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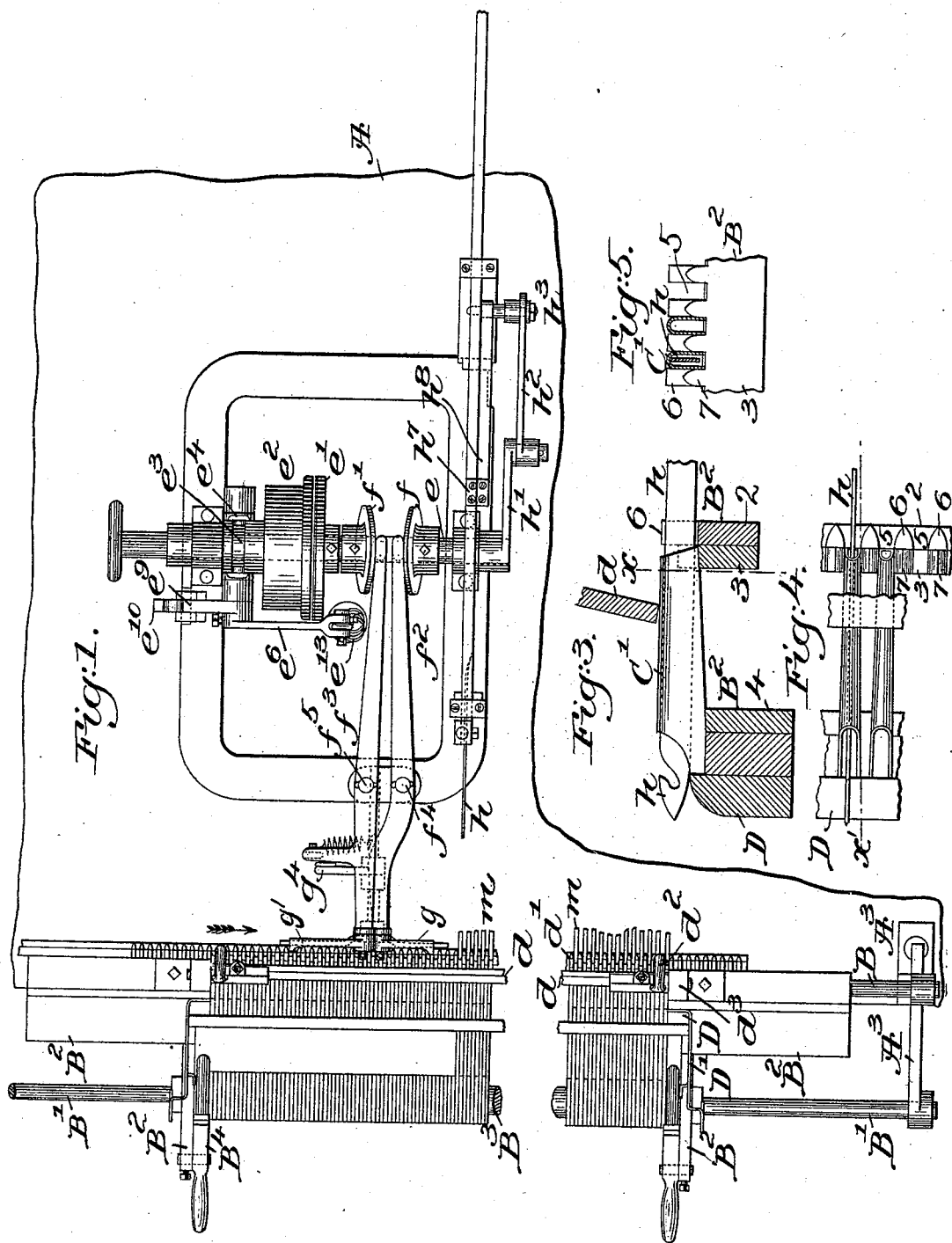
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MECHANISM FOR DRAWING YARN OR THREAD INTO CARRIERS.

No. 516,147.

Patented Mar. 6, 1894.



Witnesses.

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Inventors
Horace Wyman
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by Crosby & Gregory Attys.

