

No. 742,813.

PATENTED OCT. 27, 1903.

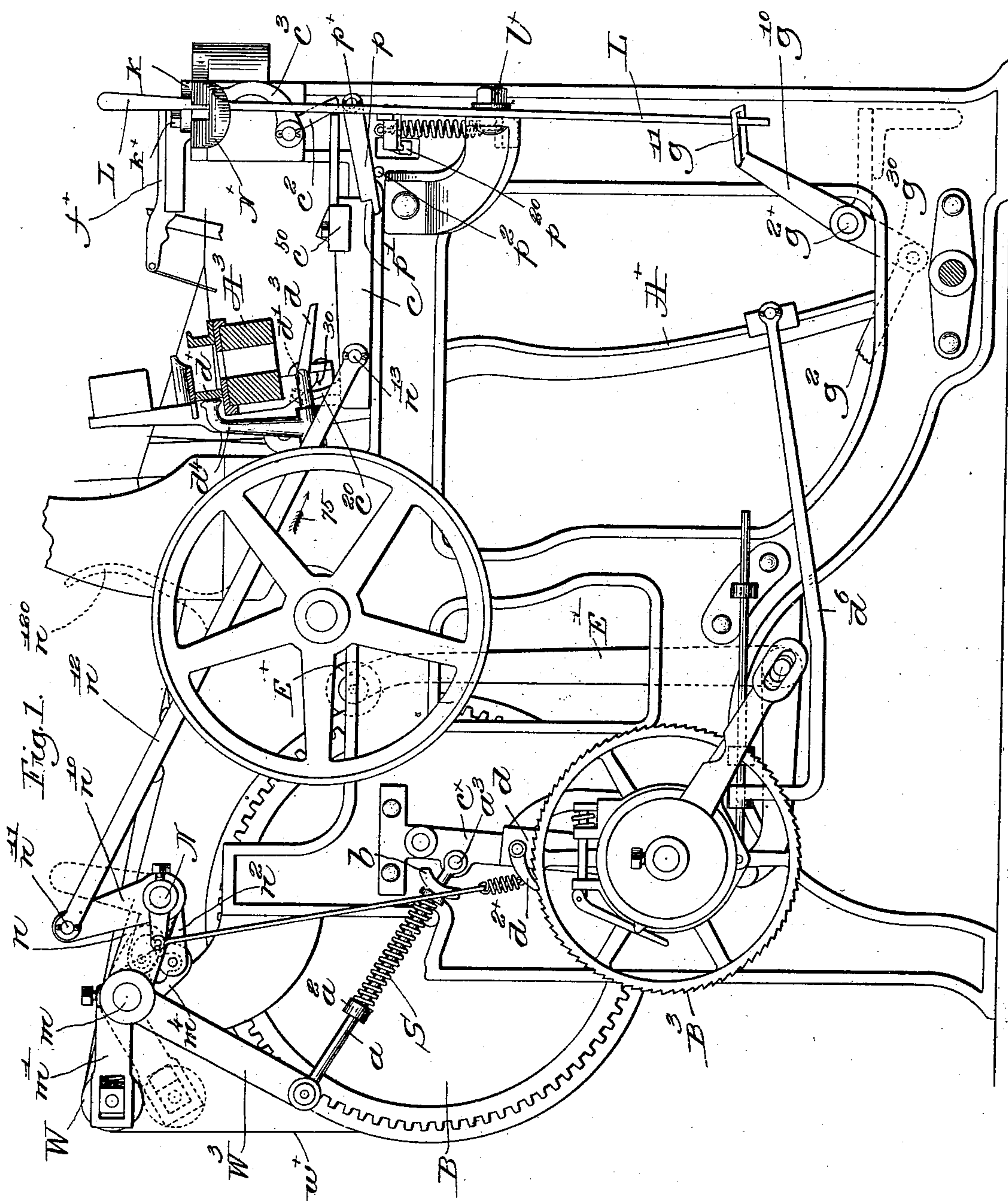
E. S. WOOD.

MEANS FOR PREVENTING BANGING-OFF IN LOOMS.

APPLIOATION FILED AUG. 13, 1903.

