

No. 692,911.

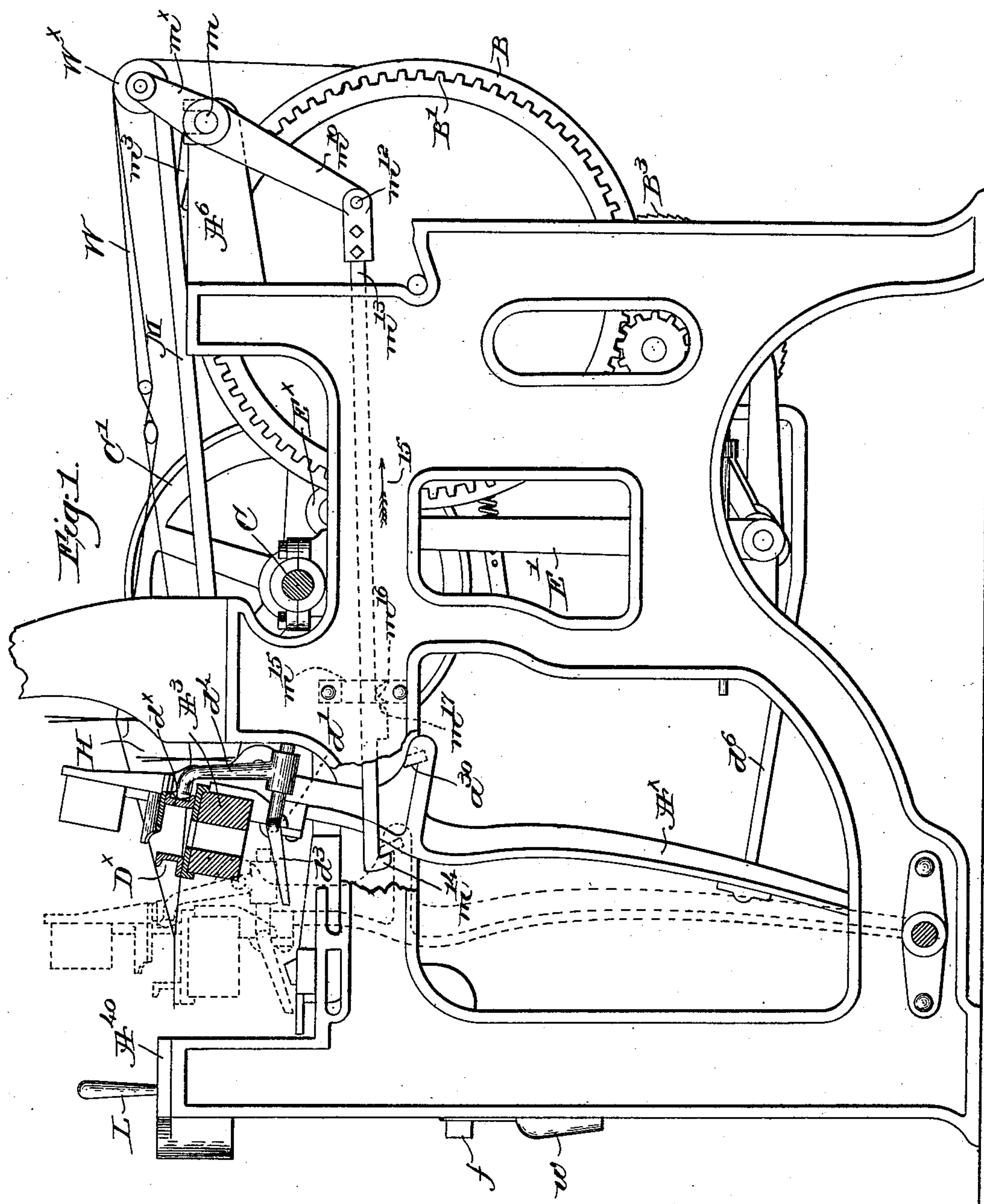
Patented Feb. 11, 1902.

