

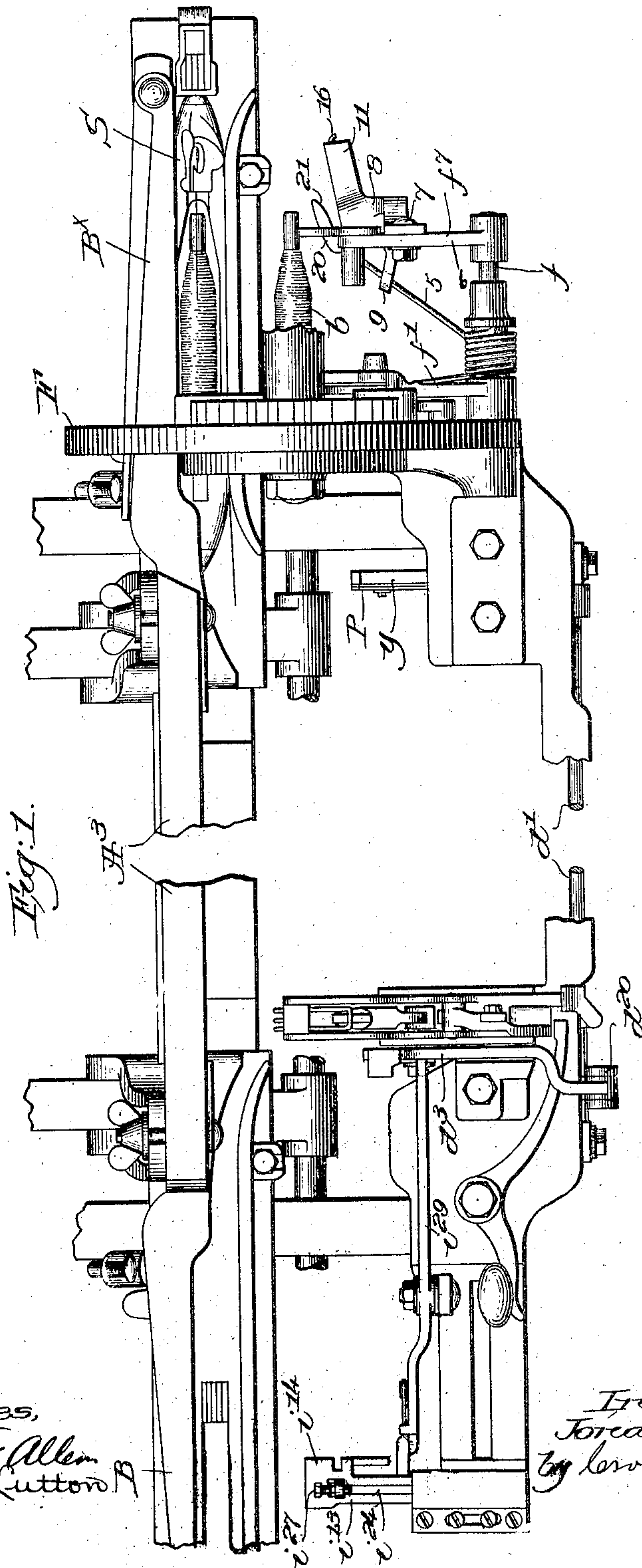
No. 812,516.

PATENTED FEB. 13, 1906.

J. NORTHROP.
SHUTTLE CLEARING MEANS FOR FILLING REPLENISHING LOOMS.

APPLICATION FILED JUNE 8, 1905.

