial 56 0\) No. 252 00 \(\partial 58 80\)	
Tai	merie.
Whole 4½@	5
	micals.
	hrome.
Acetate b @	7 Oxide 8 @

Large lots.... 52%@

Cream Tartar. Fuller's Earth. Powdered...... 22 00@22 50 Lump......24 50@44 00 Gums. Arabic, pk'd... 5) @ 55 Garnet...... 16 @ 17 Arabic, sorts. 14½@ 17 V. S. O...... 21 @ 23 Camphor.... 60½@ 65 Th...... 14½@ 15½ Sheilac, D. C. 30 @ Bleached.... 17 @ 18 Iron. Nitrate 7 @ 111/2

100 lbs..... 70 (c. 75

Isinglass. American, tb.. 55 @ 70 Russian 3 90 @ 4 45 Lead. White Sugar.. 73/4@ 83/4 Brown Sugar. 53/4@ 6

Mercurials. Ointment.....88 @4 Red precip...98 @ Bisulphate...60 @ Potash.

Chlorate....... 8½@ 9 Bromide...... 46 @ 47

Sal. (Am.) ... 70 @ 80 Potash:
Sal. (Eng.) ... @ 70 Carbonate... 4 @ 8½
Caustic... ... 2.00 C2.25 Caustic... 6 @ 7
Blearb ... 1.37½@1.75 Bromtde... 46 @ 47
Nitrate... ... 1.76¼71.80 Prussste ... 15¾@ 16

Tin. Muriatic..... 12 @ 17 Bichloride.. 9½@ 12 Crystals..... 22 @ 28½

Miscellaneous. Blue Vitriol...... 5¼@ 5½ Zinc....... 7½@ 8 Quicksilver......67½@70

INSURANCE.

BOILER INSURANCE,

The Inspecting and Insuring of Steam Boilers Becoming More Important.

There is no denying the fact that there is a necessary financial outlay attending the insuring of a steam boiler. It is but to be expected that that kind of insurance must cost something as well as all other kinds. How many mills or manufacturing concerns are there in this country that do not carry some insurance? Insurance against fire has become a recognized necessity, and there are very few manufacturing plants that do not carry some.

It seems strange to us that more do not insure themselves against losses from boiler explosions. There is no part of a manufacturing plant that offers so many risks and is so dangerous as is the sham boiler. If properly inspected and watched this danger is reduced to a minimum, and the chances of suffering loss from its explosion are almost entirely eliminated. A good engineer may be depended upon to exercise due precaution in his department, but, alas! how few are the truly careful engineers.

When it is possible not only to insure a manufacturer against all losses that may result from the explosion of his boiler, but also to obtain quarterly inspections by experts in steam engineering at the same time, it seems almost incredible that there should be so many who do not avail themselves of the opportunity offered them. The cost attending such insurance and inspection is most trivial, and when compared with the risk which it covers it becomes too insignificant to consider. As to whether such insurance and inspection pays, the records of the insurance companies which show the number of explosions, both of the insured and the uninsured, with a sufficient degree

accuracy, answers that question.

But not only should the manufacturer who employs a steam boiler insure himself against all loss, but one who does not have his boiler inspected and its true condition made known at regular intervals is guilty of neglect, and, should an explosion occur under these circumstances, the indemnity to persons injured through such neglect should in justice be larger, since ordinary precautions were not taken. An owner of a steam boiler has the right to run his boiler in any manner he chooses and as econom ically as he may see fit; but he bas no right to jeopardize the lives and property of people in his employ and others in his vicinity. There is such a thing as carrying economy beyond the safety limit. When one endeavors to economize so far as to endanger the lives and property of those about his premises, whose safety is virtually in his keeping, he is guilty of criminal neglect, which is deserving of the extreme penalty

Persons who are employing steam hoilers can insure themselves in one of the strongest and best insurance companies in this country. The Hartford Steam Boiler Inspection and Insurance Company, of Hartford, Conn., has long held an enviable reputation. It is most courteous and thorough in its quarterly inspections, it pays its claims with the greatest prompt-ness, and it is one of the strongest companies, financially, in the world. Its officers are all men of the highest integrity and business ability, and they do everything in business solitify, and they do everything in their power to make all matters entirely agreeable to their patrons. Any person who operates a steam boiler in his plant should put himself in communication with the Hartford Steam Boller Inspection and Insurance Company, Hartford, Conn. C. E. Roberts is manager of the New England office, Milk street, Boston.

