

No. 640,154.

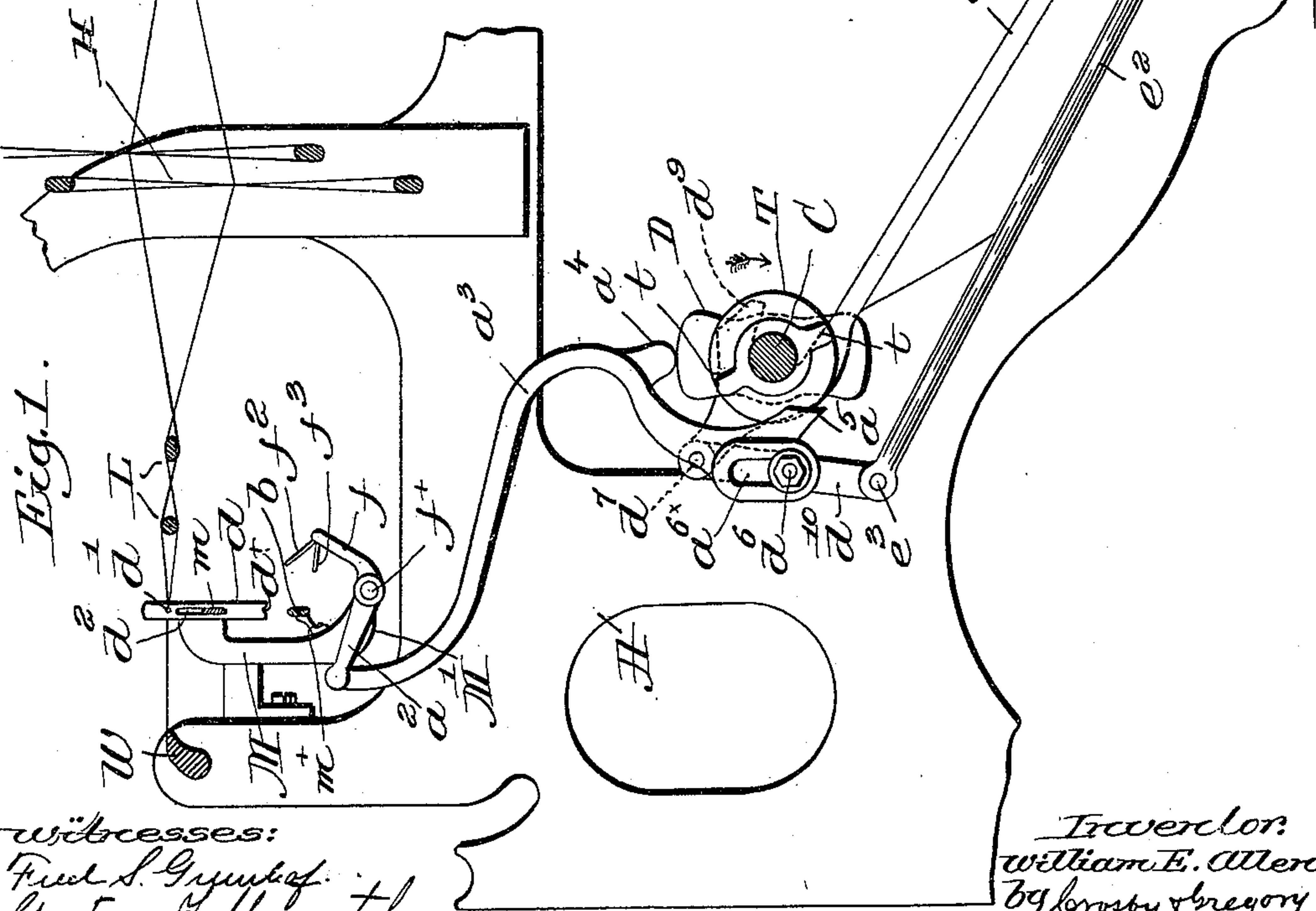
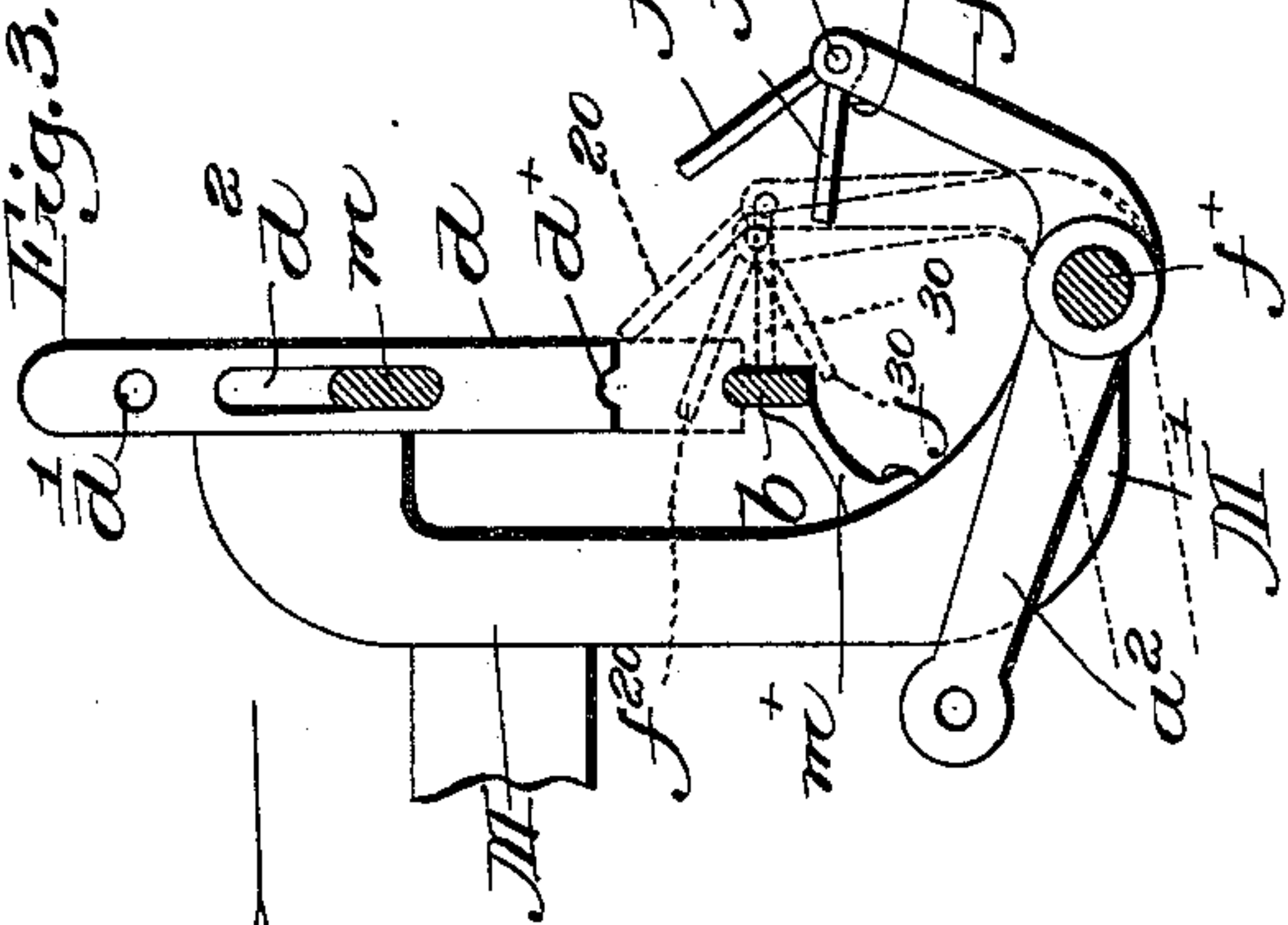