3 SHEETS—SHEET 1.



Witnesses,
Edward F. Allen
S. Wm. Lutton

Inventor:
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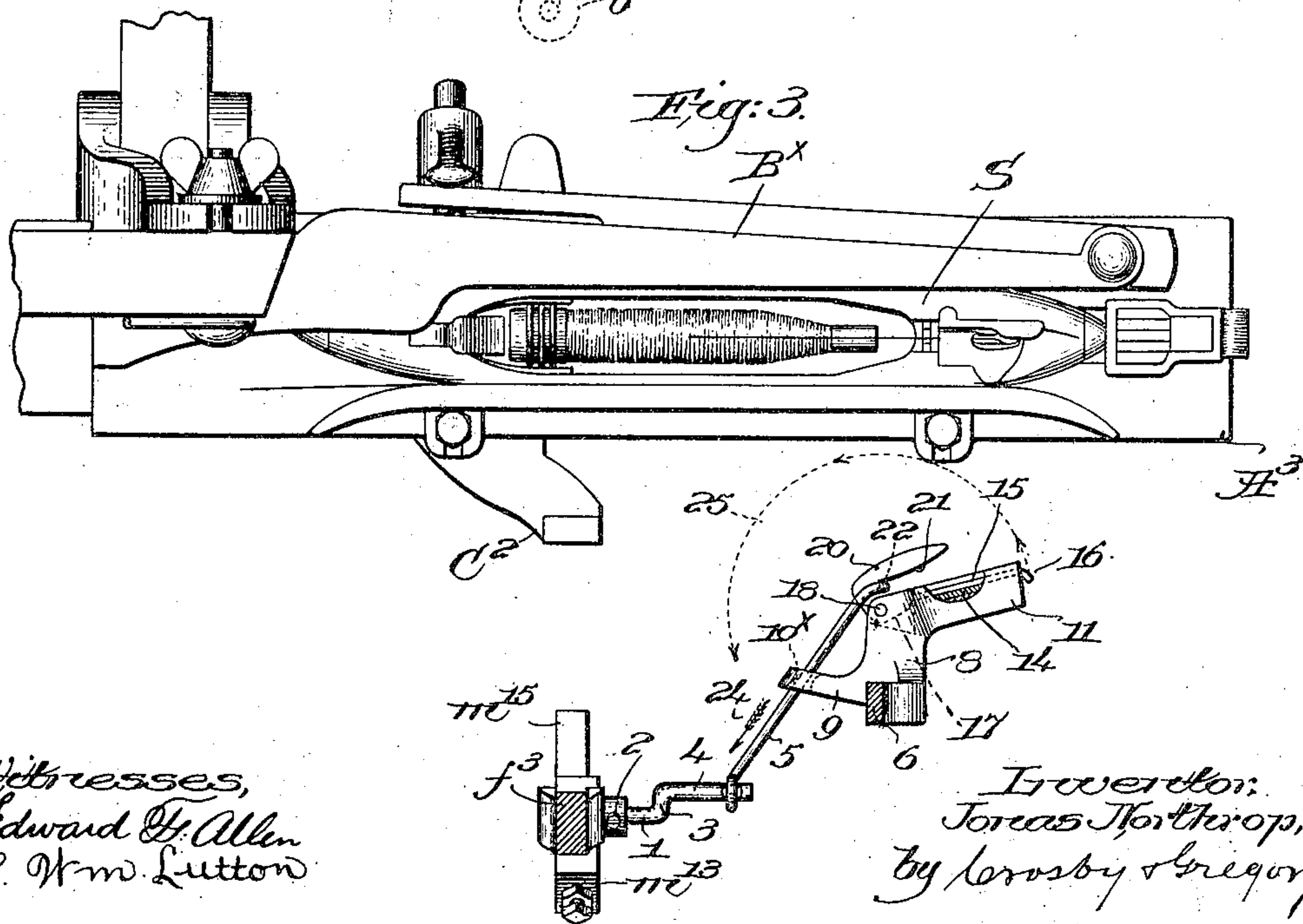
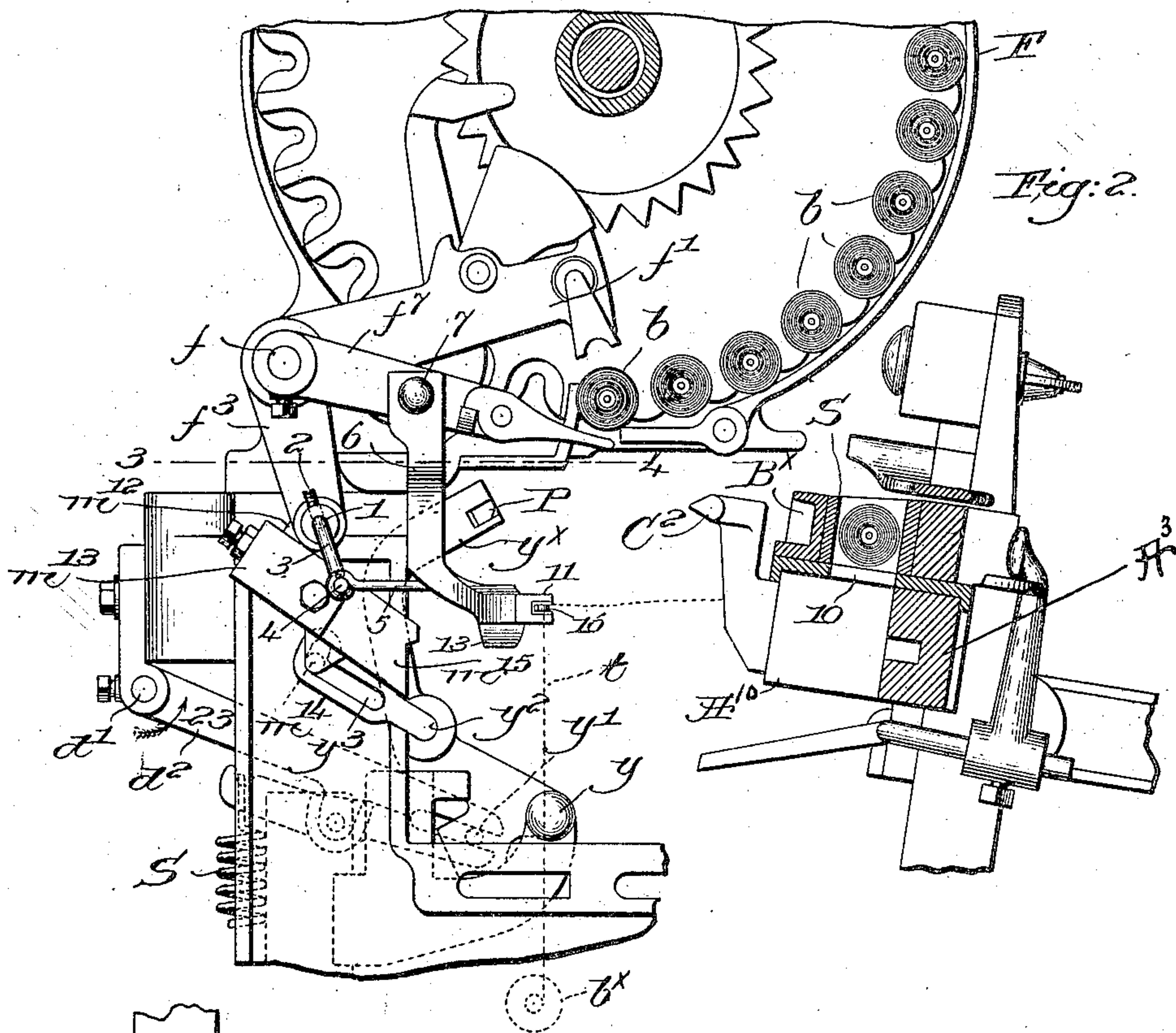
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