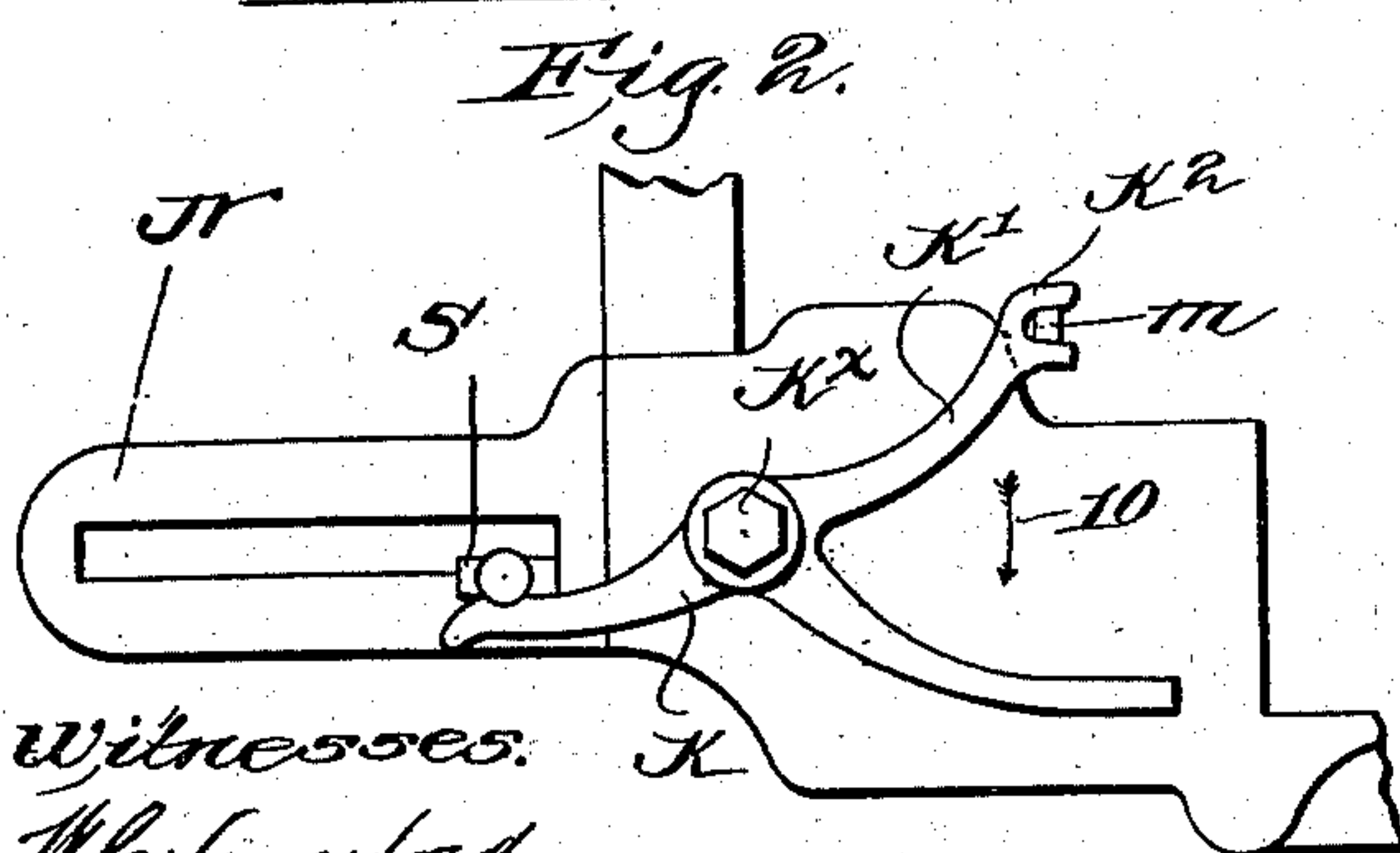