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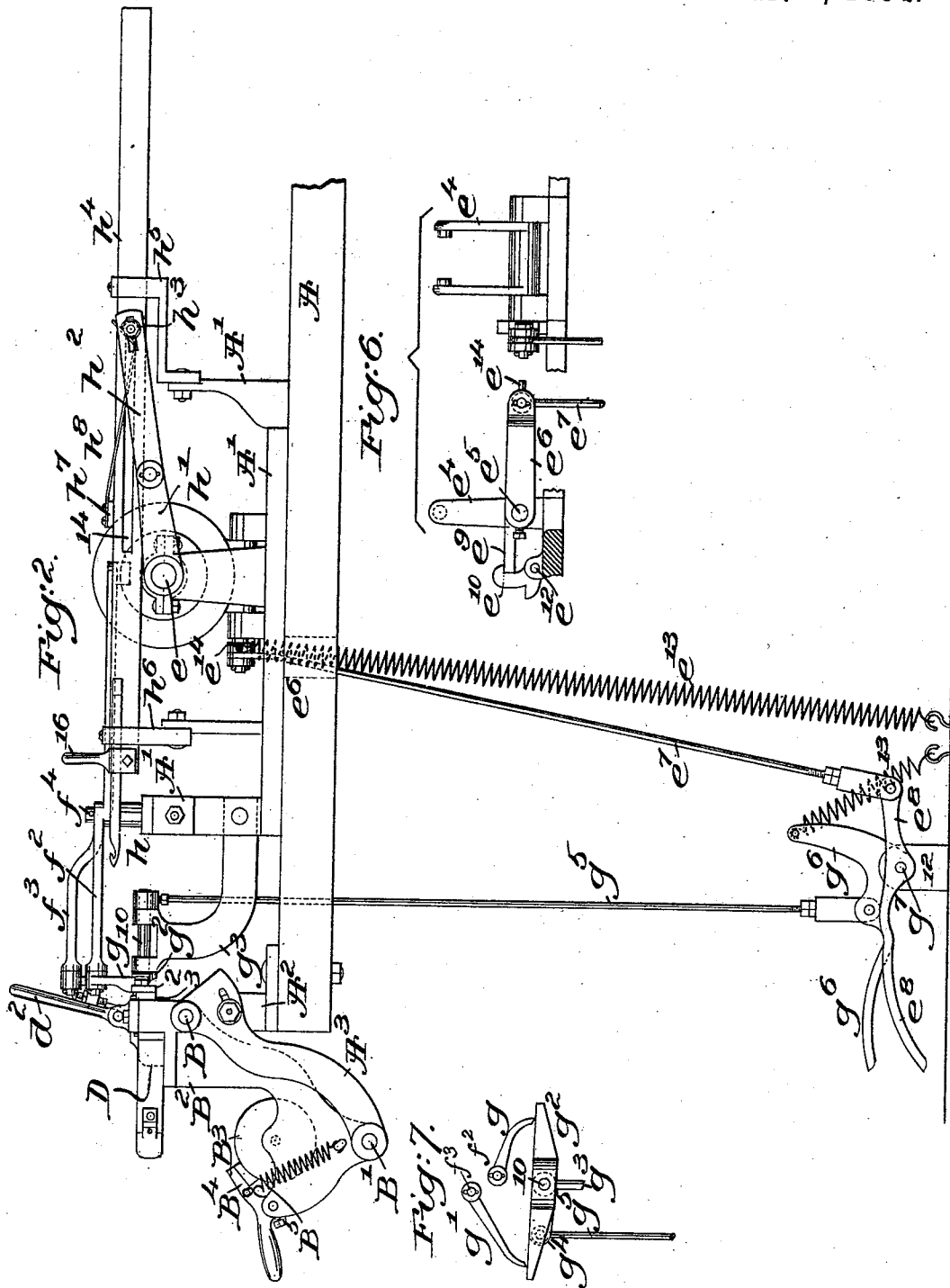
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Attorneys

UNITED STATES PATENT OFFICE.

HORACE WYMAN AND JOHN A. CLARK, OF WORCESTER, MASSACHUSETTS,
ASSIGNORS TO THE CROMPTON LOOM WORKS, OF SAME PLACE.

MECHANISM FOR DRAWING YARN OR THREAD INTO CARRIERS.

SPECIFICATION forming part of Letters Patent No. 516,147, dated March 6, 1894.

Application filed June 29, 1893. Serial No. 479,124. (No model.)

To all whom it may concern:

Be it known that we, HORACE WYMAN and JOHN A. CLARK, of Worcester, county of Worcester, State of Massachusetts, have invented an Improvement in Mechanism for Drawing Yarn or Thread into Carriers, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts.

