

No. 764,899.

PATENTED JULY 12, 1904.

A. K. PRATT.

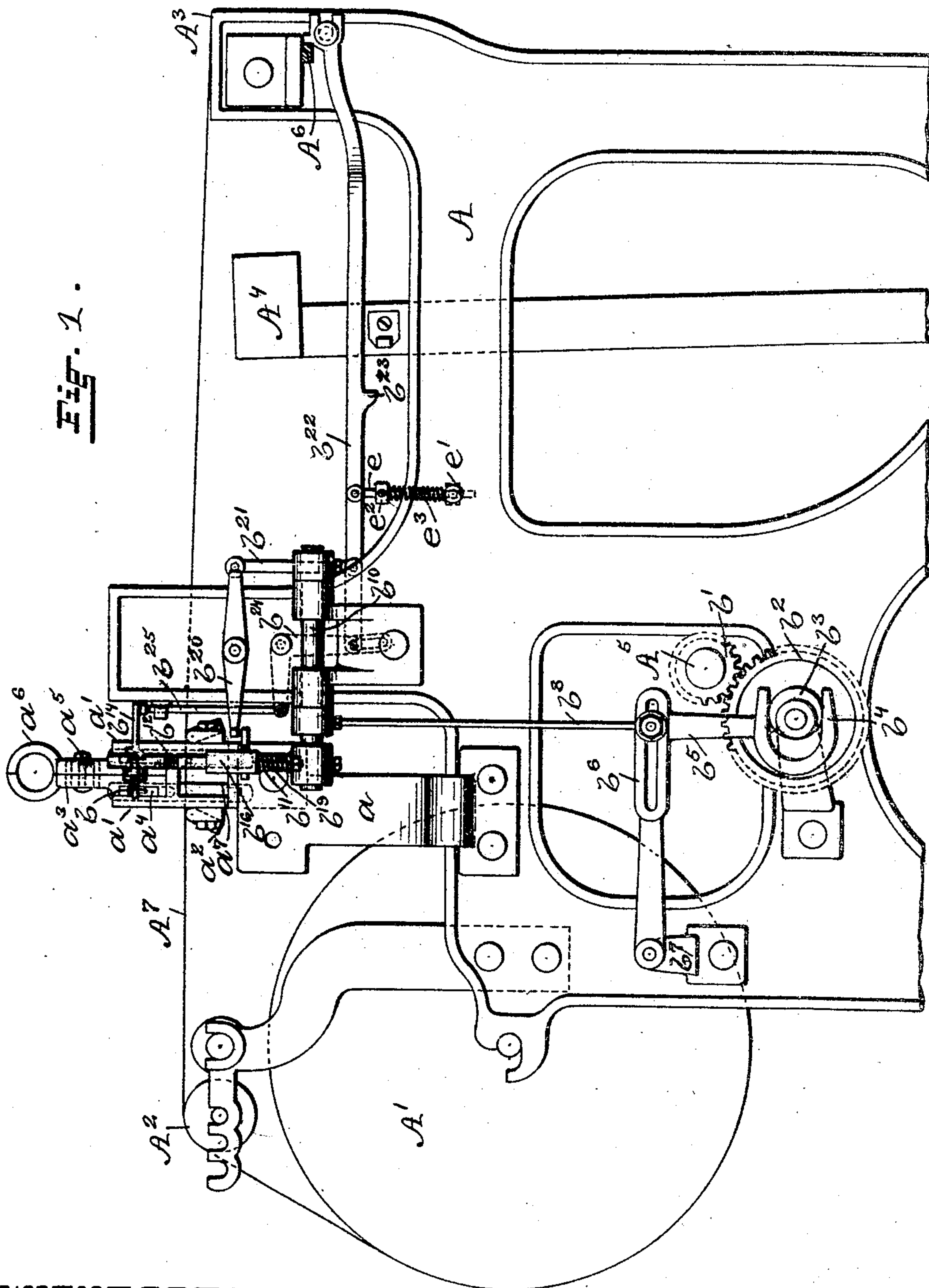
WARP STOP MOTION FOR LOOMS.

APPLICATION FILED JAN. 2, 1902.

NO MODEL.

3 SHEETS—SHEET 1.

Fig. 1.



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3 SHEETS—SHEET 2.