THE NEW ENGLAND EXCHANGE RAISES RATES.

An Advance for Rhode Island and Connecticut.

At its meeting last Saturday the New England Exchange adopted the advanced rates for unprotected f rm and store property in Rhode Island and Connecticut. A resolution was introduced for the employment of an inspector to lay out and draught sprinkler equipments, relieving the factory im-provement committee of that part of its

and 153 covers spread. The fire loss of the month was \$63,163.80, of which only \$12,794 was on buildings. Losses by sprinkler breaks were \$129.18. The entire losses of October, 1899, were only \$29,094.38.

COTTON MANUFACTURING IN CHINA.

[CONTINUED FROM PAGE 216.]

tion have steadily improved, and we have today a supply of labor which enables us to run 37,536 spindles.

The next matter to which I have to refer is the financial position of the company and more particularly in its indebtedness to Messrs. Jardine, Matheson & Co. I made reference to the matter at our meeting a year ago, and in then explaining the reason why the company has been so much under-capitalized at the time of its flotation, I said: "Up to the present time Messrs. Jardine, Metheson & Co. have met the financial wants of the company, but this was a purely temporary arrangement, and later on some permanent system of finance would have to be introduced. The same problem has again to be met, but in an aggravated form, and unless shareholders come forward and provide capital, I can see no solution of the situation except liquidation. Considering the very large sum of money which the general managers have already provided, it will not be a surprise to the shareholders that they hesitate to make further advances to the company, and I do not think any of you will consider that Messrs. Jardine, Matheson & Co. are overcautious in declining to allow the debt which the company owes them further to increase.

The question which therefore presents itself, gentlemen, is "What are the share-holders prepared to do?" In conclusion I may add that were the sum due to the general manager a very modest one, instead of the very large amount which it is, they might consider it advisable, under the circumstances, to earry the company on with their own funds for a time, as they have been doing, but you will recognize that such a large debt being already due to them it would only make matters worse further to increase it. I shall be glad to answer any questions before proposing the adoption of the report and accounts, and to receive any suggestions as to meeting the financial difficulties with which the company is confronted. I cannot, of course, expect shareholders to make any well-considered proposals at this meeting as to how the finan-cing of the company is to be carried on, and I intend, therefore, to call a special meeting at an early date to receive an expression of your views, and to come to a decision as to what is to be done. The report was adopted.

Cotton Waste.

There has been out little business re ported in this market the past week and duliness still prevails. A little better de-mand has been noted in some grades, but quotations show no change.

We quote as follows:

No. 1. 7¼ @ 8 No. 1. (oily) ., 8½ @ 4½ No. 2. 6½ @ 6½ No. 2. (oily) ... 2½@ Clips. 3luit...... 8 @ 3½ White...... 4½ @ 4½ Colored...... 1½@ 2

Egyptian. Roving 9% @ 9% Combing 9 @ 9% Linters.

Thread.

Colored...... 4 @ 4½ Ends solled. 1 @ 1½ No. 1...... 5½ @ 5½ Cut........ 4 @ 4½ No. 2........ 4 @ 4½ Soft........ 4 @ 4½

The largest cotton cargo ever taken out of a United States port in a single vessel, and probably the largest cargo of cotton ever recorded in the world, was cleared on the new British steamship Mechanician, belonging to the Harrison line, on Wednes-day of last week, from New Orleans. The work. No action was taken on the resigna-tion of this committee. cargo consisted of 26,000 square beles of cotton. Eight steamships were cleared at Superintendent Abbott's report of the the New Orleans custom house for European protective department for October shows ports, having on board 76,757 bales of cot-122 alarms for the month, 450 hours duty, ton, as well as 4921 round bales.

Magdalena River Colonization Company,

No. 1123 St., James Building, New York City.

Capital Stock, \$500,000 50,000 Shares-unassessable-\$10 each.

THE CARTAGENA TERMINAL AND IMPROVEMENT COMPANY, LIMITED

HAS A TRACT OF

Three Hundred Thousand Acres In The Republic of Colombia, South America,

on the east bank of the Magdalena River, about Five Hundred miles from the coast. It is about 1000 feet above the level of the sea, and has a frontage on the river of about twenty-five miles.

