

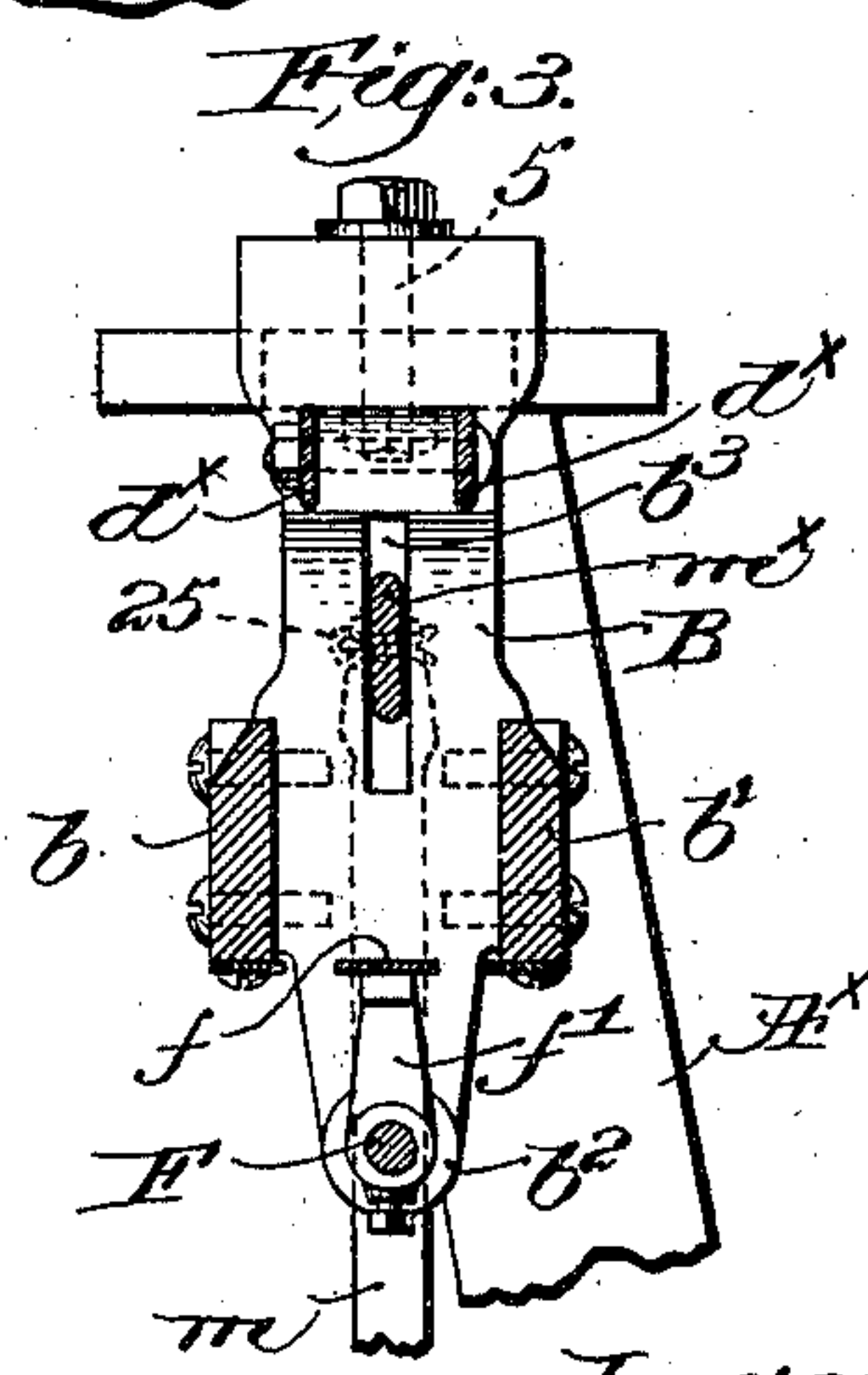
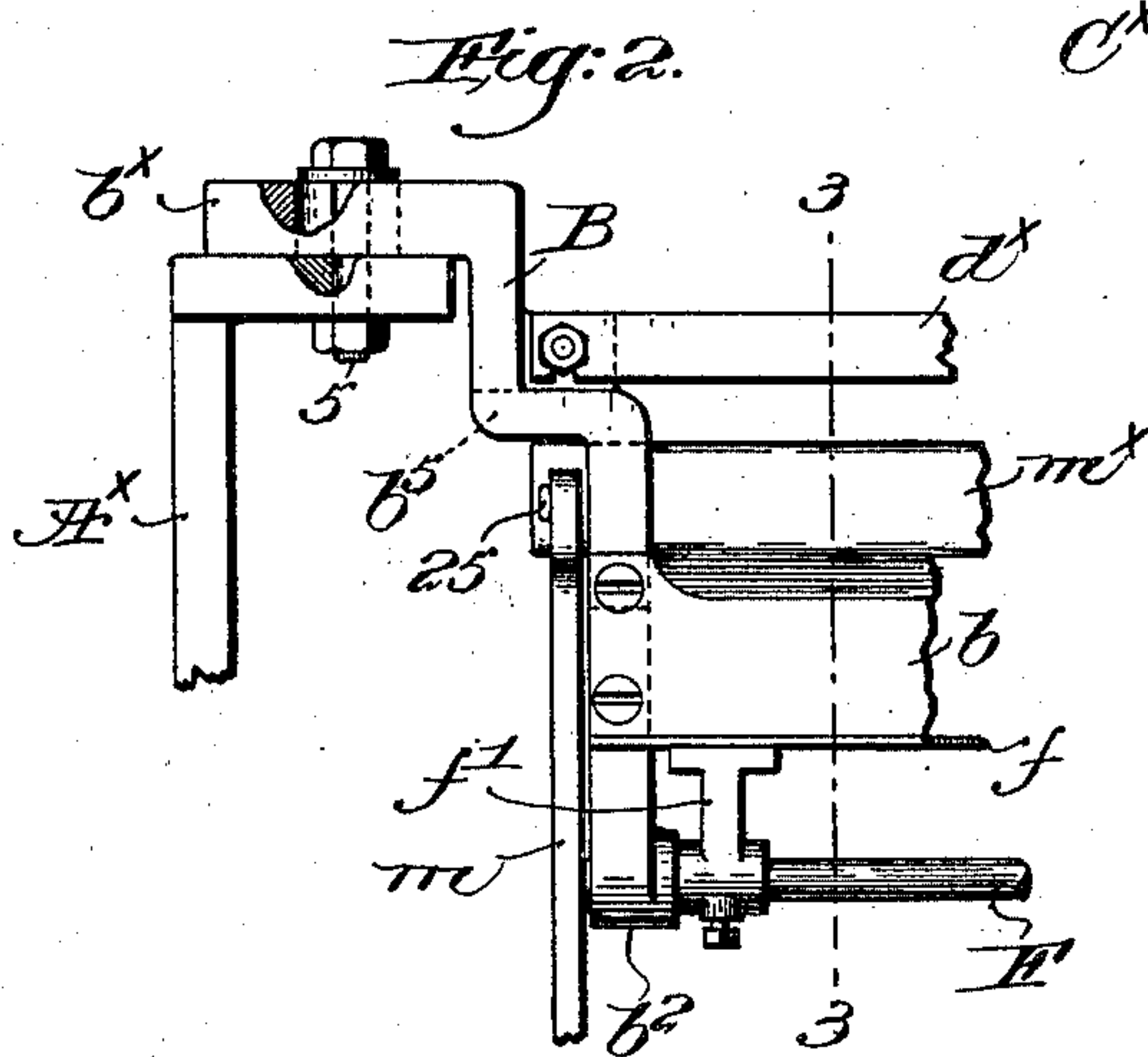
