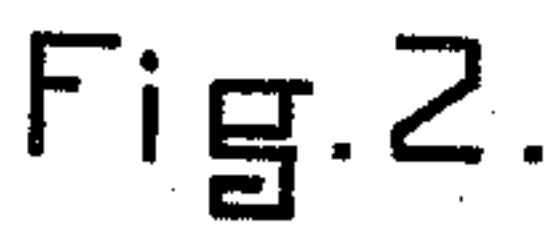


2 Sheets—Sheet 1.

No. 466,872.

Patented Jan. 12, 1892.



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 ATTORNEY

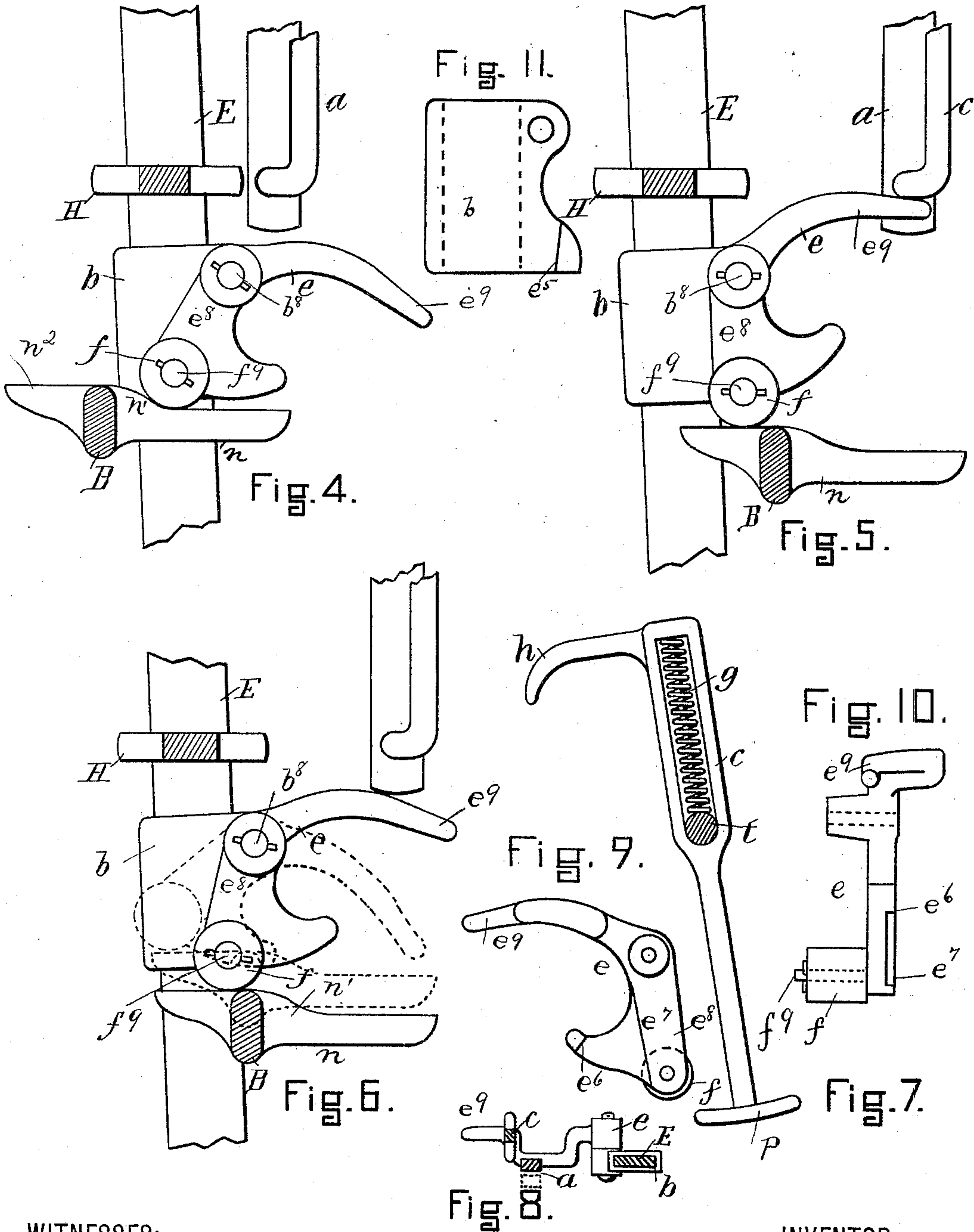
(No Model.)