Looms for weaving tufted fabrics, among which may be named carpets, employ tubular carriers into which are drawn the ends of the tuft-yarns on the tuft-yarn beams, said carriers being employed to put the tuft yarns carried by them into the sheds formed in the warps in the loom, said tuft yarns forming the separate transverse rows of tufts.

Our invention comprehends an apparatus for drawing the tuft yarns into and through the said carriers or tubes.

In accordance with our invention, a yarn beam provided with a series of tuft yarns, and also a series of carriers or tubes to receive the said yarns from said beam, are mounted in a carriage adapted, in the manner in which we have herein chosen to embody our invention, to slide longitudinally on a suitable guide or track so as to bring one carrier or tube after another in proper position with relation to a drawing-in hook carried by a hook bar, the said hook, as herein shown, being attached to a longitudinally reciprocating bar, a suitable feeding-mechanism effecting the relative change of position of the carriage, and the bar to which the hook is attached, so that the hook may enter the carriers or tubes in the desired order or sequence. For the greatest simplicity and convenience it is preferred that the carriage holding the tuft yarn beam and series of carriers or tubes be moved relatively to the path of reciprocation of the drawing-in hook.

Another part of our invention consists in a guide which is adapted to direct the drawing-in hook unerringly into the open ends of the carriers or tubes; and also to exactly center or position the ends of the carriers or tubes with relation to the needle guide.

Figure 1 is a plan view of a sufficient por-

tion of a drawing-in machine to enable our invention to be understood, part of the frame being omitted and other parts being broken out centrally at the sides to save space upon the drawings. Fig. 2 is a side elevation of the particular parts of the apparatus shown in Fig. 1. Figs. 3, 4 and 5, are enlarged details showing the carriers or tubes mounted in the carriage and with the drawing-in hook in position in one of the carriers, the section for Fig. 5 being on the line x , Fig. 3, the section for Fig. 3 being on the line x' , of Fig. 4. Fig. 6 is a detail of some of the parts instrumental in opening or controlling the clutch pulley device for stopping and starting the machine. Fig. 7 is a detail showing part of the feeding mechanism for the carriage.

In the drawings, let A represent a bed-plate of suitable size and shape. Upon this bed-plate is erected a suitable frame-work A', and a stand A² having depending brackets A³, the parts so far referred to constituting what may be designated as the frame-work.

In Fig. 1 we have omitted from the drawings the stand A² and the bracket A³ located at one side of the machine, but it will be understood that the said stands and brackets are alike.

The stands A² support a guide rod B, and the lower ends of the brackets A³ support a guide rod B', said guide rods forming suitable tracks for a carriage B². The end pieces of the carriage, which is free to slide on the guide-rods referred to, are suitably shaped to receive the journals of the tuft yarn beam B³, provided, it will be supposed, with a series of yarns wound side by side, there being as many yarns as there are tufts to be made in a transverse row of tufts in the fabric to be woven. The carriage has suitable brakes shown as levers B⁴ controlled by suitable springs B⁵, which brakes by their action upon the heads of the beam prevent rotation thereof due to momentum.

The upper part of the carriage B² is herein represented as composed essentially of three longitudinally arranged bars, 2, 3, 4, the upper edge of the bar 2 being notched at 5 to leave teeth 6, the upper edge of the bar 3 being also notched to leave teeth 7, the upper

edge of the bar 4 being preferably level. The notches referred to in the upper edges of the bar 3 receive in them the backs of the carriers or tubes C' attached to the bar D, preferably a wooden bar, it having connected to it spring catches D' adapted to engage the links of an endless chain when the said bar with its carriers or tubes is to be used in a loom, the said bar and spring catches being common to United States Patent No. 454,414, dated June 16, 1891. To keep the series of carriers or tubes and bar D in and down firmly upon the carriage during its movements, we have provided a presser d , shown as a bar suitably attached to arms d' of levers d^2 having suitable journals supported in stands d^3 attached to a part of the carriage B², the tipping of said levers d^2 forcing the presser down upon the said series of carriers or tubes, as best represented in Fig. 3. The bar d and its actuating devices constitute a locking device to keep the series of carriers in place.