The property will be divided into 20, 40, 80 and 100-acre farms and sold to the first 500 settlers at \$5 per acre. payable \$1 per acre cash and \$1 per acre in four equal annual payments.

Without Interest.

Shares of stock in our company exchangeable at any time for land in our colony.

The Town

will be laid out in 1000 lots of ONE ACRE EACH. Four lots in each block. The company will try and induce the purchasers of farms to select the town lots for their residences, independent of their farms. That is, those whose farms will be located within three or four miles of the town. If this is acceptable it will be the means of securing good, congenial society, and make our colony attractive. To those who accept of this offer a town lot

TIMBER.

In addition to the agricultural products mentioned, we have thousands of acres of all varieties of hard woods, such as Mahogany, Lignum-Vitae, Ebony, Oak, Spanish Cedar, Ash, Laurel, Redwood-suitable for cabinet work. Also Cinchona, Copaiva, Sarsaprilla, Ipecacuana, Cinnamon, Cloves, Arrow Root, Ginger Root and Ginseng Root.

Lumber Mills.

If any lumber mill men will undertake the erection of a first class mill, our company will donate a sufficiently large tract of land to warrant them in doing so. Our settlers must have lumber to build and the railroads must have ties and sleepers.

Our pioneer colony is sure to meet the approval of every intellegent citizen of Colombia, as, if it proves a success, other colonies will be sure to follow.

We also have in

CALIFORNIA

Improved and unimproved fruit and vineyard lands. Southern California; beautifut home: Santa Barbara: Colony Lands near Riverside.

CALIFORNIA-" WATER IS KING;" a great bargain; splendid established orchard. very valuable location; must sell part or whole; \$3500; also old orange orchard; \$1000; unusual opportunity; photos and particulars.

A 40 acre home in Santa Barbara county; located at Los Olivos, northwest of the city of Santa Barbara; the Alamo Pristado Creek runs through the ranch, supplying it plentifully with water; a pretty little romantic cottage; peaches, prunes and other fruits at hand, and wonderfully fertile soil, where everything grows; the prettiest place in the valley; price, \$5000. Full particulars upon application.

We have land in any part of California and particularly fine Orange Groves at Riverside, Ontario, Pomona and also unimproved lands cheap

Choice California Orange and Lemon Land.

Two hundred acres first-class orange and lemon land in the largest orange growing section in the world; absolutely frostless and very best of water rights; abundance of it. Land all cleared ready to plant. Would make splendid small colony. About six miles from Riverside near the famous Magnolia avenue. Can be bought in 10 or 20-acre tracts for \$250 per acre. It is very choice and desirable; would make lovely houses for few select families. Water piped, under pressure, to the high corner of each 10-acre piece.

Ten acre Orange Grove on Magnolia Ave-5 acres seedlings-16 years old-3 acres Naval Oranges, 2 acres Malta Blood Oranges, 5 years old, all in bearing. Small house and barn. Crop last year sold for \$1200. This year will bring \$1500. Abundance of water-price, \$5000. This property is on the most beautiful avenue in California.

We do not wish to patent our efforts to colonize in Colombia, but will aid any other similar enterprise in

We desire to notify our correspondents that there is a work entitled "THE REPUBLIC OF COLOMBIA," of about 120 pages, beautifully illustrated with views from all parts of Colombia, which is issued by the CON-SULATE OF COLOMBIA and can be had for ONE DOLLAR.

If you will forward that amount to this office a copy will be forwarded to you postage paid. It is well written and perfectly reliable, and to any one thinking seriously of making their future home in Colombia, the richest and most prolific of all South American Republics, it will be one of the best investments one could

Send for pamphlets, maps and photographs.

Applications for stock or lands can be made at our office, No. 1123 St. James Building, corner Broadway and 26th Street. WALTER C. RICHARDS, Agent.

(Please mention this paper when you write to the Magdalena River Col. Co.)

AND MARKETS. YARN OTHER

Yarns and Warps.

COTTON.

There is an improvement in the demand for cotton yarns. Eastern spinners seem to southern mills. Southern spinners are looking for new business and are making conce sions in order to secure it. No changes in quotations are noted.

We quote as follows:

Skein

[Reported by the American Cotton Yarn Exchange, A. B. Sanford Manager, Boston Mass.]

Carded Northern-Single Skeins. Warps.