2 Sheets—Sheet 2.

G. W. STAFFORD.  
LOOM STOPPING MECHANISM.

No. 466,872.

Patented Jan. 12, 1892.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## LOOM STOPPING MECHANISM.

SPECIFICATION forming part of Letters Patent No. 466,872, dated January 12, 1892.

Application filed August 28, 1890. Serial No. 363,321. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE W. STAFFORD, of Providence, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Loom Stopping Mechanism; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

My invention relates to stopping mechanism for looms, and in particular to the devices in a loom which serve to apply a brake when the motion of the loom is to be arrested, such devices being known as a "brake-motion."

The principal object of my invention is to provide a brake-motion which shall be adapted for use upon a loom in connection with the ordinary weft detecting mechanism or in connection with such mechanism, and also the protecting mechanism commonly in use, and which brake-motion shall be so constructed and arranged as that when either of these mechanisms becomes operative to dislodge automatically the shipper-handle from its holding-notch, and thus to free the said shipper-handle so as to permit it to move the belt-shipper and ship the driving-belt from the fast pulley of the loom to the loose pulley thereof, the brake shall be applied to check the rotation of the driving-shaft of the loom, and also so as that when the shipper-handle is dislodged by hand to occasion the shipping of the belt the brake shall not be applied. When a weft-thread breaks or runs out and the weft detecting mechanism in consequence is permitted to act to cause the stoppage of the loom, or when a shuttle fails to enter its box and the protector mechanism in consequence is permitted to act, the conditions are such that it is desirable that the motion of the loom should be arrested as soon as is practicable, whereas when the driving-belt is shipped by hand it usually is not necessary that the loom should be stopped so quickly.

Another object of my invention is to enable the brake to be disengaged from the brake-wheel, when desired, after the loom has been brought to a state of rest and without the loom being restarted in consequence of the shipper-handle being moved.

My invention consists in certain novel features of construction and novel combinations of parts, which will first be described in connection with the accompanying drawings, and will then be particularly pointed out in the claims at the close of this specification.

In the drawings, Figure 1 is a view in side elevation of one of the side frames of a loom and certain parts of the driving and stopping and starting mechanism of a loom and showing the application of my invention. Fig. 2 is an elevation of certain of the parts shown in Fig. 1 at the front of a loom, viewing the same from the left-hand side in Fig. 1. Fig. 3 is a plan view of the parts represented in Fig. 2. Figs. 4, 5, and 6 are detail views of certain parts at the left-hand side of the dotted line *yy* in Fig. 1, the parts being seen as they would appear if viewed from the right in Fig. 1 and being shown in different positions for the purpose of illustrating the mode of operation. Fig. 7 is a view, partly in section, intended to represent the disengager, by which the brake-lever may be relieved from pressure, when desired, without it being necessary to move the shipper-handle. Fig. 8 is a plan view in horizontal section on the dotted line *xx* of Fig. 1. Figs. 9 and 10 are respectively side and edge views of the depressor, which is pivotally mounted upon the shipper-handle and which acts upon the brake-lever to depress the forward end of the same to cause the brake carried by the rear end of the said lever to be borne against the brake-wheel on the driving-shaft of the loom. Fig. 11 is a view of the sleeve or collar which is carried by the shipper-handle and to which is pivoted the depressor shown separately in Figs. 9 and 10, this view being made from the rear in Fig. 1.