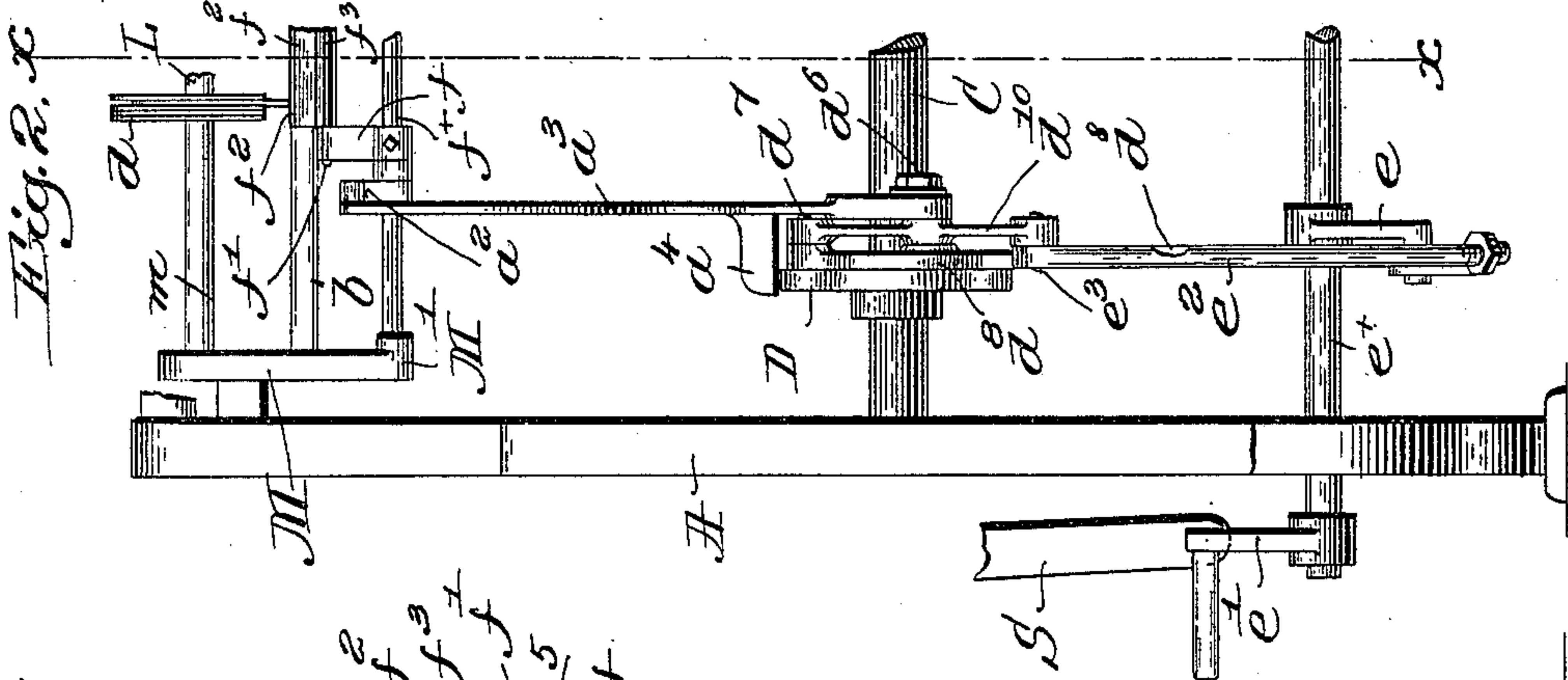
Patented Dec. 26, 1899.

