

No. 671,666.

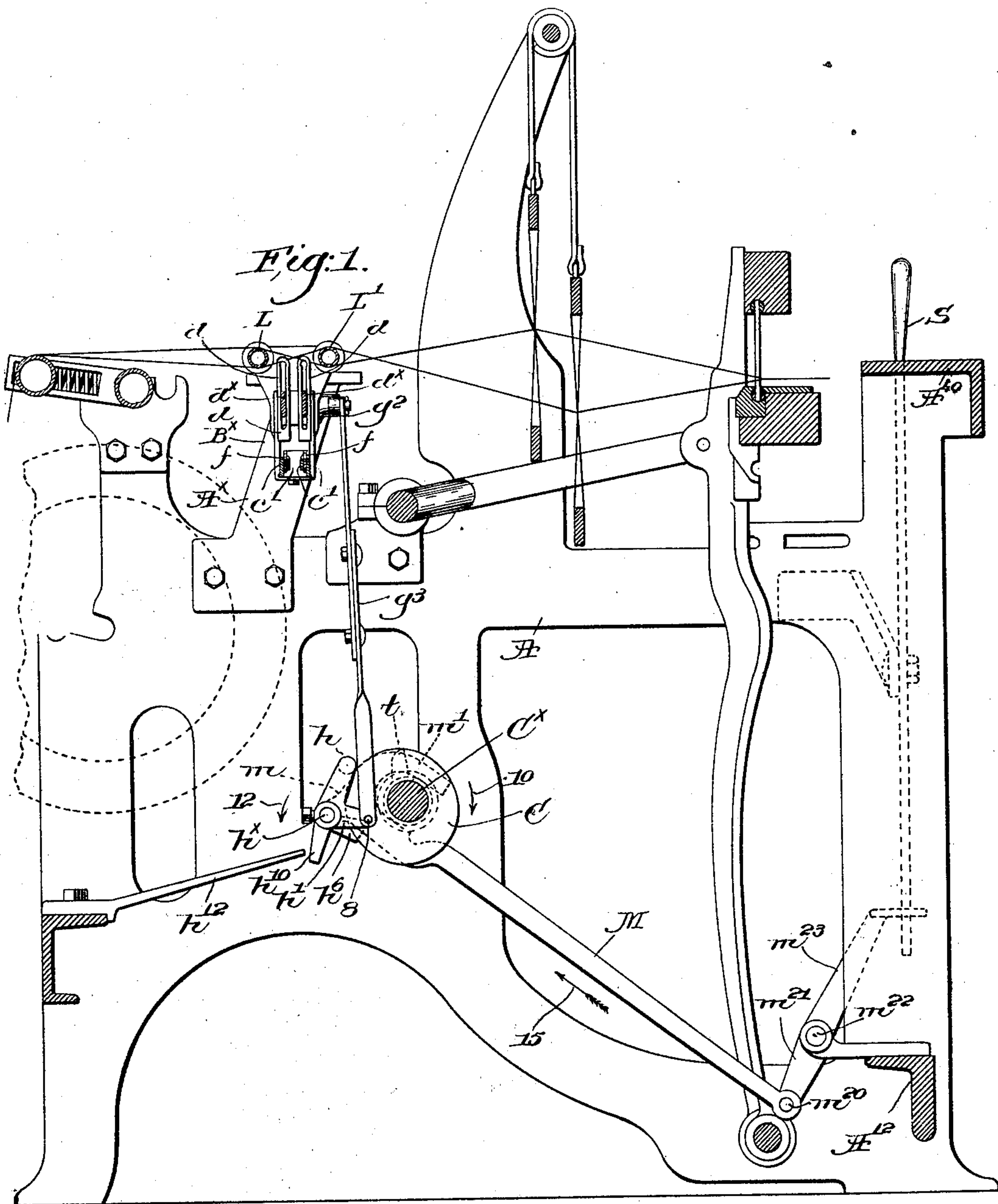
Patented Apr. 9, 1901.