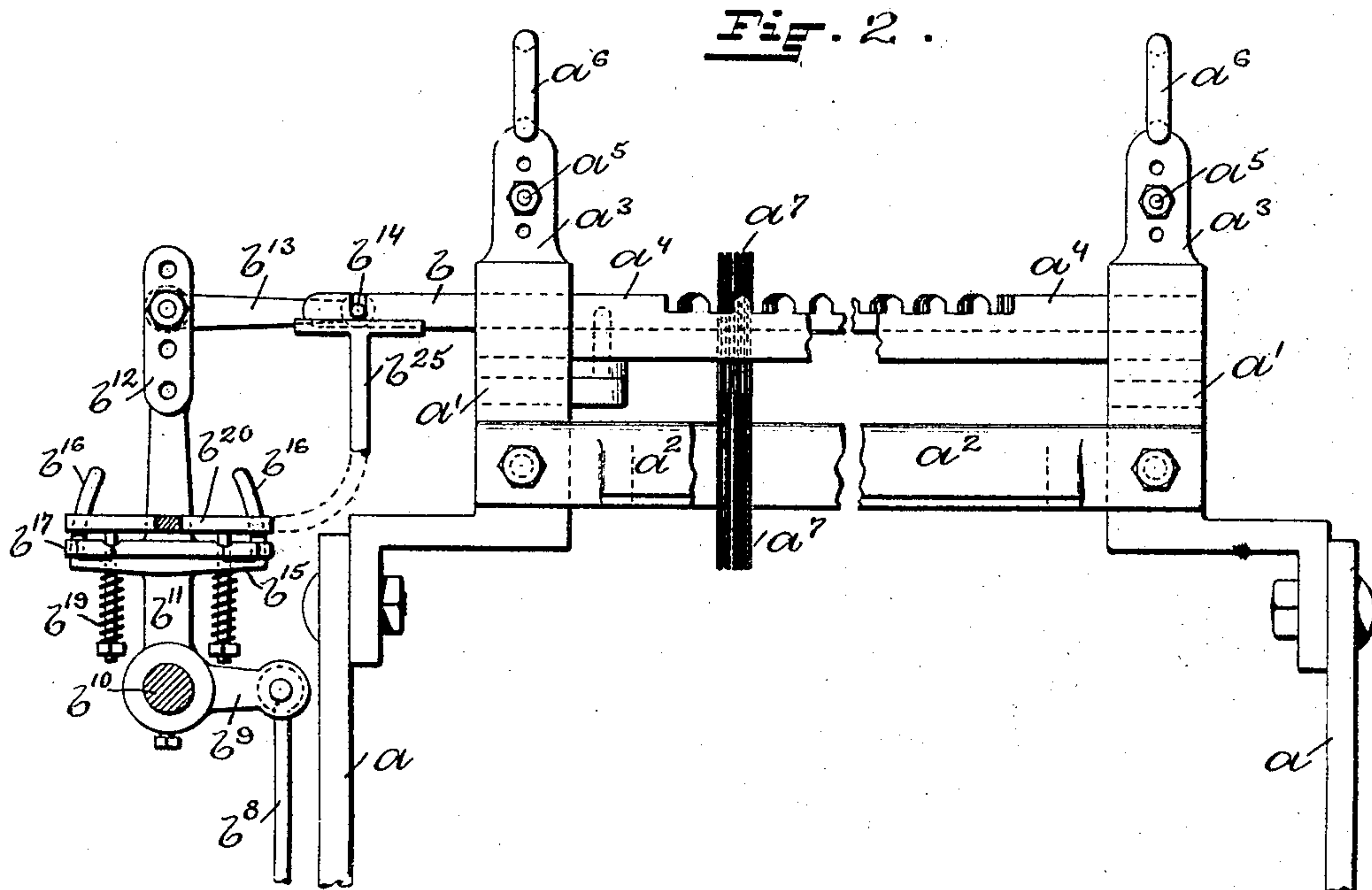


Fig. 3.