A is one of the side frames of a loom. P is the driving-shaft thereof. D is the loose pulley, mounted on said shaft outside of the fast or driving pulley. (Not shown.) C is a hand-wheel or brake-wheel fast upon the shaft P. H is the shipper or belt-shifting fork, mounted to slide in and out from the loom side upon a long stud M, made fast to the side frame A. B is a brake-lever pivoted upon a stud N, carried by the side frame A. B<sup>9</sup> is the brake-shoe, carried by the rear end of the said brake-lever. S' is a weight hung from the said rear end. E is the shipper-handle



engaging, as usual, with the forward end of the shipper H to move the same and acted upon, as usual, by a spring, (not shown,) which tends to move the same outwardly. L is the holding-plate for the shipper-handle, mounted upon the breast-beam of the loom and having therein the slot *j*, in which the upper end of the shipper-handle plays. F<sup>9</sup> is the weft-fork. F is the slide to which the weft-fork is pivoted. J is a lever, which usually has one end thereof disposed in position to be acted upon by the weft-fork slide when the latter is moved forward in the loom in consequence of the failure of the weft and when the tail of the weft-fork is engaged with the weft-hammer (not shown) and the other end thereof disposed adjacent to the notch or offset of slot *j*, in which the shipper-handle rests or is lodged while the belt is maintained on the driving-band pulley; and M<sup>9</sup> is the frog, mounted with capacity for slight movement, and adapted, as usual, to be engaged by the dagger of the protector mechanism when a shuttle fails to enter its box. All of these parts are old and well known and are in common use in looms. They need not, therefore, be further described.

After the shipper-handle has been pushed laterally out of the offset or notch of slot *j* in which it rests while the driving-band is on the fast pulley it springs to the outer end of slot *j*, carrying the shipper H with it and moving the driving-band from the fast pulley upon shaft P to the loose pulley D. It is usual to so construct and arrange the brake-motions of looms as that when this outward movement of the shipper-handle takes place the brake shall be applied, this application being occasioned whether the shipper-handle is dislodged by hand or by the action of the weft detecting mechanism or protector mechanism. In order to provide for applying the brake only in the latter case—that is, not when the shipper-handle is dislodged by hand, but when it is dislodged automatically in consequence of a failure of weft or a failure of a shuttle to enter its box—I provide the following devices: I form or provide the forward end of the brake-lever B with a cross bar or head *n*, the upper edge whereof has preferably two horizontal planes united by a slight inclined grade or shoulder *n'*. Upon the shipper-handle E is placed a sleeve or collar *b*, which is secured at the desired height thereon by the set-screw *b*<sup>9</sup> and carries a stud *b*<sup>8</sup>, upon which is pivotally mounted the depressor *e*. The normal position of this depressor is substantially as represented in Fig. 4. The depressor consists of the body *e*<sup>8</sup> and the tail *e*<sup>9</sup>. The former is intended for action upon the upper surface of the cross-bar *n*, and in order to render easy its movements over such surface in acting to depress the forward end of the brake-lever, and thereby to raise the rear end thereof to cause the brake to bear against the brake-wheel, I mount a roller or bowl *f* on a stud *f*<sup>9</sup>, carried

by the lower end of the said body *e*<sup>8</sup>. Upon the side of the body *e*<sup>8</sup> which is toward the front of the loom there are formed shoulders or stops *e*<sup>6</sup> *e*<sup>7</sup>, which co-operate with the rearwardly-extending stop or lug *e*<sup>5</sup>, formed on an arm of collar *b*, and serve to limit the swinging movement of the depressor in each direction. As is shown most clearly in Fig. 8, the middle portion of the tail is crooked or bent toward the front of the loom in a manner to place such middle portion and the free end thereof in different vertical planes, which are parallel to the front of the loom. Upon the stud *t*, secured to the side frame A, I pivot the controlling-lever *a*, the upper end of which is notched, as at *i*<sup>7</sup>, to receive a pin *i*, carried by the outer end of the lever J, or the said upper end of lever *a* otherwise is connected with the said lever J in a manner to cause adjacent ends of the two levers to move together. The lower end of the controlling-lever *a* extends down into proximity to the tail *e*<sup>9</sup> of the pivoted depressor, and when the loom is running and the parts are in their normal position the said lower end overhangs the crook in the tail *e*<sup>9</sup>, as indicated by full lines in Fig. 8, so as to prevent the said tail from rising. When, however, the lever J is turned on its pivot in consequence of the failure of the weft and of the resulting action of the weft-hammer in occasioning the forward movement of the slide F, the controlling-lever *a* is moved on its pivot *t*, so as to carry its lower end from the position indicated by full lines in Fig. 8 forward into the position indicated by dotted lines in the said figure, thereby leaving the said tail free to be moved upwardly. A bar *m*, bolted to the side of the frog M<sup>9</sup>, extends forward, as shown in Fig. 1, so as that when the said frog is engaged by the dagger of the protector mechanism and moved forward in the loom the said bar *m* will act against the lower arm of the controlling-lever *a* and turn the lever *a* so as to press the lever J against the shipper-handle E and dislodge the latter from its offset in the slot *j*. When the bar *m* thus acts against the controlling-lever *a*, it also carries the lower end of said lever forward into the dotted-line position in Fig. 8.