20s	21	20s	25
248	22	24s to 26s.	25
266	24	3)s	26
30s	25	40s	29
40s	29		

	List price.	
в.	W	arps.
14	88	18
15	10s to 12s	10

6s to 8s	14	88	15
108	15	10s to 12s	16
12s to 14s	151/2@161/2	14s to 16s	163
16s	16	20s	18
188	17	223	185
208	17¾	26s	19
268	181/4	30s	22
378	21		

Carded 2. 3 and 4-Ply Chains

	List price.
Northern.	Southera.
20823	8s15
24825	10815%
268	128161/2
30828	11s17
36930	163171/2
40332	20s 20
50s40	24s to 26s 21
60g47	30828½
70s 55	869 27
89s65	40930

Carded 2, 3 and 4-Ply Skeins.

	List price	
Northern.	Southern	
20822	8815	
24824	10815%	
26825	12816	
30*27	148 16%	
36329	16s17%	
40s31 %	208 19	
50s	24819½	
60s45	26s21	
70s54	30823	
9065	36827	
	40= 90	

Com ed. 6c extra.

Carpet and	Chuciatera rura	
Carnet, 3-ply, 8s	Slack, 3-ply, 8s	15
and 98 15	Slack, 2-ply, 10s	15%
Upholsterv slack.	Slack, 3-plv, 16s	161/2
4-mlm 0s 15		

Carded Hostery Yarns.

Dist price.	
Southern.	Cone and frame spi
64 to 85	\$0s19½
10s17	224 20
11	24821
12517½	26s22
13s17¾	28823
14818	80s24
16818½	40829
18s19	
For Mock Egypti ns, 2	cextra.
Far Silver G eys, 2c ext	ira.

For Jaegers, 2c extra.

Carden Autrile	in mure-apun.
American cops.	Egyptian cops.
817	823 @
1017%	10231/2@
1217%	1223%@
1418	1424 @
16181/2	1624 %@
18	18 25 @
20 19½	2025%@
2220	2226 @
2421	2427 (a)
26 22	2628 @
30 24	_
4927	
Combed, 7 cents extra.	Combed, 5 cents extra
G O . 4 . 34 . 4 3 4	

Cones 8s to 14s inclusive % cent above cops. Cones 15s to 22s inc usive 1 cent above cops. Cones 23s to 35s inclusive 1½ cent above cops. Cones 40s and above 2 cents above cops. Carded Frame Egyptian Yarns in Skeins.

Quoted on application only. For austations on combed varns add 5 to 6 cents to those

Cones: 16s, to 36s, 1 cent higher; 36s, to 50s, 1% c, high

er; 50s, to 70s, 2 cents higher; 70s, and above 3 c. higher. Warps: 16s, to 36s, ½ cent higher; 36s, to 50s 1 c, higher; 50s, to 70s, 2 cents higher; 70s and above 3 cents higher.

Mercerized Yarns.

	Combed	Combed	Sea Island.
	Peeler.	Egyptians	
8-2 to 12-2	52	54	63
16 to 20-2	53 ≨	553/2	64
24-2	56	58	67
30-2	581/2	601/2	693%
36-2	62 -	64	73
40-2	64	66	75
45-2	67	69	78
50-8	691/2	71%	801/2

60-2	753%	771/2	8
70-2	83	85	95
80-2		95	1.08
90-2		1.03	1.13
100-2		1.17	1.27
110-2		1.28	1.38
120-2		1.40	1.50

WOOLEN AND WORSTED.

The market for woolen yarns is feeling very much better and the outlook is promwery much octer and the authors is position to place orders just a soon as they receive orders for their production and spinners are feeling quite pleased over the outlook. Worsted yacus have noted a fair business doing and woolen yarns have also reported something doing.

WOOLEN YARNS.

	_		
13 cut42	@46	2-10s32	@34
18 cut50	@	2-18850	@
22 to 27 cut	@60	2-20g50	@52
	FII	ling.	
12 cut37	@38	22 cut55	@60
18 cut50	@52	34 cut72	@76
	Me	rino.	
226 40-6050	@	28s 40-600	@58
22s 50-5052		30s 40-6950	@53
22s 60-40 57	@		
22s 70-3062	@63		

WORSTED YARNS.