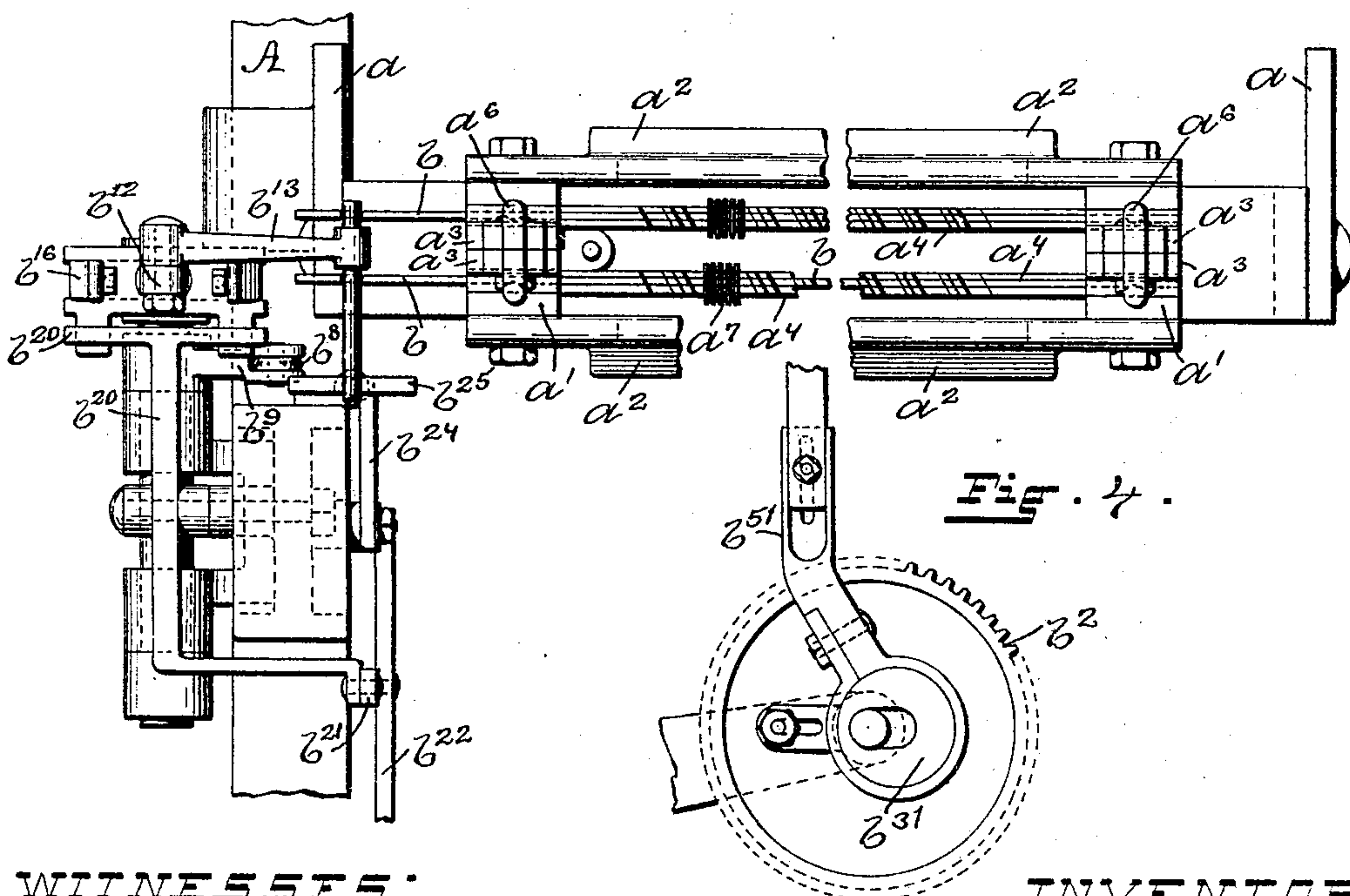


Fig. 4 -

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3 SHEETS—SHEET 3.

Fig. 5.

