



(No Model.)

3 Sheets—Sheet 2.

T. HALTON.  
JACQUARD APPARATUS FOR LOOMS.

No. 524,898.

Patented Aug. 21, 1894.

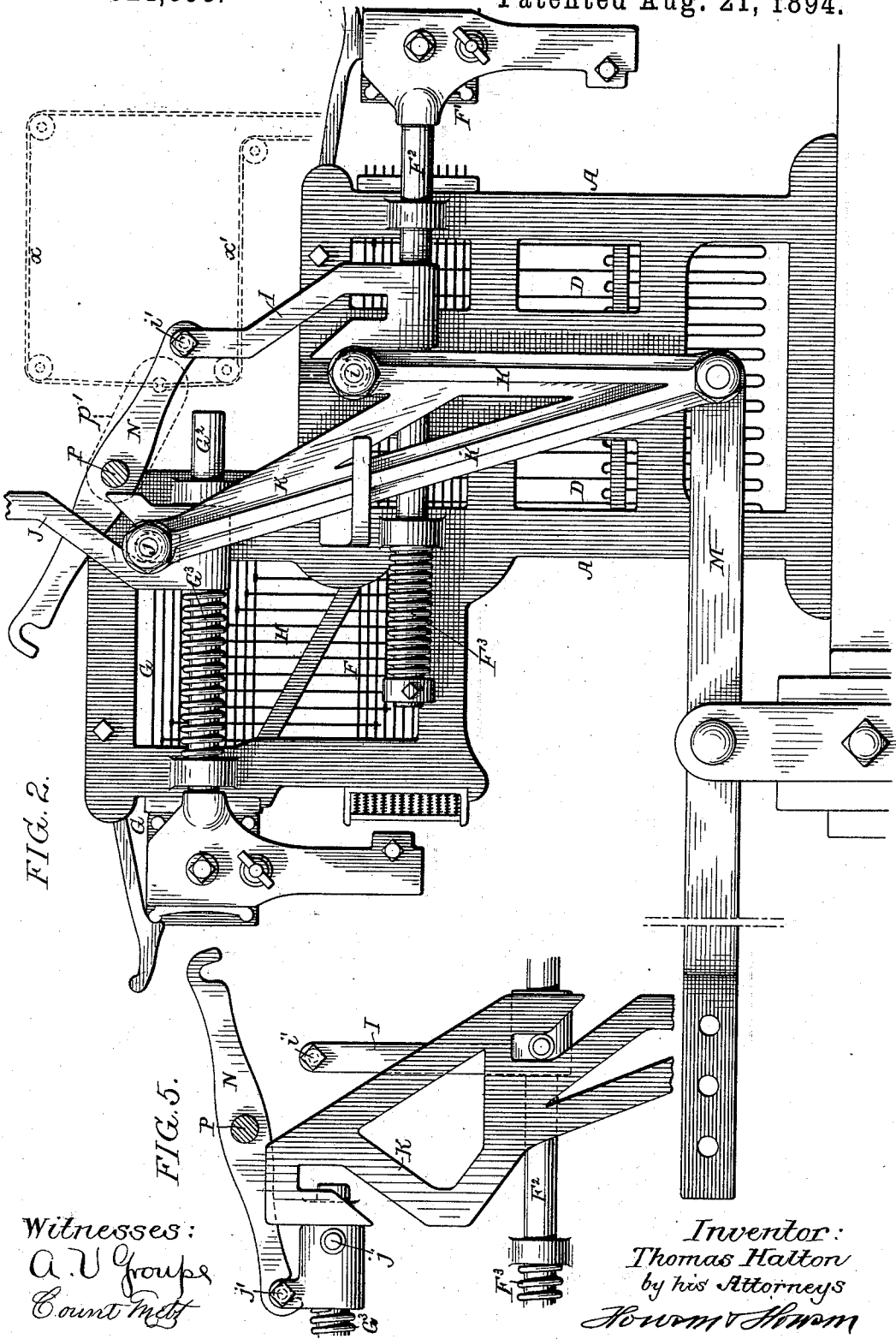


FIG. 2.

FIG. 5.