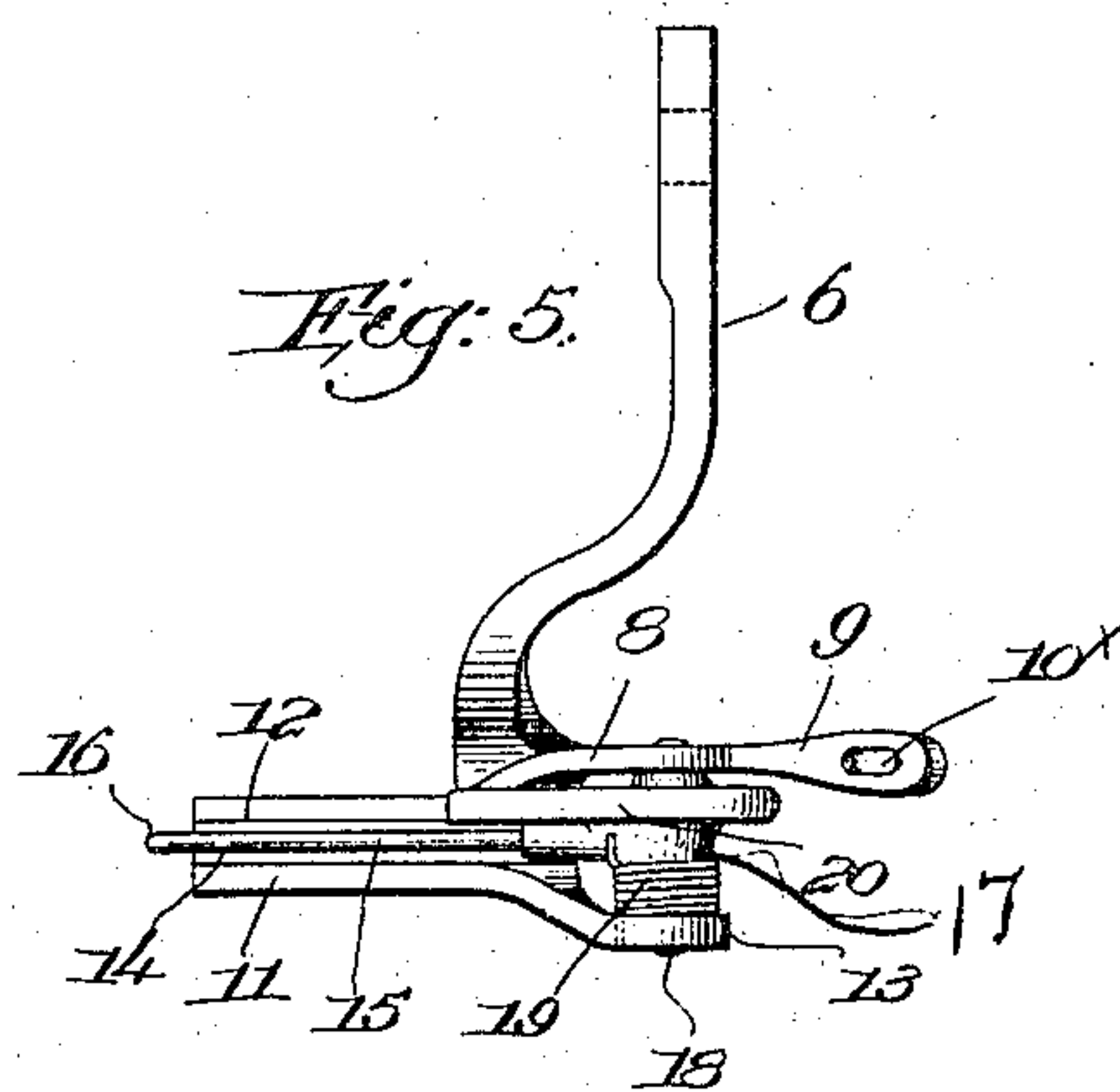
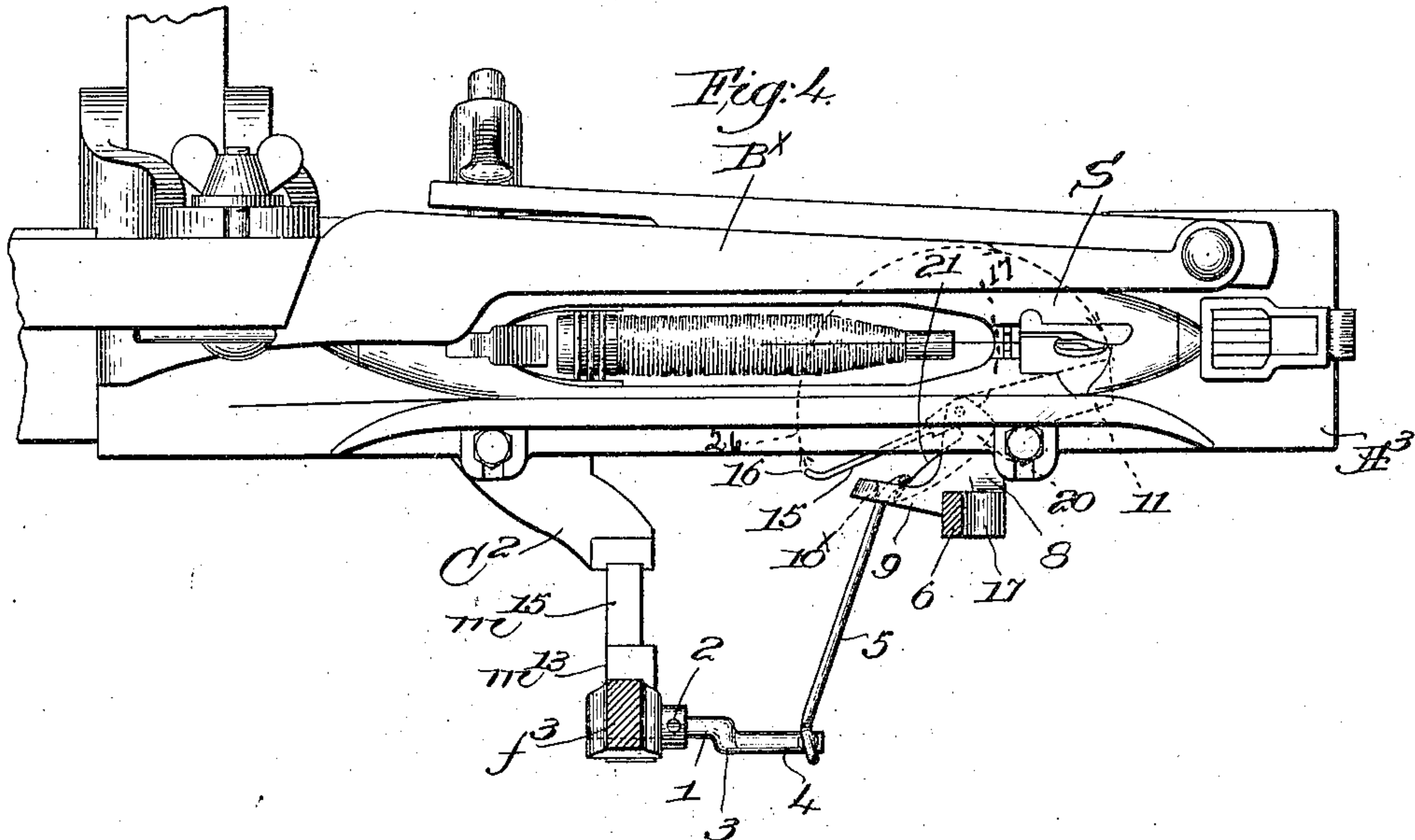
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3 SHEETS—SHEET 3.