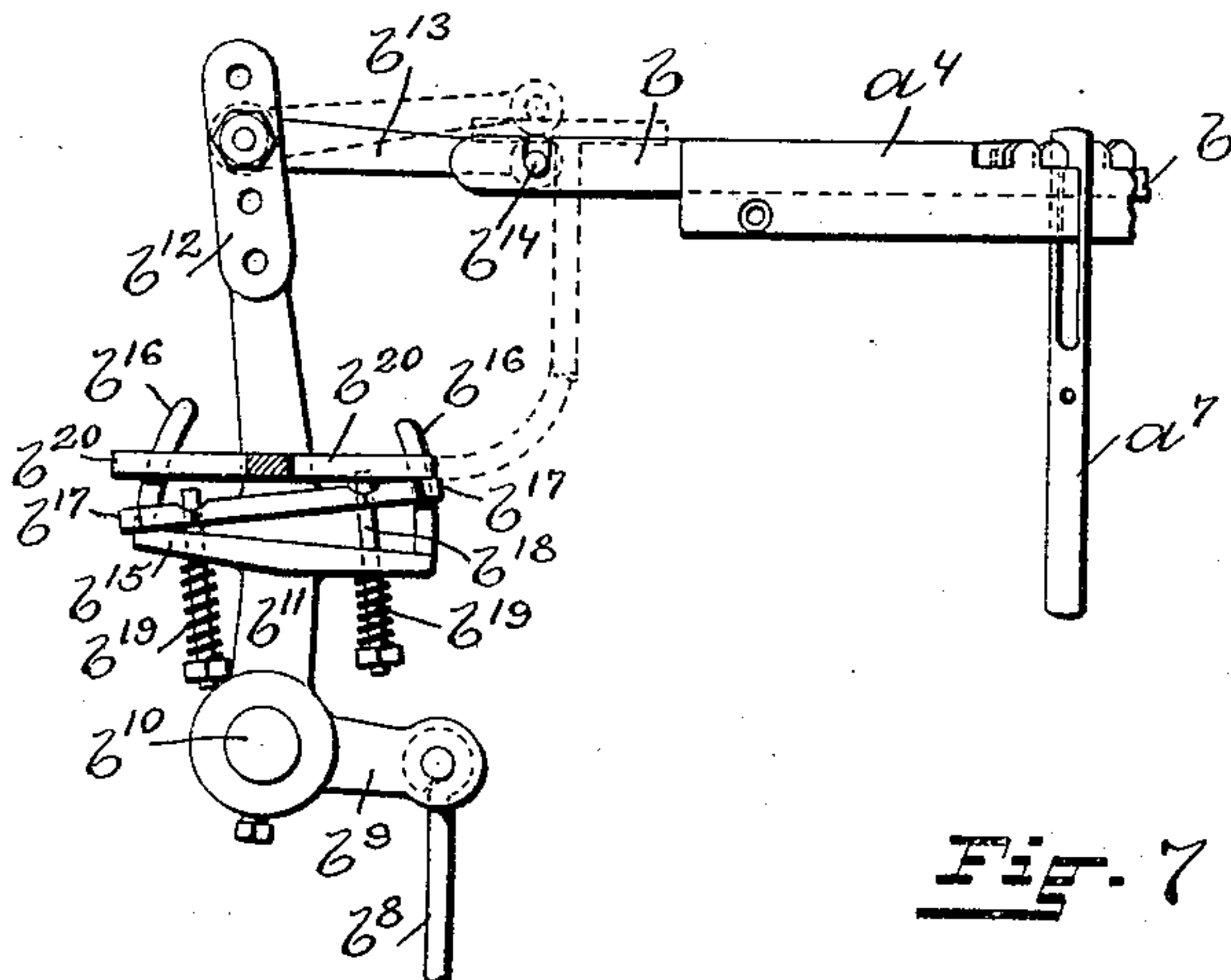


Fig. 7.

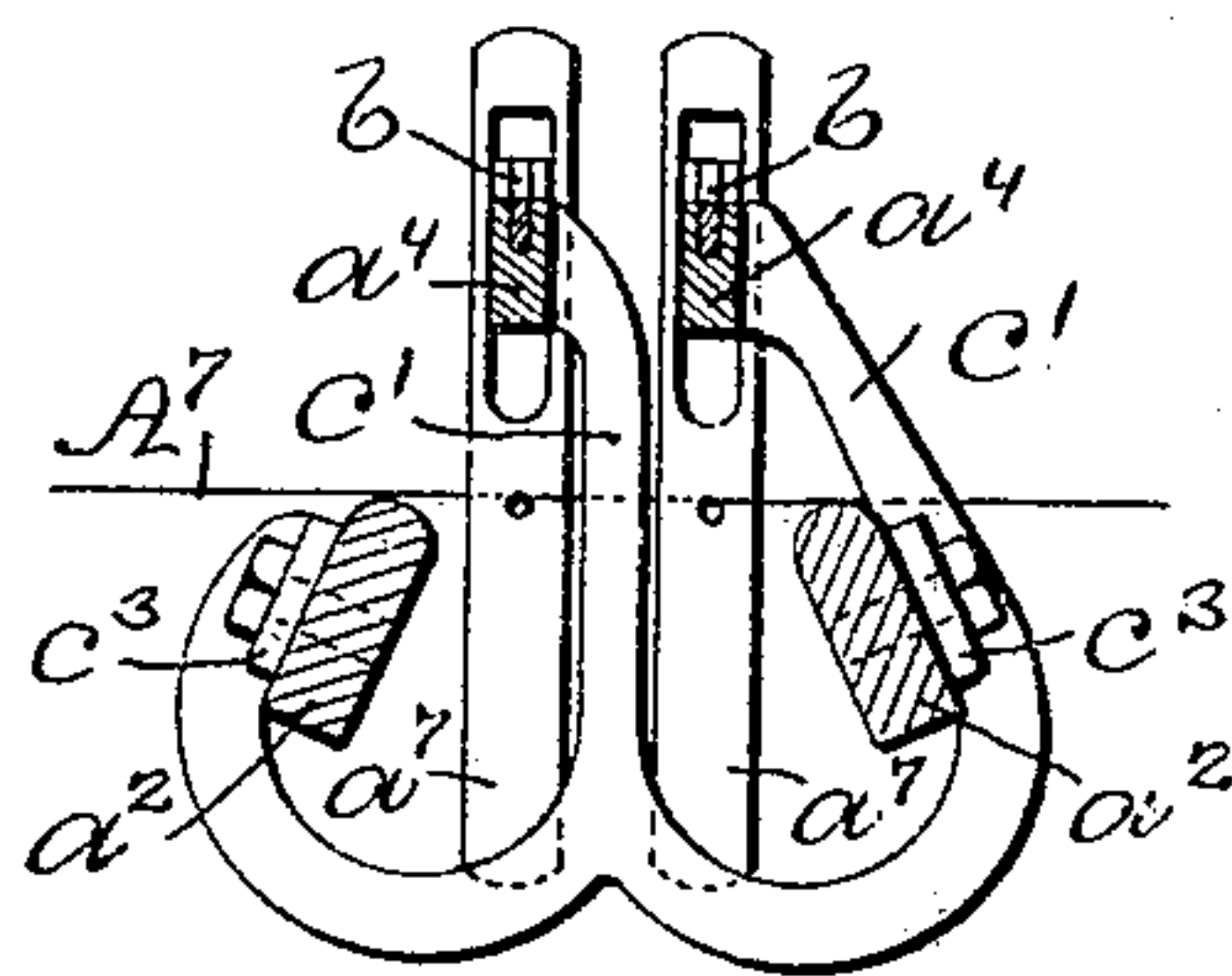


Fig. 8.