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

Application filed Jan. 3, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses,
Edward H. Allen.
Adolph H. Kaiser.

In witness whereof,
Clare H. Draper,
by Bradley & Gregory,
attys.

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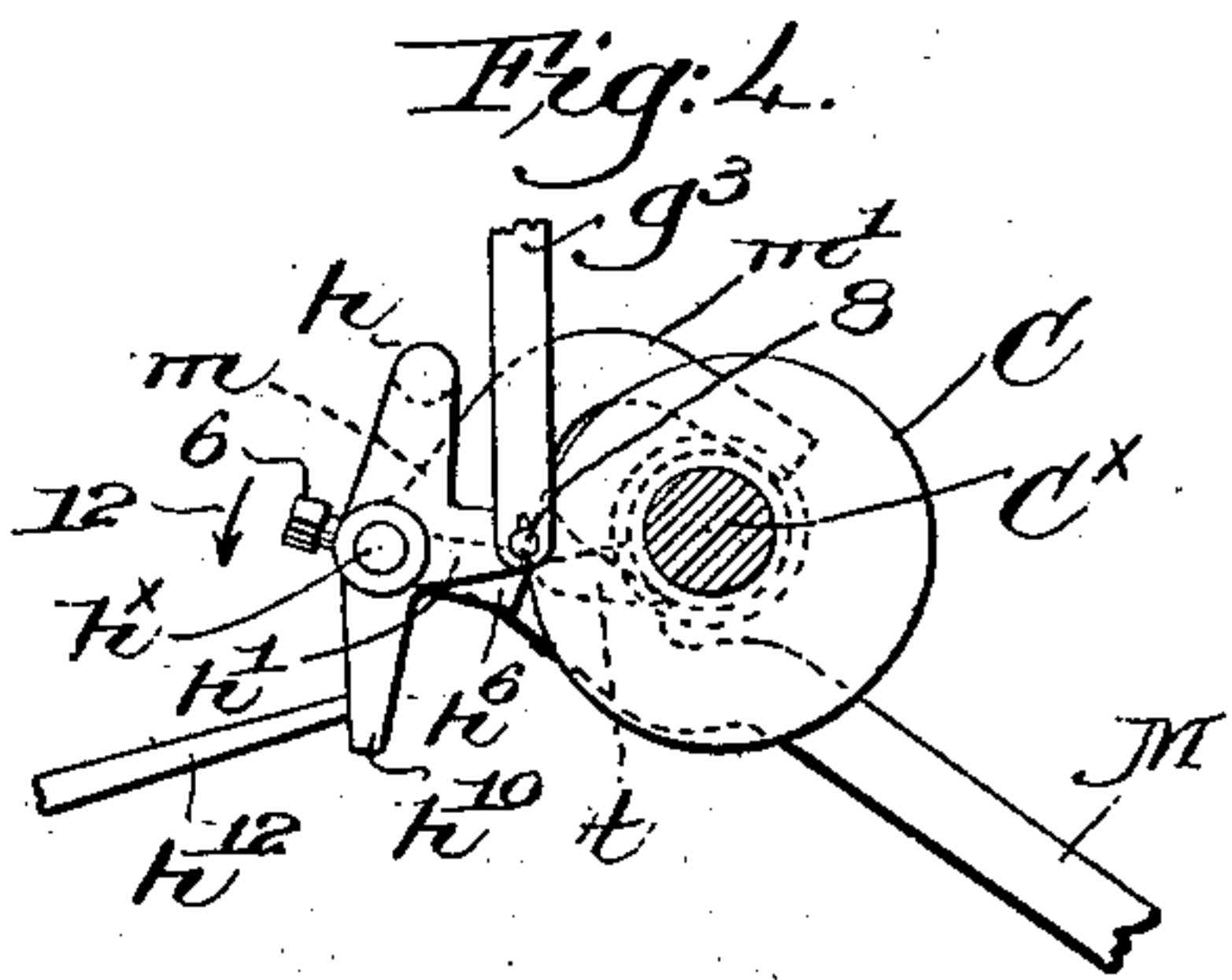