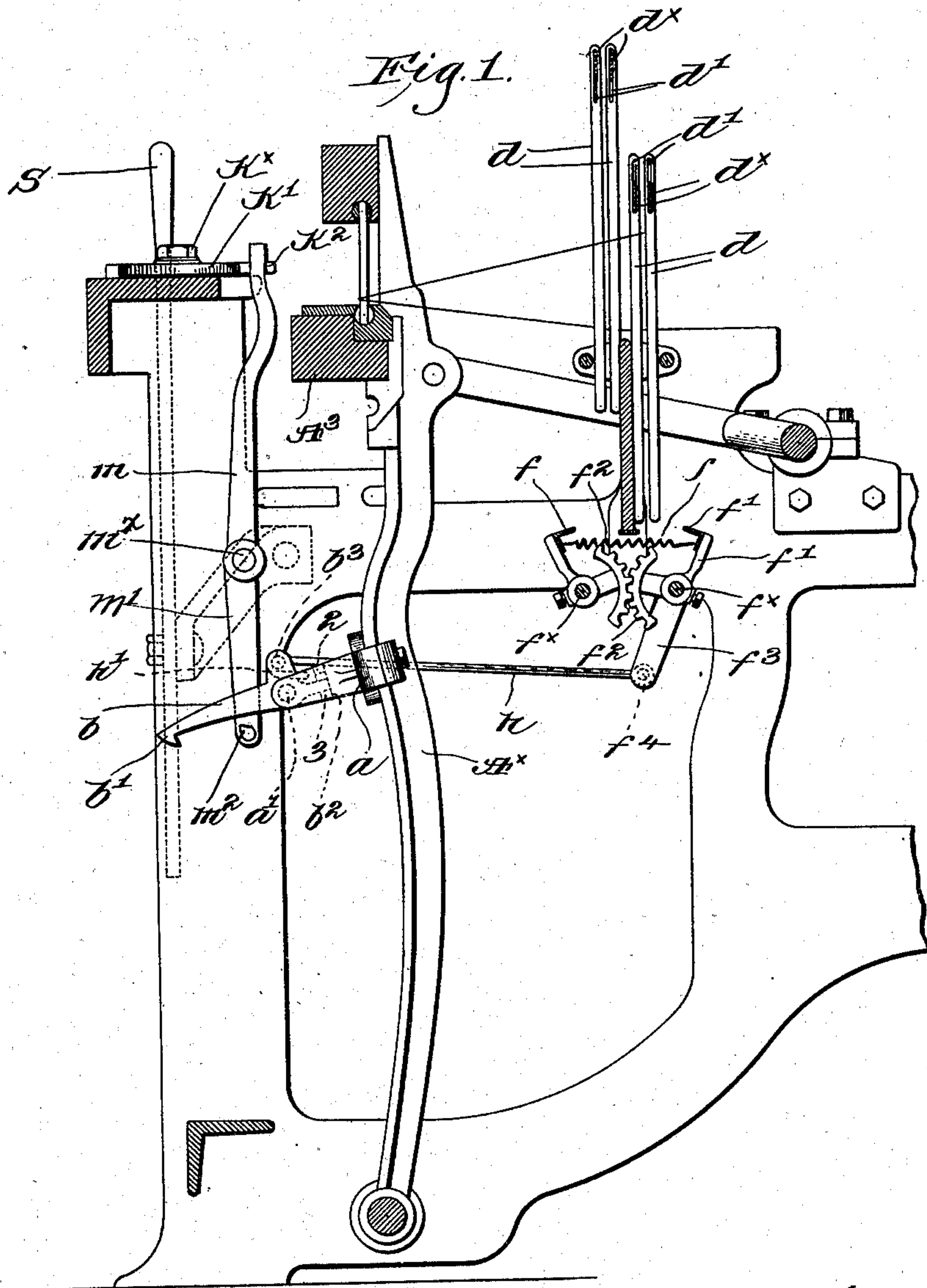