The frame-work A' has suitable bearings for a shaft e , upon which is fixed one member e' preferably of a friction disk or pulley, the other member e^2 of said disk or pulley loose on said shaft having its hub grooved as at e^3 to be embraced by the arms of a suitable fork e^4 attached to a rock shaft e^5 having an arm e^6 connected by a rod e^7 to a suitable treadle e^8 . The arm e^4 has a projection e^9 which when the loose clutch pulley part e^2 is out of contact with the fast clutch pulley part e' , is held in such position by a locking device e^{10} , shown as a hook pivoted at e^{12} . A spring e^{13} connected to a pin e^{14} of the arm e^6 acts normally to move the loose clutch pulley part e^2 into driving contact with the fast clutch pulley part e' , and said spring will operate to start and drive the machine whenever the operator turns the locking device e^{10} so as to free the arm e^9 . The shaft e carries, as herein represented, two cams f, f' , shown as inclined disks, the faces of which act upon and move respectively two levers f^2, f^3 , pivoted respectively at f^4, f^5 , the lever f^2 carrying a feeding pawl g , and the lever f^3 a feeding pawl g' . During the rotation of the shaft e , these levers are moved toward and from each other, substantially in unison, and the carriage B² will be moved in one or the other direction upon the tracks referred to, according to which of the pawls g or g' is permitted to engage the teeth or projections 6, the point of engagement of either of said pawls with the said teeth, being at one side the path of movement of the drawing-in hook h . To determine which of the pawls referred to shall engage and move the carriage in one or the other direction, we have provided the machine with a pawl controller g^2 , the said pawl controller being represented as a lever attached to a rock shaft 10, shown in full lines in Figs. 2 and 7, and in dotted lines Fig. 1, said shaft having its bearings in suitable ears at the upper end of an arm g^3 , suitably at-

tached to the frame-work. The controller g^2 is represented as connected to the rock-shaft 10, so that one arm of the controller is longer than the other arm. The rear end of the rock shaft 10 has attached to it an arm g^4 , to which is jointed a link g^5 attached at its lower end to a treadle g^6 pivoted at g^7 on a suitable stand 12, a spring 13 normally acting upon the said treadle to keep the long arm of the controller elevated in such position as to keep the point of the pawl g' out of engagement with the teeth of the said carriage, letting the pawl g work to feed the carriage in the direction of the arrow shown in Fig. 1. If, however, it is desired to move the carriage automatically in a direction opposite said arrow, the operator will put his foot upon the outer end of the treadle g^6 and will throw the pawl g out of operative position and let the pawl g' come into operative position with relation to said teeth.

The shaft e carries a crank h' , upon the pin of which is mounted a link h^2 provided with a stud h^3 , which for the best results is made adjustable on said link h^2 , the end of said pin passing through a slot 14, shown in the bar h^4 , to which is suitably attached the drawing-in hook h , said bar being supported in suitable guide-ways h^5, h^6 erected upon the frame-work. The bar h^4 has connected to it a block h^7 , to which in turn is connected a suitable spring blade h^8 , one end of which is bent or shaped to engage the stud h^3 when at the outer end of the slot 14 in the bar h^4 , so that said stud as the shaft e is rotated is made to slide the bar h^4 longitudinally in its guides. This spring and slot serve two important purposes, one of which is that if, for any reason, the drawing-in hook should meet with any obstruction in its forward movement toward the carriers or tubes, the spring h^8 will yield before any damage will be done, the second advantage being that should the operator at any time desire to retract the bar h^4 while the shaft e is at rest, the operator may engage the hand-piece 16 attached to the bar, and move it to the right, the bar during such independent movement, by reason of the slot 14, traveling along over the stud h^3 .

In operation, the attendant of the machine,—the tuft yarn beam and the bar holding the carriers or tubes having been put into position as represented,—will start the machine and let the drawing-in hook be carried forward and passed through a carrier or tube, as represented in Figs. 3 and 4, and while in such position will by hand lay into the mouth of the drawing-in hook the end of the tuft-yarn opposite and which is to be drawn into the carrier in which the drawing-in hook then rests, and having supplied the drawing-in hook with a tuft-yarn, the said hook will be retracted pulling with it the tuft-yarn, as represented best at m in Fig. 1. Another way of using the machine is for the attendant to engage a tuft-yarn end and hold it above the

bar D in position to be caught by the mouth of the drawing-in hook when the latter shall have been thrust forward through the carrier or tube, the attendant releasing the tuft-yarns as the drawing-in hook starts on its return movement.

