

No. 661,161.

Patented Nov. 6, 1900.

C. WHITAKER.
WARP STOP MOTION FOR LOOMS.

(No Model.)

(Application filed Dec. 27, 1897.)

2 Sheets—Sheet 2.

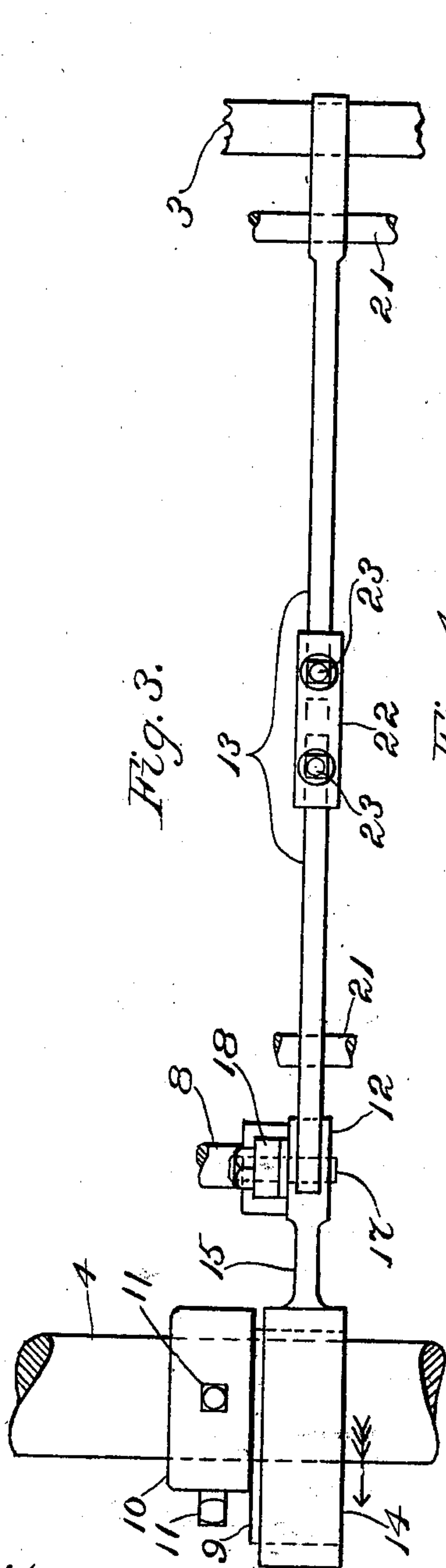


Fig. 3.

Fig. 4.