C. F. ROPER.
LOOM.

(Application filed May 8, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

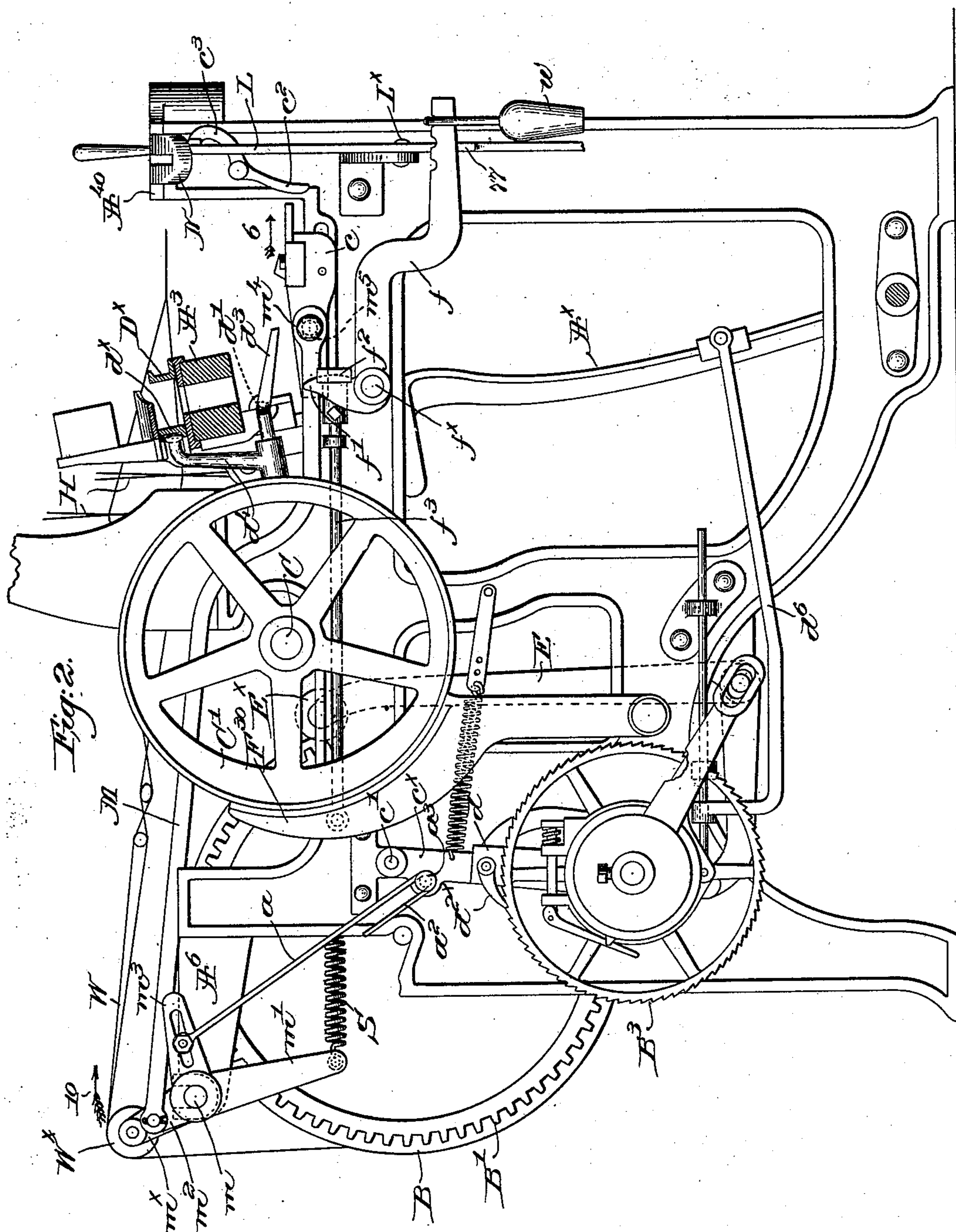


Fig. 2.

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UNITED STATES PATENT OFFICE.

CHARLES F. ROPER, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO
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LOOM.

SPECIFICATION forming part of Letters Patent No. 692,911, dated February 11, 1902.

Application filed May 8, 1901. Serial No. 59,247. (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 Mas-

5 sachusetts, have invented an Improvement in 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 In the normal operation of a loom for weaving the cloth is moved forward at the fell at each beat-in of the filling to an extent depending very largely on the "give" or stretch of the warps, and when soft or very elastic
15 warps are being used frequently the intermittent forward movement of the cloth at the fell will be too great to permit the insertion of the desired number of picks of filling per inch. In my present invention I have pro-
20 vided means for increasing the resistance of the warps to the action of the lay in beating in the filling, so that improper forward movement of the cloth at the fell is prevented, the desired result being attained in the present
25 instance by holding the warps from bodily movement toward the fell as the filling is beaten in. I have also provided means to positively slacken the warps to an abnormal degree if the shuttle is improperly boxed—as,
30 for instance, when the loom "bangs off;" but while such means is independent of the means for holding up or restraining the warps on the beat-in the latter means is rendered in-
operative upon operation of the former means,
35 contemporaneous operation being manifestly inadmissible, so that if one instrumentality operates the other does not.

I have not herein broadly claimed warp-slackening means, as the same forms the sub-
40 ject-matter of another application, Serial No. 59,246, filed by me the 8th day of May, 1901, said application containing broad claims for such subject-matter.