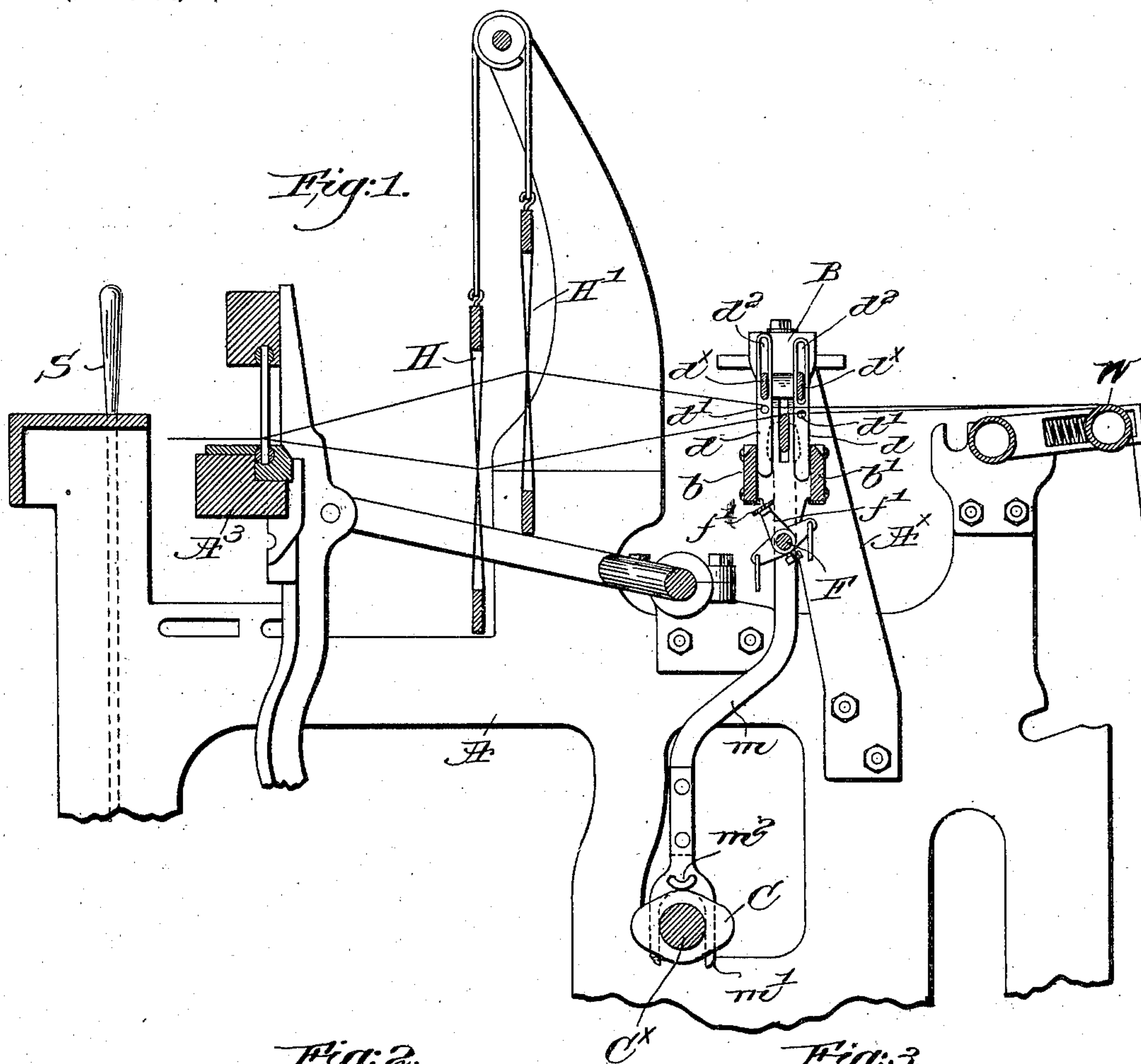
No. 708,536.