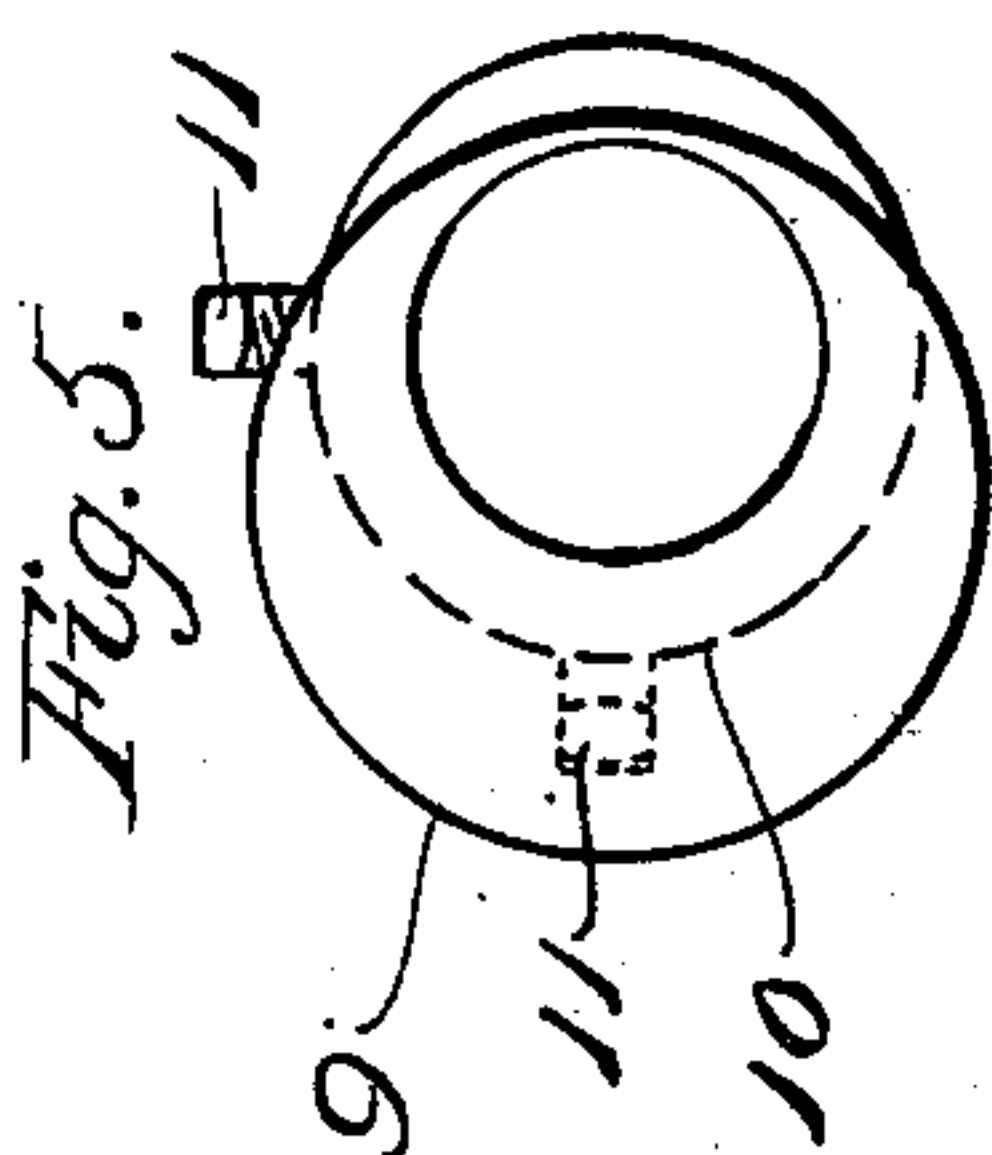
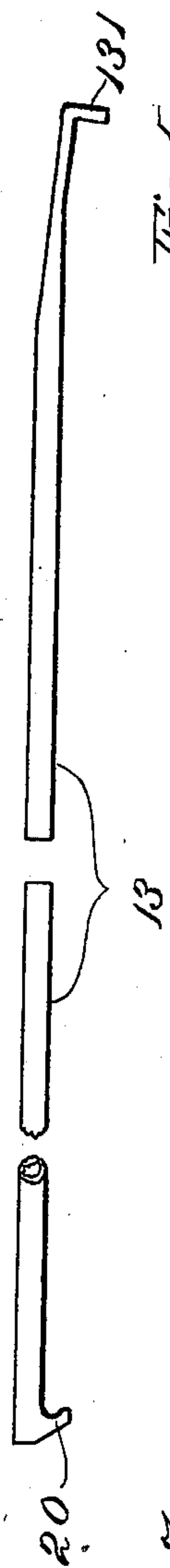


Fig. 5.