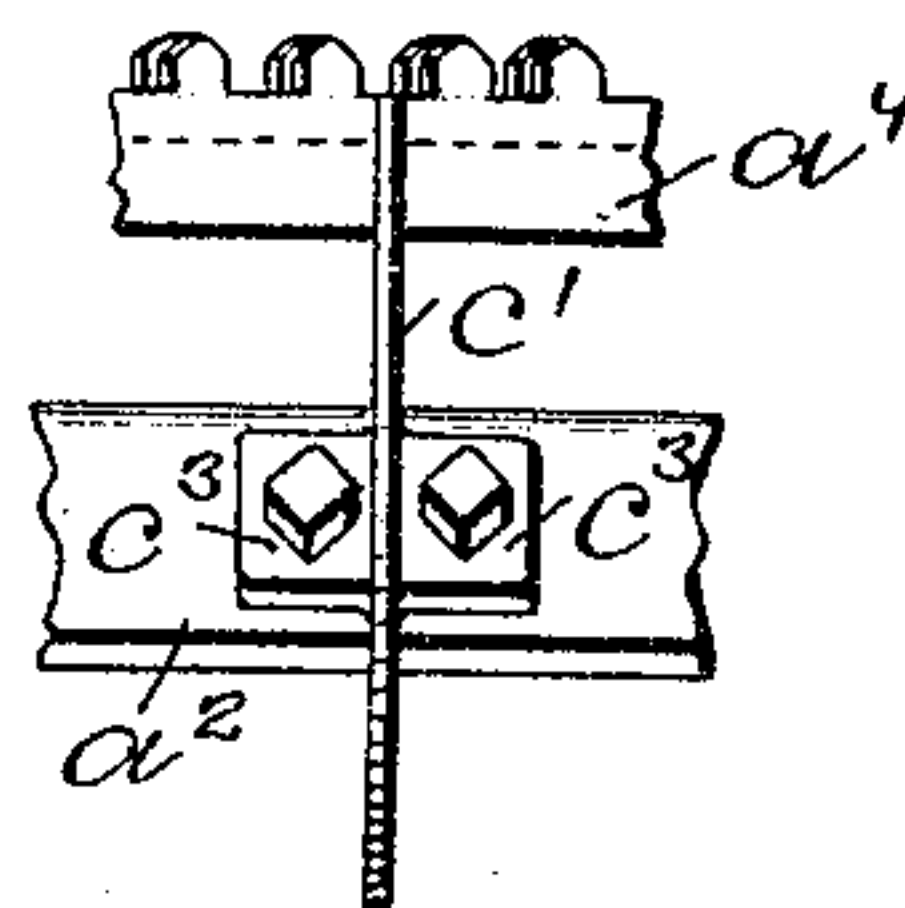
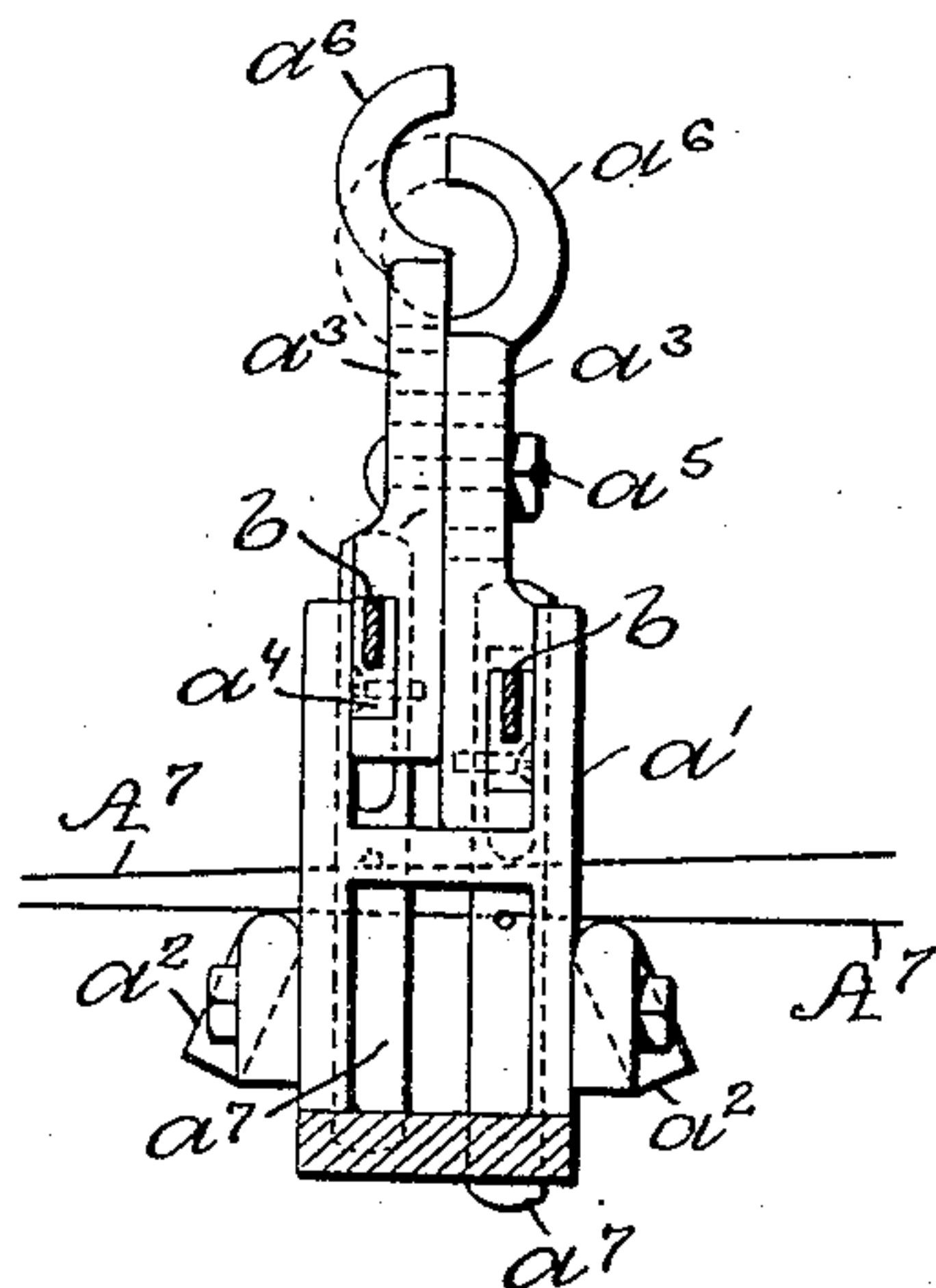