The action of the foregoing parts will now be understood from the following: Fig. 4 of the drawings may be assumed to show the parts as they stand normally, it being understood that the lower end of controlling-lever *a* overhangs the crook in the tail *e*<sup>9</sup> of the depressor, as in full lines in Fig. 8. If now the weft detecting mechanism or the protecting mechanism should act to occasion the dislodging of shipper-handle E from its offset in slot *j*, the said shipper-handle will move outwardly in the said slot *j*, carrying the shipper H with it and shifting the driving-band from the driving-pulley to the loose pulley, all as usual. The controlling-lever *a* having been turned upon its pivot *t* by the action of the weft detecting mechanism or protecting



mechanism in such a manner as to carry its lower end forward into the dotted-line position indicated in Fig. 8 and away from over the tail  $e^9$  of depressor  $e$ , the result is that as the shipper-handle moves outwardly and as the depressor is carried along therewith, when the roller  $f$  comes in contact with the rise or incline  $n'$  on the cross-bar  $n$  and the said rise or incline by its resistance tends to hold back the lower end of the body  $e^8$  of the depressor, the tail  $e^9$  is free to rise and the depressor is permitted to turn upon the pivotal stud  $b^8$  until stop  $e^7$  on the forward side of the depressor comes against stop  $e^5$  on collar  $b$ , when the turning movement of the depressor is arrested, its position then being approximately that which is represented in Fig. 5 of the drawings, with the stud  $f^9$  of the roller  $f$  beneath the pivotal stud  $b^8$  and approximately in the same vertical line therewith, the said stud  $f^9$  in practice being permitted to pass slightly beyond the said vertical line, in order that the upward pressure exerted by the forward end of the brake-lever may tend to hold the stop  $e^7$  of the depressor against the stop  $e^5$  of collar  $b$  and not carry the former stop away from the latter. During this action and as the roller  $f$  rides along the incline  $n'$  the forward end of the brake-lever is depressed and the rear end thereof is carried upward so as to bear the brake-shoe against the brake-wheel. The position of the parts after the shipper-handle has moved entirely out is substantially as represented in Fig. 5. Should the shipper-handle be pressed inward to restart the loom, the inward movement of the lower end of body  $e^8$  will at first be retarded by the resistance offered by the surface of cross-bar  $n$  to the passage of roller  $f$  inward along it. As soon as the stud  $b^8$  has passed inward beyond the vertical line that passes through the stud  $f^9$  the upward pressure exerted by the forward end of the brake-lever against the depressor will no longer be resisted by the depressor and such forward end will at once rise, turning the depressor on stud  $b^8$  into the position shown in dotted lines in Fig. 6, while the rear end will be permitted to descend so as to remove the brake-shoe from the brake-wheel. This action reduces the resistance encountered in moving the shipper-handle inward in restarting the loom and also permits the brake to be promptly disengaged from the brake-wheel in restarting. Should the shipper-handle be dislodged from its notch by hand, lever  $a$  not having been moved, the lower end of controlling-lever  $a$  will remain over the crook in the tail  $e^9$  of the depressor. In consequence, and as shown in Fig. 6, such lower end will prevent the tail from rising when roller  $f$  is resisted in its advance outward by incline  $n'$ , and the depressor will retain relatively to the shipper-handle substantially the position in which it is represented in full lines in said Fig. 6—that is, with stud  $f^9$  outside of the

vertical line passing through stud  $b^8$ . In this position it continues to pass along the surface of the cross-bar  $n$ ; but as will be seen, while it will act to depress somewhat the forward end of the brake-lever in its passage along the incline  $n'$ , as soon as it passes the said incline  $n'$  and reaches the upper level of the cross-bar the upward pressure of the said bar against the roller  $f$  will throw the depressor into the dotted-line position shown in Fig. 6 and permit the forward end of the brake-lever to rise into the position indicated by dotted lines in the said figure.