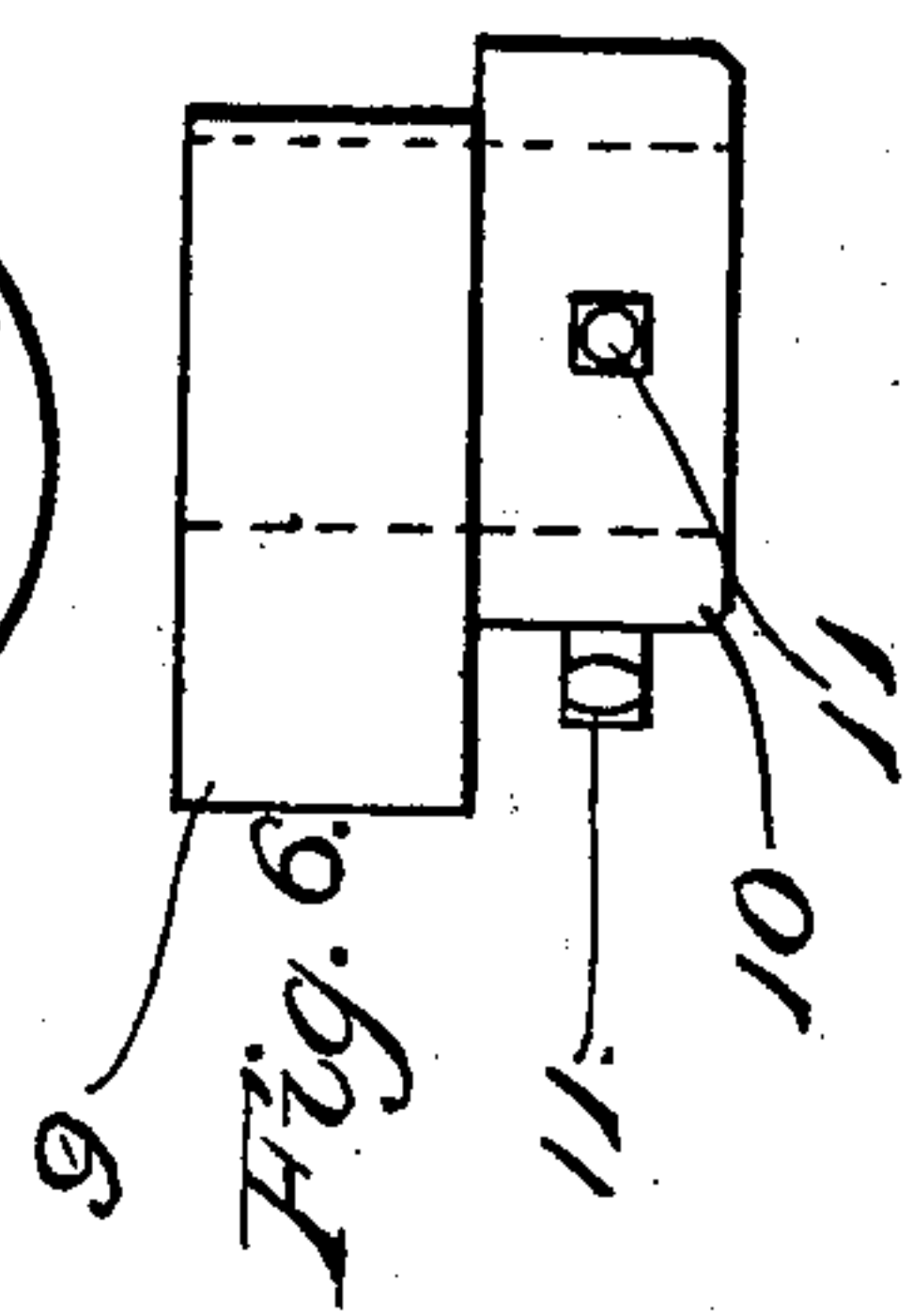


Fig. 6.

