No. 767,942. PATENTED AUG. 16, 1904.

W. W. HODGSON.

JACQUARD APPARATUS FOR LOOMS.

APPLICATION FILED MAR. 19, 1903.

NO MODEL.

Fig. 1.

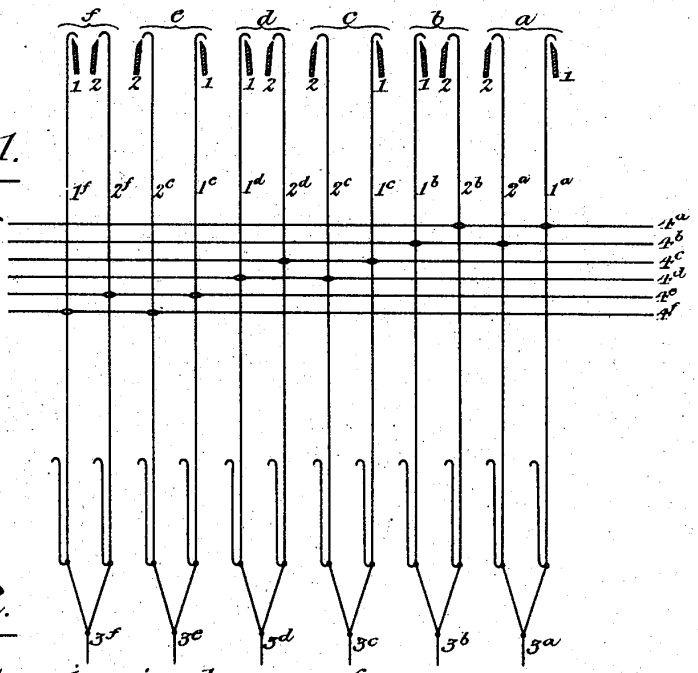
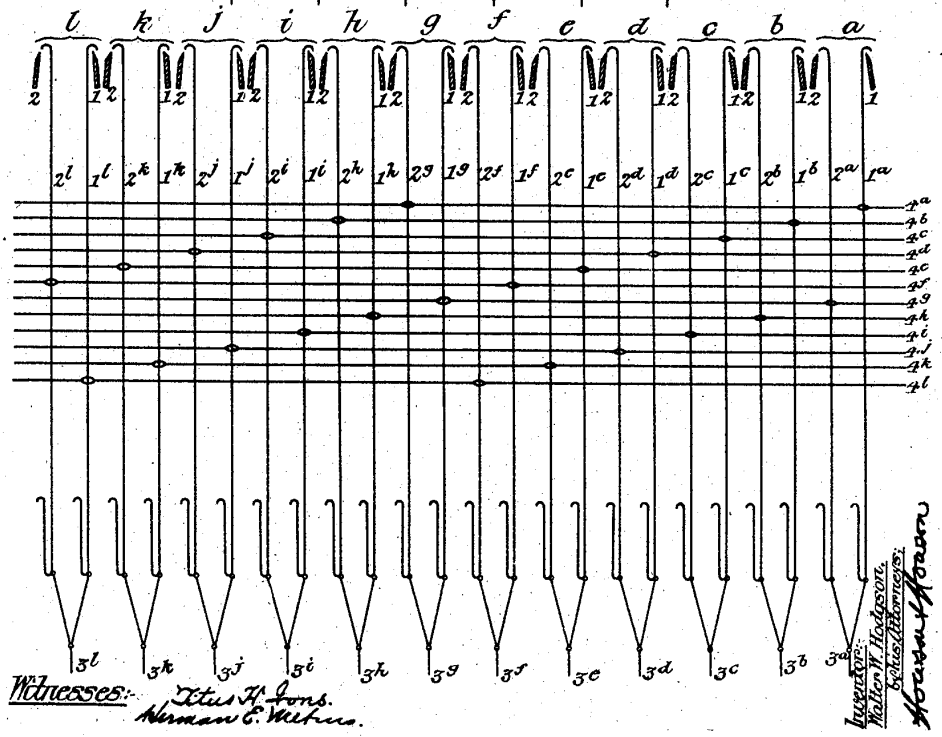


Fig. 2.



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No. 767,942. Patented August 16, 1904.

UNITED STATES PATENT OFFICE.

WALTER W. HODGSON, OF PHILADELPHIA, PENNSYLVANIA.

JACQUARD APPARATUS FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 767,942, dated August 16, 1904.

Original application filed January 5, 1903, Serial No. 137,815. Divided and this application filed March 19, 1903. Serial No. 148,605. (No model.)

To all whom it may concern:

Be it known that I, WALTER W. HODGSON, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Jacquard Apparatus for Looms, (the same being a division of my application, Serial No. 137,815, filed January 5, 1903,) of which the following is a specification.

My invention relates to that class of jacquard apparatus for looms known as "double-lift" apparatus, the object of my invention being to effect without change of the card either a like or a different shedding of the warps on successive lifts of the machine, depending upon the manner in which the card is punched.