Patented Sept. 9, 1902.

C. H. DRAPER.  
WARP STOP MOTION FOR LOOMS.

(Application filed Jan. 6, 1902.)

(No Model.)



Witnesses,  
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# UNITED STATES PATENT OFFICE.

CLARE H. DRAPER, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO DRAPER COMPANY, OF HOPEDALE, MASSACHUSETTS, A CORPORATION OF MAINE.

## WARP STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 708,536, dated September 9, 1902.

Application filed January 6, 1902. Serial No. 88,523. (No model.)

*To all whom it may concern:*

Be it known that I, CLARE H. DRAPER, 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 like parts.

This invention has for its object the production of novel means for taking up warp slack in order to prevent unnecessary stoppages of a loom or other mechanism provided with a warp stop-motion, which includes a series of controlling-detectors normally maintained inoperative by intact warp-threads. While it is desired to stop the mechanism promptly and automatically whenever a warp-thread breaks, it is neither necessary nor desirable to have such stoppage occur merely because of slackness of some one or more of the warp-threads, and unless this slack is taken up the detector is apt to move far enough from its normal position to render operative the stopping means.

Figure 1, in cross-section, represents a sufficient portion of a loom to be understood with one embodiment of my invention applied thereto. Fig. 2 is an enlarged detail, in front elevation, of a portion of the stop-motion shown in Fig. 1; and Fig. 3 is a sectional view on the line 3 3, Fig. 2, looking toward the left.

The loom-frame A, lay  $A^3$ , whip-roll W, and harnesses H H', the only part of the shed-forming mechanism herein shown, may be and are of usual construction and operate in well-known manner, the shipper S being the only member of the usual stopping means herein illustrated.