NO MODEL.

2 SHEETS—SHEET 1.



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2 SHEETS—SHEET 2.

Fig. 2.

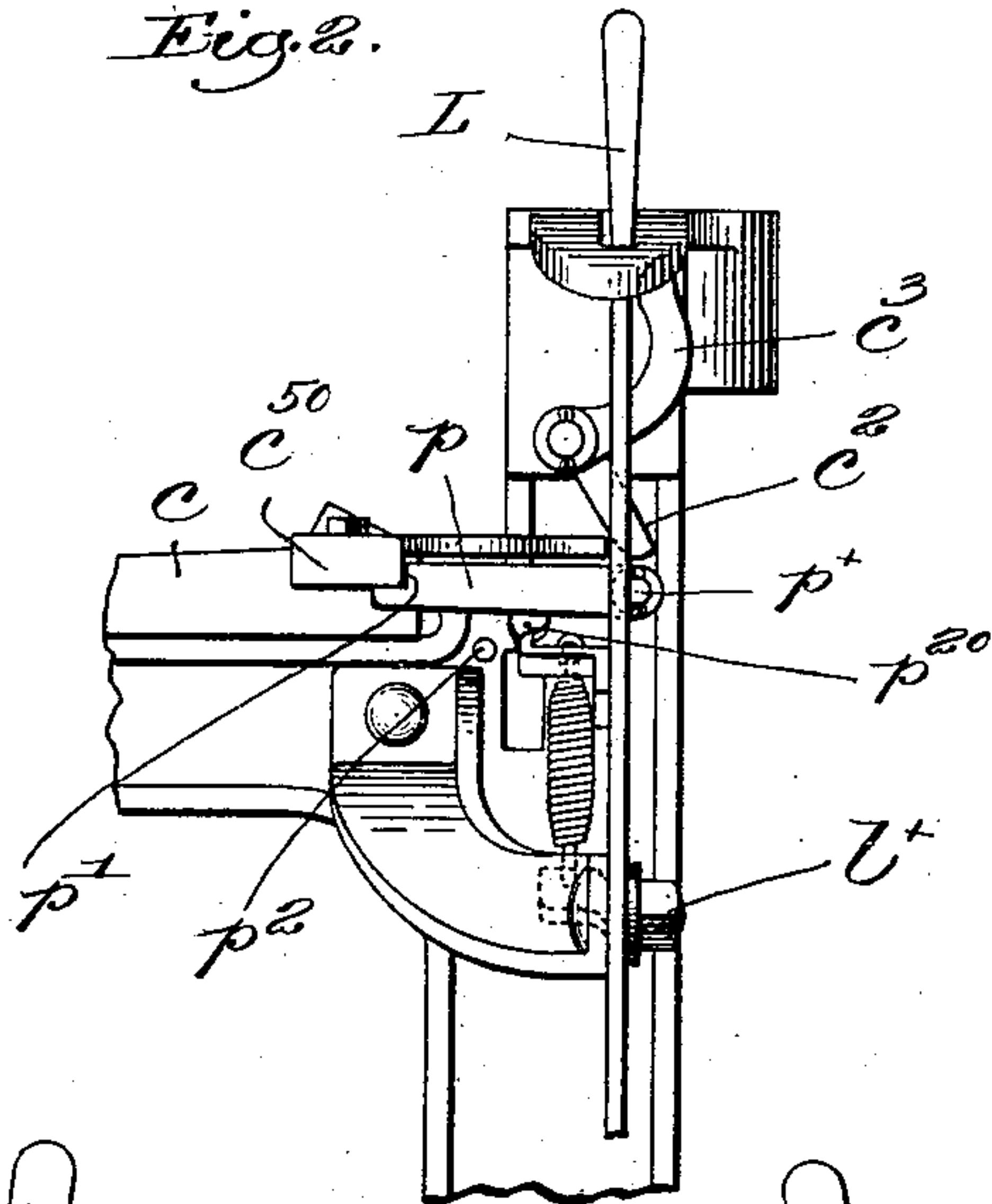


Fig. 4.