Fig. 6.



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WARP STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 764,899, dated July 12, 1904.

Application filed January 2, 1902. Serial No. 88,151. (No model.)

To all whom it may concern:

Be it known that I, ALBERT K. PRATT, a citizen of the United States, residing at Whitinsville, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Warp Stop-Motions for Looms, of which the following is a specification.

This invention has reference to an improvement in looms for weaving, and has for its object the production of an improved and novel warp-detector stop mechanism by which on the breaking of a warp-thread the loom is automatically stopped.

Other novel features will be hereinafter described, and pointed out in the claims.

Figure 1 is an end view of a loom provided with my improved warp stop-motion. Fig. 2 is a front view of the detector part of the warp stop-motion and the mechanism for operating the feeler-blades, the central portion extending across the loom being broken away to reduce the length of the drawing. Fig. 3 is a top view of the parts shown in Fig. 2. Fig. 4 is a side view of the modified form of eccentric by which the detector mechanism is operated. Fig. 5 is a front view of the rocking arm operating the feeler-blades, showing the parts in the positions occupied by them when a warp-thread has broken and indicating in broken lines the connection between the rocking arm and the feeler-blade disconnected. Fig. 6 is an end view of one of the end standards supporting the detector-bars. Fig. 7 is an end view, partly in section, of braces secured to the warp-bars and bearing on the detector-bars. Fig. 8 is a front view of the parts shown in Fig. 7.

Similar marks of reference indicate corresponding parts in all the figures.

In Fig. 1 the essential elements of a loom with which my improved warp stop-motion coöperates are illustrated. These consist in the end frame A, the warp-beam A', the guide-roll A², the breast-beam A³, the lay A⁴, the cam-shaft A⁵, the knock-off bar A⁶, and the warp A⁷.

In applying my warp stop-motion to the

loom the uprights *a a* are first secured to the end frames, and to these uprights are secured the standards *a' a'*. The warp-supporting bars *a² a²* extend under the warp and are secured at the opposite ends to the standards *a' a'*, one on each side. In each of the standards *a' a'* are supported the two blocks *a³ a³*. The two longitudinally-grooved detector-bars *a⁴ a⁴* are supported at their ends in the blocks *a³ a³*. By this construction the two detector-bars may be supported at different levels, and alternate warp-threads, forming the two halves of the warp, may be supported one half above the other, as is shown in Fig. 6, or both on the same level, as shown in Fig. 1. I have shown each pair of blocks *a³ a³* provided with a number of holes one above the other and have shown the blocks secured together by the bolts *a⁵*. Each of the blocks is provided with the handhold *a⁶*, so that they may be raised to the desired position and secured by the bolts *a⁵*.