No. 719,879.

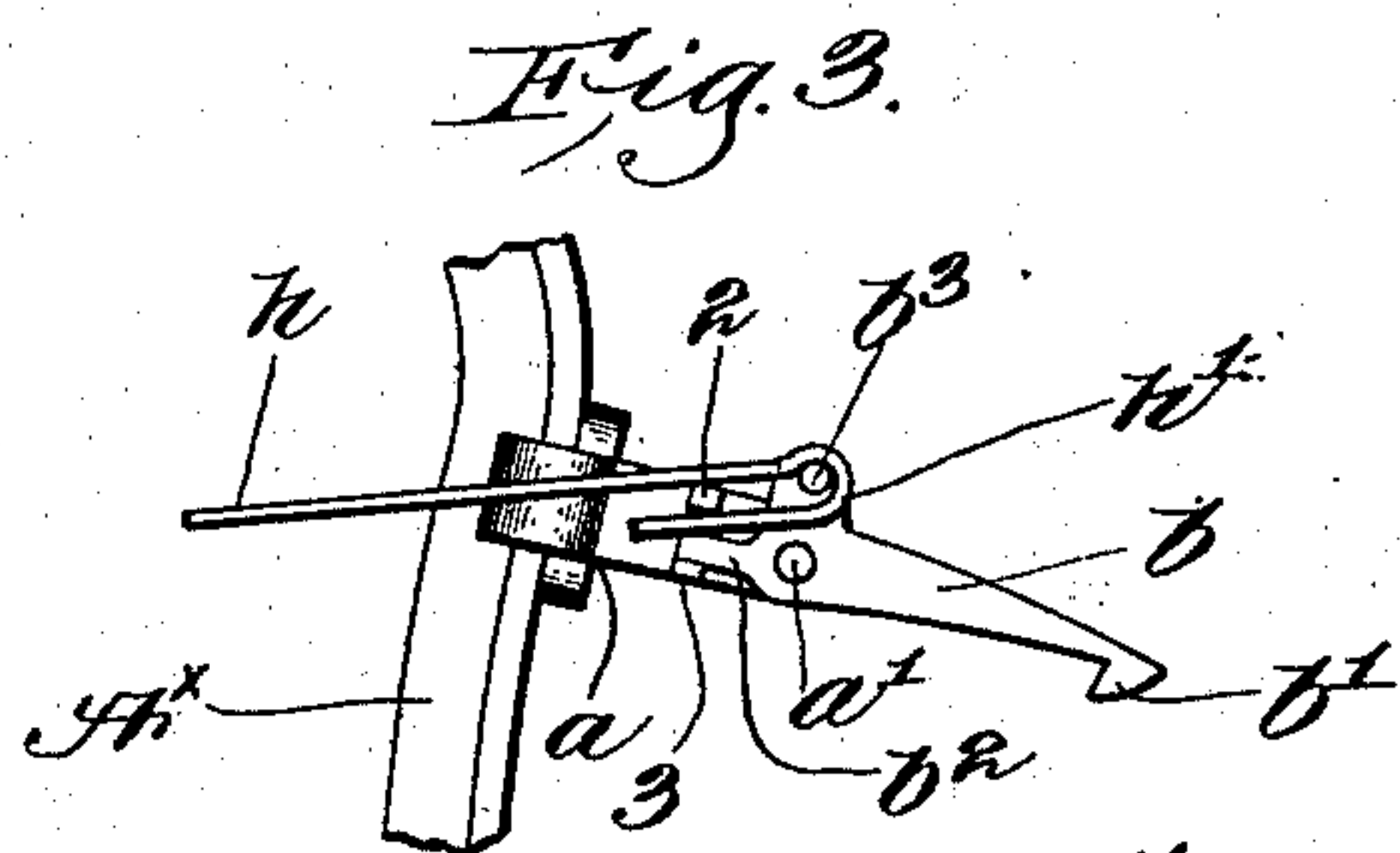
PATENTED FEB. 3, 1903.