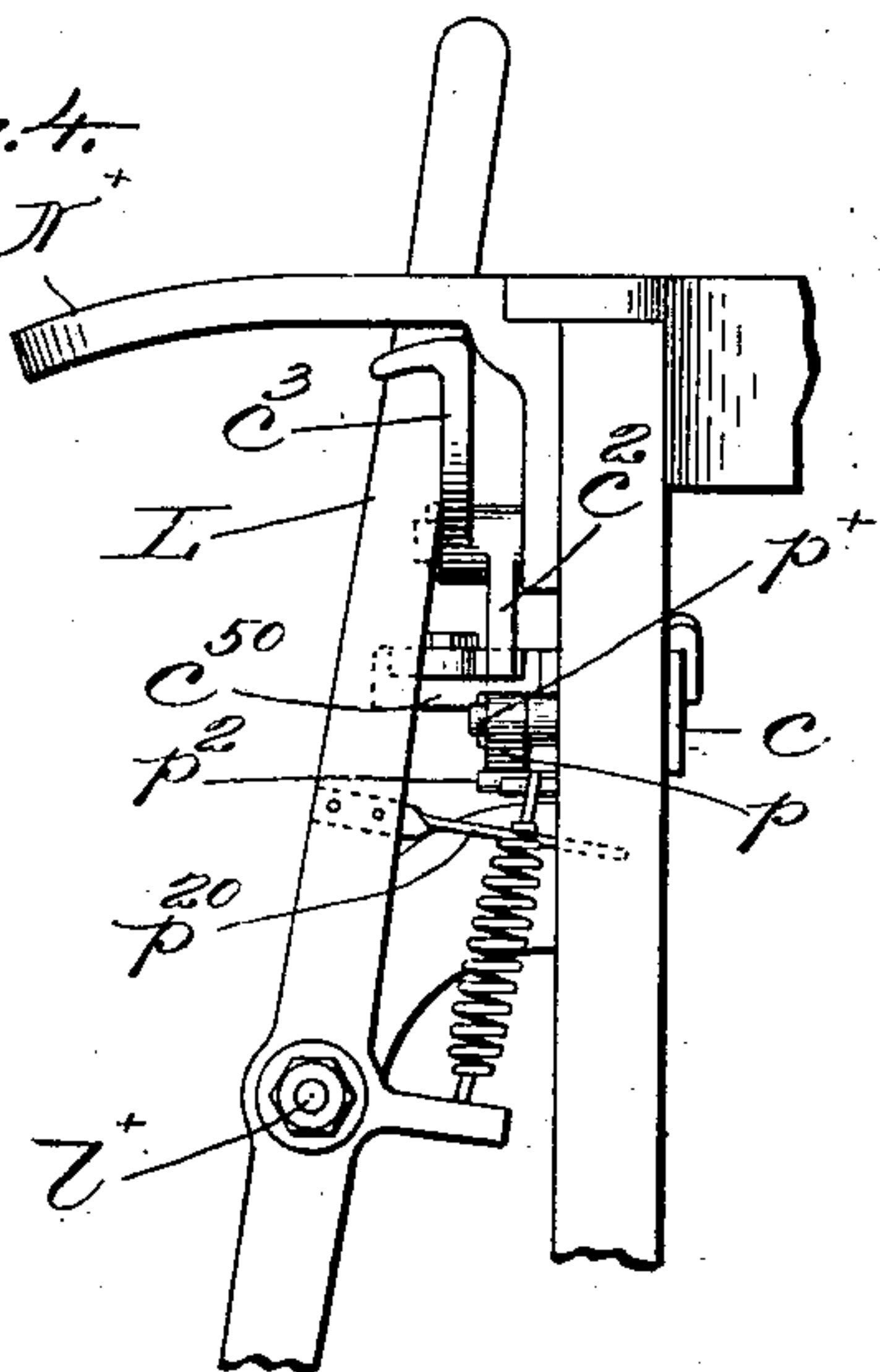


Fig. 3.

