

No. 639,182.

Patented Dec. 12, 1899.

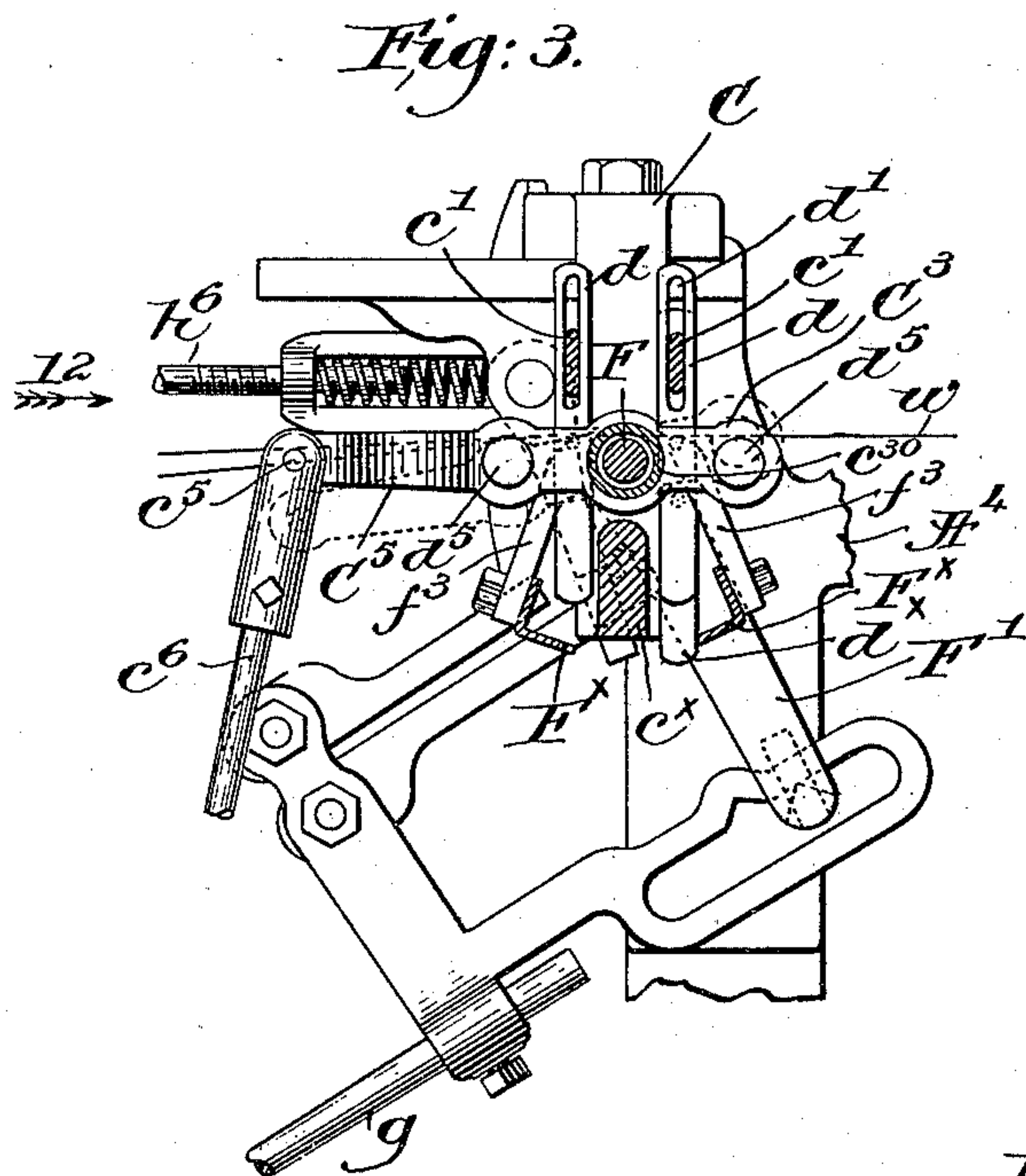
