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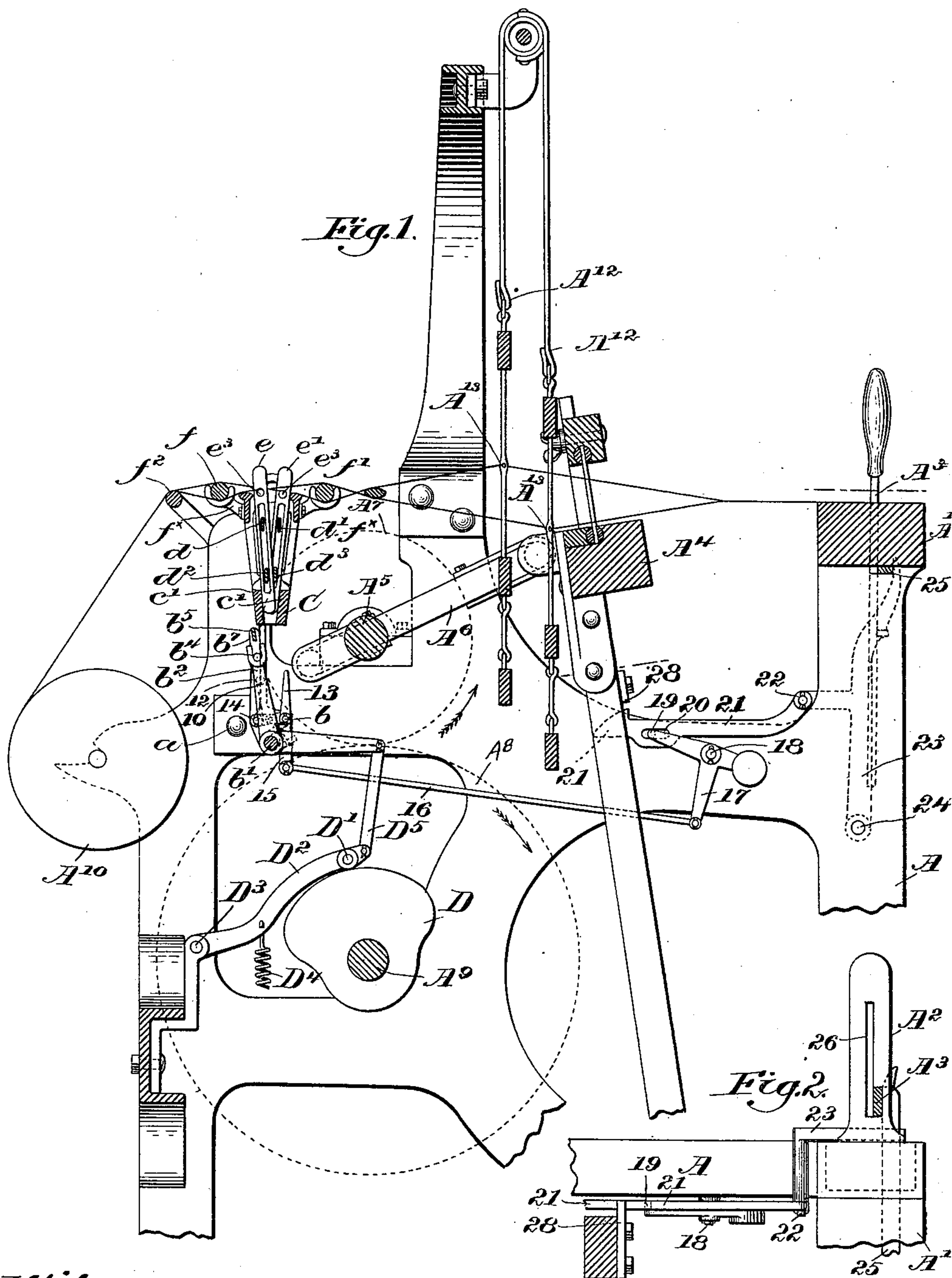
Patented Aug. 15, 1899.

H. WYMAN & J. A. CLARK.
WARP STOP MOTION FOR LOOMS.

(Application filed Apr. 29, 1898.)

(No Model.)