In piecing up broken warp-threads the half of the warp containing the same may be raised above the other half and the piecing up materially facilitated. The detector-plates *a⁷* are strung on the grooved detector-bars and are supported each on a separate warp-thread. When a warp-thread breaks, the detector-plate supported on it drops on the detector-bar and is clamped between the teeth of the bar and the teeth on the feeler-blade moving in the groove of the detector-bar. In the drawings the shoulders of the teeth on the detector-bar and the feeler *b* are shown in the preferred form oblique to the groove in the bar. The feeler *b* is reciprocated by mechanism operated by the cam-shaft A⁵ of the loom. As shown in Fig. 1, the pinion *b'* is secured to the end of the cam-shaft and engages with the gear *b²*, which is twice the diameter of the pinion. The gear has on its side the eccentric disk *b³*, forming a circular cam. The U-shaped yoke *b⁴* bears on the opposite sides of the disk *b³*. The yoke is connected with the arm *b⁵*, which extends from the slotted lever *b⁶*, pivotally secured to the bracket *b⁷*.

In the modified form shown in Fig. 4 the disk b^{31} is slotted and adjustably secured to the gear b^2 , so that the throw of the cam-disk b^3 may be adjusted. In place of the yoke b^4 the arm b^{51} is provided with a ring surrounding the cam-disk.

The rod b^8 is pivotally secured to a stud adjustably secured to the slotted lever at the lower end and is pivotally secured at the upper end to the arm b^9 on the rock-shaft b^{10} . The arm b^{11} is secured to the rock-shaft b^{10} and serves, with the arm b^{12} , to impart reciprocating movement to the feeler-blade b , being connected with the feeler-blade by the lever b^{13} , pivotally secured to the arm b^{12} and provided with the rod b^{14} , which normally rests in slots formed in the feeler-blades.

The detector-plates used in warp stop-motions are supported one on each individual warp-thread. In looms weaving the ordinary print-cloth some sixty warp-threads are used for every inch of the width of the cloth. Therefore sixty detector-plates and sixty warp-threads are crowded into the space of one inch. These thin detector-plates when dropped on the saw-toothed detector-bars form but slight resistance to the reciprocating movement of the saw-tooth feeler-blade and are liable to be cut or bent by the same before the reciprocation is arrested and the loom stopped. To overcome this difficulty and prevent injury to the detector-plates and the feeler saw-blade, I have inserted into the feeler-blade-operating mechanism what may be termed a "breaking joint," which can be adjusted to yield when the movement of the feeler-blade is resisted by one of the thin detector-plates, and have illustrated in the drawings the construction of this breaking joint as at present used by me. I do not wish to confine myself to the exact construction shown, which I will now describe more fully.

The arm b^{11} I provide with the cross-bar b^{15} , from which extend the curved arms b^{16} , and the arm b^{12} I provide with the cross-bar b^{17} . The rods b^{18} extend from the cross-bar b^{17} through the cross-bar b^{15} . The lower ends of the rods b^{18} are screw-threaded and provided with nuts. The coiled springs b^{19} surround the rods b^{18} and abut on the nuts and the cross-bar b^{15} . The tension of the spring may be adjusted so as to hold the two cross-bars one against the other with the desired spring force, which when the teeth of the feeler-blade encounter a detector-plate will yield and allow the cross-bars to separate and break the joint, as is shown in Fig. 5.

In the preferred form the cross-bar b^{17} is formed to inclose the curved arms b^{16} and in part projects under the T-shaped end of the lever b^{20} , pivoted on the end frame of the loom and connected by the link b^{21} with the knock-off arm b^{22} , a projecting stud on one end of which engages with the knock-off bar A^6 and the shoulder b^{23} on which engages

when lowered with a stud on the lay A^4 . By this construction the arresting of the reciprocation of the feeler-blade acts through the breaking joint to knock off the shipper mechanism and stop the loom.

When the shipper of a loom is released, the loom is not instantly stopped even if a break mechanism is used. To insure the instant stoppage of the reciprocating feeler-blade when it encounters a detector-plate, I provide the warp stop mechanism with a device by which the connections between the feeler-blades and the operative mechanism is broken, and to this end I pivotally secure to the end frame of the loom the bell-crank lever b^{24} and connect the slotted end of the vertical arm of the bell-crank lever b^{24} with the knock-off arm b^{22} by a stud, the horizontal arm of the bell-crank lever b^{24} being connected with the T-post b^{25} , the cross-bar and the upper end of which are close to and just below the rod b^{14} , which is connected with the pivoted arm b^{13} and normally rests in the notches of the feeler-blades b . When now the warp stop mechanism is operated and the knock-off arm is lowered to engage with the lay, the knock-off arm is drawn backward to knock off the usual controlling-handle to stop the loom, and at the same time the bell-crank lever b^{24} is swung on its pivot, the T-post b^{25} is raised, and the rod b^{14} is raised out of engagement with the feeler-blades b . The knock-off arm b^{22} is supported on the post e , pivotally secured to the knock-off arm, and on the boss e' , secured to the end frame. A collar e^2 is adjustably secured to the post e and the coiled spring e^3 interposed between the stud e' and the collar e^2 .

