decision of the collector is concise and all that is necessary. It refers to two representative invoices of worsted cloths, submitted to him by importers, and is as follows :—

"The above invoices having come before the collector on a hearing, at the request of numerous importers, as to whether classification thereon should be made under paragraph 363 of the tariff as manufactures of worsted, or under paragraph 362 as manufactures of wool, the collector decides that the classification of the merchandise covered by said invoices shall be made under paragraph 362, and duty assessed accordingly."

This has the satisfaction of bringing the question to an issue, though a judicial opinion may not be obtained for a long time to come. Looked at in this light it will be received with more or less gratification by all concerned.

Under the tariff of 1867, there was in the cotton schedule a similar condition of affairs as that connected with worsted and woollen cloths at the present time affecting sheetings and drillings. It has been asserted that because worsteds are made from wool they are necessarily woollen cloths or manufactures of wool, regardless of the tariff distinction. The present tariff makes no distinction between drillings and sheetings, but the tariff of 1867 did, the first being specially designated and the latter included under manufactures of cotton. The drillings were subject to higher rates of duty. It is not a disputed question whether woollens and worsteds are made from wool of the same character, neither is it whether sheetings and drillings are made from the same kind of cotton, nor whether they are both manufactures of cotton, yet the 1867 tariff regarded them differently for duty purposes. A standard sheeting then as now was reckoned at 2·85 yards to the pound, plain weave, number twelve yarn. The drilling was like it except that it was of narrower width and twill weave. Both were made from the same number of yarn and the same kind of cotton. The principal difference between the two was due to a single process in their manufacture—weaving. That difference exists today. Woollens and worsteds stand in the same category, the difference being not in the weaving, perhaps, but in the process preparatory to spinning, which the tariff, however unjustly it may be, takes cognizance of, and as was done with the cotton manufactures in 1883 should be rectified, not by an executive department but by a legislative department.

Joint Stock and Financial News.

COTTON COMPANIES.

STAR SPINNING COMPANY, ROYTON, OLDHAM.—The profit for three months is £1,898 19s. Dividend proposed, 1s. 9d. per share of £3 10s., or 10 per cent. per annum, which will absorb £1,225. The sum of £673 15s. is placed to the reserve fund. The share capital is £49,000; loans, £67,050. Spindles, 103,536 (59,532 W and 44,004 T). Plant three months ago, £94,786. Company formed 1874.

DUCHESS SPINNING COMPANY, SHAW, NEAR OLDHAM.—The profit for three months is £1,420. Dividend, 10 per cent. per annum, which will absorb £925. Share capital, £35,000; loans, £31,994; mortgage, £20,000. Spindles, 73,012 (25,908 T and 47,104 W). Plant three months ago, £75 266. Fireproof mill. Company formed 1884.

LANSDOWN SPINNING COMPANY, OLDHAM.—The profit for the past three months is £400, which reduces the adverse balance to £2,395. The capital employed is £15,923 shares and £33,618 loan; the plant standing at £45,669 and the number of spindles 25,808 twist and 23,352 weft. The shares are £5 in amount with £2 per share paid, and are quoted—"Sellers 32s. dis."

SHILOH SPINNING COMPANY.—The directors, in their quarterly report and balance-sheet, state that the working of the concern has resulted in a profit of £349 15s. 7d. The share capital is £17,793 and loan capital £23,385. There was no dividend last quarter.

LIVINGSTONE SPINNING COMPANY.—In their 61st quarterly report the directors state that on February 27th a fire took place at the Lydgate Mill, resulting in the destruction of the main building. Mr. Hoyle, fire assessor, of Bolton, was engaged to prepare a claim against the insurance companies, which was immediately presented, and although some time had elapsed they were now in a position to report a full settlement of the claim for a total sum of £8,081 and all the salvage. The directors, after consulting with the auditors, have decided that it would be impracticable to issue more than a cash statement for the quarter just ended.

LOWMOOR SPINNING COMPANY OLDHAM.—Stock was taken on Saturday, and they have a profit which will allow 1s. 6d. per share, or 8 per cent. The capital employed here is £8,066 shares and £5,803 loan, the value of plant standing at £10,775, and number of spindles 9,756, all twist. The shares are £5 in amount, with £3 15s. per share paid, and are quoted in the latest official list—"Buyers, 6s. dis."