2 Sheets—Sheet 1.



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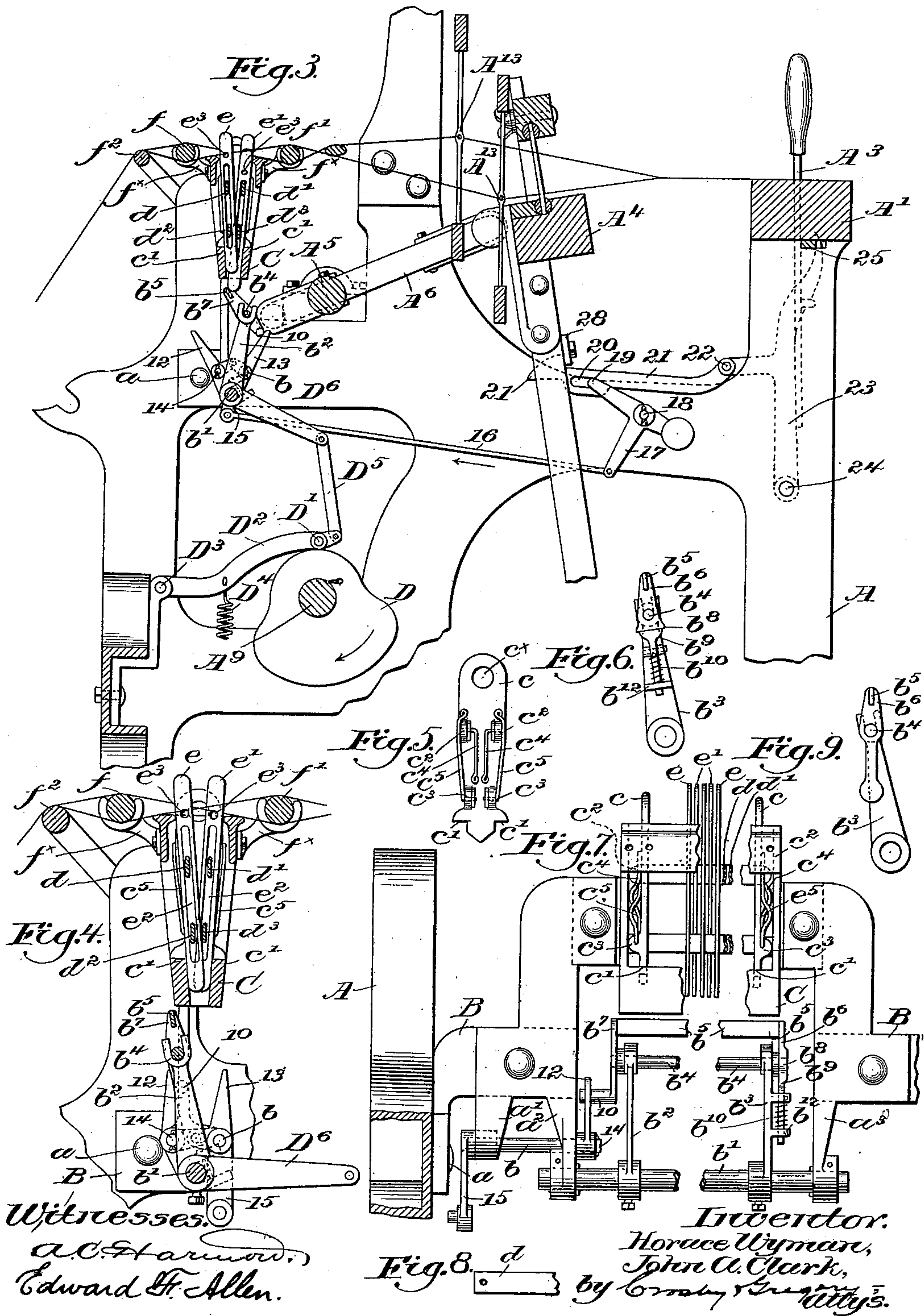
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2 Sheets—Sheet 2.



UNITED STATES PATENT OFFICE.

HORACE WYMAN AND JOHN A. CLARK, OF WORCESTER, MASSACHUSETTS, ASSIGNORS TO THE CROMPTON & KNOWLES LOOM WORKS, OF SAME PLACE.

WARP STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 631,241, dated August 15, 1899.

Application filed April 29, 1898. Serial No. 679,181. (No model.)