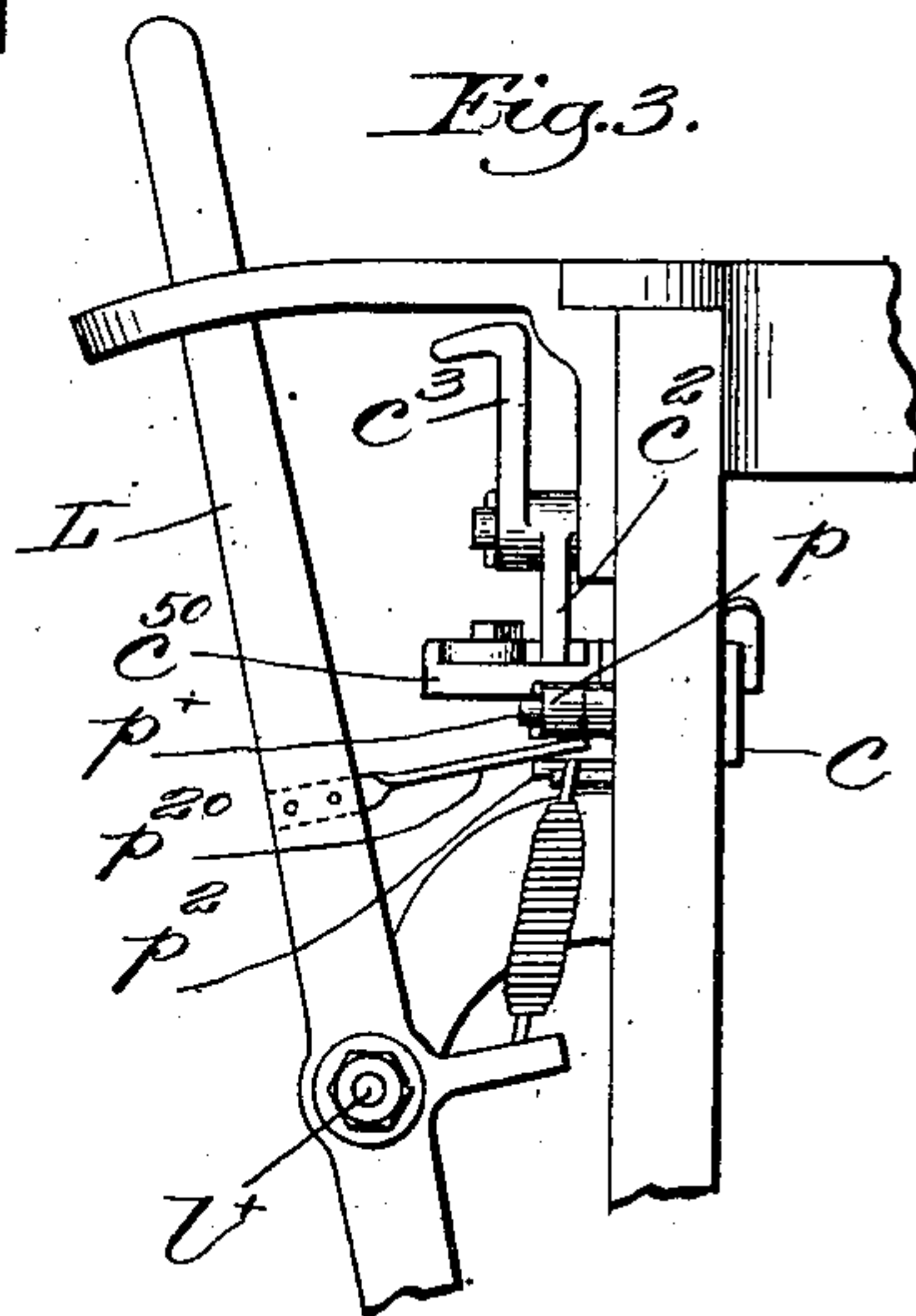