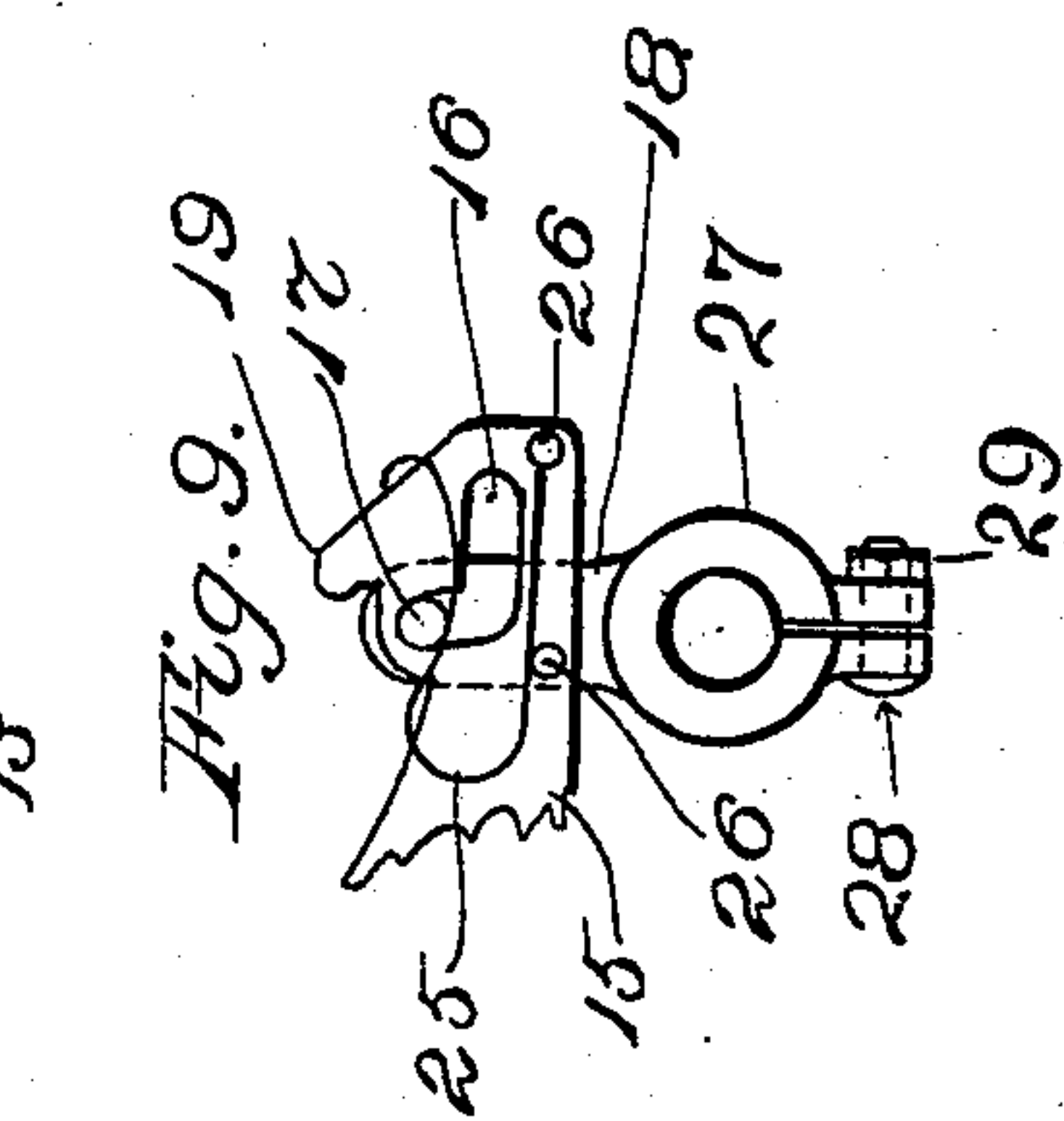


Fig. 9.