To all whom it may concern:

Be it known that we, HORACE WYMAN and JOHN A. CLARK, of Worcester, county of Worcester, and State of Massachusetts, have
5 invented an Improvement in Warp Stop-Motions for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like
10 parts.

This invention has for its object to provide novel devices adapted to act at the proper times to stop the loom on the breakage of a warp-thread.

15 Each drop device herein shown has a long slot to enable it to slide vertically on a stringer-bar, which supports it in its abnormal position, and above said slot a warp-thread-receiving eye or opening. The stringer-bar
20 is connected at its ends to end pieces, said bar and end pieces constituting a carrier for the drop devices, whereby they may be set into a suitable guide independent of the lay and harness mechanism and lifted or removed
25 therefrom readily when it is desired to thread the ends of the new warp-beam through said drop devices, said stringer-bar when in its operating position in the loom occupying a position below the level of the warp, leaving the
30 ends of the drop devices standing freely above the threads in their eyes. This carrier and the parts mounted on it are free to be put into the space in the said guide. I have herein shown a plurality of series of drop
35 vices, as thereby it is possible for the loom to contain more warp-threads, and each set of drop devices has its own appropriate stringer bar or bars to direct and restrain the movement of the drop devices as they hang on the
40 warp-threads or descend into abnormal position. The guide in which the carrier is set will preferably be fixed to the loom-frame and cross the same between the harness mechanism and the usual whip-roll, and it will
45 present at its upper surface or top two warp-rests, the lower part of the guide receiving against it the edges of the drop devices and guiding them externally in their descent into abnormal position to be struck by a feeler.

The carrier is portable and may be easily
50 lifted from the loom with its drop devices without dismembering the loom in any essential particulars. It will be understood that these drop devices must receive through their
55 warp-eyes the warp-threads just as the eyes of the usual heddles of the harness-frames receive the warp-threads, and by mounting the drop devices so that they may be removed readily from the loom the threading up of the
60 warp-thread may be done off from the loom in connection with the threading of the harnesses from a new warp-beam, and when the threading has been effected the new warp-beam, the drop devices, and the harness-
65 frames may be applied to the loom. Supporting the drop devices in this removable manner on the loom results in saving of very much time and adds materially to the convenience of the operator.

The feeler-rail is carried by a pivoted
70 frame which vibrates to and fro below the ends of the elevated drop devices, they being suspended on the warp-threads, first in one and then in the other direction, such movement of the feeler-rail enabling it to act with
75 each full stroke of the lay, and it may meet either side of a drop device if in abnormal position. In this our invention the feeler-rail is carried by a frame having journals pivoted in open arms of a rock-shaft which is
80 moved in one direction during one complete stroke of the lay and in the opposite direction at another stroke of the lay, and should a drop device be in its abnormal position the feeler-rail will meet it, and by contact with
85 the drop device the rail and its carrying-frame will be rocked in one or the other direction in or on the arms carrying it, according to which edge of the drop device is struck by the feeler-rail. When the frame or support
90 carrying the feeler-rail is moved in one or the other direction, it meets one or the other of two suitable arms operatively joined with a latch, putting said latch in position to be engaged and moved by the lay, in this
95 instance of our invention on the back stroke of the lay, thus effecting the release of the usual shipper-handle.

The drop devices are very thin and light, and in those looms wherein the pressure of the feeler is directly against the vertical edge of a drop device it often happens that the opposite edge of the drop device is pressed with such force against the surface over which it usually moves in coming into abnormal position that the said drop device cannot be easily lifted when it is desired to rethread the slot or eye of the drop device. In this our invention whenever the feeler-rail meets a drop device it contacts therewith, and in the further movement of the feeler-arm it rocks or tips on its supports and rolls, as it were, over the end of the drop device, (the feeler-arms continuing their movement,) and it soon gets substantially under the end of the drop device, then in its abnormal position, thereby partially relieving such drop device from edge pressure, so that it, when engaged by the fingers of the operator, may be easily lifted to be put into position to be rethreaded.