NEW COMPANIES.

BARKING JUTE FACTORY, LIMITED.

With a capital of £100,000 in £5 shares, of which 15,000 are now offered for public subscription. This company has been formed to acquire as a going concern the factory known as the Abbey Mills, Barking, Essex, where, it is stated, an extensive business in the manufacture of jute goods has for many years been carried on. According to the prospectus, the property is freehold, and consists of land of over 12 acres in extent, with a river frontage of over 1,500 ft. It is estimated that with an output of 80 tons per week, at a profit of £2 10s. per ton all round, the annual profit of the company will amount to over £10,000. Offices: 19, Cullum-street, E.C.

THE WATERFORCE LAUNDRY MACHINE COMPANY, LIMITED.

Registered by A. E. N. Ward, 27, Leadenhall-street, E.C., with a capital of £10,000 in £1 shares. Object, to acquire any inventions capable of being used as washing machines for laundry, wool-cleaning, or other purposes. The first subscribers are:—

	Shares.
W. Barnard, The Bourne, Norwood	1
R. de Hove, Trebor, Norwood	1
A. Stevens, 53, Swaton-road, Bow	1
T. Shephard, 38, Brondesbury-villas, N.W.	1
C. Brown, 69, Cranfield-road, Brockley	1
R. Ray, Devereux Chambers, Temple	1
S. Cross, 12, Crookham-road, S.W.	1

Registered without articles of association, and consequently the regulations of Table A in the first schedule of the Companies' Act, 1862, apply.

GATES AND CO., LIMITED.

Registered by E. C. Rawlings, 2, Walbrook, E.C., with a capital of £45,000 in £50 shares. Object, to acquire the business of Gates and Co., carpet manufacturers, Wilton and Salisbury, and of Gates, Lander, and Marshall, carpet warehouse and agency business, 13, Oxford-circus Avenue, London. The first subscribers are:—

	Shares. Founders.	Ord.
Mrs. Gates, Wilton	1	139
J. Lander, Wilton	1	159
P. Gates, Wilton	1	129
C. Marshall, 12, Cromwell-grove, W.	1	169
		Pref.
Mrs. Marshall, 17, Kensington-crescent, W.		10
J. Rutter, Shrewsbury		10
E. C. Rawlings, 212, The Grove, Hammersmith		10

The number of directors shall not be less than three nor more than six. Qualification £5,000 stock. The first are Mrs. R. Yates, J. Lander, P. Gates and C. Marshall.

RICE AND CO., LIMITED, CHORLEY.

Registered by R. Jordan, 120, Chancery-lane, London, W.C. Capital, £40,000 in £10 shares. Object, to acquire the business of cotton manufacturers now carried on by T. W. Rice, jun., under the style of Rice and Co., at Chorley. The first subscribers are:—

	Shares.
T. W. Rice, jun., 81, Mosley-st., Manchester	1
J. Thompson, 81, Mosley-street, Manchester	1
J. Sellers, Chorley	1
E. Sellers, Chorley	1
E. Sellers, jun., Chorley	1
Mrs. Rice, Sale	1
H. Thompson, 81, Mosley-st., Manchester	1

There shall not be less than two directors. T. W. Rice is appointed managing director. The first ordinary directors are J. Thompson and J. Sellers. Qualification 20 shares. Remuneration to be fixed at the yearly meetings.

Gazette News.

ADJUDICATIONS.

Adam Proctor, Grafton-street, Bradford, wool and waste dealer.

Thos. S. King, Player's Factory, Radford, Nottingham, lace manufacturer.

Tappling and Co., Bethnal Green, London, carpet manufacturers.

RECEIVING ORDERS.

Charles Peake, Fore-street, London, manufacturer; London.

Adam Proctor, Manchester-road Bradford, wool dealer; Bradford.

Froggatt and Sons, Newton, Cheshire, candlewick pinners.

NOTICES OF DIVIDENDS.