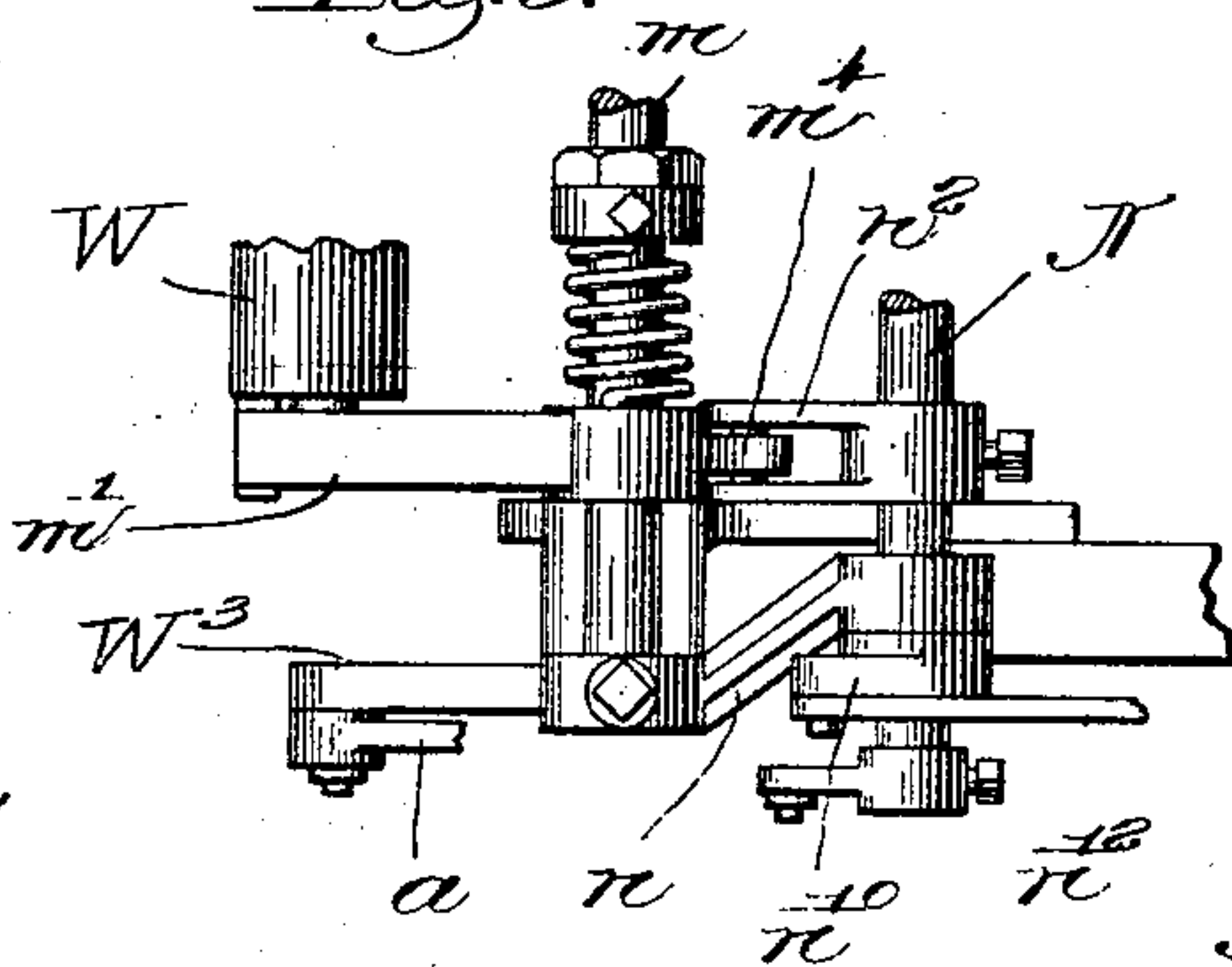