Figure 1, in longitudinal section, shows a sufficient portion of a loom with our improvements added thereto to enable our invention to be understood. Fig. 2 is a partial plan view of the right-hand front corner of the loom, chiefly to show the shipper-handle and the means for engaging it. Fig. 3 is a similar view to Fig. 1, but with the feeler-rail arrested by a drop device. Fig. 4 is an enlarged detail of the drop devices and their support, substantially as shown in Fig. 1. Fig. 5 shows one of the end pieces of the removable frame upon which the drop devices are strung. Fig. 6 is a detail showing a squaring device cooperating with the support for the feeler-rail to thus hold it normally in nearly upright position; and Fig. 7 is a detail view looking, it is supposed, at the rear end of the loom, some of the parts being broken out centrally to save space upon the drawings. Fig. 8 shows one end of one of the bars d , and Fig. 9 shows a modification.

The loom-frame A, the breast-beam A', having attached to it a shipper-handle guide A², the shipper-handle A³, the lay A⁴, the crank-shaft A⁵, the connecting-rods A⁶ between it and the lay to move the same, the gear A⁷ on the crank-shaft engaging a gear A⁸, (shown by dotted lines,) fast on the usual cam-shaft A⁹, the crank-shaft operating twice to one rotation of the cam-shaft; the warp-beam A¹⁰, and the harness or shed forming mechanism A¹², having suitable heddles A¹³, are and may be all as common in usual looms, so need not be herein further described.

In accordance with our invention we have attached to the loom between its side frames, at or near the rear end thereof, a beam B, the shape of which may be substantially as shown in Fig. 7, the opposite ends of said beam being suitably bolted to the loom sides by bolts a , one of said bolts being represented in Fig. 7 and also in Fig. 1. The guideway B has depending from it suitable ears, as a' a^2 a^3 , which receive suitable rock-shafts b and b' ,

to be described, and the upper part of said beam receives in it a guideway C, the same being preferably permanently mounted as a part of the beam. Inside this guideway we place removably, however, the series of drop devices e e' and their carrying-frame, which we will now describe. This frame for the drop devices consists, essentially, of two end pieces c c , (see Figs. 7 and 5,) each of said end pieces having at its lower end suitable shoulders or projections c' to rest on a part of the guideway C. Each of these end pieces, as herein represented, has two sets of ears, as c^2 c^3 , each provided with a transverse hole, and cooperating with each of these ears is a suitable engaging device, as c^4 c^5 , the lower end of the engaging device c^4 being pivoted to the end pieces at or near the ears c^3 , their upper ends being turned at right angles to thus form points which may enter suitable holes in the ears c^2 , first, however, entering a hole in the end of the like guide-rods d d' . (See Fig. 8.) The engaging devices c^5 , pivoted at or near the ears c^2 , have their ends adapted to pass through the holes in the ears c^3 , after which they enter suitable holes in the opposite ends of the two guide-bars d^2 d^3 , both ends of said guide-bars standing in and extending through slots in the end pieces, (see Fig. 7,) the whole construction forming a framework held in position with the engaging devices adjustably connected, so that either of the guide-rods can be disconnected from the frame for the removal or introduction of the drop device.

Each drop device has a long slot e^2 and a warp-thread-receiving eye e^3 . Said drop devices may be mounted in the loom in diagonal positions, so as to make two cross-rows, the upper ends of the drop devices in said two rows being separated one from the other; but the lower ends of the drop devices are brought substantially together, so that the drop devices of the two rows cross each other. The drop devices e e' are shown as separated at their upper ends into two rows and strung upon guide-rods d d^2 and d' d^3 . These guide-bars may be readily withdrawn from their end pieces by moving the engaging devices to release the bars either at one or both ends.

By providing the drop devices with the separate warp-thread-receiving eyes e^3 above the slots occupied by the guide-bars it is found that the warp-threads may be more easily and readily and quickly threaded into the said eyes than when the threads are put into the slots entered by the guide-bars, and putting the said eyes at the upper ends of the drop devices above said guiding-slots greatly facilitates access to the guide-eyes.

The guide-bars and the end pieces connected therewith by suitable engaging devices constitute a removable support or frame for the drop devices, said support being free to be taken to the point where the warp-beam next to be put into the loom is located, together with the loom harness-frames, and the

warps may be threaded through the warp-thread-receiving eyes e^3 of the drop devices and then through the eyes of the heddles in the usual harness-frames, and that operation performed the warp-beam, the drop devices, and the harness-frames may be taken to the loom and put in place in the usual manner.