Figure 1 is a right-hand side elevation of a
45 portion of a loom with one embodiment of my present invention applied thereto, the lay and crank-shaft being shown in section; and Fig. 2 is a left-hand side elevation of the loom, showing a portion of the novel mechanism to
50 be hereinafter described.

The lay A^3 , breast-beam A^{10} , having the

holding-plate N for the shipper L , the knock-off arm $c^2 c^3$, the protector mechanism comprising, essentially, a frog c , slidably mounted on the loom side, the dagger d^3 on the rock-
5 shaft d' , carried by the lay, and the arm d^4 , secured to the rock-shaft and adapted to be moved by the binder d^x of the shuttle-box D^x when the shuttle is properly boxed to there-
by lift the dagger into inoperative position, 60
are and may be all substantially as in United States Patent No. 591,979, dated October 19, 1897, except that the frog herein does not act to bring the lay to a full stop, the stopping
65 of the loom being effected gradually by the brake mechanism. As in said patent, if the shuttle fails to enter either shuttle-box sufficiently to press the binder back and rock the shaft d' to lift the dagger d^3 the latter will
70 on the forward beat of the lay engage the frog c and move it forward in direction of arrow 6, Fig. 2, to operate the knock-off arm
 $c^2 c^3$ and release the shipper L , and the latter in turn renders the brake mechanism opera-
75 tive. The said mechanism comprises, essentially, a lever f , Fig. 2, fulcrumed on the loom side at f^x and having a weight at its free end and an upturned toe f' at its other end ad-
jacent the fulcrum, the toe acting against a
80 head or collar f^2 on a rod f^3 , connected at its other end to a brake-shoe F^{30} , adapted to co-
operate with a fly-wheel or pulley C' , fast on the crank-shaft C . The shipper has a lug 77
to normally engage the weighted end of the
85 brake-actuator f and maintain the brake mechanism inoperative; but when the shipper is released and it rocks on its fulcrum L^x the lug 77 is withdrawn and the brake is set.

The warp-beam B , having an attached gear B' , the actuating mechanism therefor, a part
90 only of which is fully illustrated, (see Fig. 2,) including a ratchet-wheel B^3 , a cooperating pawl d^{2x} , compound pawl-carrier $c^x d$, link d^6 , connected with the lay-sword A^x , and the
95 arm E' , having a roll E^x to engage the periphery of the yarn mass on the beam, are substantially as shown in United States Patent No. 647,815, dated April 17, 1900, though any
other form of let-off mechanism may be em- 100
ployed, so far as my present invention is con-
cerned.

Brackets A^6 on the loom sides support a

rock-shaft m , having secured thereto upturned arms m^x , in which the whip-roll or bar W^x is rotatably mounted and over which latter the warps W pass from the beam B to the harnesses H . A depending arm m' , Fig. 2, fast on the rock-shaft, has attached to it one end of a spring S , the other end of the latter being secured to a fixed part of the loom, said spring acting upon the whip-roll in opposition to the pull of the warps. I have shown a bell-crank $m^2 m^3$ secured to the rock-shaft outside one of the brackets A^6 at the left-hand side of the loom, a link M , pivotally attached to the upturned arm m^2 , being pivotally connected at its forward end with the frog c , as at m^4 , so that movement of the frog in the direction of arrow 6 will swing the whip-roll in the direction of arrow 10 to slacken or release the warps from normal tension.

Referring now to Fig. 1, the rock-shaft m is provided at or near the right-hand side of the loom with a depending arm m^{10} , pivotally connected at m^{12} with one end of a link m^{13} , which is extended forward adjacent the inner face of the loom side and provided at its front end with a hook-like projection or lug m^{14} , herein shown as downturned, the link passing through a guide m^{15} , secured to the loom side, the bottom of the guide shaped as a cam m^{16} , (see dotted lines, Fig. 1,) on which the link normally rests. On its under side and adjacent the fixed cam the link itself is provided with a cam m^{17} , so that when the link is moved in the direction of the arrow 15, Fig. 1, the cam m^{17} will engage and ride up on the fixed cam m^{16} to elevate the projection m^{14} out of the path of a hook-like stop a^{30} , movable with the lay and herein shown as secured to or forming a part of one of the lay-swords A^x . The relative position of the stop a^{30} and the hook-like projection m^{14} of the link m^{13} when the lay is in its dotted-line position, as it will be when the filling is beaten in, is such that the whip-roll W^x cannot be drawn forward by the impact of the reed against the filling laid in the shed, and as a consequence the forward movement of the warps is restricted or prevented, and this practical increase of warp tension resists the forward movement of the cloth at the fell, due to the beating in of the filling, at the instant the latter is beaten in, so that the forward movement of the cloth will not be so great as to prevent the insertion of the requisite number of picks of filling per inch. The coöperation of the stop with the hooked link thus acts to hold the warp on the beat of the lay, and with very elastic or soft warps it prevents the improper forward movement of the cloth on the beat-up.