TWO-PLY.					
12s common	@54 @67% @71	32s ¼-blood70 31s-36s ¼ blood70 23s-31s ½-blood74 36s ¾-blood98 40s ½-blood88 40s delain95	@ @76 @81 <i>@</i> 90		

FOREIGN.

(Domestic Spun.)

French	Spun	and	Australian.	
French.		Α	ustr [,] lian.,	

French.			Austriban.,
20s85	; a	90	4°s1.12 @1.16
248	@	97	50g115 @1.20
3°s95	@	98	60s1.20 @1.25
40s de'aine1 00	@1	05	
		rwo	-PLY.
			40s 1/4-blood 95 @1.00
368	75 6	D: 80	40s Australian1,10 @1.15
30s 1/4-blood 8	35 6	90	50 * Australian 1.13%@1.28
			60s Australian1.25 @130

COTTON.

American.

The New York market for spot cotton has been fairly active and a good demand is reported. Quotations are steady at an ad-

vance of 1-16c.	
We quote as follows:	
Middling Unlands	10 3-16c

Middling Gulf	10 7-16c
In the New York market future	es ere i
light request and values remain a	bout the

	quon							
Januar	у	 					 	
Februa	ry	 					 	
April.		 					 	
May		 			••••	••••	 	
June		 		. .			 •	
шис	******	 	••••			*****	 ••••••	

October	
Spot cotton as quoted at various ports	i
Augusta 97%	c
Charleston 9%	c
Galveston 9 1	1-
Memphis 9 1	8-
Mobile 95/4	е
New Orleans 934	e
Norfolk	c

MODILE	0786
New Orleans	9% c
Norfolk	9% 0
Savannah	9%c
a	

prines are steady at an advance.		
Fair Middli g	5	19-32d
Good Middling		
Middling	5	31-32d

Spot cotton at Liverpool is steady ard

Futures at Liverpool are quiet but steady and prices are reduced a few points.

November		
December	5	26-6
January	5	23-6
February	5	21-
March	5	19-4
April	5	17-
May	5	14-
June	5	11-
July	5	08-
August	4	58-
September	4	57-

Alexandria quotations for November, Decemb. 1 and Charcoal, I. C...... \$6 25@ 6 75 Coke, I. C........ \$4 75@5 00 Liverpool quotations for prompt shipment. Mit [Atifi.]

Types.	Alexandria.	Liverpo	ol.
S. E.P.	1837	19.14	
S. I. L.	18,25	19.01	
D. A. D.	18.25	19.01	
A. S. P.	17.99	18.76	
O. R. D.	17.61	18.44	
C. A. I.	17.23	18.12	
R. I. B.	16.97	17.99	
T. I. Z.	16.72	17.86	
I. D. E.	16.59	17.74	
A. D. E.	16.46	17,61	
A.M.G.	16 27	17.35	
R. A. P.	16.08	17.10	
M.A.H.	15.82	16.84	
E. W. O.	15.44	16.33	
H.A.M.		14.67	
C. A. T.	f	13.65	
F. A. F.			
A. F. A.			
	Bamia.		
N. U. D.	No	minal.	
E. R. O.		Do.	
	Abasil.		
F. A. Z.	N	ominal.	
A. F. Z.		Do.	
M. I. T.		Do.	
S. I. S.		Do.	
I. S. I.		Do.	
	Ashmuni.		
		Nov	Dec.
B. F. B.		15.50c	16 83c
N. E. W.		15 12e	16.08c
M. U.Y.		14,61e	
F. E. U.		14.16c	
F. A. Y.		13.27c	
M. A. F.			

COAL.

Coastwise Freights.

New York to Boston\$	70	@	\$ 65
Philadelphia to Boston\$	75	@	\$ 80
Baltimore to Boston\$	85	@	90
Newport News to Boston\$	75	(a)	80
Norfolk to Boston\$	75	@	80

The situation in anthracite coal is easier, although prices are about the same.

(Quotations or	New York	basis f. o. b.:		
8	tove	\$4 50 @	Egg	@	94
T	trolon	@ \$4.60	Chastant	0	

The market for anthracite coal is very dull and quiet. The weather is against a good movement and consumption is light There is a little more coal coming forward at wholesale and under present trade conditions there is little danger of a shortage.