Witnesses:  
A. V. Grouse  
Count Mett

Inventor:  
Thomas Halton  
by his Attorneys  
Rowan & Rowan

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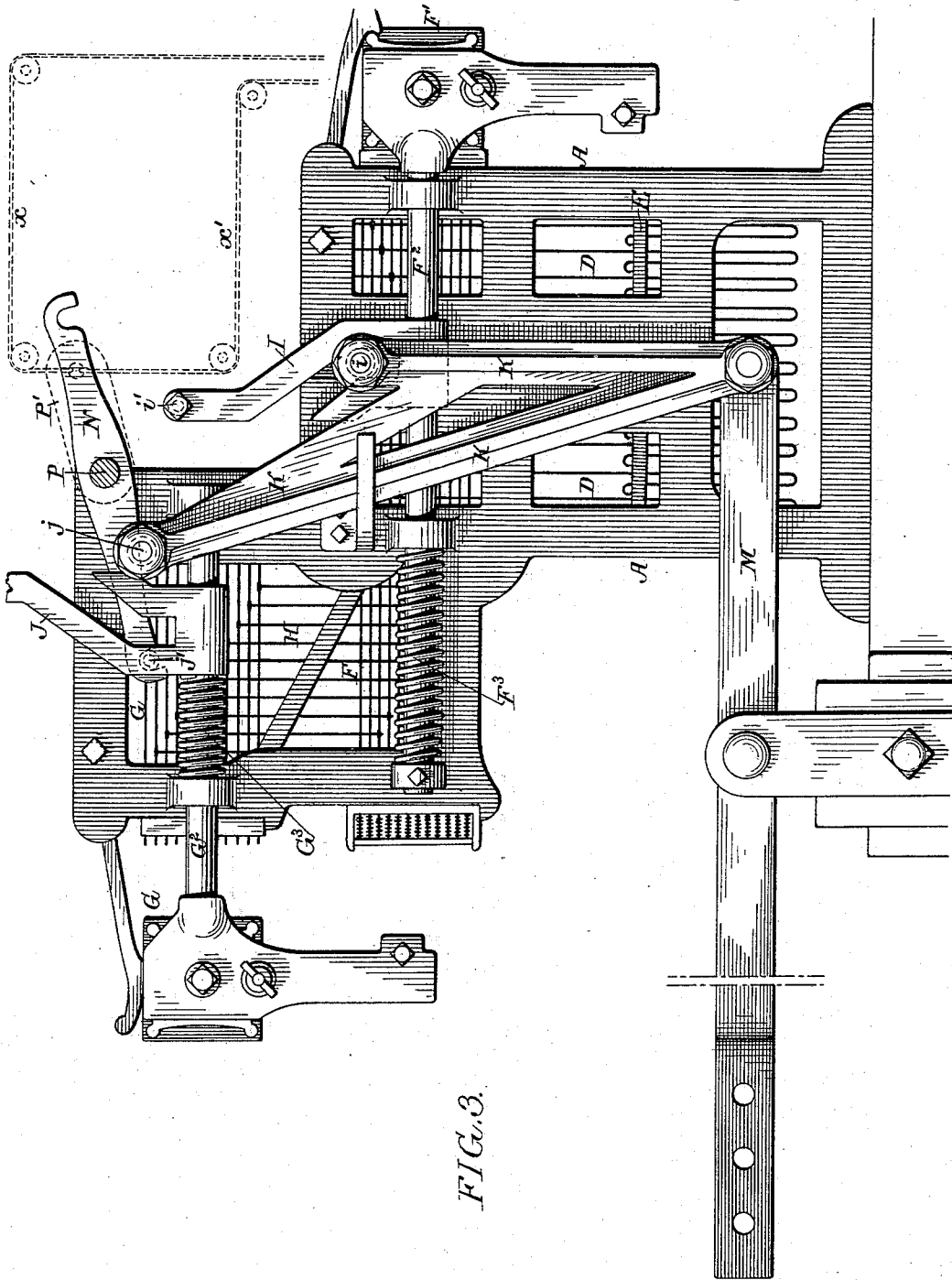


FIG. 3.

Witnesses:  
A. V. Groupé  
Count Metz

Inventor:  
Thomas Halton  
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# UNITED STATES PATENT OFFICE.