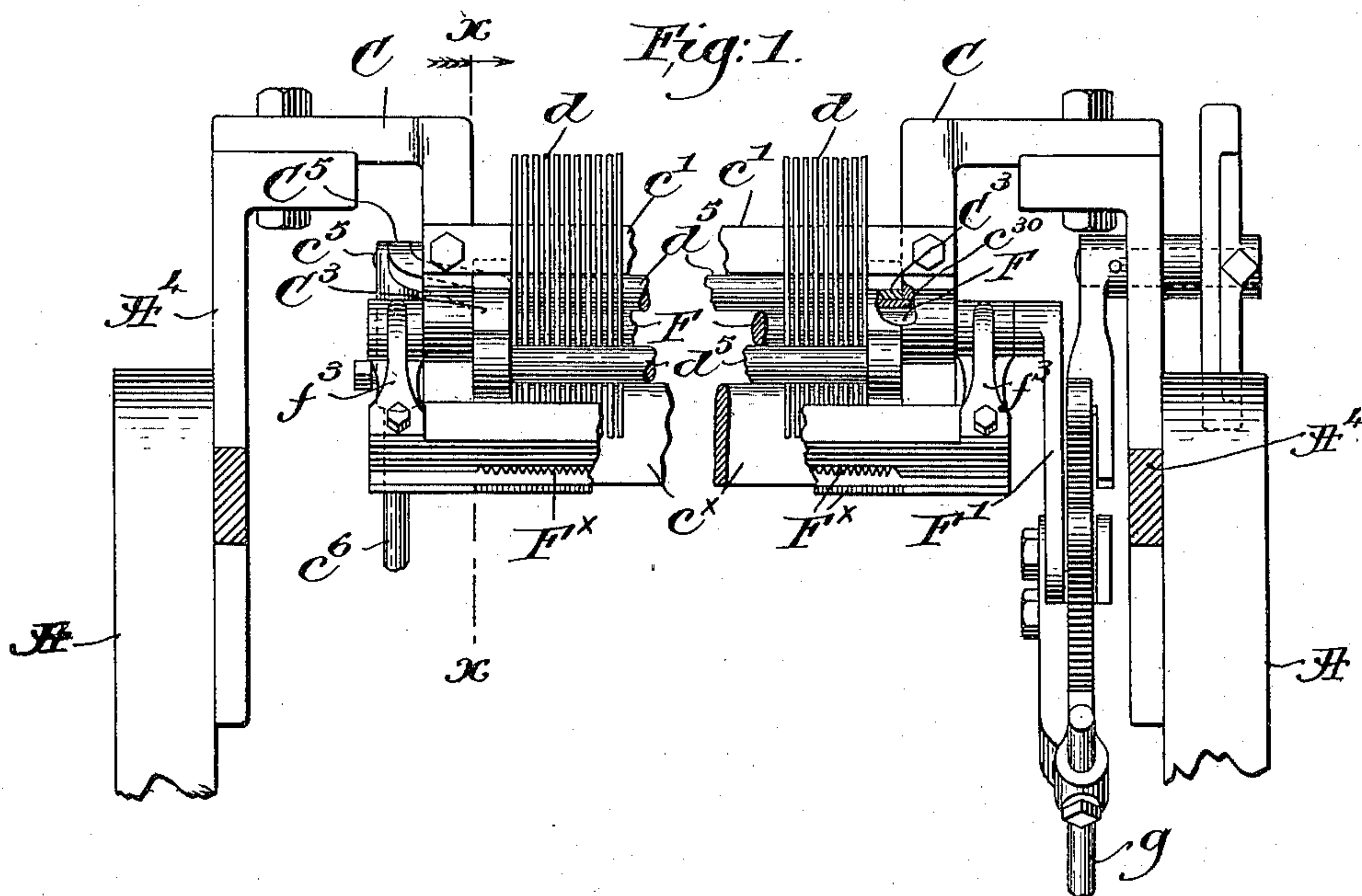
J. H. NORTHRUP.