Fig. 5.



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UNITED STATES PATENT OFFICE.

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MEANS FOR PREVENTING BANGING OFF IN LOOMS.

SPECIFICATION forming part of Letters Patent No. 742,813, dated October 27, 1903.
Application filed August 13, 1903. Serial No. 169,328. (No model.)

To all whom it may concern:

Be it known that I, EVERETT S. WOOD, a citizen of the United States, residing at Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Means for Preventing Banging Off in Looms, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

When a loom is running and the shuttle fails to properly box, the shipper is released by or through the frog, then engaged and moved by the dagger, and at such time the loom is said to "bang-off."

In order to obviate warp breakage when the loom bangs off, means have been devised to positively and automatically slacken the warps to an abnormal extent, so that on the beat up if the shuttle is in the shed the warps will not be broken or strained. Such a device forms the subject-matter of United States Patent No. 731,622 and therein means are provided to restore automatically and positively the proper working tension of the warps when the loom is again started, such resetting of the warp-tension-controlling instrumentality being dependent upon the backward movement of the lay after banging off. Now in looms so equipped means are frequently provided to release the shipper upon the occurrence of a warp or a filling fault, and of course it is at times necessary to stop the loom by manual release of the shipper, and heretofore such a loom is apt to bang-off when the shipper is released by any one of such means, automatic or manual. The bang-off is due to the fact that when the shipper is released the loom is apt to turn over one or more times, its speed diminishing as the momentum rapidly decreases, and owing to the diminished speed the shuttle may not box properly. Thereupon the dagger engages the frog and the warps are slackened unnecessarily, because the lay may not reach front center thereafter, or may beat up so slowly as to prevent any warp damage even if the shuttle were in the shed. As a result of such a bang-off the warp tension must be restored by manual resetting of the controlling instrumentality, requiring the expenditure of considerable strength by the op-

erator and loss of time. In the patent referred to the lay is permitted to come to rest gradually when the loom bangs off, and manifestly such a loom is apt to bang-off unnecessarily if the shipper is released for any reason other than improper boxing of the shuttle.

My present invention has for its object the production of means for preventing the loom from banging off unnecessarily when the shipper is released for other cause than improper boxing of the shuttle, and I have herein shown my invention embodied in a loom equipped as in said patent and provided also with means to release the shipper automatically upon the occurrence of a warp or filling fault. I thus obviate the necessity for manually restoring the proper warp tension prior to starting up the loom, because by preventing bang-off the warps are not slackened.

The various novel features of my invention will be described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is a left-hand side elevation of a loom embodying one form of my invention, the nearer end of the lay and the shuttle-box being shown in section, the warp-controlling means being shown in operative position. Fig. 2 is a similar view of a portion of the apparatus illustrated in Fig. 1, showing the means for preventing bang-off in operative position and the shipper as released and in stopping position. Fig. 3 is a front elevation of the parts shown in Fig. 2 in the position therein illustrated. Fig. 4 is a similar view, but with the parts in normal position, as in Fig. 1; and Fig. 5 is a top or plan detail of a portion of the warp-tension-controlling instrumentality.

Referring to Fig. 1, the warp-beam B, actuating-ratchet B³, let-off pawl d^{2x}, pawl-carrier c^x d, actuated through the link d⁶ from the lay-sword A^x, the arm E', having a roll E^x to engage the periphery of the yarn mass on the beam, the rock-shaft m, having loosely fulcrumed upon its arms m' for the whip-roll or bar W, the arms n, fast on rock-shaft m, and supporting a controlling rock-shaft N, the cooperating locking arms or members m⁴ n², rigidly connected with said arms m' and shaft N, respectively, the depending arm W³,

rigidly connected with said shaft m and pivotally connected at its lower end with a rod a , having a collar a^2 and passing loosely through the fixed ear b , said rod being pivotally connected at a^3 with the member c^x of the pawl-carrier, and the tension-spring S , coiled around the rod between said ear and collar, may be and are all as in the patent referred to and operate as therein provided. As in said patent, I have herein shown an upturned arm n^{10} fast on rock-shaft N and pivotally connected at n^{11} with one end of a link n^{12} , the other end of the latter being connected at n^{13} with the frog c , forward movement of the latter by engagement with the dagger d^3 moving said link in the direction of arrow 75, Fig. 1. At such time the rock-shaft N is turned, the whip-roll is unlocked by the relative movement of the locking-arms m^4 n^2 and moved into dotted-line position, Fig. 1, positively effecting slackening of the warps w^x , so that as the lay beats up the shuttle cannot, if in the shed, tear or damage the warps.