Witnesses,
Edward H. Allen.
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UNITED STATES PATENT OFFICE.

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SHUTTLE-CLEARING MEANS FOR FILLING-REPLENISHING LOOMS.

No. 812,516.

Specification of Letters Patent.

Patented Feb. 13, 1906.

Application filed June 8, 1905. Serial No. 264,250.

To all whom it may concern:

Be it known that I, JONAS NORTHROP, a citizen of the United States, and a resident of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Shuttle-Clearing Means for Filling-Replenishing Looms, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to automatic looms of the type wherein the running filling is replenished from time to time by inserting automatically a fresh filling-carrier into the running shuttle and simultaneously ejecting therefrom the filling-carrier from which the filling is more or less exhausted. When the filling-carrier is ejected, it drops from the shuttle and pulls the old filling end through the shuttle-eye, and to clear the shuttle and prevent fouling of the fresh filling and also to prevent the end from being carried back by the shuttle into the cloth it is necessary that the old filling end be drawn completely out of the shuttle. This trailing filling end will always be present when the loom is provided with means to cause filling replenishment before complete exhaustion of the running filling, such so-called "feeler-loom" being also provided with means to part the old filling between the cloth and the shuttle upon filling replenishment. Such a filling end will also be present when the running filling breaks at some distance from the shuttle-eye, and in either of the cases mentioned it tends to cause trouble if it is not completely drawn out from the shuttle when the filling is replenished. Means to part the old filling have been provided, as in United States Patents Nos. 641,792 and 677,096, and in patent to Marcoux, No. 766,151, dated July 26, 1904, means is provided to engage the old filling end between the shuttle and the ejected filling-carrier to clear the filling end from the shuttle.

My present invention has for its object the production of novel and effective means applicable to automatic looms of the type hereinbefore referred to to engage the old filling end between the shuttle and the ejected filling-carrier and effect in a very perfect manner the drawing out of such filling end from the shuttle.

I have herein shown my invention applied to a loom of the "Northrop" type (such as shown in United States Patent No. 529,940, for instance) and equipped with filling-exhaustion-indicating mechanism, which is substantially that shown in patent to Wood, No. 789,473, dated May 9, 1905, though, as will appear, my invention is not restricted to that particular form of filling-exhaustion-indicating mechanism. So, too, it will be manifest that my present invention is applicable to an automatic filling-replenishing loom not of the feeler type.

The various novel features of my invention will be fully described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is a top plan view, centrally broken out, of a sufficient portion of an automatic filling-replenishing loom to be understood with one embodiment of my invention applied thereto, a portion of the replenishing mechanism being omitted. Fig. 2 is a right-hand side elevation of the loom, showing the replenishing mechanism and the means for clearing the shuttle of the old filling end, the filling-feeder, the lay, the shuttle, and the replenishing shuttle-box being shown in section. Fig. 3 is an enlarged detail, partly in plan and partly on the line 3-4, Fig. 2, showing the replenishing shuttle-box and the clearing means, the latter being shown in its normal quiescent condition. Fig. 4 is a similar view, but showing the clearing means as set and ready to operate to engage the old filling end below the shuttle and above the ejected filling-carrier. Fig. 5 is an enlarged detail, in rear elevation, of the clearing means when in its normal condition.

Referring to Figs. 1 and 2, the filling-feeder F to hold the reserve filling-carriers *b*, the transferrer *f'*, mounted to rock on the fixed stud *f* to remove the filling-carriers one by one and transfer them to the shuttle S, (of the automatically self-threading type,) the controlling rock-shaft *d'*, the lay *A*³, cut away at *A*¹⁰, Fig. 2, below the replenishing shuttle-box *B*^x, slotted in its bottom at 10 to permit the discharge of a filling-carrier ejected from the shuttle at the time of filling replenishment, may be and are of well-known construction and operation. The notched dog *m*¹⁵, carried by the downturned extension