WARP STOP MOTION FOR LOOMS.

(Application filed Dec. 15, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses,
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Edward H. Allen.

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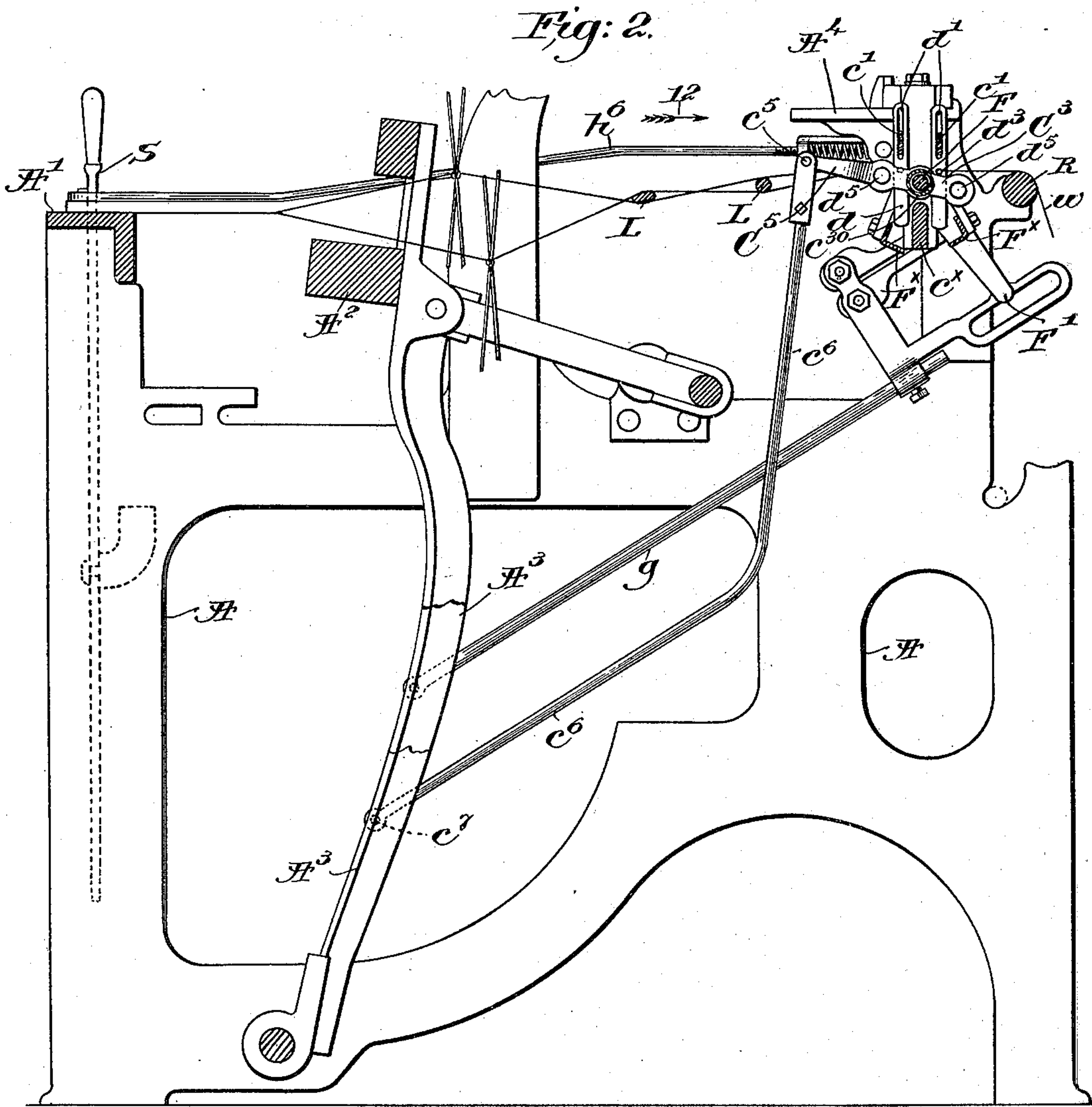
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UNITED STATES PATENT OFFICE.