William Child, 47, Monton-street, Greenheys, Manchester, Joseph Binning, Calcutta, India, trading as Child, Binning, and Co., 68, Major-street, Manchester, and as J. Binning and Co., Calcutta, India, merchants and commission agents; 1s. 6d., second.

PARTNERSHIPS DISSOLVED.

Bagshawe Brothers and Co., Upper Thomas-street: London, steel and general machinery and plant sellers, as regards Peter J. de Bangy.

Pollard and Senior, Wellington-street, Batley, oil and grease merchants, &c.

M. W. Carr and J. Slater, Keighley, reed and heald makers; as regards J. Slater.

Patents.

APPLICATION FOR PATENTS.

The names in italics within parentheses are those of Communicators of Inventions.

Where Complete Specification accompanies Application an asterisk is suffixed.

20TH MAY.

8326. ISAAC MILLAS, Morley, near Leeds. Improvements in double lift harness or dobbys for weaving.

8335. GEORGE SOWTEY, 88, Clarendon Villas, Robin Hood Chase, Nottingham. Improvement in the manufacture of hose, half hose, and socks.

8347. JOHN CATTERALL and WILLIAM CATTERALL, 8, Quality Court, Chancery-lane. Improvements in top clearers employed in spinning and preparation machinery, and in apparatus for operating the same.

8357. BENJAMIN TWEEDALE, 57, Lincoln's Inn Fields, London. An improvement in healds.

8373. JAMES YATE JOHNSON, 47, Lincoln's Inn Fields, Middlesex. Improvements in preparing colouring matters of the oxyketone group suitable for dyeing and printing with the aid of mordants. (*Badische Anilin and Sodafabrike*, Germany.)

21ST MAY.

8395. ANTHONY SMITH DAVIS, 52, Chancery-lane, London. Improvements in pulley covering.*

8406. FRANCIS BEST FAWCETT, 44, Comberton-road, Kidderminster. Improvements in the manufacture of jacquard Brussels and velvet carpets.

8407. JAMES ROBERT WAIN, 4, St. Ann's Square, Manchester. Improvements in self-acting mules and twiners.

8410. PAUL WALLACE, Commercial-street, Halifax. Improvements in apparatus employed for spinning, doubling, and roving wool, cotton silk, and other fibres.

8413. JAMES WADSWORTH and JOHN HADDOW, 1, St. James's-square, Manchester. Improvements in apparatus for stretching woven material.

8424. FRANZ WALTER, 41, Eastcheap. Method of signalling, and avoiding or minimising the danger of steam generators running short of water.*

8431. JOHN HENRY WHITLEY, Town Hall Buildings, Halifax. Improvements in apparatus for indicating and recording inequalities in the "feed" or bulk of fibre supplied to cotton scutchers and openers.

22ND MAY.

8477. DAVID WALKER and ROBERT WALKER, trading as the MIDDLETON PAPER STAINING COMPANY, 1, St. James's-square, Manchester. Improvements in printing designs in several colours at one operation upon paper, cloth, and other similar materials and fabrics.

8481. WILLIAM CAREY HARGREAVES, of the firm of WILLIAM JACKSON, SONS, and Co., 8, Quality Court, London. Improvements in dressing or beaming warps.

8487. JAMES THOMAS LISHMAN, 1, Chellon Mount, Allerton, Bradford, Yorkshire. An improved picking shaft "top or cap" in looms for weaving any kind of textile fabrics.

8488. WILLIAM CRAIG HAMILTON and ADMIRAL BARRACLOUGH, Sunbridge Chambers, Bradford, Yorkshire. Securing pegs for forming the pattern surfaces for looms.

8498. Friedrick Hermann Wilke, 17, St. Ann's-square, Manchester. Improvements in looms.

8503. Ignatz Carl Koch, 37, Chancery-lane, London. Improvements in woven wire and asbestos fabrics.

23rd May.

8548. Ernest de Pass, 68, Fleet-street, London. Process for producing azo colouring matters from dehydrothioparatoluidine of 191 deg C. melting point, and from its homologue dehydrothio-metaxylidine. *(The firm of Ewar and Pick, Germany.)*

8564. Hugh Cousland, 70, Wellington-street, Glasgow. Sewing machines.

8571. James Bradshaigh Hodgkinson, 8, Quality Court, Chancery-lane. Improvements in the manufacture of figured cloth.

8578. John Thomas Ball and Robert Whitaker, 78, Park-street, Farnworth, near Bolton. Picking motion in power looms, viz:—"Improved positive cam."