f^3 of the transferrer to cooperate with the bunter C^2 on the lay when filling replenishment is to be effected, the yoke $y^x y^2$, fulcrumed at y and having a lug y' , cooperating with the jaw-like arm d^2 , fast on the controlling rock-shaft d' , the spring S^x connected with said arm, and the cam-slot y^3 on the yoke-arm y^2 , cooperating with a lateral lug m^{14} , connected with the dog m^{15} , may be and are substantially as shown in United States patent to Stimpson, No. 718,587, dated January 13, 1903. Herein I have shown the yoke-arm y^x as forming a shuttle-feeler and provided with means (indicated at P, Fig. 2) to part the old filling end between the cloth and the shuttle when replenishment takes place, as in Patent No. 641,792, hereinbefore referred to. The arm f^7 , Fig. 2, for the tip-support is as shown in said Patent No. 718,587, the arm being rigidly secured to the stud f , and, as will appear hereinafter, the means for cooperating with the old filling end is mounted on said arm. The lower end of the extension f^3 is bifurcated, as usual, and the ear m^{12} on the block m^{13} enters between the branches, the notched dog m^{15} being secured to the block in usual manner; but herein I have mounted the ear to rock on a pin 1, passed through the bifurcated end of the extension f^3 , said rod being held rigidly in place by a set-screw 2. Said rod is bent downward at 3 and then laterally toward the right at 4, as best shown in Figs. 3 and 4, and the part 4 having pivotally connected with it one end of a link 5. A depending bracket or support 6 is bolted rigidly at 7 to the tip-supporting arm f^7 , (see Fig. 2,) the lower end of the bracket being enlarged to form a substantially horizontal foot 8, having an inwardly-extended lateral guide portion 9, provided with a hole 10^x , (see dotted lines, Figs. 3 and 4,) through which the link 5 slides loosely and by which it is supported and guided. The foot 8 is so located that when the lay beats up the cut-away portion A^{10} will receive the foot and a diagonal outturned lateral extension 11, which forms one of the filling-end-holding members, it being longitudinally grooved or recessed at 12, Fig. 5, on its rear face and provided at its inner end with an ear 13 below the foot 8. A grooved non-metallic lining 14, of wood or other suitable material, is set into the recess 12 (see Fig. 3) to cooperate with the movable clearer member in holding the old filling end. The movable clearer member is shown as an elongated arm 15, conveniently made of stout wire slightly bent at its free end at 16 and at its opposite end fixedly secured in a hub 17, fulcrumed on a pin 18, set into the foot 8 and the ear 13, a spring 19, coiled around the lower portion of the hub, being fixed at one end to the ear and at its other end to the hub, as shown in Fig. 5, the winding of the spring being such that it tends normally to hold the clearer member

15 in the grooved lining 14 of the fixed member 11. (See Figs. 2, 3, and 5.) The hub 17 is provided with a cam-hook 20, the inner face of the hook being cam-shaped, as at 21, and cooperating with the downturned rear end 22 of the link 5, the latter being slightly bent adjacent said end to clear the corner of the foot 8. While the loom is running properly the filling-end-clearing means remains quiescent in the position shown in Figs. 2 and 3, the downturned end 22 of the link 5 resting easily in the inner end of the cam-hook 20. When filling replenishment is called for, the rock-shaft d' is turned in the direction of the arrow 23, Fig. 2, lifting arm d^2 and effecting rearward movement of the shuttle-feeler y^x and operatively positioning the parting device P, the cam-slot y^3 of the branch y^2 at the same time cooperating with the lug m^{14} to swing the dog m^{15} upward into the path of the bunter C^2 . The lay beats up, the bunter and dog engage, and as the lay completes its forward stroke the dog is pushed forward, rocking the transferrer f' and its extension f^3 , and a fresh filling-carrier is inserted in the shuttle, while the filling-carrier previously held in the shuttle is ejected through the bottom of the replenishing shuttle-box and is discharged into any suitable receptacle. The old filling has in the meantime been parted between the cloth and the shuttle by the parting device P, and the ejected filling-carrier drops from the shuttle while the lay is fully forward in the position shown in Fig. 4, the parted filling end leading from the ejected filling-carrier to the shuttle. When the extension f^3 was swung forward by the cooperation of the dog and bunter, the rod 1 was moved forward in unison therewith, drawing the link 5 forward in the direction of arrow 24, Fig. 3, and at the instant the fresh filling-carrier was inserted in the shuttle and the old one ejected the link had been moved to the position shown in Fig. 4, the end 22 of the link acting upon and wiping over the cam-face 21 of the hook 20 to swing the clearer member 15 in a lateral path in the direction indicated by the dotted direction-line 25, Fig. 3; but owing to the quickness of movement of the clearer member it had assumed the position shown in Fig. 4 and had been set or operatively positioned before the ejected filling-carrier had crossed the lateral path of movement of the member 15, the setting of said member acting against the force of the spring 19 and increasing its tension. Change of filling having been effected, the lay begins to move back as the transferrer f' rises out of the shuttle in well-known manner and the extension f^3 moves toward the rear, of the loom, moving the link 5 oppositely to arrow 24, Fig. 3, and the cam-face of the hook 20 permits the spring 19 to quickly swing the clearer member 15 from the position shown in Fig. 4 back to that shown in

Fig. 3, so that said member swings behind the old filling end, between the shuttle and the ejected filling-carrier, and then carries such filling end forward to and against the fixed member 11. The return or engaging sweep of the clearer member 15 is indicated by the dotted direction-line 26 in Fig. 4, the member 15 being long enough to engage and carry forward the old filling end, which is positively held between the members 11 and 15 as the latter comes to rest in the grooved lining 14.