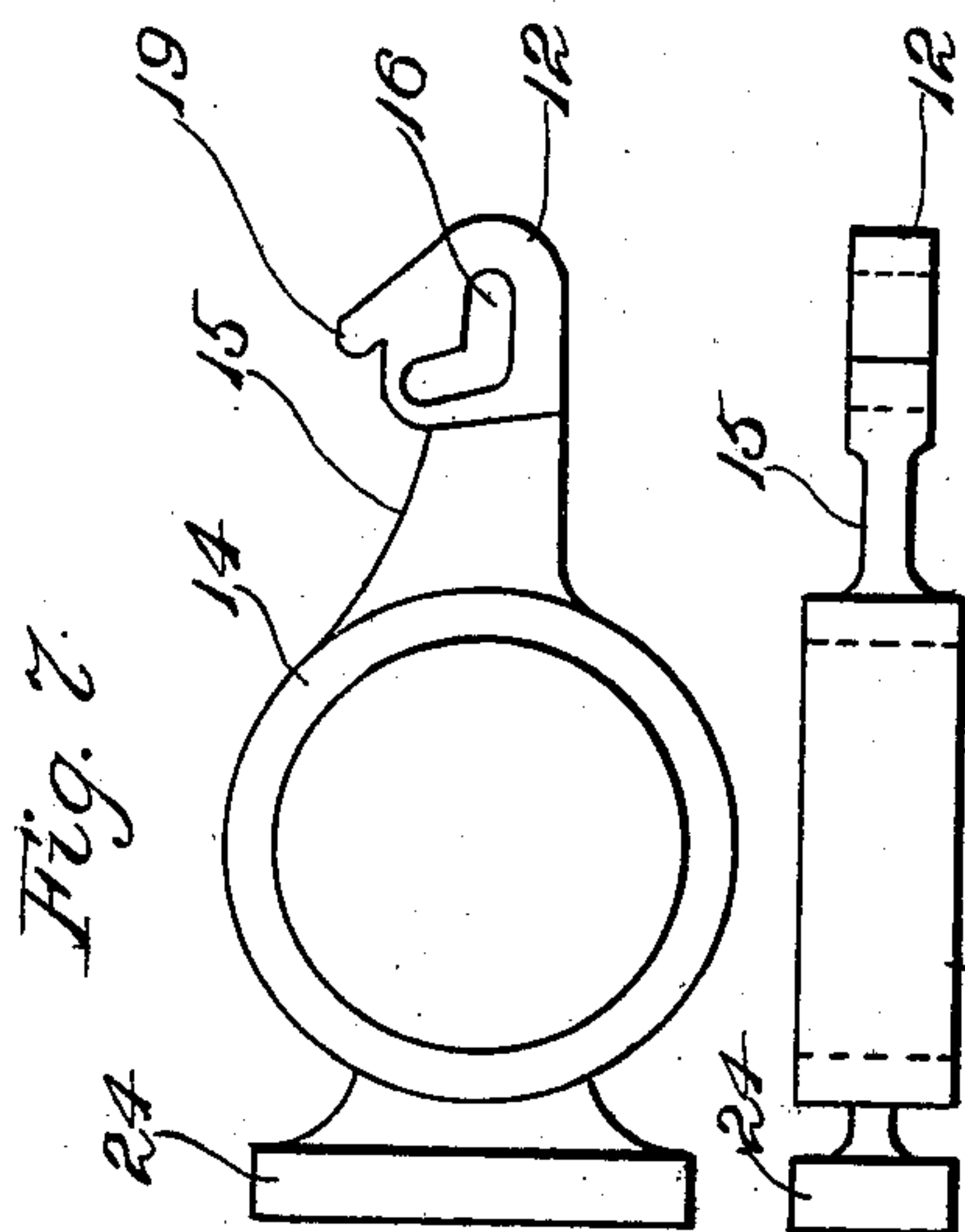


Fig. 7.

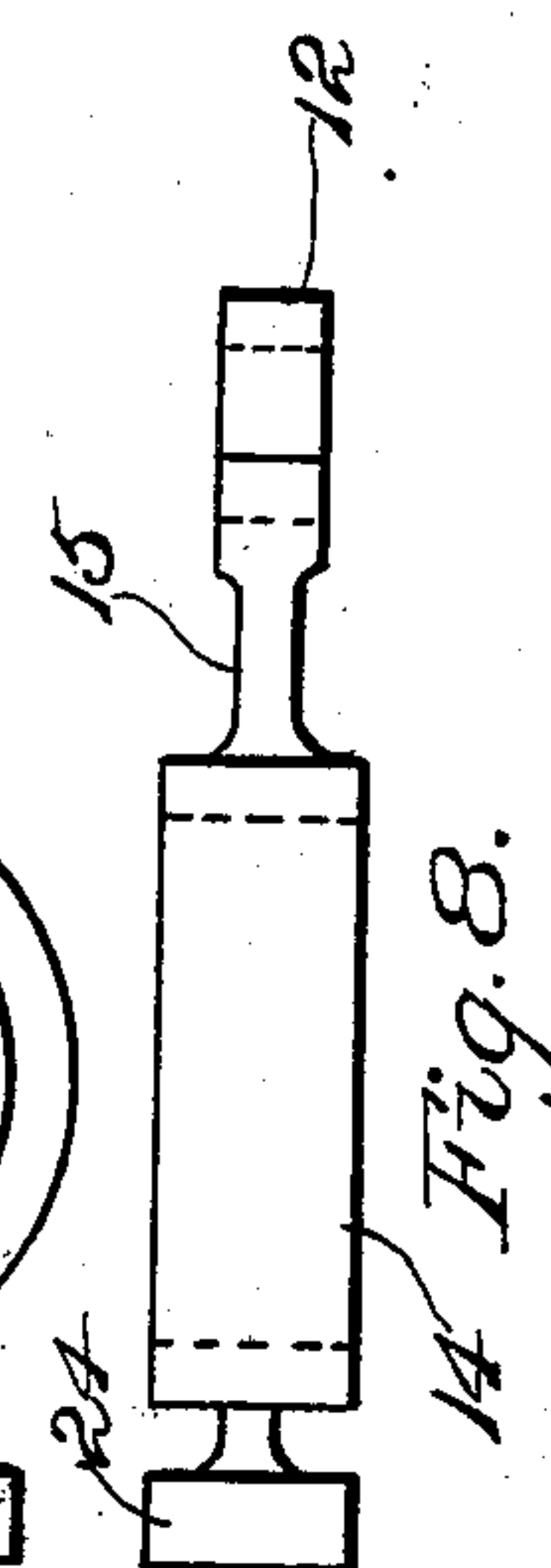


Fig. 8.