C. F. ROPER.
WARP STOP MOTION FOR LOOMS.
APPLICATION FILED OCT. 10, 1902.

NO MODEL.



Witnesses:
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UNITED STATES PATENT OFFICE.

CHARLES F. ROPER, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO
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WARP STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 719,879, dated February 3, 1903.

Application filed October 10, 1902. Serial No. 126,667. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. ROPER, a citizen of the United States, and a resident of Hopedale, county of Worcester, 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 characters on the drawings representing
10 like parts.

This invention relates particularly to a warp stop-motion for looms, and to that type of stop-motion wherein arrest of a vibrating feeler is made effective to stop automatically
15 the operation of the loom.

My invention has for its object the production of simple means for very directly effecting the vibration of the feeler by or through the movement of the lay, the movement of the
20 latter also being utilized to cause the operation of the stopping means when the movement of the feeler is arrested.

The various novel features of my invention will be described hereinafter, and particularly
25 pointed out in the following claims.

Figure 1 is a cross-section of a sufficient portion of a loom to be understood with one embodiment of my invention applied thereto, the lay being shown in its forward position.
30 Fig. 2 is a plan view of the holding-plate for the shipper with the releasing-lever therefor; and Fig. 3 is an inner side elevation of the dog and its support and the lost-motion connection between the dog and the link, to
35 be described, by which the release of the shipper is effected automatically.

The lay A^3 , lay-swords A^x , (only one being shown,) the shipper S , (the only member of the stopping means illustrated,) and its
40 notched holding-plate N , Fig. 2, are all of usual or well-known construction. A releasing-lever k , fulcrumed at k^x on the plate N , (see Fig. 2,) has a rearwardly - extended branch k' , forked at its extremity at k^2 to receive the upper end of a knock-off member
45 or arm m . This member is pivoted on a stud m^x (see Fig. 1) on the loom side below the breast-beam, the depending end m' of the member having a lateral lug or projection m^2

on its inner side. The lay-sword A^x has 50 clamped or otherwise attached to it a bracket a , extended toward the front of the loom in this instance and having fulcrumed upon it at a' a dog b , having its front end terminating in a downturned hook b' . The rear end 55 of the dog is reduced in width to constitute a tail b^2 , which projects between two lateral lugs or stops 2 and 3 on the bracket a , as best shown in Fig. 3. Normally the dog is held up with its hooked end above the projection 60 m^2 of the knock-off arm by means to be described when the lay swings back and forth; but when a warp-thread breaks the dog is permitted to drop and engage the projection m^2 and operate the knock-off arm as the lay 65 swings back.

I have herein shown the controlling - detectors d of the warp stop-motion arranged in two banks or series for each harness-frame, only the transverse detector-supporting bars 70 d^x of the frames being shown, passing through slots d' in the detectors in well-known manner, the detectors being maintained inoperative by intact warp-threads. A feeler f co-operates with the detectors of each harness-frame, arms f' connecting the feelers with 75 suitably-supported parallel rock-shafts f^x , provided with like intermeshing segmental gears f^2 to effect simultaneous rocking of said shafts in opposite directions. A spring s^x is 80 shown in Fig. 1 as connecting and tending to move the feelers toward each other on their feeling stroke. Ordinarily the feelers vibrate below the detectors; but if one of the latter is released by breakage of its warp-thread it 85 will when its frame descends drop into the path of and engage and arrest the corresponding feeler on its spring-effected stroke, as will be familiar to those skilled in the art. One of the rock-shafts f^x , the rearmost one here- 90 in, has a depending arm f^3 fast thereon, pivotally connected at f^4 with one end of a link h , the other end of the link being bent to form a slot-like elongated hook h' , which embraces a lateral stud b^3 on the dog between its hooked 95 end and its fulcrum a' and above the latter. As shown in Fig. 1, the link is nearly horizontal. The pull of the spring s^x acts nor-