Stove	£6.25	Egg	66,(0
Chestnut	6 25	Furnace	5.75
Pea	5.00	Franklin	7.75
Shamokin	6.50		

Bituminous coal is in pretty good supply with the market firm. There is a good demand and quotations remain the same. At tidewater the quotation is at \$2.20@2.40 alongside; the market is at \$3.35@3.45.

MARKET REPORTS.

METALS.

Domestic Pig Iron-There is a good demand for foundry pig iron in this section and values are held firm. In anticipation of higher prices the foundry people are anxious to secure iron ahead.

We quote as follows:

ο.	1\$16	00 @	16 50	No. 3\$14 60@	15 1
_	9 \$15	10 @	15 60		

Steel continues in good demand with prices held steady.

We quote as follows:

Am. pig\$19 50@19 75	Am. machinery 2	15@2	21
Sheet steel 2 95@ 3 00	Cast steel	7@	14
Fire box 1 75 @ 2 10	Rivets 2	75@2	8

Copper—This market is firmer and a fair trade is reported. We quote at wholesale \$17.00 for lake and \$16,60@16.62½ for casting brands.

Lead continues quiet. There is a light demand and quotations are about the same. Large lots are quoted at 4ge per pound, small lots at 48@43c

Aluminium-The market remains steady and a good trade is reported at previous prices.

No. 1	33@	35 No. 2			31@8
Nickel-	A steady	demand	is	noted	and
values are	held firm	at previo	us	quotati	ions
C	*00	200 man		40	

Tin Plates are firm and a moderate busi

ness is reported at last week's quotations.

Antimony, Quicksilver and Spelter are in good request and prices are slightly changed.

Antimony, # lb... 9½@ 10 Quicksliver.....\$51 00@52 50 Spelter, Am.ref 4 30 @4 35

Pig Tin is firmly held at full quotations although a dull request is mentioned. Quotations are 27 90@28.00 for large lots and 28.00@28.25 for jobbing.

MISCELLANEOUS.

Alcohol continues steady in tone with a good demand. We quote grain \$2.45@2.47 per gallon, according to quantity.

Starch-The market remains firm and a ood demand is reported at last week's quotations.

Tallow and Grease are fairly active and a fair business is transacted at former

Tallow, city.... 5 @ 5 1-16 Grease, bone....... 4½@ 4½ Tallow, country.... 4½@ 5 Grease, house....... 4½@ 4½

Hemp-The fiber market remains in a very quiet condition. The position of Manilla hemp is unchanged with buyers holding off as long as possible

Manila...... 8% 8% Sisal..... Jute and Jute Butts are dull and essy and buyers show no interest in the market.

Values remain about steady.

ROPE.

7-16 inch diam ter and larger 9½	a 10
%-inch diamete10	@10%
34 and 5-16 inch diameter	@11c
3-16 Inch diameter11	@12c

% inch dia veter % and 5-16 meh diamete	7-16 inch diameter and larger	
Hay	% inch diar eter	
	54 and 5-16 inch diamete:	
Lath varns 110 and 130.	Hay	
	Lath yarns 110 and i30	

WOOLEN RAGS

The quiet condition of this market is still a noted feature and little or no change is reported. There is a little better demand in some grades but the general condition remains the same. An early improvement is looked for.

We quote dealers' prices as follows:

	Soft back 1 @ 1½ Hard back ½@ ½
Cl	lps.
good light!4%@15	fine dark10 @111/4

Cloth.

seamed,	dark	%@ 1	worsted	8%@ 9%
seamed,	blue	1 @1%	skirted	4 @ 6
			unskirted	1%@ 2
seamed,	mixed	12@ %		

Delaine.

unskirted 1 @ 1¼ skirted 1¼@ 1½

2/ a) \$/ light

gray	73 49	1 24	118111	(G Tu
white	2 @	21/2	dark 8	@ 93
brown	1%@	2	black103	4(0)
blue	@	2	seamed black135	€@143

red flannel	3344	ā, 10	0	blue1	0%	9 11%
blue flannel	9 (9	9%	red		@11
knit jacketsl	10 6	2:10	11/2	gray	1034	@10%
				mixed common	9	@10
				white and knit	28	@

Miscellaneous.