The ends of the supporting-rolls f and f' rest in open bearings and said rolls stand at opposite sides of the path in which the drop devices rise and fall. These rolls serve the purpose of lease-rods, and they are of such size and located at such distance from the path of movement of said drop devices that the threads between said two rolls cross each other at a point in the space between the two sets of drop devices e and e' . (See Fig. 4.) The crossing of the warp-threads at a point between the two rows of drop devices lessens the wear on the warps and leaves the drop devices free to be moved readily.

Each end piece c is shown as provided with a suitable hole, as c^x , to thus afford provision for hanging up the said end pieces with their guide-bars and drop devices in order that the drop devices may be readily accessible when the warp-threads are being strung through them. The loom-frame has also been provided with a warp-rest f^2 , it supporting the warp between the warp-beam and the rolls f .

The cam-shaft is provided with a cam D , which acts on a roller or other stud D' of a lever D^2 , pivoted at D^3 on a stand secured to a cross-girth of the loom-frame, a spring D^4 , connected with said lever, normally acting to keep the roller-stud D' toward and against the face of the cam D . The lever D^2 has a link D^5 , which is joined to an arm D^6 , attached to the rock-shaft b' , before referred to, said shaft having attached to it two upright arms, as $b^2 b^3$, the upper ends of said arms being forked to receive a rod b^4 , forming part of the frame carrying the feeler-rail b^5 , said rod and rail being connected by suitable end pieces b^6 and b^7 . The end piece b^6 extends somewhat below the rod b^4 , and at that point it is squared or flattened, as at b^8 , said flattened part being acted upon by a squaring device b^9 , shown as a rod supported in a yielding manner by a spring b^{10} , surrounding the shank of said squaring device, said spring resting on a yoke b^{12} of the arm b^3 . Instead of the squaring device above described the end piece b^6 may be still further extended (see Fig. 9) and made of sufficient weight to keep the feeler-rail b^5 in an upright position and thereby dispense with the rod and spring $b^9 b^{10}$. The end piece b^7 is prolonged below the rod b^4 and is provided with a pin or stud 10, which stands in the space between two arms 12 and 13, the arm 12 being pivoted on a stud 14, while the arm 13 is fast on the short shaft b , the opposite end of said shaft having connected to it an arm 15, provided with a pin which enters a hole in the end of a connecting-rod 16, attached, as herein represented, to one arm of a weighted elbow-lever 17, piv-

oted at 18, one end of said lever having a pin, as 19, which enters a slot 20 in a latch 21, pivoted at 22 on an arm of a knock-off device 23, pivoted at 24 on the loom side, the upper end of said device acting against a knock-off lever 25, pivoted at one end under the breast-beam in usual manner, said knock-off lever resting against the shipper-handle A^3 when the latter is engaged in the notch of the slot 26 of the guide A^2 . Whenever the latch 21 is elevated, so that the plate or projection 28, fixed to the lay, meets the said latch in the backward movement of the lay, the knock-off device 23 is turned and moves the knock-off lever, thus releasing the shipper-handle, the latter in its movements acting in the usual manner through usual devices common in looms to shift the belt or driving-power from the fast to the loose pulley.

We have not herein shown the fast and loose pulley and the shipper-lever controlled by the shipper-handle, as the same may be of any usual or suitable construction.

The arm 12 is made of elbow shape, the short arm of the elbow having, let it be supposed, a slot, and the arm 13 is of similar shape, its short arm having, let it be supposed, a pin entering the slot in the short arm 12. By this pin-and-slot connection the two arms 12 and 13 are moved in unison one toward the other, and either may be acted upon to move the other.