mally to hold the stud b^3 in the end of the hook h' , the latter and the stud constituting a lost-motion connection of the slot-and-pin type between the link and the dog. As the lay beats up the link h is drawn forward positively, lifting the dog above the projection m^2 and pulling the tail b^2 against the stop 3, limiting the lifting movement of the dog. This longitudinal movement of the link acts against the stress of the spring to swing the feelers away from each other, and when the lay swings back the spring draws the feelers toward each other on their feeling stroke. Now if on this stroke either feeler is arrested by a released detector the longitudinal movement of the link h is stopped immediately and its forward end drops, allowing the dog to drop onto the projection m^2 , the dog being made long enough for this purpose. The hook b' engages the projection, and as the lay goes back it causes the dog to swing the knock-off arm on its fulcrum, and its upper end acts to turn the releasing lever in the direction of arrow 10, Fig. 2, and thereby throw the shipper S out of its holding-notch, stopping the loom. As the dog moves back with the lay-sword the stud b^3 slides in the hook h' of the link, this lost motion between link and dog compensating for the stoppage of longitudinal movement of the link.

The apparatus is simple, very direct acting, and quickly responsive to the coöperation of the feeler with a released detector. The latter when engaging the feeler is subjected to only the strain of the spring s^x , and the latter can be made quite light, so that there is no tendency to twist or otherwise damage the detectors.

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

1. In a loom, the lay, a pivotally-mounted dog movable therewith, stopping means, including a knock-off member, warp-stop-motion mechanism, including a feeler, a link between it and the dog and having a lost-motion connection with the latter, and a spring to effect feeling movement of the link and tending to maintain the dog inoperative, the non-feeling movement of the feeler being effected through the link by movement of the lay, arrest of the feeler permitting lost motion between the link and dog, to allow the latter to turn on its fulcrum and engage and operate the knock-off member.

2. In a loom, the lay and a lay-sword, a dog pivotally mounted on the latter, stopping means, including a knock-off member, warp-stop-motion mechanism, including a feeler, a link between it and the dog and having a lost-

motion connection with the latter, and a spring tending to hold the dog inoperative and to effect feeling movement of the feeler, its opposite stroke being effected positively by movement of the lay-sword, arrest of the feeler permitting lost motion between the link and dog, to thereby allow the latter to turn on its fulcrum and engage the knock-off member, to operate the same by or through subsequent movement of the lay-sword.

3. In a loom, the lay and a lay-sword, a hooked dog fulcrumed on the lay-sword and having a limited up-and-down throw, stopping means, including a knock-off arm, warp-stop-motion mechanism, including a feeler, a link between it and the dog and having a lost-motion connection with the latter, and a spring tending to hold the dog up and effect feeling movement of the feeler, its opposite stroke being effected through the link by movement of the lay-sword, arrest of the feeler permitting the dog to drop and engage the knock-off arm, to operate the latter through subsequent movement of the lay-sword.

4. In a loom, the lay and a lay-sword, a hooked dog pivotally mounted on the latter, stopping means, including a knock-off arm, warp-stop-motion mechanism, including a feeler, a link between it and the dog and having a lost-motion connection with the latter, and a spring tending to hold the dog up and effect the feeling movement of the feeler on the backward stroke of the lay, the opposite feeler-stroke being effected through the link as the lay beats up, arrest of the feeler holding the link and permitting the dog to engage the knock-off arm, to operate the latter as the lay swings back.

5. In a loom, the lay, a pivotally-mounted dog movable therewith, stopping means, including a knock-off arm, warp-stop-motion mechanism, including a feeler, a link between it and the dog and having a slot-and-pin connection with the latter, and a spring to normally prevent lost motion at such connection and maintain the dog inoperative, the spring effecting the feeling stroke of the feeler on the backward beat of the lay, the opposite stroke being effected positively through the link on the forward beat of the lay, arrest of the feeler permitting the dog to turn on its fulcrum into engagement with the knock-off arm, to operate the latter as the lay swings back.

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

CHARLES F. ROPER.

Witnesses:

GEORGE OTIS DRAPER,
ERNEST WARREN WOOD.