W. E. ALLEN.

WARP STOP MOTION FOR LOOMS.

(Application filed June 27, 1899.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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WARP STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 640,154, dated December 26, 1899.

Application filed June 27, 1899. Serial No. 722,003. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. ALLEN, of Salem, county of Essex, State of Massachusetts, have invented an Improvement in Warp Stop-Motions for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts.

10 This invention relates to warp-stop-motion mechanism for looms, wherein suitable stopping instrumentality is made operative to effect the stoppage automatically of the loom upon the occurrence of an abnormal condition, 15 such as failure or undue slackness of one or more warp-threads, a series of detectors controlled as to their position by the warp-threads being employed to control the actuation of the stopping instrumentality; and my present 20 invention has for its object the production of means for preventing the subjection of a detector in operative position to any material strain when the stopping instrumentality is operated.

25 I have herein illustrated and described one practical embodiment of my invention, without, however, limiting the application of my invention to the particular construction and arrangement shown, for variations and modifications may be made therein without departing from the spirit and scope of my invention, 30 as will be manifest hereinafter.

Figure 1 is a longitudinal sectional view of a portion of a loom, with one embodiment of 35 my invention applied thereto, taken on the line xx , Fig. 2. Fig. 2 is a partial rear elevation of the apparatus shown in Fig. 1, and Fig. 3 is an enlarged detail of a portion of the apparatus shown in Fig. 1.