8583. James Parsons, Upper Bilson, Cinderford, near Newnham, Gloucestershire. The cleansing and prevention of incrustation of boilers.

8585. William Pullen and Moss Pullen, Town Hall Buildings, Halifax. Improvements in apparatus for the manufacture of looped or pile fabrics.

8586. Jeremiah Ramsden, Commercial-street, Halifax. Improved apparatus to enable endless ropes, straps, or cords to be placed on to the wharles and cylinders of spinning, twisting, and other like machinery.

8589. Samuel Clegg, Theatre and Concert Tavern, and John William Clegg, 53, Princess-street, Hurst, both in Ashton-under-Lyne. Picker for weaving.

8612. Henry Fawcett, 24, Southampton Buildings, London. Jacquards.

8613. Thomas Townend, John Eaton, and Arthur Powell Townend, 4, South-street, Finsbury, London. Improvements in felt hats.

8619. Andrew Seigmann, 20, High Holborn, London. Electrical alarm for announcing the varying water levels of steam boilers.*

24th May.

8628. Willlam Birch, 4, St. Ann's-square, Manchester. Apparatus for guiding woven fabrics to stretching or other machines.

8635. Edward Mercer Whipp, Thomas Roberts, John Hargreaves, and James Townsend, Town Hall Buildings, Halifax. Apparatus employed in the weaving or manufacture of "slit ups."

8650. John Hargreaves and Edward Gillow, 8, Quality Court, Chancery-lane. Improvements in the construction of rings and travellers employed in ring-spinning and ring-doubling frames for spinning and doubling cotton and other fibrous substances.

8673. Benjamin Willcox, 47, Lincoln's Inn Fields, London. Colouring matter and leucobases employed therein. *(The farnbenfabriken vorm. Friedrich Bayer and Company, Germany.)*

8676. George Wassermann, 46, Lincoln's Inn Fields, London. Circular looms for weaving.

8680. Henry Harris Lake, 45, Southampton Buildings, London. Machines for winding yarn or thread on spools or bobbins. *(William Henry Goldsmith and John Stratton Wright, United States.)*

8681. Henry Harris Lake 45, Southampton Buildings, London. A device for holding spools or bobbins in machines for winding yarn or thread thereon. *(William Henry Goldsmith and John Stratton Wright, United States.)*

8682. Henry Harris Lake, 45, Southampton Buildings, London. Machines for winding yarn or thread on spools or bobbins. *(William Henry Goldsmith and John Stratton Wright, United States.)*

8683. Henry Harris Lake, 45, Southampton Buildings, London. Machines for winding yarn or thread on spools or bobbins. *(William Henry Goldsmith and John Stratton Wright, United States.)*

8688. Charles Sutcliffe Brooke and Ellis Beaumont, 2, New-street, Huddersfield. Picking mechanism of power looms.

8693. John Corry Fell, 1, Queen Victoria-street, London. Tension weights for shuttles. *(Harold Kelly and Melville H. Kelly, United States.*)*

SPECIFICATIONS PUBLISHED.

1888.

6570 Braiser. Treating fibrous materials. 8d.
7518 Groth (*Ceren.*) Breaking hemp, &c. 8d.
7620 Tweedale. Carding engines. 1s. 6d.
7641 Croker and others. Cleaning cotton seed. 8d.
9419 Holden and Ashworth. Winding yarns. 11d.
9604 Wirth. Vulcanising caoutchouc, &c. 8d.
9791 Oldfield. Looms. 8d.
15,145 Whitaker. Looms. 8d.

1889.

2012 Jucker. Looms. 8d.
5499 Jowett. Looms. 6d.
5741 Smith, Combing wool, &c. 6d.

466. January 11, 1888. **Pile carpets, &c.** T. Tempest-Radford and E. J. Morton.

In weaving "Brussels," "Wilton," and tapestry carpets and rugs, and other cut and uncut pile fabrics one or more sets of additional warps are introduced at the back, such warps being operated by an extra heald or healds arranged in front of the ordinary cordage of a Brussels loom. [8½d.]