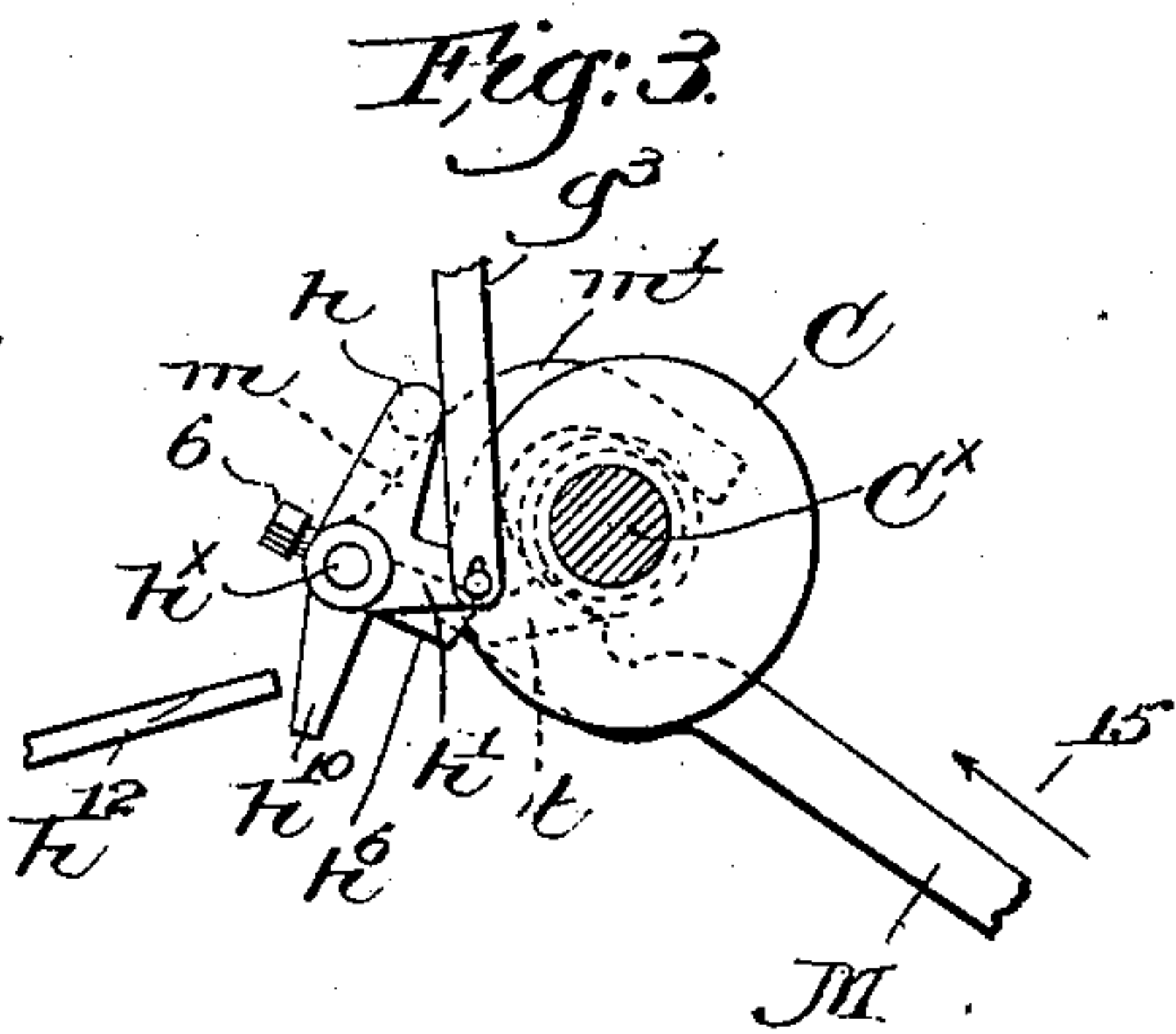
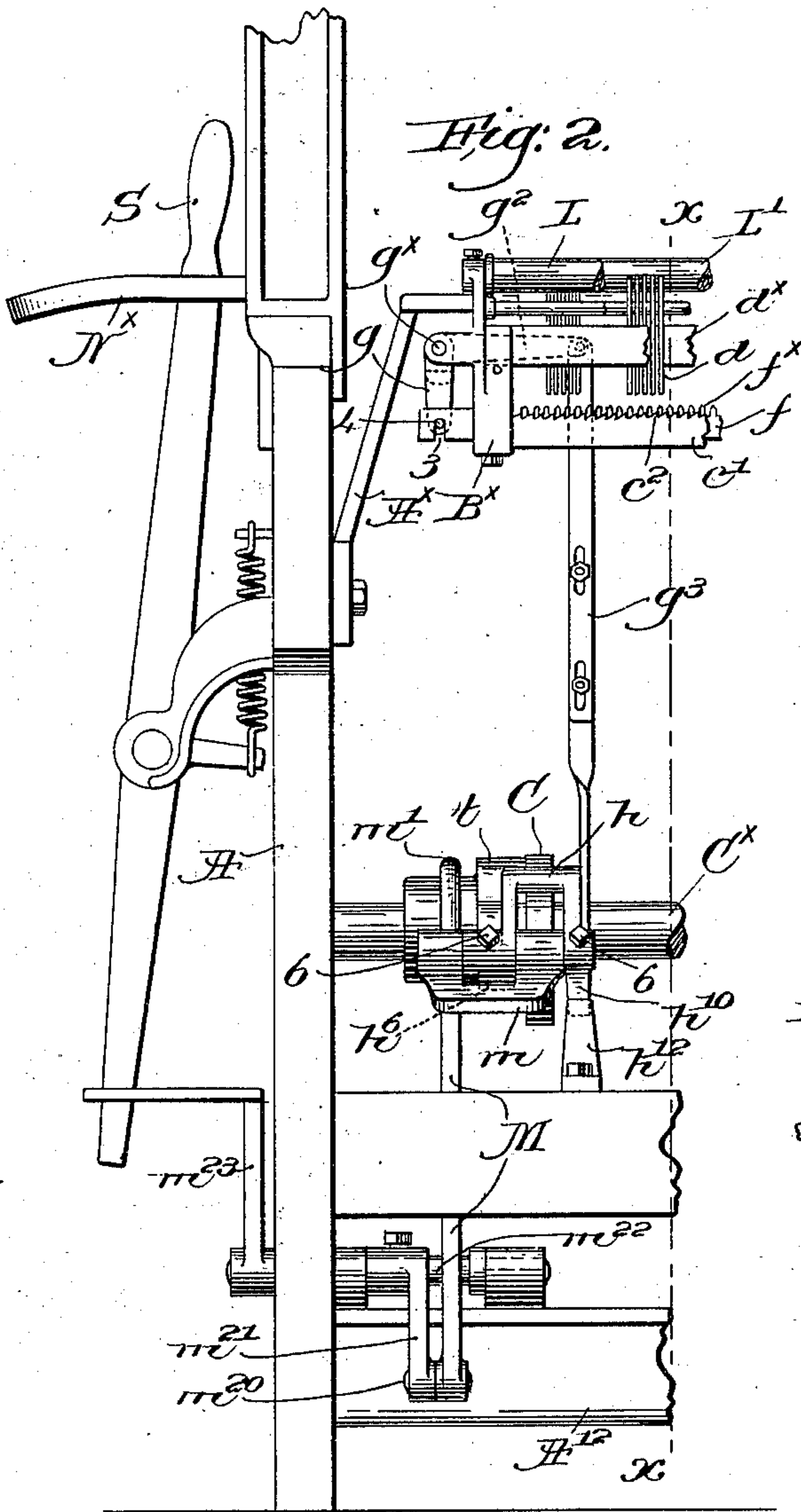
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WARP STOP MOTION FOR LOOMS.