Fig. 1 of the drawings shows the drop devices strung upon the warp-threads, and it will be supposed that the loom is running regularly and that the warp-threads are unbroken, and during such regular operation of the loom the feeler-rail—the rod b^4 of the frame being mounted in the open forked ends of the arms b^2 and b^3 —will be carried to and fro under the lower end of the guide C by the movement of the rock-shaft b' through the lever D^2 , the squaring device keeping the bar in place. Now should a warp-thread break the drop device sustaining it will drop, as represented in Fig. 3, and let it be supposed that the arms b^3 and b^2 are being moved toward the front of the loom, the drop devices falling while the feeler-rail was in its backward position toward the warp-beam. As the feeler-rail meets the lower end of the drop device in its abnormal position, the further movement of the rail is immediately stopped, but the arms b^2 and b^3 continue to move under the action of the spring D^4 and the end pieces carrying the feeler-rail and the rod b^4 are rocked in the forked arms b^2 and b^3 , causing the pin or projection 10, before described, to act upon the arm 13 and turn it with its shaft b , so as to draw upon the rod 16 in the direction of the arrow near it in Fig. 3, thus elevating the latch 21, so that the projections 28 of the lay, as the latter is moved back away from the breast-beam, meet the said latch and effect the release of the shipper-handle, as described. While the feeler-rail is rocking, as described, about the lower end of the

drop device it does not exert any objectionable pressure against said drop device, so as force its right-hand edge (viewing Fig. 3) against the guide C, and consequently the operator may readily engage the drop device with his finger and with but slight pressure elevate it into the proper position to again have the broken warp-thread passed through it and tied. When the arm 13 was moved, as described, it, through its connection by the pin and slot referred to with the arm 12, moved the latter arm into the position shown in Fig. 3. Let it be supposed that a drop device should drop, as shown in Fig. 3, while the feeler-rail occupied the dotted-line position shown in Fig 4. In such instance the feeler-rail would meet the right-hand side of the lower end of the drop device then in its abnormal position, and the said feeler-rail being restrained from further movement by the drop device the pin 10 would act against the arm 12, causing it, through the pin-and-slot connection described, with the arm 13, to turn it and its rock-shaft *b* and arm 12, the movement of the latter arm turning the rod 16 in the direction of the arrow in Fig. 3 and putting the latch 21 in position to be engaged, as before, with the projection 28 of the lay. It will thus be understood that the feeler-rail may act in either direction of its movement and upon either edge of a drop device, according to the direction of movement of the feeler-rail when it meets a drop device in its abnormal position.

It will be understood from the foregoing that the pressure of the feeler-rail against a drop device in its abnormal position is not directly against the said edge of the drop device, but rather against its rounded lower end, and that the feeler-rail in its further movement after having met the lower end of the drop device rocks, as it were, about said lower end, thus relieving the drop device from strain, which owing to its being made of thin light metal might throw it out of proper line or shape.

By the term "latch" as herein used we mean any device which is capable of being put into or out of position with relation to a moving part of the lay, so that when said device is put into the range of movement of, say, the projection 28, carried by the lay, the said device may be struck and will immediately thereafter effect the release of the shipper-handle.

It will be noticed that the feeler-rail is mounted loosely upon the arms of a rock-shaft, the latter having a positive motion back and forth, and, so far as we are aware, a feeler has never been so supported, and therefore said feeler and its support are herein claimed broadly.

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

1. In a warp stop-motion for looms, a guide crossing the loom-frame between the usual whip-roll and harness, and presenting at its upper end a rest for the warp-threads, and slotted at its lower end to present walls against

which the edges of the lower ends of the drop device may contact when in their abnormal position, and a stringer-bar located below the upper end of said guide and warp-threads; combined with a series of drop devices slotted to embrace said stringer-bar below the warp-threads, and having each a warp-receiving eye or opening above said stringer-bar slot, the upper ends of the drop device above their warp-receiving eyes or openings being unobstructed.

2. A series of drop devices slotted for the reception of a stringer-bar and having warp-receiving eyes above said slots; combined with a stringer-bar united at its opposite ends to end pieces, and means to sustain said end pieces in position with the stringer-bar below the warp-line, said end pieces and bar being readily removable from the part of the loom sustaining it when it is desired to provide the loom with a new warp, substantially as described.

3. A guide crossing the loom-frame and presenting at its upper end two points of support for the warp-threads, a series of drop devices independent of the harness mechanism and slotted for the reception of a stringer-bar, and having warp-receiving eyes above said slots; combined with a stringer-bar united at its ends with end pieces, said end pieces and stringer-bar entering the space at the top of said guide putting the stringer-bar below the top of said guide and below the warps, substantially as described.