467. January 11. 1888. **Embroidery.** E. Cornely, 87, Faubourg-street, St. Denis, Paris.

Universal Feed Machine.—Two or more hook-needles reciprocate through a throat-plate, and receive threads from reciprocating guide-tubes, to form chain-stiches. The tubes are carried by a plate, which is guided at one end by a stud, and engages an eccentric; the eccentric is carried on a hollow spindle through which the threads pass, and which is rocked by gearing with a sliding-rod. In a modification, the plate is reciprocated by a crank on a pinion which gears with another on the spindle, and the tubes move in elliptical paths. The throat-plate and stud are carried by a wheel, revoluble by gearing from the handle which determines the direction of feed; and the needles are also turned by gearing with the handle, so that the needles, throat-plate, and tubes always have their proper relative positions. An additional thread may be laid round the needle-loops by a rotating guide; one needle may be set higher than the other to produce loose loops. [11½d.—*Drawings.*]

495. January 12, 1888. **Roofing felt.** S. and T. Cooper, Brookfield, Heaton, Lancashire.

Consists in the employment of "wood-wool" or "wood-straw" in substitution for, or in addition to, the fibrous materials usually employed in the manufacture of roofing-felt. The wood shavings constituting the straw are much finer than when used for packing and are crushed, and mixed with tar, etc., to form felt in the ordinary manner. [4½d. *No drawings.*]

511. January 12, 1888. **Screw fan.** J. Howorth, Victoria Works, Farnworth, Lancashire.

The invention comprises improvements in the blades, arrangements for moistening, warming or cooling the air by steam or a spray of water, and an arrangement for enabling fans to be used as draught producers in chimneys or ships funnels. [8½d. *Drawings.*]

535. January 13, 1888. **Screw gill machines for flax, &c.** J. Brown, 164, Agnes-street, Belfast.

Rubbers.—The revolving rubbers are driven positively from the screw shaft by means of a worm and suitable gearing. The gearing may be duplicated so that the rubbers of two gill-heads may be driven from the same worm. [6½d. *Drawings.*]

550. January 13, 1888. **Cotton-seed oil.** R Hunt, 19, Oldhall-street, Liverpool.

The cotton-seed oil is intimately mixed with an alkaline solution of suitable strength, and the oil is afterwards separated by a centrifugal separating apparatus. To obtain the best results, the separated oil is treated once again or oftener with a weaker solution. The mixing apparatus may consist of a rapidly rotating basin, to which the oil and solution are supplied in two streams, and forced by centrifugal action through a narrow orifice against the walls of a second basin or container. Apparatus constructed similarly to a cream separator may be used for separating the oil; and a hydro-extractor with imperforate basket for separating the soap from the oil. [6½d. *No drawings.*]

603. January 14, 1888. **Fullers' earth.** C. R. Dames, 9, Leonard Place, Kensington, Middlesex.

Consists in a process for preparing fullers' earth for commercial use. Crude earths of various colours and qualities are first hand-picked from stones, &c., then crushed by machinery or broken by hand, mixed together in suitable proportions and ground with water, preferably by edge-runners. The slurry or solution produced is run into tanks to settle, after which the supernatant liquid is decanted and the deposit is thoroughly stirred and passed into other reservoirs where it is drained. Finally it is left in drying sheds until it is bone dry. [4½d.]

606. January 14, 1888. **Filter.** W. A. Nicholl, Sowerby Bridge Mills, Yorkshire.

The filter consists of a tank divided into compartments by transverse vertical partitions. In each compartment media of varying sizes are placed. The passage of the water from compartment to compartment is effected by perforations made alternately at the top and bottom of the partitions so that the water takes a horizontal zig-zag course. [8½d. *Drawings.*]

607. January 14, 1888. **Acid tars.** C. Rave, Malines, Belgium.

Relates to the treatment of the acid residuums or tars resulting from the refining of mineral oils by concentrated acids. The oils obtained by the distillation of the bitumens are capable of being transformed into colouring matters. [6½d.]