(Application filed Jan. 3, 1901.)

(No Model.)

2 Sheets---Sheet 2.



Witnesses,
Edward H. Allen.
Adolph H. Kaiser.

Traverdon;
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UNITED STATES PATENT OFFICE.

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

WARP STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 671,666, dated April 9, 1901.

Application filed January 3, 1901. Serial No. 41,961. (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 relates to warp-stop-motion apparatus more particularly adapted for use in connection with looms for weaving and of that type of apparatus wherein the stopping of the loom is controlled automatically by or through the action of detectors normally maintained in inoperative position by the warp-threads. A feeler, which is normally vibrated by suitable means, is adapted to engage a released detector, such engagement arresting the feeling movement of the feeler, and at such time such detector is subjected to pressure by the feeler.

The principal object of my present invention is to provide for the relief of the detector from the pressure of the feeler when the stopping means is operated, thereby increasing the life of the detector and effecting a better operation of the apparatus as a whole and leaving the detector free to be replaced by the operative in its normal position.

Figure 1 is a transverse sectional view of a loom with one practical embodiment of my invention applied thereto, the section being taken on the line $x x$, Fig. 2, looking toward the left. Fig. 2 is a rear elevation of the warp-stop-motion mechanism shown in Fig. 1. Fig. 3 is a sectional detail taken on the line $x x$, Fig. 2, looking to the left and showing a portion of the mechanism as just about to operate to effect the actuation of the stopping means; and Fig. 4 is a similar view showing the changed position of some of the parts illustrated in Fig. 3, such change of position operating to relieve the engaged detector from the pressure of the feeler.

The operative parts of the loom shown in Fig. 1 are of usual and well-known construction, the loom being provided with stopping means, the only portion thereof which is herein illustrated being the shipper-lever S,

which is held in running position in the usual notched holding-plate N^x , Fig. 2, mounted on or forming a continuation of the breast-beam A^{40} .

Stands A^x on the loom sides A support lease-rods $L L'$ and two cross-bars d^x , which are extended through longitudinally-slotted detectors d , shown as arranged in two banks or series and hung upon the warp-threads, the latter normally maintaining them in the position shown in Fig. 1, and below each bank of detectors is shown a pair of parallel plates c' , slightly separated from each other and having their upper edges notched or serrated, as at c^2 , one of the faces of each tooth being substantially vertical, as best shown in Fig. 2.

Between each pair of toothed plates c' is mounted a feeler f , shown as a long flat plate having its upper edge comb-like to present a series of tines f^x , and the two feelers are extended through the supporting-bracket B^x and are notched at their outer ends at 3 (see Fig. 2) to embrace a tine 4 on one arm, as g , of a bell-crank lever fulcrumed at g^x on the bracket B^x , the other arm g^2 of said lever having connected therewith a depending arm g^3 , and it will be obvious that longitudinal reciprocation of such arm will rock the bell-crank lever, and thereby effect a longitudinal vibration of the feeler arranged to cooperate with each series or bank of detectors.

If the detector is released, as by breakage or failure of its warp-thread, it will descend and its lower end will be engaged by the teeth c^2 , and it will also enter between two of the tines f^x of the feeler. Now when the feeler is moving to the left, viewing Fig. 2, its tine in engagement with the released detector will press the latter against the upright faces of the fixed teeth c^2 , which latter act as stops for the detector, so that the movement of the feeler to the left, which is its feeling movement in the present instance, will be stopped.