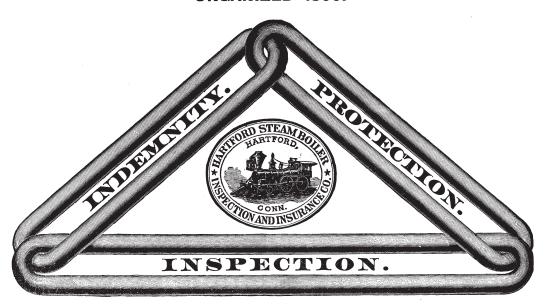
Hats-Old felt 1 @ 1% Satinets, old 38 @48 Mixed woolen rags 1 @ 1% Reps and bunting 6 @

Telephone 2419 Franklin.

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W. H. ALLEN, Assistant Manager.

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"EVENERS.

It is generally conceded that the most important feature of preparatory machinery is

The old type of the English "piano" evener has been improved upon and practi-

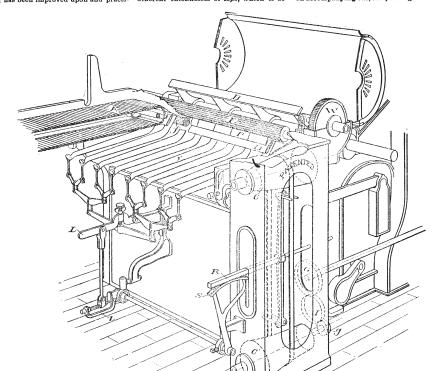
plain view of the operator, any slight trouble can be readily perceived and corrected.

Another important consideration is the readiness with which the evener can be adjusted to adapt it to various conditions and different thicknesses of laps, which is ac-

must be positive and reliable, and such things as rope or chain, etc., susceptible to stretch and unevenness are to be strictly avoided, as they will undoubtedly cause the same varying results just mentioned.

Owing to a peculiar patented combination on accompanying cut, the picking and evenThe A.T. Atherton Machine Company, of Pawtucket, R. I., who apply this type of evener to all of their lappers.

This concern makes the largest variety of machinery for the picker room, and the number of mills equipped with their machines in the few years since this company was incorporated fully attests the radical improvements made by them in this line; in fact, they claim to be "the leading manufacturers of preparatory machinery."



cally done away with in this country; furthermore the American makes are, generally speaking, radically different, and as they vary in construction so do they in effectiveness.

Recent inventors have found the field so well covered that they have not only found it hard to introduce anything new that would at the same time be an improvement, but have also been prevented to a large extent from copying, on account of the force and breadth of patents already in existence.

A study of the development of the evener for cotton lappers would be very interesting, but as the modern manufacturer has to deal more with what is up to date, we will waive this interesting study and consider the various types now in most common use.

Talking points are not always practical ones, and a purchaser is for this reason largely forced to use his own judgment in reaching a verdict concerning the soundness of arguments offered. When simplicity is combined with effectiveness it is the thing most to be desired in mechanical motton, as it enables the mechanism to accomplish the required results with the least care to the operator and at a minimum cost for repairs, etc.

Careful tests have always given a preference to the evener having its plates or sectional rolls beneath rather than above the feed roller, working in conjunction with the same. There are several reasons for this, but the main one is so apparent to one having had experience that it cannot be overlooked.

It is a fact that the parts coming above the feed roll have to be encased, and as the cotton beats from the rolls the lint and dust which necessarily fly from the sheet of cotton gradually clog up the working mechanism boxed in the above-mentioned casing or covering. Of course, this can be taken apart and cleaned; but it not only requires an expenditure of about four hours' labor, but it also stands to reason t hat the evener is becoming less and less effective from the time it is first cleaned until it is cleaned again, owing to the fact that the clogging is a gradual process, and the sensitiveness of the evener becomes less and less as the clogging operation gradually goes on. Furthermore, where all the parts are open and in

complished on the evener illustrated herewith by simply turning a screw. Parts must not be intricate or delicate, as the least amount of backlash or play is detrimental.

The mechanism should be very sensitive and quick to work, as the communication from the evener plates or rolls to the cone belt must be practically instantaneous to accomplish what is expected of it, and in this connection a convex and concave cone should be used communicating directly with one another, as where a drum or idler is used it is necessary to travel twice the distance to obtain the same result. It can readily be seen that where screws, worms and similar contrivances are used in the make-up of the evener there is apt to be more or less friction, even though the operator takes the greatest of care and spends a great deal of time in oiling the parts, and the least amount of friction retarding the immediate action of any of the connecting parts practically makes the evener unreliable, as it may make an even and smooth lap for a time, and then, for practically no accountable reason, vary beyond a reasonable limit.