I find it convenient to provide means whereby the pressure of the brake against the brake-wheel may be relieved after the loom has been stopped automatically, and whereby such relief may be effected without the shipper-handle being moved. To this end I provide a disengager-slide  $c$ , whereby when the depressor is in the position represented in Fig. 5 the said depressor may be tripped so as to permit the forward end of the brake-lever to rise. This disengager-slide  $c$ , which is shown most clearly in Fig. 7, has an expanded or T-shaped lower end, which overhangs the tail  $e^9$  of the depressor in all the positions of the shipper-handle, while the upper part of the said slide is slotted for the passage through it of the pivot-pin  $t$ , the said slide being placed upon the said pin at the side of controlling-lever  $a$ . Within the slot and between pin  $t$  and the upper end of the slot is placed a spring  $g$ , the tendency of which is to keep the slide  $c$  in its most elevated position. The said slide is provided with a forwardly-projecting handle  $h$ , whereby it may be operated by hand. A hooked piece or clip  $r$ , carried by the controlling-lever, passes partly around the slide  $c$ , so as to cause the lower ends of the said lever and slide to move forward and rearward in the loom in unison, although the T-shaped lower end of the slide never passes from above the tail  $e^9$ .

If the devices hereinbefore described have been operated to dislodge the shipper-handle automatically and the latter has sprung outwardly, shifting the driving-band and applying the brake, and it is desired to relieve the pressure of the brake against the brake-wheel without moving the shipper-handle inward, it is simply necessary to grasp handle  $h$  and depress slide  $c$ , whereupon the lower end of the said slide, which overhangs the free end of tail  $e^9$ , (see Fig. 5,) will act upon the said free end and turn the depressor upon its pivotal stud  $b^8$ . As soon as stud  $f^9$  is carried from the side of the vertical line passing through stud  $b^8$ , on which it stands in Fig. 5, to the side of such line on which it stands in Fig. 6, the depressor will be free to move under the upward pressure of the forward end of the brake-lever and the brake-shoe will be permitted to move away from the brake-wheel.

Having described my invention and the



best manner of reducing it to practice at present known to me, I claim as my invention—

1. The combination, with the brake-lever and the cross-bar carried thereby, formed with a rise or incline, of the handle E and the swinging depressor pivoted to said handle and free to swing laterally on its pivot thereon, the said depressor acting against the cross-bar to apply the brake as the handle E is moved in one direction, but swinging on its pivot and yielding to free the brake-lever when the handle E is started in the other direction, substantially as described.

2. The combination, with the brake-lever and the cross-bar carried thereby, formed with a rise or incline, of the handle E and the swinging depressor pivoted to said handle and free to swing laterally on its pivot thereon, the said depressor having a roller which bears against the said cross-bar, the said depressor acting through the roller against the cross-bar to apply the brake as the handle E is moved in one direction, but swinging on its pivot and yielding to free the brake-lever when the handle E is started in the other direction, substantially as described.

3. The combination, with the brake-lever and the cross-bar carried thereby, formed with a rise or incline, of the handle E, its holding-plate L, the depressor pivoted to said handle and acting against the said cross-bar to apply the brake as the handle is moved in one direction and having a projecting tail portion, a controlling-lever for engagement with the said tail portion to prevent the latter from rising, a dislodging-lever connected with the said controlling-lever, and a detector mechanism in operative connection with the said dislodging-lever, substantially as described.

4. The combination, with the brake-lever and the cross-bar carried thereby, formed with a rise or incline, of handle E, the depressor pivoted to the said handle and acting against the said cross-bar to apply the brake when the handle is moved in one direction and having a projecting tail portion, and the tripping or disengaging slide for acting upon said tail portion to trip the depressor, substantially as described.

GEO. W. STAFFORD.

Witnesses:

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BENJ. ARNOLD.