In Fig. 2 I have shown the ejected filling-carrier b^x and the old filling end t held by the clearing means, as described, it being supposed that filling replenishment has just been effected and the lay has moved back from replenishing position, showing the extremity of the old filling end as just cleared from the shuttle. Ordinarily the clearance will be completed on the backward stroke of the lay, the old filling end being nipped or grasped between the fixed and movable clearer members, and thereby being held positively, so that its loose extremity must be pulled out of the shuttle-eye and the shuttle cleared. If for any reason the clearance is not completed as the lay moves back, it will be completed as the shuttle is shot from the box B^x , the filling end being held by the clearing means as the shuttle is thrown.

The curved or bent end 16 of the clearer member 15 serves to prevent accidental disengagement of the filling end should it slide toward the outer end of said member as the latter is swinging around on its fixed fulcrum.

So far as concerns mere breakage of filling my present invention is operative on a non-feeler loom, as will be manifest, for whenever the filling breaks far enough away from the shuttle to leave a long filling end it will be cleared from the shuttle, no means being necessary in such case to part the filling between the cloth and the shuttle upon filling replenishment. When my invention is used on a feeler-loom, however, the parting means is necessary, for it will be remembered that in such a loom filling replenishment is called for and its operation effected by or through the feeling or filling-exhaustion indicating mechanism. In both cases the filling-replenishing mechanism is controlled as to the time of its operation by or through the controlling rock-shaft d' .

Referring to Fig. 1, the filling-exhaustion-indication mechanism is shown at the left-hand side thereof, the feeler i^{13} having the head i^{14} to intermittingly engage the filling in the shuttle when the latter is in the left-hand shuttle-box B, the shuttle-engaging bunter i^{27} on the member i^{24} and the transmitter i^{29} to govern the position of the latch d^3 being substantially as shown in Patent No. 789,473 referred to and operating as therein set forth,

the latch d^3 being pivotally connected with the upturned arm d^{20} , fast on the rock-shaft d' . Inasmuch as the function of the filling-exhaustion-indicating mechanism is to cause the operation of the filling-replenishing mechanism before complete exhaustion of the filling in the running shuttle, any other suitable form of exhaustion-indicating mechanism may be employed instead of that herein shown, so far as my present invention is concerned.

I have herein shown and described one practical embodiment of my invention; but the same may be modified or changed in various particulars by those skilled in the art without departing from the spirit and scope of my invention.

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a loom, in combination, automatic filling-replenishing mechanism, and automatic means to engage, draw out of the shuttle and positively hold the old filling end as the ejected filling-carrier leaves the shuttle.
2. In a loom, in combination, automatic filling-replenishing mechanism, and means, actuated by said mechanism upon operation thereof, to engage, draw out of the shuttle, and positively hold the old filling end as the ejected filling-carrier leaves the shuttle.
3. In a loom, in combination, automatic filling-replenishing mechanism, and means actuated thereby to clear the shuttle of the old filling end, said means including a clearer member movable in a lateral path, and a fixed fulcrum on which said member is mounted.
4. In a loom, in combination, automatic filling-replenishing mechanism, and means to automatically clear the shuttle of the old filling end, said means including a clearer member angularly movable in a path below the shuttle and intersecting the path of an ejected filling-carrier, and a fixed fulcrum on which said member is mounted.
5. In a loom, in combination, automatic filling-replenishing mechanism, a normally quiescent clearer member angularly movable in a substantially horizontal plane below the shuttle and intersecting the path of an ejected filling-carrier, and operating connections between said member and the replenishing mechanism, whereby said member is caused to engage the old filling end between the ejected filling-carrier and the shuttle, upon filling replenishment, and draw such filling end out of the shuttle.
6. In a loom, in combination, automatic filling-replenishing mechanism, a bracket mounted on the loom, a clearer member fulcrumed on said bracket, and means actuated by operation of the replenishing mechanism to cause said clearer member to swing upon its fulcrum and engage the old filling end between the shuttle and the ejected filling-car-

rier and draw the filling end out of the shuttle.

7. In a loom, in combination, automatic filling-replenishing mechanism, and automatic means to engage, draw out of the shuttle and positively hold the old filling end as the ejected filling-carrier leaves the shuttle, said means including a fixed member, and a movable clearer member to engage the old filling end and move it against the fixed member, and hold it.

8. In a loom, in combination, automatic filling-replenishing mechanism, and automatic means to engage, draw out of the shuttle and positively hold the old filling end as the ejected filling-carrier leaves the shuttle, said means including a fixed member, and a cooperating member fulcrumed at one end thereof and movable automatically upon filling replenishment to engage and move the old filling end against the fixed member, to be held between said members.