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UNITED STATES PATENT OFFICE.

CHANNING WHITAKER, OF TYNGSBOROUGH, MASSACHUSETTS, ASSIGNOR
TO THE LOWELL MACHINE SHOP, OF LOWELL, MASSACHUSETTS.

WARP STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 661,161, dated November 6, 1900.

Application filed December 27, 1897. Serial No. 663,554. (No model.)

To all whom it may concern:

Be it known that I, CHANNING WHITAKER, of Tyngsborough, in the county of Middlesex and State of Massachusetts, have invented
5 certain new and useful Improvements in Warp Stop-Motions for Looms, of which the following is a specification, reference being had therein to the accompanying drawings, forming a part thereof.

10 Figure 1 of the said drawings is a view, partly in side elevation and partly in vertical section, illustrating the best embodiment of the invention which I have contrived and showing it combined with certain portions of
15 a loom, only so much of the loom being shown as is required for the purpose of making clear the application and relations of the parts which are involved in my invention. In Fig. 1 the vibrator or feeler is shown in a position
20 in advance of the warp-detectors—that is to say, in its extreme forward position. Fig. 2 is a view of the same character as Fig. 1 and representing the same parts as the latter, but showing them in the positions which they oc-
25 cupy after the vibrator or feeler has become engaged with a warp-detector occupying its normal position—namely, in the present instance, dropped or lowered, as in conse-
30 quence of the breakage or failure to be upraised of the warp-thread which when upraised uplifts the said warp-detector into its abnormal position above the path described by the said vibrator or feeler. Fig. 3 is a view
35 in plan of the parts which are represented in Figs. 1 and 2, omitting, however, the shipper-handle and the end frame of the loom. Fig. 4 is a view showing in side elevation the two portions or lengths of the transmitting-rod. Figs. 5 and 6 are views, respectively in side
40 elevation and in plan, of the eccentric. Figs. 7 and 8 are views, respectively in side elevation and in inverted plan, of the actuator, showing the manner in which the same may be counterbalanced. Fig. 9 is a detail view,
45 in side elevation, representing the arm of the vibrator or feeler and the forward arm of the actuator, showing one form of spring combined therewith.

50 The object of the invention chiefly is to provide a simple, substantial, and practical means of actuating the vibrator or feeler of

warp-stop-motion devices and of effecting the unshipping of the loom whenever such vibrator or feeler becomes engaged with a warp-detector.

The invention consists in a novel construction and combination of parts, which first will be described with reference to the accompanying drawings and then will be particularly pointed out and distinctly defined in the
55 claims at the close of this specification.

In the drawings, 1 designates part of one side frame of a loom.

2 designates part of the shipper-handle.

201 designates part of the usual slotted
65 guide-plate through which the shipper-handle passes.

3 designates part of an ordinary knocking-off lever that is applied to the loom-frame in customary manner.

4 designates part of the crank-shaft of the loom.

5 designates one of the warp-detectors of the series that is employed in connection with the warp-threads in a loom. Only a part of
75 the said warp-detector is represented, and the showing is intended to be merely conventional.

The particular character and construction of the warp-detectors that are employed in
80 conjunction with the devices that are about to be described are not material, inasmuch as the warp-detectors themselves are not directly involved in the invention.

6 designates part of a rest, support, or
85 backing for the warp-detector 5. The same may be of any approved character or construction.

7 designates a vibrator or feeler which co-acts with the warp-detectors in usual manner.

8 designates the shaft of the vibrator or feeler.