40 The loom-frame A, harnesses H, lease-rods L, shipper-lever S, and the whip-bar W may be of any usual construction, and I have herein shown the controlling-detectors for the stop-motion as located back of the lease-rods, 45 said detectors being shown as thin flat strips d , preferably of strong sheet metal, each having a warp-receiving opening d' and a longitudinal slot d^2 , a support or guide m being extended through the slots of the detectors 50 and secured to stands M, attached to the loom-frame. As the depth of the support m is less

than the length of the slots, the detectors have a limited longitudinal movement relative thereto, and when the warp-threads are normally conditioned the detectors are held in 55 elevated inoperative position, as shown in Fig. 1 and by full lines, Fig. 3, while the occurrence of an abnormal condition in a warp-thread, such as breakage or undue slackness, permits its detector to move into operative position. 60 (Shown by dotted lines, Fig. 3.)

Heretofore it has been customary in apparatus of this character to provide a feeler which is normally vibrated and adapted to 65 coöperate directly with and be arrested by a detector in operative position, such arrest of the feeler operating through suitable intervening devices to actuate the stop-motion, and it will be manifest that the detector must resist the strain upon it necessary to arrest 70 the feeler. Thus the detectors have been subjected to a strain whenever the stop-motion was operated, and while that strain has been compressive or tensile, according to construction, still the fact remained that the 75 detector was required to perform too much work, and in making it strong enough to so do certain delicacy of operation had to be sacrificed. I have, however, devised an apparatus wherein the normally-vibrating mem- 80 ber coöperates not with the detector but with other means, the detector when in operative position serving merely to control or govern the coöperation of the vibrating member with the means which change its normal 85 action, so that the detectors are relieved from any material strain.

Referring to the drawings, the stands M are shown as provided with depending arms M', which form bearings for a rock-shaft f^x , 90 having upturned arms f secured thereto, the arms being so located as to be normally moved toward and from the lower ends of the detectors, as will be described. Below the detectors a stop b is mounted, shown as a flat bar 95 set on edge and attached to brackets m^x on the stands M, the lower ends of the detectors being preferably notched, as at d^x , to straddle the upper edge of the stop and guide the detector when in operative position. 100

The arms f at or near their free ends receive the journals f' of a light but strong plate

f^2 , preferably of sheet metal, extending upwardly from the arms and toward the detectors, and fingers or bunters f^3 are secured to the plate f^2 at an acute angle thereto, as here-
 5 in shown, stop-shoulders 5 on the arms f engaging the fingers or bunters and maintaining them and the feeler member f^2 normally in the position shown in Fig. 1 relatively to the rocker-arms f . It will be seen that when
 10 said arms move toward the stop b the bunters will be below it, as shown at f^{30} in dotted lines, Fig. 3, and the feeler member will be above the stop, but below normally-positioned detectors, as at f^{20} , Fig. 3. When a detector
 15 assumes its operative position, however, as shown by dotted lines, Fig. 3, the feeler member f^2 will on its rearward stroke engage the edge of the detector, and said member will be rocked or tipped on its journals f' into the
 20 position shown at 20, Fig. 3, and the fingers or bunters f^3 will be moved into position 30, dotted lines, Fig. 3, to engage the stop b and arrest the movement of the arms f and the rock-shaft f^x . The only strain brought upon
 25 the detector is that sufficient to tip the feeler member and bring the fingers f^3 into operative position to engage the stop b , the latter and the fingers or bunters bearing all of the strain required to arrest the movement of the
 30 arms f and the connected parts. When the fingers or bunters are in operative position, they are shown as assuming a substantially horizontal position directly between the stop b and the journals f' , and the very slight
 35 pressure upon the detector due to engagement of the member f^2 is immaterial, the support m and the stop b holding the detector from displacement.

Any suitable mechanism may be employed
 40 to effect the normal movement of the rock-shaft f^x and its attached parts and to operate the stopping means for the apparatus, the convenient form herein shown being substantially that illustrated in United States Patent
 45 No. 622,182, dated March 28, 1899, and which will be briefly described.