4. In a warp stop-motion for looms, a guide extending transversely of the loom-frame behind the harness mechanism and presenting warp-rests with a space between; combined with a carrier composed of end pieces united by a stringer-bar; the carrier entering the space in the said guide and being sustained therein detachably with the stringer-bar below the upper end of said guide, and a series of drop devices each having a slot to embrace the stringer-bar and an eye above said slot to receive a warp-thread, substantially as described.

5. In a warp stop-motion for looms, a guide crossing the loom-frame behind the harness mechanism and presenting warp-rests with a space between, combined with a carrier composed of end pieces united by a stringer-bar, said bar being located below the top of the carrier and a series of drop devices each provided with a slot and above said slot with a thread-eye; the carrier and its drop devices, being bodily removable from said guide, substantially as described.

6. In a warp stop-motion for looms, a carrier composed of end pieces united by stringer-bars, a plurality of series of drop devices each having a slot to embrace said stringer-bars, and provided above said slot with a warp-receiving eye, a guide extended across the loom-frame and presenting warp-rests with a space between in which space said carrier and its plurality of drop devices may enter to put the

stringer-bars below the surface of said rest leaving the warp-eyes in position for the reception of the warp-threads lying on said rest, substantially as described.

5 7. In a warp stop-motion for looms, a guide crossing the loom and presenting warp-rests with a space between, combined with a carrier composed of end pieces having suitable shoulders, and stringer-bars connecting said
10 end pieces, and located below said warp-rests; a plurality of series of drop devices having slots, and eyes above said slots, said slots receiving in them the stringer-bars, said carrier and its plurality of series of drop devices
15 entering the space between said warp-rest, the shoulders of the carrier acting to sustain the latter in position on said guide, substantially as described.

20 8. In a loom, a guideway erected at the loom-frame, combined with connected end pieces carrying a series of drop devices freely movable vertically between said end pieces, the latter being applied to said guideway loosely and so as to be readily removed with
25 said drop devices from said guideway, substantially as described.

9. In a loom, a series of drop devices to receive warp-threads, guide-bars extended through slots of said drop devices, and end
30 pieces with which said guide-bars are detachably connected, said end pieces having shoulders or projections; combined with a guide adapted to receive said end pieces, said guide having a portion to support said shoulders
35 and hold said end pieces, guide-bars and drop devices removably in position on the loom, substantially as described.

10. In a loom, a series of drop devices adapted to be sustained by warp-threads, a
40 rock-shaft having arms at its opposite ends, means to move said rock-shaft and vibrate said arms to and fro under the path of movement of said drop devices, a feeler-rail, and its carrying-frame, said frame being mounted
45 loosely in the upper ends of said arms to rock therein, a pin carried by or movable with said frame, said feeler-rail being adapted to strike a drop device in its abnormal position in both directions of movement of the said rail, combined
50 with a shipper-handle two independent arms, either of which may be struck by the pin of said carrying-frame when the feeler-rail meets a drop device in abnormal position, a latch and means intermediate said latch and said
55 arms to put said latch into position to be actuated after the descent of the drop device and the arresting of the motion of the feeler-rail, the movement of said latch effecting the release of the shipper-handle, substantially as
60 described.

11. In a warp stop-motion, a guide connected with the loom-frame, a carrier composed of end pieces and connected stringer-bars located in operation below the top of
65 said guides; said stringer-bars having mounted upon them a plurality of sets of drop devices, said carrier being supported in said

guide, a rock-shaft having its center of motion below the lower end of said guide, said
rock-shaft having arms, a rock-shaft mounted in said arms and having an attached feeler-rail and a projection, combined with two pivoted arms having their free ends located at
70 opposite sides of said projection, connections between the said two arms, means to vibrate the rock-shaft and its arms, a shipper-handle, suitable intermediate connections deriving their movement by either of said levers to effect the release of the shipper-handle, one or the other of said levers being
75 moved to release the shipper-handle only after the arrest of the feeler by a drop device in its abnormal position, substantially as described.

12. In a loom, a guideway composed of two
85 sets of bars extended across the loom, one set being located above the other set, the bars of each set being separated one from the other, combined with a frame composed of end pieces and connected bars, said bars having strung
90 on them drop devices, the said end pieces, bars and a plurality of series of drop devices being set loosely into the space between said two sets of cross-bars, the lower set of cross-bars supporting the lower ends of said end
95 pieces, while the upper set of said cross-bars maintain the upper ends of said end pieces in their proper working position, substantially as described.