In carrying my invention into effect I apply to the crank-shaft 4 an actuating instrumentality in the shape of either a cam or an
95 eccentric. The drawings show an eccentric 9, the latter being by preference formed or provided with a hub 10, to which are applied binding-screws 11 11, (see particularly Figs. 3, 5, and 6,) by means of which to secure the
100 said eccentric in the required place and position on the crank-shaft. The inner ends

of the said screws are intended in the present instance to make contact with the surface of the crank-shaft. To the said cam or eccentric I apply the part 12, which for convenience of designation I shall term herein the "actuator," it having for its functions to operate the vibrator or feeler and also at the required moment to move the transmitting-rod 13 so as to occasion movement of the knocking-off lever 3, and thereby effect the release or unshipping of the usual shipper-handle or shipper-lever. (Not shown.) The said actuator 12 is formed and arranged to be engaged and reciprocated by the cam or eccentric. In the present case it is constructed, as at 14, to encircle and fit the eccentric 9 after the fashion of an ordinary eccentric-strap, and the forwardly-extending arm 15 thereof is formed with a slot 16, in which is received a pin 17, projecting from the arm 18 of the vibrator. The direction of a portion of the said slot 16 is inclined to that of its path of motion. Preferably, but not necessarily, the forward portion of the said slot is extended in the direction of the path of motion of the actuator, as shown, and preferably, but not necessarily, the rearward portion thereof is deflected or extended upwardly and rearwardly at an angle to such forward portion of the slot, as shown. The gravitating tendency of the forward portion of the actuator causes such portion to bear downwardly normally with reference to pin 17, so that the upper and rear extremity of the slot 16 normally contains and fits upon pin 17, as in Fig. 1, and in the to-and-fro movements of the actuator, which are communicated thereto by the eccentric 9 in its rotation, the arm 18 and the vibrator are carried along in unison therewith so long as the path of movement of the vibrator or feeler remains unobstructed by a warp-detector. Should, however, a warp-detector occupy a position in the said path of movement, so as to obstruct the rearward movement of the vibrator or feeler, as indicated in Fig. 2, in which case the pin will stand still, the continued movement of the actuator toward the rear will draw the slotted portion thereof over the pin, and the inclined side wall of the slot 16 which bears on the said pin in drawing over the pin will operate after the fashion of a cam to occasion a lifting movement of the forward portion of the actuator 12 until the pin 17 passes into the longitudinal portion of the slot. The actuator is formed or provided with an engaging portion, as 19, and a corresponding projection, as 20, is formed or provided upon the rear extremity of the transmitting-rod 13. The said lifting movement takes place at an intermediate moment in the rearward movement of the vibrator and operates to place the projection 19 in engagement with the projection 20, so as that during the remainder of the rearward movement of the actuator it shall draw with it the transmitting-rod 13, moving the latter endwise, the effect of which

will be to move the knocking-off lever 3 or equivalent device and effect the dislodging of the shipper-handle from the notch or offset in the slot 202 of the holding-plate 201 and the stopping of the loom.

The transmitting-rod 13 has a projection 131 on its forward end, that engages the knocking-off lever. The said rod extends approximately in a straight line from the knocking-off lever to a point adjacent to the upper surface of the crank-shaft. It may be supported in any convenient manner. I consider the best arrangement of the parts to be that which is shown in Fig. 2 of the drawings. In the latter the transmitting-rod rests upon spring-supported rings, hooks, rods, studs, or pins 21 21. The supporting-springs are designated 211 211.

Reference has been made to the fact that when the vibrator is arrested in its rearward movement by engagement with a warp-detector the continued rearward movement of the actuator will draw its slotted portion over the stationary pin, and thereby occasion a lifting of the said slotted portion until the longitudinal portion of the slot 16 receives the pin and to the further fact that this lifting movement operates to place the projection 19 of the actuator in engagement with the projection 20 of the transmitting-rod. In the illustrated arrangement, furthermore, the movement of the actuator brings the point of engagement between the projections 19 and 20 substantially into line with the virtual center of the eccentric—namely, the center of the circular body which is encircled by the strap—and the point at which the projection 131 of the transmitting-rod 13 engages with the knocking-off lever 3. The virtual center of the eccentric continues to change its position as the eccentric rotates; but inasmuch as the transmitting-rod is free to change its direction within limits and inasmuch, also, as the actuator is now entirely free from the pin 17 of the vibrator-arm the actuator and disengaging-rod are enabled to accommodate themselves to the rotation of the eccentric, so as to permit the point of the engagement of the actuator with the transmitting-rod—namely, the point at which power is transmitted from the former to the latter—always to assume a position in or nearly in a straight line connecting the virtual center of the eccentric with the point at which the transmitting-rod contacts with the knocking-off lever. Since the power is thus transmitted by a direct pull from the eccentric to the knocking-off lever, there is no considerable waste of power in performing needless work, in occasioning unnecessary movements, or in overcoming unnecessary resistance, there is no tendency of the parts to overturn, cramp, or bind, and no friction to be overcome. For convenience in fitting the devices to the loom in which they are to be used I contemplate in some cases forming the transmitting-rod 13 in two portions, as shown in the drawings,