Brackets B, having outturned heads  $b^x$ , (see Fig. 2,) are supported upon the intumed tops of stands  $A^x$ , secured to the loom sides, the brackets being adjustably held in place by clamping-bolts 5, as clearly shown in Fig. 2. The brackets are connected by cross-bars  $b b'$ , set on edge and arranged in front of and behind the warp-stop-motion controlling-detectors, herein shown as arranged in two parallel series, and, referring to Fig. 1, the de-

tectors  $d$  are shown as thin flat plates arranged side by side and each having a warp-eye  $d'$ , through which a warp-thread passes, and an elongated longitudinal slot  $d^2$  is made in each detector to receive supporting-bars  $d^x$ , which are extended across the loom from one to the other of the brackets B and attached thereto in suitable manner. The cross-bars  $b b'$  serve to guide the detectors in their vertical movements and also serve as back-stops when a detector in one or the other series is released by breakage of its warp-thread, a feeler  $f$  at such time engaging and being arrested by the inner edge of such released detector. The brackets B have each a depending bearing  $b^2$  for a rock-shaft F, provided with arms  $f'$ , to which the feeler is secured.

Any suitable feeler arrangement may be employed to cooperate with a released detector—such, for instance, as that shown in United States Patent No. 673,824—the feeler  $f$  being normally vibrated in a path below the lower ends of the detectors. When a released detector engages and arrests the movement of the feeler, suitable intermediate devices (not herein shown) operate to automatically release the shipper S from its holding-notch to thereby stop the loom, to which form of apparatus my invention is herein shown as applied.

Each bracket B is provided with a vertical slot  $b^3$ , (shown clearly in Figs. 1 and 3,) and a warp-support  $m^x$  is extended through the slots to project beyond the outer faces of the brackets, as shown in Fig. 2, said warp-support being shown as a rather thin flat bar set on edge and of less depth than the length of the slots  $b^3$ , so that the said warp-support may be vertically movable therein. This warp-support is located between the two series of detectors and engages the warps adjacent thereto, supporting the warps between the detectors, and I have provided means for reciprocating the warp-support so that the warps are intermittently elevated to thereby take up slack and prevent descent of a detector into position to engage the feeler.

Referring to Fig. 1, the cam-shaft  $C^x$  of the loom is provided with a double-throw cam C at or near each side of the loom, only



one of the cams being herein shown, and an upturned bent link  $m$  is formed at its upper end to receive the projecting end of the warp-support  $m^x$ , the lower end of the link being formed, as at  $m'$ , to embrace the cam-shaft, a follower  $m^2$  on the side of the link traveling on the periphery of the cam C. At every revolution of the shaft  $C^x$  the warp-support  $m^x$  will be raised and lowered twice, and I prefer such an arrangement, as thereby the warp-support is moved each time the shed is changed. I have arranged the cam in such manner that the warp-support will be elevated at each change of shed, as at such time the warps are slackest and the danger from stoppage due to a warp-thread slacker than its fellows is greatest. The feeler is so set with relation to the cam that the warp-support reaches its highest position simultaneously with the detecting movement of the feeler. When the parts are thus set, a slack thread is enabled to hold its detector above the path of the feeler, while a detector whose warp-thread is broken will have no farther to drop when the warp-support is in its lowest position than it would without the addition of such movable support. In this way I secure an equally prompt detector drop in case of warp breakage, thus preventing warp-runs, which would be apt to occur if the additional detector movement were obtained otherwise, such additional movement decreasing the number of slack threads which are permitted to stop the loom—that is, the drop of a detector which would occur by reason of a slack thread is counteracted by the rise of the warp-support, and the feeler will not be engaged and arrested, while the rise of the support has no influence on a broken warp-thread. Hence its

detector drops from the same point and travels the same distance into the feeler-path as it would were the warp-support omitted or made stationary. The warp-threads are thus supported and intermittingly elevated between the series of detectors sufficiently to take up any slackness which may be present.

The cam-shaft  $C^x$  is usually arranged to rotate once for every two picks, and for that reason I have provided a double-throw cam.

The warp-support is retained in place in the links  $m$  by any suitable means, such as cotter-pins 25, extended through the support outside of the link, as clearly shown in Figs. 2 and 3.

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

In a loom, two parallel series of vertically-movable warp-stop-motion controlling-detectors maintained inoperative by intact warp-threads, a normally vibrating feeler for each series, stopping means for the loom actuated by or through the arrest of a feeler by a released detector of the series with which it co-operates, a single vertically-movable warp-support between the two series of detectors to lift the warp-threads simultaneously with the detecting movement of each feeler, to take up warp slack and thereby prevent improper action of a detector, and means to positively lift the warp-support.

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

CLARE H. DRAPER.

Witnesses:

GEORGE OTIS DRAPER,  
ERNEST W. WOOD.