The usual cam-shaft C^x of the loom has fast upon it a feeler-actuating cam C, the periphery of which is engaged by a follower h , the follower being shown as a substantially \square -shaped casting, fixedly secured, as by set-screws 6, to a rock-shaft h^x , mounted in a yoke m , secured to or forming part of a link M, which at its upper end is hooked at m' to

embrace the cam-shaft C^x , the yoke m extending rearwardly from the upper hooked end of the link, as clearly shown in Fig. 1. The follower is herein shown as provided with an arm h' , pivotally connected at 8 with the depending arm g^3 , and it will be obvious from an inspection of Fig. 1 that when the high part of the cam C , rotating in the direction of the arrow 10, engages the follower h it will rock the latter and the shaft h^x in the direction of the arrow 12 to thereby lift the arm g^3 and through the bell-crank levers $g g^2$ move the feeler to the right, viewing Fig. 2. The opposite or feeling movement is effected in this instance by gravity due to the weight of the arm g^3 and the follower, the weight of such parts always tending to keep the follower against the periphery of the cam. A bunter-cam t , shown as a tappet-cam, is also fast on the cam-shaft C^x and rotates in the path of a bunter h^6 , shown as secured to or forming a part of the \square -shaped follower, the feeler-cam C being shaped to permit the bunter h^6 to move below or out of the path of the bunter-cam when the follower h is in engagement with the low part of the feeler-cam. If, however, the feeling movement of the feeler is arrested by engagement with a released detector, the follower will be held up away from the cam C , and at the same time the bunter h^6 will be maintained in the path of the bunter-cam t , as shown in Fig. 3, so that continued movement of the bunter-cam, as the shaft C^x continues to rotate, will operate to move the link M longitudinally in the direction of the arrow 15. Such movement of the link is made effective to release the shipper-lever S , and thereby stop the loom, the lower end of the link being pivotally connected at m^{20} to an arm m^{21} , fast on a short shaft m^{22} , supported in suitable bearings on the cross-girth a^{12} , the rock-shaft having secured to it a knock-off arm m^{23} , which engages the lower end of the shipper-lever, the knock-off arm operating to release the shipper-lever from its holding-notch.

The rock-shaft h^x has secured to it a rocker-arm h^{10} , and I have herein shown this rocker-arm as a part of the follower-casting, said arm depending below the end of the detent h^{12} , shown as a bar rigidly secured to a part of the loom-frame, and normally the rocking movement of the follower will not be sufficient to bring the rocker-arm h^{10} into engagement with the detent; but when the link M is moved longitudinally, as has been described, it will also move the follower and the rocker-arm h^{10} bodily toward the back of the loom, so that the rocker-arm will be brought into engagement with the detent, such engagement being just about to be effected in Fig. 3, and as the bunter-cam continues the movement of the link M it will be obvious that the rocker-arm h^{10} will swing upon the end of the detent h^{12} as a fulcrum, such swinging operating to rock the shaft h^x in the direction of the arrow 12 to thereby elevate the arm h'

and the depending arm g^3 , pivotally connected therewith. As has been before described, such upward movement of the arm g^3 acts to move the feeler f to the right, and this rocking of the rock-shaft h^x is sufficient to move the feeler to the right far enough to relieve the detector engaged thereby from pressure, it being remembered that the engaged detector is held on one side by the stop-teeth c^2 and pressed upon on its opposite side by one of the tines of the feeler with a pressure due to the weight of the parts which give the feeler its feeling movement. By effecting a retractive movement of the feeler when the stopping means is operated the engaged detector is relieved from pressure due to the feeler, so that any bending or twisting of the detector is obviated.

While I have shown one particular form of feeler and means to effect the vibration thereof to illustrate a practical embodiment of my invention, the latter is not restricted to use with such form of mechanism, as it may be readily adapted to other forms of feeler-vibrating means.

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

1. In a warp stop-motion, a series of detectors normally held inoperative by the warp-threads, a feeler to cooperate with a released detector, means to vibrate the feeler, stopping means actuated by or through engagement of the feeler with a released detector, and means operative upon actuation of the stopping means to relieve the engaged detector from the pressure of the feeler.