which are disposed end to end with each other and joined by means of a coupling-piece 22, to which they are connected in an adjustable manner. In the present case the coupling-piece consists of a tubular or sleeve-like piece, into the bore of which the ends of the two portions of the rod 13 are inserted in opposite directions, and the said ends are fixed therein by means of clamping or binding screws 23 23.

In some cases in order to give greater ease of working I contemplate forming or providing the rear portion of the actuator with an enlargement or other suitable counterbalancing-weight, as at 24, Figs. 7 and 8, whereby to partially balance the weight of the forwardly-extending portion of the actuator. In some cases also I may provide for insuring the retention of the pin 17 in the upper end of the rear portion of the slot 16 in the actuator, so as to insure against undesired movement of the actuator and pin relatively to each other. Thus I may apply to the actuator a spring-retainer like unto that which is represented in Fig. 9, in which latter, 25, is a spring made of a length of suitable material bent into substantially U shape, one leg of the said spring being supported by the pins or studs 26 26, projecting from the actuator, to one of which pins or studs one end of the said leg is connected. The other leg of the said spring bears against the under side of pin 17 on the vibrator-arm and operates to keep the forward portion of the actuator pressed downwardly with reference to the said pin 17, so as to hold the elevated end of the slot 16 seated on the pin while the actuator is not engaged with the transmitting-rod. The latter leg of spring 25 is sufficiently long to provide against passing out from under the pin 17 during the time that the vibrator in consequence of engagement with a warp-detector is held from completing its rearward movement with the actuator.

For convenience in connecting the vibrator-arm 18 with the shaft 8 I form the said arm with a split socket, as at 27, to receive the said shaft, and I provide a bolt and nut 28 29 or other means of compressing the sides of the said split socket upon the shaft.

While my present invention is intended for use in connection with warp stop-motions for looms, it should be understood that I regard it as within the scope of my claims to employ the same elsewhere than in looms.

I claim as my invention—

1. The improved stop-motion devices comprising the cam or eccentric, the actuator operated by the said cam or eccentric and hav-

ing a slot inclined to its path of motion, the vibrator having connected therewith a pin which enters the said slot and thereby receiving motion from the actuator, the transmitting-rod engaged by the actuator and moved endwise thereby, and a knocking-off device to be operated by the endwise movement of the said rod.

2. The improved stop-motion devices comprising the eccentric, the actuator having a strap-like portion fitting the said eccentric and having a slot with a longitudinally-extending portion and an inclined portion, the vibrator having an arm provided with a pin fitting the said slot, and normally having the end of the inclined portion of the latter seated thereon, whereby the vibrator receives motion from the said actuator, the transmitting-rod engaged by the actuator and moved endwise thereby, and a knocking-off device to be operated by the endwise movement of the said rod.

3. The improved stop-motion devices comprising the eccentric, the actuator fitting said eccentric and having an angular slot, the vibrator having an arm provided with a pin fitting the said slot and thereby receiving motion from the actuator, a knocking-off device, and the transmitting-rod engaged by the actuator and moved endwise thereby, and also free to rise and fall with the actuator whereby the point of engagement of the actuator with the transmitting-rod remains substantially in a straight line connecting the virtual center of the eccentric with the point of engagement of the said rod with the knocking-off device.

4. The improved stop-motion devices comprising the eccentric, the counterbalanced actuator fitting the said eccentric and having a projecting portion containing an angular slot, the vibrator having connected therewith a pin fitting the said slot and thereby receiving motion from the actuator, a transmitting device to be moved by the said actuator, and a knocking-off device.

5. The improved stop-motion devices comprising the actuator having an angular slot, means to oscillate the said actuator, the vibrator having connected therewith a pin fitting said slot and thereby receiving motion from the actuator, and a spring tending to hold the end of the offset portion of the slot seated on the said pin.

In testimony whereof I affix my signature in the presence of two witnesses.

CHANNING WHITAKER.

Witnesses:

FRED A. BAKER,

L. A. HARRIMAN.