JAMES H. NORTHROP, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO THE
DRAPER COMPANY, OF SAME PLACE AND PORTLAND, MAINE.

WARP STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 639,182, dated December 12, 1899.

Application filed December 15, 1898. Serial No. 699,341. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. NORTHROP, of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in
5 Warp Stop-Motions for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 In another application, Serial No. 697,949, filed by me the 1st day of December, 1898, I have shown warp-stop-motion mechanism wherein the feelers are mounted on and depend from a supporting rock-shaft which is
15 rocked while the loom is running, to thereby vibrate the feelers and move them toward and away from detectors normally maintained by the warp-threads out of the paths of the feelers. The supporting-shaft was so located as
20 to serve also as a rest for the warp-threads, and in the particular embodiment shown in said application the detectors were arranged in two series, in front and back of the shaft, respectively, while fixed warp-rests were
25 mounted outside of and adjacent each series. Owing to the location of the detectors between the whip-roll and the lease-rods the warp-threads and detectors have little or no movement in vertical planes and dust and lint
30 will collect on the detectors, tending to clog or retard their proper detecting movement.

My present invention has for its object the production of means for giving the warp-rests a vertically-reciprocating movement, to there-
35 by agitate the warp-threads and their detectors sufficiently to keep the latter clear of lint and dust and also prevent the detectors from sticking together.

Figure 1 is a rear elevation, centrally broken
40 out, of a portion of a loom provided with warp-stop-motion mechanism embodying my invention. Fig. 2 is a transverse section of the apparatus on the line xx , Fig. 1, looking toward the right, showing the lay and lay-swords;
45 and Fig. 3 is an enlarged similar sectional view of the parts shown at the upper right-hand corner of Fig. 1, with the warp-rests in a different position.

The loom-frame A, breast-beam A', lay A²,
50 lay-swords A³, whip-roll R, the lease-rods L,

and the shipper-handle S are and may be of usual or well-known construction.

The warp-stop-motion mechanism proper is supported on brackets A⁴, on which rest L-shaped stands C, rigidly connected by a trans-
55 verse bar or support c^x and by thin detector supports or bars c' , set on edge and secured to the stands C, said bars being herein shown as extended through the longitudinal slots d' of the stop-motion-actuating detectors d , ar-
60 ranged herein in two parallel banks or series, the length of the slots being greater than the depths of the supporting-bars to permit longitudinal movement of the detectors relatively thereto, the detectors being located be-
65 tween the whip-roll and the lease-rods and being held in inoperative position by normal warp-threads w —that is to say, by warp-threads under proper tension and intact. The lower ends of the two series of detectors are
70 separated by the bar c^x , which forms a back-stop for a released detector when engaged by one of the coöperating feelers F^x, said feelers, as in my application hereinbefore referred to, being shown as angle-irons attached to arms
75 f^3 , rigidly secured to a rock-shaft F, mounted in bearings in the stand C. The feelers will be vibrated by the rocking of the shaft back and forth below the lower ends of the detec-
80 tors when the latter are controlled by normal warp-threads; but should a thread break or become unduly slack its detector will drop the length of its slot, as shown at d^x , Fig. 3, and its lower end will be interposed between the adjacent feeler and the separator c^x to stop
85 the inward movement of the feeler, so that the latter and its rock-shaft F will be held from movement and a rocker-arm F', secured to the rock-shaft, will also be held stationary. This stoppage of the rocker-arm operates,
90 through suitable mechanism forming no part of this present invention and substantially the same as in the application referred to, to move a rod h^6 in the direction of the arrow 12, Figs. 2 and 3, to knock off or release the
95 shipper-lever from its usual notched holding-plate, (not shown,) the normal vibration of the rock-shaft F and the release of the shipper-lever when a feeler is engaged by a detector being controlled by an actuating-link 100

g, pivotally connected to one of the lay-swords.