It will be remembered that the whip-roll is normally controlled by the spring S to impart a certain tension to the warps, and the means hereinbefore described for holding on the beat prevents the forward movement of the whip-roll against the action of its spring, which would otherwise take place on the beat.

Should the shuttle fail to be properly boxed, the dagger will engage and move the frog c , Fig. 2, to release the shipper and through the latter to render the brake mechanism operative; but the frog does not act of itself to stop the movement of the lay. The movement of the frog, however, due to operation of the protector mechanism, operates through the link M to move the whip-roll toward the fell of the cloth to slacken the warps to an abnormal degree, so that when the loom "turns over" after the release of the shipper and before the brake mechanism brings the loom to a stop the presence of the shuttle in the shed as the lay beats up will not result in tearing out or breaking the warps. Manifestly if this warp slackening is effected the means for holding the warps on the beat-up must be rendered inoperative to prevent contemporaneous operation of the latter means and the means for effecting warp slackening, and a comparison of Figs. 1 and 2 will clearly show how the operation of the warp-slackening means prevents the operation of the holding means. The forward movement of the whip-roll—that is, in the direction of the arrow 10, Fig. 2—acts through the arm m^{10} to move the link m^{13} in the direction of the arrow 15, so that the coöperation of the cams $m^{16} m^{17}$ will lift the hook m^{14} out of the path of the stop a^{30} before the latter is moved far enough forward to engage said hook-like projection m^{14} , and consequently the holding means will not operate. The latter instrumentality operates at every beat-up of the lay when the loom is running normally; but the warp-slackening means will operate only when the shuttle is improperly boxed, and while the two instrumentalities are independent, still the operation of the warp-slackening means will automatically render inoperative or prevent the operation of the holding means. The arm m^3 of the bell-crank has pivoted to it a link a , which is hooked, as at a^2 , to loosely embrace a headed stud a^3 on the pawl-carrier member c^x , which is fulcrumed on the loom side at c' , the variations in warp tension acting through said link a in opposition to the spring S to move the pawl-carrier on its fulcrum, substantially as in Patent No. 647,815. When the whip-roll is positively moved to slacken the warps, as has been described, the hook a^2 permits the link a to slide on the stud a^3 . By making an elongated slot m^5 (see dotted lines, Fig. 2) for the stud or pin m^4 to pass through the vibrating movement of the whip-roll will not act to move the frog during the normal running of the loom.

My invention may be varied or rearranged without departing from the spirit and scope of my invention, one practical embodiment whereof is herein shown and described.

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

1. In a loom, a movable whip-roll, means

operative upon improper boxing of the shuttle to positively move the whip-roll to slacken the warps, independent means to hold the warps from bodily movement toward the fell 5 when the filling is normally beaten in, and mechanism to prevent contemporaneous operation of the said two means.

2. In a loom, a spring-controlled whip roll, protector mechanism, means actuated by or 10 through operation thereof to positively move the whip-roll to slacken the warps, independent means to hold the whip-roll from movement upon normal beat-in of the filling, and mechanism to prevent contemporaneous op- 15 eration of the said two means.

3. In a loom, a movable whip-roll, means operative upon improper boxing of the shuttle to positively move the whip-roll to slacken the warps, independent means to restrain bodily 20 movement of the warps toward the fell upon normal beat-in of the filling, and a device controlled by the operation of the former means to prevent the operation of the latter means.

25 4. In a loom, the lay, a movable whip-roll, protector mechanism, means actuated by or through operation thereof to positively move the whip-roll to slacken the warps, a link connected with the whip-roll and normally adapt-

ed to be engaged and held stationary by the 30 lay as the filling is beaten in, to thereby retain the whip-roll from movement, and a device to move said link into inoperative position by or through the positive movement of the whip-roll to slacken the warps.

5. In a loom, the lay having a stop movable therewith, a pivotally-mounted spring-controlled whip-roll, a link connected therewith 35 and provided with a cam and a projection, the latter normally engaging the stop when the 40 filling is beaten in, to hold the whip-roll from movement toward the fell, a fixedly-mounted cam, protector mechanism, and means actuated by operation of said mechanism to positively move the whip-roll to slacken the warps, 45 such positive movement of the whip-roll effecting engagement of the cam on the link with the fixed cam, to thereby move the projection on the link out of the path of the said 50 stop.

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 W. WOOD.