9. In a loom provided with automatic filling-replenishing mechanism, means to clear the old filling end from the shuttle, said means including a swinging clearer member movable in a lateral path below the shuttle, a fixed fulcrum for said member, a spring to move said member into engagement with the old filling end between the shuttle and the ejected filling-carrier and draw such filling end from the shuttle, and connections between the replenishing mechanism and the clearer member to set the latter when said mechanism is operated.

10. In a loom, in combination, automatic filling-replenishing mechanism, means to part the old filling between the cloth and shuttle upon filling replenishment, a fixed support, and a clearer member fulcrumed thereon and operatively connected with the replenishing mechanism, to engage the parted filling end between the shuttle and the ejected filling-carrier and draw such filling end out of and thereby clear the shuttle.

11. In a loom provided with automatic filling-replenishing mechanism, and with means to part the old filling between the cloth and shuttle upon filling replenishment, the combination of means to clear the shuttle of the parted filling end, said means including a clearer member angularly movable in a path below the shuttle during filling replenishment, a fixed fulcrum for said member, and actuating devices to swing said member into engagement with and behind the parted filling end between the shuttle and the filling-carrier from which it leads.

12. In a loom provided with automatic filling-replenishing mechanism, and with means to part the old filling between the cloth and shuttle upon filling replenishment, the combination of means to clear the shuttle of the parted filling end, said means including a horizontally-swinging clearer member, a fixed

member, and devices to swing the clearer member into engagement with the parted filling end between the shuttle and the ejected filling-carrier during filling replenishment and carry the filling end into holding engagement with the fixed member, to cause the filling end to be drawn out of the shuttle.

13. In a loom provided with automatic filling-replenishing mechanism, and with means to part the old filling between the cloth and shuttle upon filling replenishment, the combination with a lay having a replenishing shuttle-box through which the ejected filling-carrier is discharged, of a clearer member automatically swung rearward and then forward beneath the said shuttle-box during filling replenishment, to pass behind the parted filling end above the ejected filling-carrier and then pull such filling end out of the shuttle.

14. In a loom provided with automatic filling-replenishing mechanism, and with means to part the old filling between the cloth and shuttle upon filling replenishment, the combination with a horizontally-swinging clearer member movable below the shuttle, a fixed fulcrum for said member, and a spring to effect swinging movement of the latter behind and to pull forward the parted filling end, of means to retract or set the clearer member against the action of the spring and to thereafter release it, during filling replenishment, whereby the clearer member can engage and draw from the shuttle the parted filling end.

15. In a loom, in combination, automatic filling-replenishing mechanism, a lay having a replenishing shuttle-box, and means to automatically engage and positively hold the old filling end below the shuttle-box when a filling-carrier has been discharged there-through, to thereby draw the filling end away from and clear the shuttle.

16. In a loom, automatic filling-replenishing mechanism, including a rocking transferer, a fixed support, a clearer member fulcrumed thereon to swing in a curved path below the shuttle during filling replenishment, to engage the old filling end between the shuttle and the ejected filling-carrier and clear such filling end from the shuttle, and a controlling connection between the clearer member and the transferer.

17. In a loom, in combination, filling-replenishing mechanism, including an automatically-operated transferer, a depending, fixed bracket having a lateral foot below the lay-path, a clearer member fulcrumed on the inner end of said foot, a spring to move said member across the path of a filling-carrier ejected during filling replenishment, to engage the old filling end and pinch it against the foot, and an operative connection between the transferer and the clearer member, to position the latter and then release it during the movement of the transferer.

18. In a loom, automatic filling-replenish-
ing mechanism, including a rocking trans-
ferrer having a depending extension, a fixed
support, a spring-operated clearer member
5 fulcrumed thereon to swing in a substan-
tially horizontal path below the shuttle dur-
ing filling replenishment and across the path of
the ejected filling-carrier, to engage the old
filling end and cause its withdrawal from the
10 shuttle, and a cam-hook on the clearer mem-
ber adjacent its fulcrum, and a link connect-
ing the hook and the transferrer extension,
operation of the transferrer acting through
the link to first retract or set, and then
15 quickly release the clearer member to enable
the latter to swing behind and engage the old
filling end between the shuttle and the ejected
filling-carrier, the cam-hook effecting the
quick release of the clearer member when set.

19. In a loom provided with automatic fill- 20
ing-replenishing mechanism, means to cause
the operation thereof prior to complete ex-
haustion of the running filling, and means to
part the old filling between the cloth and
shuttle upon filling replenishment, combined 25
with means the operation whereof is effected
by actuation of the replenishing mechanism
to engage, and positively hold the parted fill-
ing end between the shuttle and the ejected
filling-carrier and thereby clear such filling 30
end from the replenished shuttle.

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

JONAS NORTHROP.

Witnesses:

GEORGE OTIS DRAPER,
ERNEST W. WOOD.