Rocker-arms C^3 are loosely mounted on sleeves c^{30} , concentric with the rock-shaft F, beyond the ends of the series of detectors and extended beyond the stands C, and the arms are rigidly connected at their outer ends by preferably round rods d^5 , located below the warp-threads and in front of and behind the series of detectors, as clearly shown in Figs. 2 and 3, said rods forming vertically-movable warp-rests, the rock-shaft F, interposed between the series of detectors, serving also as a warp-rest, but being relatively fixed.

As herein shown, one of the arms C^3 , and that one at the opposite side of the loom from the rocker-arm F', is extended, as at C^5 , and pivotally connected at c^5 with the head of a link c^6 , downturned and forwardly bent and pivotally connected at c^7 at its free end with the adjacent lay-sword, so that the vibration of the latter will operate to raise and lower the arm C^5 , and thereby rock the warp-rests d^5 alternately above and below the normal plane of the warp-threads.

In my said application referred to the location of the detectors between the whip-roll and the lease-rods deprives said detectors of any material movement during the normal operation of the apparatus, so that lint and dust are apt to collect on the detectors, clogging their warp-receiving eyes d^3 and preventing free sliding movement of the detectors in the event of breakage or improper slackness of their warp-threads.

By making the warp-rests d^5 movable vertically the warp-threads as a whole are alternately raised and lowered, and said threads acting on their detectors give them a slight vertical vibratory motion, sufficient, however, to keep them clear of lint and dust to insure their proper sliding movement to detect when released.

In Figs. 1 and 2 the arm C^5 is shown in its highest position and in Fig. 3 in its intermediate position when the fixed and movable warp-rests are substantially in alignment, the lowermost position of said arm being shown in dotted lines, Fig. 3.

The timing of the feeler vibrations and the vibratory movement of the warp-rests d^5 are preferably such that one of the latter will be elevated as the feeler of its adjacent series of detectors moves toward the detectors, as shown in Fig. 2. Such elevation of the warp-rest tends to lift slightly-slack warp-threads sufficiently to prevent the lower end of their detectors from moving into position to cooperate with the feeler, for it is not desirable to effect such cooperation unless a warp-thread has failed or has become unduly slack.

Obviously the mechanism for vibrating the feelers is not necessarily restricted to that herein shown, as any other suitable feeler-actuating mechanism may be employed in lieu thereof to cooperate with any desired stopping mechanism. So, too, it will be obvious that

a single series of detectors may be used with a cooperating feeler and one or more movable warp-rests.

My invention is not restricted to precisely the construction and arrangement of parts herein shown and described, as the same may be modified or rearranged in various particulars without departing from the spirit and scope of my invention.

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

1. In warp-stop-motion mechanism for looms, a series of detectors maintained inoperative by normal warp-threads, a cooperating feeler to engage a detector in abnormal position, and a vertically-reciprocating warp-rest to raise and lower the detectors.

2. In warp-stop-motion mechanism for looms, a series of detectors maintained inoperative by normal warp-threads, a cooperating feeler to engage a detector in abnormal position, two warp-rests, located respectively in front of and behind the detectors, and means to vertically reciprocate the warp-rests and thereby raise and lower the detectors.

3. In warp-stop-motion mechanism for looms, a series of detectors maintained inoperative by normal warp-threads, a cooperating feeler to engage a detector in abnormal position, two warp-rests, located respectively in front of and behind the detectors, rocker-arms connecting said warp-rests at or near their ends, and means to rock the arms and thereby alternately raise and lower the rests, to thus impart vertical movement to the detectors.