2. In a warp stop-motion, a series of detectors normally held inoperative by the warp-threads, a normally vibrating feeler to engage a released detector, means to positively move the feeler in one direction, stopping means actuated by or through engagement of the feeler with a detector, and means to effect movement of the feeler away from an engaged detector when the actuation of the stopping means has been inaugurated.

3. In a warp stop-motion, controlling-detectors normally maintained inoperative by the warp-threads, a feeler to engage a released detector, means to vibrate it, stopping means, a link to effect its operation, provided with a bunter, an operating or bunter cam, engagement of a detector by the feeler effecting cooperation of the said cam and bunter, and means controlled by operative movement of the link to relieve the pressure of the feeler upon the released detector.

4. In a warp stop-motion, controlling-detectors normally maintained inoperative by the warp-threads, a feeler to engage a released detector, means to vibrate it, including an actuating-cam to move it in one direction, stopping means, a link to effect the operation thereof, provided with a bunter, an operating or bunter cam, engagement of a detector with the feeler withdrawing the latter from con-

5 trol by its said actuating-cam and effecting
coöperation of the bunter and the operating
or bunter cam, and means actuated by move-
ment of the link to positively move the feeler
5 away from the released detector.

10 5. In a warpstop-motion, controlling-detec-
tors normally maintained inoperative by the
warp-threads, a vibratable feeler to engage
and be stopped by a released detector, a feeler-
cam, a follower, connections between the lat-
ter and the feeler, a link on which the fol-
lower is pivotally mounted, a bunter on the
link, an operating-cam, stopping means ac-
tuated by movement of the link, engagement
15 of the feeler with a detector effecting coöp-
eration of the bunter and its operating-cam,
and means to rock the follower and move the
feeler away from the engaged detector when
the link is moved.

20 6. In a warpstop-motion, controlling-detec-
tors normally maintained inoperative by the
warp-threads, a vibratable feeler to engage
and be stopped by a released detector, means
to vibrate the feeler, including a rock-shaft,
25 a follower, a bunter, and an arm, all fast on
said rock-shaft, a feeler-cam with which the
follower coöperates, and a bunter-cam, com-
bined with a link on which the rock-shaft is
mounted, stopping means operated by move-
30 ment of the link, engagement of the feeler
with a detector moving the bunter into po-
sition to be engaged by the bunter-cam to
move the link, and a detent to engage the
arm on the rock-shaft and rock the latter
35 when the link is moved, to relieve the detec-
tor from the pressure of the feeler.

40 7. In a warpstop-motion, controlling-detec-
tors normally maintained inoperative by the
warp-threads, a feeler movable toward the
detectors by gravity and adapted to be en-
gaged and stopped by a released detector,
means to move the feeler positively away

from the detectors, said means including a
cam, and a rocking follower operatively con-
nected with the feeler, a rock-shaft on which 45
the follower is mounted, and a rocker-arm on
said rock-shaft, combined with stopping
means, an actuating-link therefor on which
the rock-shaft is mounted, means operative
upon engagement of a detector with the feeler 50
to move the link and actuate the stopping
means, and a detent to engage the rocker-arm
when the link is moved and thereby rock the
rock-shaft to withdraw the feeler from the
detector in engagement therewith. 55

8. In a warp stop-motion, a series of detec-
tors normally maintained inoperative by the
warp-threads, a feeler to coöperate with a re-
leased detector, means, including a rock-shaft
and a cam, to effect the vibration of the feeler, 60
stopping means, operated by or through en-
gagement of the feeler with a detector, and
means to rock the rock-shaft independently
of the cam upon operation of the stopping
means, to withdraw the feeler from the en- 65
gaged detector and thereby relieve the latter
from pressure.

9. In a warp stop-motion, a series of detec-
tors normally maintained inoperative by the
warp-threads, a feeler to coöperate with a re- 70
leased detector, means, including a cam, to
effect the vibration of the feeler, stopping
means operated by or through engagement
of the feeler with a detector, and means in-
dependent of the cam to withdraw the feeler 75
from the engaged detector when the stopping
means operates.

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.