619. January 14, 1888. **Sewing-machine.** E Böttcher, 59, Stallschreibstrasse, Berlin.

The machine is particularly applicable for producing overedge chain-stitching on knitted goods. [11½d. *Drawings.*]

620. January 14, 1888. **Sewing-machine.** E. Böttcher, 59, Stallschreibstrasse, Berlin.

Relates to the governing of the needle thread. The amount of thread delivered for the formation of each stitch is varied in accordance with the thickness of the work. [11½d. *Drawings.*]

654. January 16, 1888. **Shuttle and picker checking appliances for Looms.** J. Marshall, Hope-street Mill, Todmorden, Yorkshire.

FIG 2.

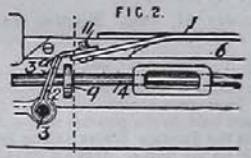
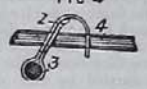


FIG 4



A strap 1 (Fig. 2) folded at 2 is attached to a boss 3 and threaded on the spindle 4 at 3^a, as shown. The other end of the strap passes behind the shuttle box 6 and around a rubber buffer, being held fast by a hook. The strap may be formed in two pieces held together by a bolt and nut 11 to admit of renewing the part 2 when worn out. A washer 9 is placed on the spindle, or the part 2 may (as in Fig 4.) be twice threaded on the spindle. The Provisional Specification describes the strap 1 as being threaded on the spindle at its other end to act also as a check to the incoming shuttle. [8½d.]

687. January 16, 1888. **Sulphonic acids.** C. D. Abel, 28, Southampton Buildings, London.—(*The Actiengesel schaft fur Anilin Fabrikation; Berlin.*)

Relates to the separation of the *a*- and *b*- monosulpho acids of *b*-naphthylamine. The process depends upon the fact that the lead and copper salts of the *b*-acid are difficultly soluble in water, while the corresponding salts of the *a*-acid are freely soluble. The separation may be effected by treating a hot solution of the sodium salts of the mixed acids with sufficient sulphate of copper to convert them both into copper salts. The salt of the *b*-acid is precipitated on cooling. The *a*-acid is obtained pure by treating the filtrate with sulphuric or hydrochloric acid. Or the copper salt may be converted into the barium salt, which is purified by crystallisation. The separation may also be effected by adding copper salt to the mixture only as long as the *b*-acid is precipitated. The lead salts act in an analogous manner. [6½d.]

749. January 17, 1888. **Spooling machines.** H. H. Lake, Southampton-buildings, London.—(*G. H. Wilkins; Shelburne Falls, Massachusetts, U.S.A.*)

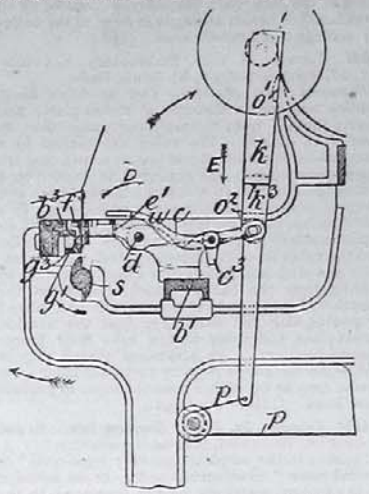
Traverse mechanism.—The reversing of the thread guide i is effected by the contact of a feeler i^1 with the conical ends of the spool placed on the spindle c. The feeler i^1 is pivoted at j^1 to the guide i, and is held in its normal position by a spring connecting the two. The thread guide is slid along a rod j by a pendant lever l formed with half nuts m, m^1 engaging, alternately, screws c, c^1 rotating in contrary directions. The half nuts are held in contact with the screws by a bar p lowered to allow the springs n^1 to effect the change. The bar p is carried by a lever r pressed upwards by a spring s, and downwards, through a pin u, by bell crank levers v, the vertical arms of which are slotted for an actuating rod a^1, passing, normally, loosely through a sleeve carried by the guide i, but nipped by a pivoted piece g^1 operated by the feeler i^1 on the contact of the latter with the conical ends of the spools. The withdrawal of the bar p is thus controlled by the shape of the spool ends. The forked part of the feeler i^1, engaging the nipper g^1, may be separate from, but adjustably fixed to the feeler; and the latter is preferably formed in two parts, 2, 3 for adjusting. The guide i is acted on at the rear end by a loaded lever, spring, &c., to secure a sufficient downward pressure of the front end. When the spool is nearly filled the feeler i^1 is arranged to be operated by adjustable stops l^1 on arms p^1 centered on, and movable against springs, along the fulcrum rod j. In a modification, the bar p is formed in halves, 7, 8 slid longitudinally in opposite directions by pincer-like arms connected with pins p^4, and controlled by the conical ends of the spool to vary the effective length of the bar. In another modification, the two screw threads are