The means for automatically restoring warp tension comprises the upturned bunter c^{20} on the frog and a part 30 moving with the lay and operating as in the patent referred to. In addition the link n^{12} may be provided with an arm n^{120} (see dotted lines, Fig. 1) for resetting the warp-controlling instrumentality by hand. The lay A^3 , dagger d^3 , binder-finger d^4 , secured to the rock-shaft d' and cooperating with the binder d^x , the notched holding-plate N^x for the shipper L , and the knock-off lever c^2 c^3 , actuated by the frog, are of usual construction, as shown in Fig. 1.

In Fig. 1 I have shown a knock-off arm k for the shipper fulcrumed at k^x on the breast-beam and adapted to be operated by outward movement of the filling-fork slide f^x upon the occurrence of a filling fault, such as failure or breakage of the filling. The shipper may also be released by the operation of a warp stop-motion upon the occurrence of a warp fault, a rock-shaft g^{2x} , mounted on the lower part of the loom-frame, having a depending arm g^{30} and an upturned arm g^{10} , Fig. 1, bent over at its upper end and provided with a cam-slot g^{11} , through which is extended the lower end of the shipper below its fulcrum b^x .

The rock-shaft and its attached arms are controlled as to their movement by suitable warp-stop-motion mechanism, a link g^2 , forming a part thereof, being connected with the arm g^{30} and serving to turn the rock-shaft g^{2x} upon a warp failure and substantially as provided for in United States Patent No. 728,593. It will be manifest, therefore, that the shipper may be released manually or upon the occurrence of a warp or a filling fault, and in either case it is unnecessary that the loom bang-off with its accompanying slackening of the warps. In order to prevent banging off when the shipper has been so released, I have herein shown a movable frog stop or dog p fulcrumed on the loom

side on a projecting stud p^x below the knock-off lever c^2 c^3 and having its rear end shouldered at p' , Figs. 1 and 2, to engage the offset c^{50} on the frog when said dog is in its operative position, Fig. 2. The length of the dog is such that when it does so cooperate with the frog the latter cannot, if engaged by the dagger, move forward far enough to effect unlocking of the warp-tension-controlling means and slackening of the warps, and consequently the loom cannot bang-off. In its normal position the frog stop or dog rests upon a stop pin or lug p^3 , Figs. 1 and 4.

An actuator for the dog is herein shown as a finger p^{20} , secured to the shipper and extended inward therefrom beneath said dog and out of engagement therewith when the shipper is in running position, Figs. 1 and 4. When, however, the shipper is released independently of the action of the protector mechanism and warp-tension-controlling means, as has been described, the outward movement of the shipper elevates the finger p^{20} and it engages and lifts the dog p from inoperative position, Figs. 1 and 4, into operative position, Figs. 2 and 3.

The finger p^{20} is made yielding or elastic, so that it may give should the shipper be released by or through the frog, (for instance, when the loom properly bangs off,) for at such time the frog moves forward before the finger can elevate the dog to operative position, and if some yield or give were not provided the outward throw of the shipper would bend or break the finger as it came into contact with the dog, the latter being held from rising by the frog above it. As soon as the shipper is moved to start the loom the dog is released by the finger and is free to resume its normal position.

Manifestly if the dog engages or stops the forward movement of the frog the lay will be stopped, but without any undue shock, as by the time the dagger drops to engage the frog the momentum of the lay is greatly diminished and no damage will ensue.

My invention is not restricted to the precise construction and arrangement herein shown and described, as the same may be varied or rearranged in different particulars by those skilled in the art 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 a loom, a shipper, means to slacken the warps upon improper boxing of the shuttle, and a device to prevent the operation of said means when the shipper is released independently of the position of the shuttle.
2. In a loom, protector mechanism, a shipper, means caused to slacken the warps by or through the operation of the protector mechanism, and a device rendered operative by release of the shipper independently of the action of said protector mechanism, to prevent the actuation of the warp-slackening means.

3. In a loom, a shipper, means, including a movable frog, to cause the positive slackening of the warps upon improper boxing of the shuttle, and a normally inoperative frog-stop rendered operative by or through release of the shipper independently of said means, to prevent movement of the frog and thereby prevent slackening of the warps.