THOMAS HALTON, OF PHILADELPHIA, PENNSYLVANIA.

## JACQUARD APPARATUS FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 524,898, dated August 21, 1894.

Application filed May 16, 1892. Serial No. 433,159. (No model.)

*To all whom it may concern:*

Be it known that I, THOMAS HALTON, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented a certain Improvement in Jacquard Apparatus for Looms, of which the following is a specification.

The object of my invention is to so construct a Jacquard apparatus for looms that it can be instantly changed from one pattern to another, as for instance in weaving fabrics with borders, where the body of the fabric requires the use of one set of cards, and the border demands the employment of another and different set. This object I attain in the manner hereinafter set forth reference being had to the accompanying drawings, in which—

Figure 1, is a diagram illustrating a Jacquard machine constructed in accordance with my invention. Fig. 2, is a side view of the machine illustrating one condition of working of the same. Fig. 3, is a similar view illustrating the other condition of working; and Fig. 4, is an enlarged section illustrating the special construction of the needle guide board. Fig. 5, is a side view illustrating a slightly modified construction of the cylinder operating mechanism.

A represents one of the side frames of the jacquard, B the griff bars, D the lifters or hooks, and E the rest or supporting bar, which may be similar to those of ordinary Jacquard machines. My improved machine, however, has two sets of needles F and G the former being acted upon by the cards upon a needle cylinder F', while the needles G are acted upon by the cards upon a needle cylinder G', said card cylinders being located, in the present instance, respectively at the right and left hand sides, or rather at the front and rear of the machine, although this is not absolutely necessary in all cases. The two sets of needles are connected for joint operation by means of levers H which consist of wires having hooked upper ends engaging with eyes *a* upon the needles G, the lower ends of the wires engaging with eyes *b* upon the needles F, said levers having their fulcrums upon

transverse rods *d* suitably mounted upon the fixed frame of the machine.

The needles F have eyes *f* which engage with the lifters D, hence it will be seen that these lifters can be operated either when the needles F are acted upon directly by the cards upon the cylinder F', or indirectly through the medium of the needles G and levers H by the cards upon the cylinder G', hence all that is necessary in order to change from one pattern to another, is to throw one needle cylinder out of action and the other into action, it being understood that one cylinder carries the cards for the pattern of one part of the fabric, and the other cylinder the cards for the pattern of the other part of the fabric, each cylinder being allowed to remain in action as long as the pattern for which its cards are designed is to be produced.

In order to provide for readily throwing either cylinder into or out of operation, I employ the mechanism shown in Figs. 2 and 3, on reference to which it will be observed that the cylinder F' has a bar F<sup>2</sup> guided in suitable lugs on the side frame of the machine, and acted upon by a spring F<sup>3</sup> tending to force the cylinder inward or toward the needles, and that the cylinder G' is likewise provided with a rod G<sup>2</sup> guided in like lugs on the side frame of the machine and acted upon by a spring G<sup>3</sup> likewise tending to move the cylinder inward. On the rod F<sup>2</sup> is a cam plate I having a slot inclined throughout the greater portion of its length, and upon the rod G<sup>2</sup> is a similar cam plate J, the slots of the two plates, however, being inclined in opposite directions.

Suitably guided on the side frame of the machine is an operating bar K, connected at its lower end to the operating lever M of the machine, to which a vibrating motion is imparted from any suitable cam or crank pin on the loom so as to cause vertical reciprocation of the bar K. Said bar carries two pins or lugs *i* and *j* each of which is, by preference, provided with an antifricition roller, the pin *i* being adapted to enter the slot of the cam plate I, and the pin *j* adapted to enter the slot of the cam plate J, the tendency of

the springs  $F^3$  and  $G^3$  being to press said cam plates toward the pins or lugs of the operating bar, so that if both cam plates were free to move there would be a simultaneous operation of both card cylinders on each vertical reciprocation of the bar K. As it is necessary to operate one card cylinder at a time, however, I provide a locking lever N which is carried by a rock shaft P of the machine, and is notched at each end so that it may be caused to engage either with a pin  $i'$  on the cam plate I, as shown in Fig. 2, or with a pin  $j'$  upon the cam plate J, as shown in Fig. 3, that cam plate with which the lever is in engagement being held thereby in its extreme outward position so that the pin or lug of the operating bar K is prevented from entering its slot and there is no movement of said cam plate on the movement of the bar. Each of the pins  $i', j'$  is also, by preference, provided with an antifricition roller.