formed on one spindle, in which case the rod j is arranged to slide with the guide i. In a third modification, the feeler is mounted underneath the spool, and is connected with the guide i by flanged toothed sectors; the change rod a^1 in this case operating catch levers to release a catch on a swinging bar, corresponding with p, engaging a forked lever, corresponding with l, to gear one or the other of the two half nuts with the right or left hand threads formed on one spindle.

Spools, removing and fixing.—The spools are removed from the spindle by an upright n^2 carried by a sliding piece l^2 operated through a rack and sector from a lever p^2. The spools are pressed to the same place on the spindle by a spring bracket, the base of which is shown at n^4, pivoted on the sliding piece l^2. [1s. 2d.]

755. January 17, 1888. **Winding Yarns, &c.** W. T. and J. H. STUBBS, Mill-street, Ancoats, Manchester.

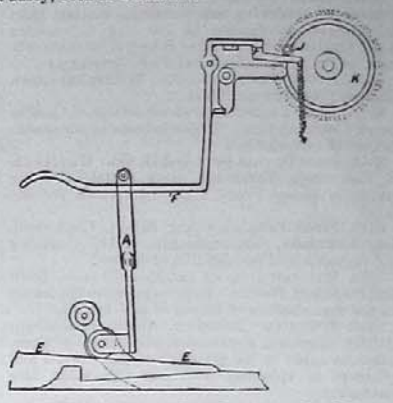
Stop-motions—broken end.—The detector carrier g, and bobbin cradle k, are carried by opposite ends of a lever or lever frame c pivoted at d. Normally the parts are held in the position shown by a projection g^1 on the detector holder taking beneath a projection b^3 on the frame. When a thread breaks, the corresponding detector wire drops, and is struck by the wiper S, the detector holder is swung on the pivots f and released from the projection b^3, and is raised out of the range of the wiper by the swinging of the lever c in the direction of the arrow D. The bobbin cradle k carried by the other end of the lever or lever frame falls, and the bobbin is forced against a fixed brake o^1 by means of the weighted cord p, which normally presses it against the winding drum; g^3, b^3, and c^3, b^1 act as stops to prevent the frame C from swinging too far. In order to "piece" the broken thread the bobbin cradle is drawn away from the brake and held in the withdrawn position by the catch o^2 taking behind a projection k^3 on the bobbin cradle; u is a lever by which the bobbin cradle is released from the catch o^2, and brought back to the position shown in the drawing, the weighted cord p forcing the bobbin



against the drum; e^1 is a stop to prevent the frame c from being turned too far in this direction.

Traverse mechanism.—In quick traverse winding machines in which the traverse rail is operated by means of a plate or disc used in conjunction with a cam, the said disc is rotated by screw gearing, the axle of the pinion by which it is driven being at right angles to that of the disc. [8½d.]

792. January 18, 1888. **Spinning mules.** J. MAY, New Wortley, and L. MAY, Church-lane, Pudsey, both in Yorkshire.



Regulating delivery.—In order to stop the delivery rollers a little earlier at each successive draw, the taking-in wheel K is moved forward at each draw by means of a lever F operated by the shoe E of the shaper through a lever A. In a modification, the lever F is attached directly to the shoe E, and engages with the adjustable stud J by means of an incline. [8½d.]

INDEX TO ADVERTISERS' NAMES.

The Roman numerals after the names refer to the pages of the Advertisement Supplement, unless when the cover is mentioned. In the case of Advertisements not appearing in the current issue, the date of their last appearance is given.

CLASSIFIED INDEX TO ADVERTISEMENTS.

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