This invention is not limited to the use of a clutch pulley or driving mechanism of the exact form represented, or to a feeding mechanism of the particular form shown, as instead we may use any well known or suitable feeding mechanism adapted to engage the part of the carriage supporting the beam to which the carriers or tubes are attached to move it intermittently and uniformly for the proper distance to enable the drawing-in hook to correctly and unerringly enter the said carriers or tubes. Neither is this invention limited to the exact shape shown for the drawing-in hooks, nor to the exact shape of the locking device or clamp to hold the carriers or tubes in correct position with relation to the carriage.

This invention is not limited to the specific devices shown of a slotted bar and spring between the drawing-in hook carrier and its actuating crank shaft and pulley, as any form of giveaway arrangement between the parts allowing one part to be moved independent of the other will come within the scope of our invention; neither is the invention limited to the specific arrangement of the controller G² as any other well known method of controlling either of the two parts to operate as described would be within the scope of this invention.

This invention is not limited to the number of guides, or tubes or carriers, but it is preferred to have one guide for each carrier.

Having described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. A series of carriers or tubes to be filled with yarns, combined with a drawing-in hook; devices to reciprocate it; a support for the series of carriers or tubes; and a notched guide for the drawing-in hook as it approaches the open mouth of and preparatory to entering a carrier or tube, substantially as described.

2. A series of carriers or tubes adapted to receive tuft yarns, combined with a drawing-in hook, devices to reciprocate it, and a support for the series of carriers or tubes to be filled with yarn, said support being notched to position the individual carriers or tubes with relation to the hook guiding notch, substantially as described.

3. A series of carriers or tubes adapted to receive tuft yarns, combined with a drawing-in hook, devices to reciprocate it, and a support for the series of carriers or tubes to be filled with yarn, a notched guide for the drawing-in hook as it approaches the open mouth of and to enter a carrier or tube, and feeding mechanism to move the said series of carriers or tubes laterally, whereby the drawing-in

hook may enter in the proper order one after another the open ends of the said carriers or tubes, substantially as described.

4. In a drawing-in machine of the kind specified, a series of carriers or tubes connected together side by side, and a longitudinally sliding support or carriage therefor; combined with two pawls; devices to actuate said pawls in opposite directions; and a pawl-controller made as a pivoted lever; and a treadle, and connections between it and said lever, whereby the lever may be moved to enable one or the other of the said pawls to engage the teeth of the support or carriage and move the latter and the carriers or tubes thereon in one or the other direction, as may be desired, substantially as described.

5. In a drawing-in machine of the class described, a series of carriers or tubes arranged side by side, and a carriage or support therefor; and a slotted bar having an attached drawing-in hook, combined with a spring attached to said bar, and with a stud and means to actuate said stud to through the said spring actuate said bar, the spring yielding to provide for independent movement between the stud and bar, for the purposes set forth.

6. A connected series of carriers or tubes arranged side by side, and adapted to receive tuft yarns; a drawing-in hook; devices to reciprocate it; and a support for the said series of carriers or tubes; combined with a notched guide for the drawing-in hook as it approaches the open mouth of and to enter a carrier or tube, said support having bearings for a warp beam to supply the said carriers or tubes with tuft-yarns, and friction devices to prevent the undue rotation of said tuft-yarn beam, substantially as described.

7. In an apparatus for drawing tuft yarns into carriers or tubes, the following instrumentalities, viz:—a drawing-in hook, devices to reciprocate it, a series of carriers or tubes; a support for the same while being filled with yarn, said support being notched to position the ends of the individual carriers or tubes correctly, feeding mechanism to change the relative position of the said support for the carriers or tubes and the bearings for the bar carrying the drawing-in hook, whereby the drawing-in hook may enter in the proper order, one after another, the open ends of the said carriers or tubes, substantially as described.

8. In a drawing-in machine of the class described, a carriage or support for a series of carriers or tubes, a drawing-in hook and carrier to reciprocate it, combined with an intermediate spring yielding mechanism to provide for independent movement between the said drawing-in hook and its carrier and actuating mechanism, for the purposes above stated.

9. A series of carriers or tubes arranged side by side and adapted for the reception of tuft yarns; a drawing-in hook; and devices

to reciprocate it; combined with a support for
the said series of carriers or tubes, said sup-
port being notched to position the ends of the
individual carriers or tubes, and a notched
5 guide to receive the point of and direct the
drawing-in hook correctly into the open mouth
of the tube or carrier to be filled with yarns,
substantially as described.

In testimony whereof we have signed our
names to this specification in the presence of
two subscribing witnesses.

HORACE WYMAN.
JOHN A. CLARK.

Witnesses:

JUSTIN A. WARE,
JOHN B. SYME.