4. In warp-stop-motion mechanism for looms, a series of detectors maintained inoperative by normal warp-threads, a cooperating feeler to engage a detector in abnormal position, a supporting rock-shaft for the feeler forming a warp-rest, means to rock the shaft, and an independent, vertically-reciprocating warp-rest, said detectors being located between it and the said rock-shaft, and lifted by the upward movement of the warp-rest.

5. In warp-stop-motion mechanism for looms, a series of detectors maintained inoperative by normal warp-threads, a cooperating feeler to engage a detector in abnormal position, a rocking shaft to which the feeler is attached, located below and to form a rest for the warp-threads, rocker-arms loosely mounted concentric with said shaft, a warp-rest carried by the said arms, and means to rock the latter to thereby raise and lower the warp-rest carried by them.

6. In warp-stop-motion mechanism for looms, a series of detectors maintained inoperative by normal warp-threads, a normally-vibrating feeler to engage a detector in abnormal position, a vertically-movable warp-rest, and means to raise it as the feeler moves toward the detectors and thereby intermittently lift the latter.

7. In warp-stop-motion mechanism for

looms, two series of detectors maintained inoperative by normal warp-threads, a feeler to cooperate with an abnormally-positioned detector of each series, a common feeler-actuating shaft located between the series of detectors and forming a warp-rest, two vertically-movable warp-rests, between which the detectors are located, and means to reciprocate the said warp-rests and thereby agitate the detectors.

8. In warp-stop-motion mechanism for looms, a series of longitudinally-slotted detectors maintained inoperative by normal warp-threads, a stationary, fixed support extending through the slots, a feeler to cooperate with an abnormally-positioned detector, and a vertically-reciprocating warp-rest adjacent the detectors, to agitate the latter and maintain them clear of lint or dust.

9. In warp-stop-motion mechanism for looms, two series of detectors maintained inoperative by normal warp-threads, a vibrating feeler to cooperate with an abnormally-positioned detector of each series, three warp-rests alternating with the two series of detectors, and means to vertically reciprocate the two outer rests to agitate the detectors.

10. In warp stop-motion for looms, a series of detectors supported by normal warp-threads and thereby maintained in inoperative position, a cooperating feeler to engage a detector in abnormal position, and means located adjacent and independent of the detectors to periodically lift the warp-threads and thereby agitate the detectors.

11. In warp stop-motion for looms, a series of vertically-movable detectors supported by intact and taut warp-threads, a cooperating feeler to engage a detector lowered by failure

or undue slackness of its warp-thread, and means to periodically lift the warp-threads adjacent the detectors, to agitate the latter and take up slight slack in the threads, preventing cooperation of the feeler with a partially-lowered detector.

12. In warp-stop-motion mechanism for looms, a series of detectors maintained inoperative by normal warp-threads, a vibrating feeler to cooperate with a detector in abnormal position, a warp-rest pivotally mounted concentric with the center of movement of the feeler, and means to raise and lower said warp-rest to agitate the detectors.

13. In a warp-stop-motion mechanism for looms, a series of detectors maintained inoperative by normal warp-threads, a feeler to cooperate with a detector in abnormal position, a rocking shaft to which the feeler is attached, fixed sleeves concentric with said shaft, a warp-rest pivotally mounted on said sleeve, and means to rock said warp-rest and thereby raise and lower the warp-threads.

14. In warp-stop-motion mechanism for looms, a series of detectors maintained inoperative by normal warp-threads, a vibrating feeler to cooperate with a detector in abnormal position, a vertically-movable warp-rest, and separate means to vibrate the feeler and raise and lower the warp-rest, to thereby agitate the detectors and maintain them free from lint.

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

JAMES H. NORTHROP.

Witnesses:

FRANK J. DUTCHER,
ALVAH W. CLEMENT.