In the accompanying drawings, Figure 1 is a representation of sufficient of a double-lift jacquard apparatus to illustrate the application of my invention thereto, and Fig. 2 is a similar view illustrating another embodiment of my invention.

In a double-lift jacquard-machine the vertically-reciprocating bars which engage the needle-controlled hooks are carried by two griff-frames which are raised alternately. In the drawings bars of one griff-frame are represented at 1 and bars of the other and alternately-operated griff-frame are represented at 2, and the hooks are arranged in pairs *a b c*, &c., one hook of each pair operating in conjunction with a griff-bar 1 and the other hook of the pair operating in conjunction with a griff-bar 2, each pair of hooks being connected to one of a series of harness-cords 3^a 3^b, &c. Each needle is connected to one of the hooks of one pair and to an opposite hook of another pair. Thus, as shown in Fig. 1, the needle 4^a is connected to the hook 1^a and to the hook 2^b, the needle 4^b is connected to the hook 1^b and also to the hook 2^a, and so on throughout the series. The hooks 1^a 1^b, &c., face in a direction the reverse of the hooks 2^a 2^b, &c., and are normally in engagement with the griff-bars 1, while the hooks 2^a 2^b, &c., are normally out of engagement with the griff-bars 2, or a reverse arrangement may be adopted, if desired. By reason of this construction and arrangement of the griff-bars, hooks, and needles it is possible to effect either a like or a different shedding of a pair of harness-cords by successive lifts of the machine and without intervening change of card. For instance, taking the two pairs of hooks connected to the first harness-cords 3^a and 3^b it will be noted that if the card is punched for a needle of the first row and blank for a needle of the second row the harness-cord 3^a will be raised on both the first lift and the second lift of the machine and the harness-cord 3^b will be down on both lifts, and there will be a reverse operation if the card is blank for a needle of the first row and punched for a needle of the second row; but if the card is punched for the needles of both rows both cords 3^a 3^b will be raised on the first lift and permitted to remain down on the second lift, a reverse operation taking place when the card is blank for needles of both rows. When, as in many cases, it is desired to lift all of the harness-cords on one pick and permit them all to remain down on the next pick, this operation can be effected by simply allowing the card-cylinder to remain in a retracted position for two picks, the griff-bars 1 first raising all of the hooks 1^a 1^b, &c., and consequently lifting each of the harness-cords and the griff-bars 2, then raising without engaging the hooks 2^a 2^b, &c., so as to permit all of the harness-cords to remain down.

The order of connection of the needles, bars, and hooks may be varied in many different ways without departing from the invention as long as each needle controls a hook of one pair and an opposite hook of another pair, and the connections between the harness-cords and the hooks may also be varied in many different ways so long as each harness-cord is connected to a hook of a griff-bar of each set.

In Fig. 2 I have shown one instance of a connection of needles and hooks different from that shown in Fig. 1, there being in this instance twelve pairs of hooks (lettered from *a* to *l*) and a needle for each pair of hooks, the needle 4^a being connected to the hooks 1^a and 2^g, the needle 4^b to hooks 1^b and 2^h, and so on to needle 4^f, which is connected to hooks

1^f and 2^l, the needle 4^g being connected to hooks 1^g and 2^a, the needle 4^h to hooks 1^h and 2^b, and so on to needle 4^l, which is connected to hooks 1^e and 2^f. This effects a repeat of the pattern.

It will be observed that the needles are connected to one half of the hooks in regular order and to the other half in reverse order—that is to say, taking Fig. 1 for example, the needle 4^a is connected to the hook 1^a, the needle 4^b to needle 1^b, the needle 4^c to the needle 1^c, and so on; but said needle 4^a is connected to the hook 2^b, the needle 4^b to the hook 2^a, the needle 4^c to the hook 2^d, the needle 4^d to the hook 2^c, and so on, and the same rule applies to the form of jacquard shown in Fig. 2.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. A jacquard-machine in which are combined two sets of alternately-operated griff-bars, a set of card-operated needles, a set of hooks for each vertical row of said needles, each set of hooks comprising a hook normally in engagement with a griff-bar of one set, and a hook normally out of engagement with a griff-bar of the other set, and harness-cords each connected to a hook corresponding with a griff-bar of each set, each needle engaging a hook of one pair and an opposite hook of another pair in the same set, substantially as specified.

2. A jacquard-machine in which are combined two sets of alternately-operated griff-bars, pairs of hooks each comprising a hook normally in engagement with a griff-bar of one set, and a hook normally out of engagement with a griff-bar of the other set, harness-cords each connected to a hook corresponding with a griff-bar of each set, and needles, each engaging a hook of one pair and an opposite hook of another pair, the connection of the needles to one set of hooks being in regular order and their connection to the other set of hooks being in reverse order, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WALTER W. HODGSON.

Witnesses:
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