As far as I know I am the first to construct a warp stop mechanism in which the reciprocating feeler-blade is disconnected when the mechanism is operated to stop the loom. I do not want to confine myself to the exact construction of this disconnecting mechanism, as the same may be materially changed. Such a modification is indicated in Figs. 2 and 5, where the T-post is indicated in broken lines as connected with the cross-bar on one end of the lever b^{20} .

In long looms for weaving wide goods the strain on the warp is transmitted to the detector-plates and through them on the detector-bars. The detector-bars are liable to yield to this strain, which causes the detector-bars to bend and bind the reciprocating feeler moving in the groove of the detector-bars. To secure greater lateral rigidity to the detector-bars a^4 , I form, preferably of sheet-steel, the bracket c and provide the same with the arms c' , which bear against the detector-bar on the side toward which the strain of the warp is exerted, and secure one or more of such brackets to the warp-supporting bars a^2 by providing the brackets with the flanges, which are secured by screws or bolts c^3 . In the preferred form I incline the bars a^2 ob-

liquely toward each other, as is shown in Fig. 7, so that when the bracket *c* is secured to the bars *a*¹ *a*² their lateral rigidity is materially increased.

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

1. In a warp stop mechanism, the combination with the feeler-blade, a two-part arm actuating the feeler-blade, means, whereby the
10 arm may yield by the breaking of the warp, and a lever supported on the two-part arm and having detachable connection with the feeler-blade, of means for disconnecting the arm actuating the feeler-blades from connection therewith, as described.

2. In a warp stop-motion, the combination with the feeler-blade, the detector-bars, the detector-plates, the two-part actuating-arm having detachable connection with the feeler-
20 blade, transverse bars on the adjoining ends of the two-part arm, and adjustable spring connections between the two transverse bars, of means comprising a bell-crank lever and a T-post, the knock-off arm, and connection be-
25 tween the bell-crank lever and the knock-off arm, and means for operating the knock-off arm, whereby upon the breaking of a warp-thread and arresting the feeler-blade the two-part arm will first yield and then be discon-
30 nected from the feeler-blade, as described.

3. In a warp stop mechanism, the combination with the feeler-blade, the detector-bar, and the detector-plates normally suspended from the warp, of the two-part actuating-arm
35 connected with the feeler-blade, transverse bars on the adjoining ends of the two parts of the arm, connections between the two transverse bars, and means interposed between the transverse bars and the knock-off bar, whereby
40 the rocking of one of the transverse bars on the other will actuate the knock-off mechanism, as described.

4. In a warp stop mechanism, the combination with the feeler-blade, and the mechanism
45 comprising an arm actuating the feeler-blade, of a notch in the feeler-blade, a lever pivotally connected with the arm actuating the

feeler-blade, a rod connected with the lever and normally in the notch of the feeler-blade, a T-post, and connections between the T-post
50 and the stop mechanism, whereby the actuating mechanism is disconnected from the feeler-blade on the breaking of the warp, as described.

5. In a warp stop mechanism, a pivoted le-
55 ver, means for connecting the lever detachably with the feeler-blade, and means for automatically disconnecting the lever from the feeler-blade, as described.

6. In a warp stop mechanism, the combina-
60 tion with the standards supporting the detector-bars, of separate supports for the ends of the detector-bars, ways in the standards for the two separate supports, and means for securing the two supports together, as described.

7. In a warp stop mechanism, the combina-
tion with the detector-bars and two warp-sup-
porting bars placed oblique toward each other, of a bracket, means for securing the bracket
70 to the supporting-bars, and arms extending from the bracket against the detector-bars, as described.

8. In a warp stop mechanism for looms, the combination of the following instrumentalities: an actuating mechanism comprising a
75 pinion, a gear, and an eccentric, a feeler-blade, a two-part arm for operating the feeler-blade, means for transmitting the reciprocating movement imparted by the eccentric to the two-part arm, a breaking joint in the two-part
80 actuating-arm, a knock-off arm, means for controlling the knock-off arm operated by the breaking joint of the two-part actuating-arm, and means for disconnecting the actuating mechanism from the feeler-blade when a warp-
85 thread breaks, as described.

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

ALBERT K. PRATT.

Witnesses:

A. S. NOYES,
R. E. LINCOLN.