The notched portions of the lever N are preferably beveled on the inner walls of the notches, so that as they are moved into engagement with the roller on the pin or lug of either cam plate, they will impart a slight additional outward movement to said plate and thus prevent the roller on the pin or lug of the operating bar from moving in contact with the vertical face of the cam plate when the latter is out of action.

It should be understood that the guide rods, springs, cam plates, and operating bar are used at each end of the machine, and it is preferable also to use a locking lever N at each end of the machine, although but one locking lever may be used if desired.

In machines of this class it is advisable that the needles shall be accurately guided, hence, the openings in the guide board through which the needles pass should be but little larger than the needles themselves, but when such small openings are used they soon become clogged with lint or dirt so as to interfere with the free movement of the needles, and the sticking of the needles prevents proper operation of the lifters and spoils the pattern. Frequent cleaning of the openings in the guide board, therefore, becomes necessary, and in order that this may be done without risk of disarranging the needles or permitting them to assume any other than their proper relation to each other I make the guide board in two parts  $m$  and  $n$ , as shown in Fig. 4, the part  $m$  having openings considerably greater in diameter than the needles so that they are not liable to become clogged, while the part  $n$  has openings but little larger than the needles themselves, these openings, therefore, constituting the guide openings.

When it becomes necessary to clean the openings in the board  $n$  the latter is readily removed from the board  $m$  which, however, supports the needles and retains them in their proper relation to each other, so that the board  $n$  can be readily re-applied to the

ends of the needles after the openings of said board have been properly cleaned.

In order to insure the holding of the needles in correct relation to each other by the board  $m$  the openings in the same are preferably tapered from the inner to the outer ends, the said outer ends of the openings being no larger in diameter than the openings in the board  $n$ .

In order to effect the operation of the lever N from a point convenient to the weaver, the rock shaft P may have an arm  $P'$  connected to cords  $x x'$ , as shown by dotted lines in Figs. 2 and 3, the cords being so guided that a pull upon one cord will cause the lever N to move in one direction while a pull upon the other cord will cause movement of said lever in the opposite direction.

It is obvious that the position of the cam slots I and J and the operating projections therefor could be reversed without departing from my invention, for instance as shown in Fig. 5 the cam slots might be formed in the operating bar K, the plates I and J in this case simply carrying pins  $i$  and  $j$  for engagement with said cam slots, in addition to the pins  $i'$  and  $j'$  for engagement with the lever N.

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

1. The combination of the carrying structures of the card cylinders, an operating bar, cam plates and projections, whereby said bar is caused to operate either cylinder carrier, and a locking lever for holding either carrier out of engagement with the operating bar, substantially as specified.

2. The combination of the carrying structures of the two card cylinders, an operating bar, cam plates and projections whereby said bar is caused to operate either cylinder carrier, springs for causing the cam plates to engage with said projections, and a locking lever for holding either carrier out of engagement with the operating bar, substantially as specified.

3. The combination of the supporting structures of the two card cylinders, the operating bar, cam plates and projections whereby said bar is caused to operate either cylinder carrier, and the locking lever adapted to hold either carrier out of engagement with the operating bar, said lever having its engaging portion beveled so as to impart a slight outward movement to either carrier on engagement therewith, substantially as specified.

4. The combination of the needles of a Jacquard machine, with a guide plate comprising two portions, the outer portion having guide openings of small diameter in which the needles snugly fit and the inner portion having openings which do not closely confine the needles, the outer portion of the plate being adjacent to the ends of the needles and

being detachable from the inner portion, whereby it can be removed for cleansing, without disturbing the needles, substantially as specified.

5 5. The combination of the needles of a Jacquard machine, with a guide plate comprising two separable parts, the outer part being adjacent to the ends of the needles and having guide openings of small diameter, and the inner part having tapered guide openings which

at their outer ends register with the small openings of the outer part of the plate, substantially as specified.

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

THOMAS HALTON.

Witnesses:

WILLIAM D. CONNER,

HARRY SMITH.