13. In a warp stop-motion for looms, the following instrumentalities, viz: a plurality of
100 bars located behind the harnesses and occupying a position below the line of travel of the warp in weaving; two series of drop devices strung on said bars and adapted to be supported in their normal position by the unbroken warp-threads, a feeler-rail carried by a shaft, means to sustain said shaft and move it to and fro under the drop devices when in their normal position; a shipper-handle, a co-
105 operating latch or device, a lay, a latch-engaging projection moved in unison with said lay, two pivoted levers, means to connect them loosely, a projection extended from the feeler-rail rock-shaft and occupying a position
110 between said two levers and intermediate devices between one of said levers and said latch or device, whereby when the feeler is arrested by striking a drop device in its abnormal position, the loom will be stopped,
115 substantially as described.

14. In a warp stop-motion for looms, the following instrumentalities, viz: a series of drop devices, a shipper-handle, a latch or device coöperating therewith, a lay having a latch-
125 engaging portion, a rock-shaft having arms, a feeler-rail supported between end pieces, one of said end pieces having a projection, said feeler-rail being mounted in bearings in said arms, means coöperating with one of said
130 pieces to retain said feeler-rail in position to meet a drop device in its abnormal position, means to move said arms and feeler-rail to and fro across the path of movement of the

drop devices, two levers coöperating with opposite sides of said projection, connections to unite said levers loosely, and intermediate devices between one of said levers and said latch or device, whereby when said feeler-rail is arrested by a drop device in its abnormal position the pin carried by one of the end pieces thereof becomes the mover of one or the other of said two levers, that depending on which side of a drop device is met by the feeler, causing the said intermediate devices to change the position of the latch or device that it may be engaged and actuated by the lay or a part moving in unison therewith, substantially as described.

15. In a loom, the following instrumentalities, viz: two levers occupying a stationary inoperative position, a series of drop devices adapted to be normally sustained by the warp-threads, a suitable guide located below the warp-threads to guide said drop devices and form a slot for the same when in their normal position, a feeler-rail, a support therefor, means to move said support and feeler-rail to and fro under the ends of the drop devices when in their normal position, said feeler-rail meeting in either direction of its movement a drop device in its abnormal position and being arrested thereby, the further movement thereafter of the support for said feeler-rail operating one of said levers to set in motion stop-motion devices to stop the loom, substantially as described.

16. In a warp stop-motion for looms, rocker-arms, means to move them, a feeler mounted on said arms and having a pin extending therefrom, said feeler and pin moving in unison with said arms when the feeler is unobstructed, and a pivoted lever occupying a position normally out of the range of motion of the pin connected with said feeler when the feeler is unobstructed, a shipping mechanism, a drop device, and means actuated by said lever to actuate the shipping mechanism, said parts being operatively organized substantially as described, whereby when the feeler

meets a drop device it is turned with relation to said arms so that the pin meets and moves said lever to effect the movement of the shipping mechanism and stop the loom, substantially as described.

17. In a loom, the following instrumentalities, viz: a rock-shaft having arms, means to positively actuate said rock-shaft, a carrying-frame having a feeler-rail, said frame having a pin and mounted in said arms, elbow-levers connected together at one end and located at opposite sides of the pin of said carrying-frame, and a series of drop devices, a latch, and means between said lever-arms and said latch to move it whenever the pin of said carrying-frame meets either of said lever-arms, said pin meeting one or the other of said arms according as the feeler-rail meets one or the other of said drop devices in abnormal position, substantially as described.

18. In a loom, a rock-shaft having arms, means to move said rock-shaft and arms, a feeler-rail supported in end pieces, said end pieces carrying a rod mounted in said arms, combined with a means coöperating with one of said end pieces to keep the feeler-rail normally in position, one of said end pieces having a pin and two pivoted arms loosely joined together, said pin meeting one or the other of said arms according to which side of a drop device is struck by the feeler-rail, the movement of either of said arms effecting the movement of a rock-shaft and the putting into its abnormal position of a latch or device to be engaged by a projection of the moving lay and effect the release of the shipper-handle, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

HORACE WYMAN.
JOHN A. CLARK.

Witnesses:

JUSTIN A. WARE,
HARRY G. BAKER.