4. In a loom, a member adapted to operate a stopping mechanism, a warp-tension-controlling instrumentality, positively - acting means operated by or through improper boxing of the shuttle to cause said instrumentality to slacken the warps, and a device rendered operative to prevent slackening of the warps by said instrumentality when said member is actuated independently of the said positively-acting means.

5. In a loom, a shipper, a movable whip-roll or bar on which the warps pass, means to operate upon improper boxing of the shuttle to move positively the whip-roll or bar to slacken the warps, and a device to prevent automatically the operation of said means when the shipper is released independently thereof.

6. In a loom, a shipper, a movable whip-roll or bar on which the warps pass, a lay, means adapted to be operated thereby on its forward beat, upon improper boxing of the shuttle, to move positively the whip-roll or bar to slacken the warps, and a device rendered operative by release of the shipper independently of said means to prevent movement of the whip-roll or bar by said means.

7. In a loom, a shipper, a movable whip-roll, protector mechanism, including a movable frog, a connection between it and the whip-roll to positively move the latter to slacken the warps, by the operation of the protector mechanism, and a frog-stop rendered operative to prevent movement of the frog to slacken the warps when the shipper is released independently of the protector mechanism.

8. In a loom, a shipper, a movable whip-roll, protector mechanism, means actuated by operation of the latter to move the whip-roll positively to slacken the warps, and a device to automatically prevent the operation of said means by the protector mechanism when the shipper is released independently thereof.

9. In a loom, a shipper having an attached finger, a movable whip-roll, protector mechanism, including a movable frog, a connection between it and the whip-roll to positively move the latter to slacken the warps upon movement of the frog by the protector mechanism, and a normally inoperative frog-stop, release of the shipper independently of the protector mechanism causing the finger to move the frog-stop into position to prevent movement of the frog by the operation of the protector mechanism.

10. In a loom, a shipper, a lay, protector mechanism, including a dagger, and a frog to be engaged and moved thereby on the forward beat of the lay to release the shipper upon improper boxing of the shuttle, a whip-

roll, means actuated by operative movement of the frog to move the whip-roll positively to slacken the warps, and a device to prevent such operative movement of the frog when the shipper is released independently thereof.

11. In a loom, a shipper adapted to be released upon the occurrence of a warp or a filling fault, means to slacken the warps upon improper boxing of the shuttle, and a device to prevent the operation of said means when release of the shipper is due to a warp or a filling fault.

12. In a loom, a shipper adapted to be released upon the occurrence of a warp or a filling fault, means to slacken the warps upon improper boxing of the shuttle, and a movable device rendered operative by the shipper when released upon the occurrence of a warp or a filling fault to prevent the operation of said warp-slackening means.

13. In a loom, a shipper, releasing instrumentalities therefor operative respectively by or through warp and filling faults, means to slacken the warps and normally to release the shipper upon improper boxing of the shuttle, and a device automatically operative to prevent the operation of said means upon prior release of the shipper by either of said releasing instrumentalities.

14. In a loom, a shipper, releasing means therefor, operative upon filling failure, a second releasing means adapted to be operated by a warp stop-motion, positively - acting means to slacken the warps upon improper boxing of the shuttle, and a device rendered operative to prevent the operation of said positively-acting means when the shipper is released by either of said releasing means.

15. In a loom provided with a shipper, releasing means therefor operative by or through filling-detecting and warp-stop-motion mechanisms respectively, a warp-tension-controlling means to positively slacken the warps upon improper boxing of the shuttle, a movable device to prevent the operation of said means, and an actuator to operatively position said device upon release of the shipper by either of the releasing means therefor.

16. In a loom, a shipper, a yielding actuator thereon, a protector mechanism, including a movable frog, means actuated by operative movement of the frog through said protector mechanism to positively slacken the warps, and a pivotally-mounted, normally inoperative frog-stop, release of the shipper independently of the protector mechanism causing said actuator to engage and lift the frog-stop into position to engage and prevent operative movement of the frog by the protector mechanism.

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

EVERETT S. WOOD.

Witnesses:

FRANK J. DUTCHER,
C. H. DRAPER.