It can also be induced from the foregoing that all adjoining and connecting parts

ing are not done from a single pair of rolls or a combination of the plates and a single roll, although this appears to be the case; consequently the argument that two sets of rolls offer a superior construction loses its force, and the second set of rolls also helps undo the work accomplished by the evener.

A great many manufacturers of picking machinery have made a failure of their machines and discontinued their manufacture because of their inability to get a successful evener.

A great many carders seem to have the impression that as long as laps taken from the finisher are reasonably even, the results wanted are being obtained. This, however, is not always the case, as it is necessary that the lap should be even when weighed by the yard, this being the true test of the work does but the area.

work done by the evener.

The scale-motion evener, with plates located beneath the rolls, having its working parts all in plain view, as illustrated herewith, is covered by patents, and as it is claimed to be the most successful form yet devised, it, of course, has been imitated in a great many ways with varying success. It is claimed, however, that nothing has yet equaled the original.

The patents are owned and controlled by

United States Textile Patents.

No. 661,268. Warping machine. Charles H. Knapp, Paterson, N. J. Filed March 6 1900. Serial No. 7483. (No model.

No.661,264. Driving mechanism for looms. Albert A. Gordon, Worcester, Mass., assignor to the Crompton & Knowles Loom Works, same place. Filed June 16, 1900. Serial No. 20,543. (No model.)

No. 661,083. Picker check for looms. David W. Shirreffs, Oswego Falls, N. Y. Filed April 2, 1898. Serial No. 676,200. (No model.)

No. 661,752. Shuttle - changing loom. Horace Wyman, Worcester, Mass., assignor to the Crompton Loom Works, same place. Filed June 9, 1899. Serial No. 719,993. (No model.)

No. 661,665. Shuttle check for looms. John P. Maloney, Woonsocket, R. I. Filed May 18, 1900. Serial No. 17,164. (No

No. 661,656. Harness for cross-weaving. William B. Dixon, Philadeiphia, Pa. Filed March 24, 1897. Serial No. 628,936. (No model.)

No. 661,640. Woven fabric. Alfred Heald, Philadelphla, Pa. Filed Feb. 19, 1900. Serial No. 5794. (Specimens.)

No. 662,029. Loom beam attachment. Charles R. Saatweber, Paterson, N. J., assignor of one-half to George W. Renkel, same place. Filed Oct. 7, 1899. Serial No. 732,912. (No model.)

Lucid Intervals.

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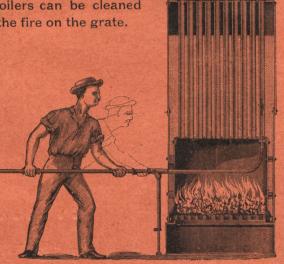
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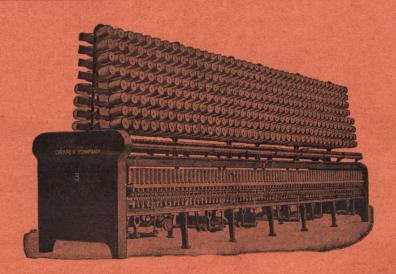
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OUR LATEST TWISTER

We take this opportunity of calling the attention of possible customers to our special for Cotton, Woolen and Worsted Yarns. We believe that we have the most up-to-date construction in the market. Our machine is built primarily for Twisting and is not a made over spinning trame. It is heavy, solid and substantial. We make its spindles and rings here in our own works and we know its every detail.

As to novelties we own patents on exclusive features that ought to settle any possible question of choice. We control the

Reversible Ring Rail, Carter Oiling Device for Vertical Rings, The Hetherington Spindle Brake, The T. H. Smith Twister Stop Motion,

And other minor features. Why not have the benefit of recent improvements when they are readily accessible? The great increase in our business testifies to appreciation of our efforts. We now have unrivaled facilities for prompt execution of large orders.

As to other lines of manufacture, we are still ready and anxious to convince those ready and anxious to be convinced by truth and logic. We take legitimate pride in our products and will alter not the grade of any one of our products to gain a possible price-clipping customer.

As to Northrop looms-send for complete pamphlet if interested.

THE DRAPER CO., HOPEDALE, MASS.