An arm a^2 on the rock-shaft f^x has pivotally connected to it a bent arm a^3 , provided with a bunter a^5 and a toe a^4 , the latter co-
 50 operating with an edge cam D, preferably on the cam-shaft C of the loom, so that the bunter will be moved alternately in and out of the path of one or more tappets t of a cam T, fast on the cam-shaft. When the normal
 55 movement of the rock-shaft f^x is arrested, as has been described, the bunter a^5 is held up in the path of the tappets, engagement therewith swinging the arm a^3 to the rear. This arm is slotted at a^6 to receive a stud d^6 on a
 60 short lever d^{10} , pivoted at its upper end at d^7 to a link d^8 , hooked around the cam-shaft d^9 and jointed at its other end to an arm e of a rock-shaft e^x , provided with a knock-off arm e' for the shipper-lever. The lower end of the
 65 lever d^{10} and the arm e are connected by a rod e^2 , the joint e^3 acting as the lever-fulcrum when the bunter a^5 is acted upon by the tap-

pet-cam T, the swing of the upper end of said lever moving the link d^8 longitudinally to operate the knock-off arm and release the ship-
 70 per-lever S. The weight of the arm a^3 and its connected parts effects the movement of the rock-shaft f^x and rocker-arms f and the parts carried thereby toward the detectors, the reverse or outward swing of the rocker-
 75 arms being effected by the cam D.

The rocker-arms, connected to move in unison by the rock-shaft f^x , may be termed a "vibrator," and the feeler member f^2 and the
 80 bunters constitute means, controlled by a detector in operative position, to cause a change in the normal movement of the vibrator, and thereby effect the actuation of the stop-motion.

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

1. In a loom, a series of stop-motion-controlling detectors movable into operative position upon the occurrence of abnormal conditions of the warp-threads, a stop-motion for
 90 the loom, a normally-moving member, and means made operative by direct engagement of a part thereof with a detector in operative position to arrest the movement of said mem-
 95 ber and relieve the detector from strain, arrest of said member effecting the operation of the stop-motion.

2. In a loom, a series of stop-motion-controlling detectors movable into operative po-
 100 sition upon the occurrence of abnormal conditions of the warp-threads, a stop-motion for the loom, a normally-moving member arrest of which effects the operation of the stop-motion, a fixed member, and means controlled
 105 by a detector in operative position to effect the arrest of the moving member by the said fixed member.

3. In a loom, a series of stop-motion-controlling detectors movable into operative po-
 110 sition upon the occurrence of abnormal conditions of the warp-threads, a stop-motion for the loom operated by or through arrest of the feeler, a feeler, a normally-vibrating support therefor, and arresting means for said
 115 support, made operative by engagement of the feeler with a detector in operative position, whereby the detector is relieved from strain due to arrest of the feeler-support.

4. In a loom, a stop-motion instrumentality, a series of controlling-detectors therefor maintained inoperative by normally-conditioned warp-threads, means including a normally-moving vibrator to effect the operation
 120 of said instrumentality upon the occurrence of an abnormal condition in a warp-thread, and a governing device for said means movable relatively to the vibrator and made operative by or through a detector in operative
 125 position.

5. In a loom, a series of stop-motion-controlling detectors operative by or through the abnormal condition of a warp-thread, a stop-motion for the loom, a normally-moving vi-
 130

brator, and means including a feeler member
movable relatively to the vibrator and made
operative by a detector in operative position,
to cause a change in the normal movement
5 of said vibrator upon engagement of the
feeler member with a detector in operative
position and thereby effect the actuation of
the stop-motion.

6. In a loom, a series of stop-motion-con-
10 trolling detectors operative by or through the
abnormal condition of a warp-thread, a stop-
motion for the loom, a normally-moving vi-
brator, a fixed stop, and means carried by the
vibrator to engage the stop and arrest the vi-
15 brator, said means being controlled and op-
erated by a detector in operative position.

7. In a loom, a series of stop-motion-con-
trolling detectors operative by or through the
abnormal condition of a warp-thread, a stop-
motion for the loom, a normally-moving mem- 20
ber, and means made operative and actuated
by a detector in operative position to engage
and arrest the normally-moving member and
thereby effect the operation of the stop-mo-
tion. 25

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

WILLIAM E. ALLEN.

Witnesses:

JOHN C. EDWARDS,
AUGUSTA E. DEAN.