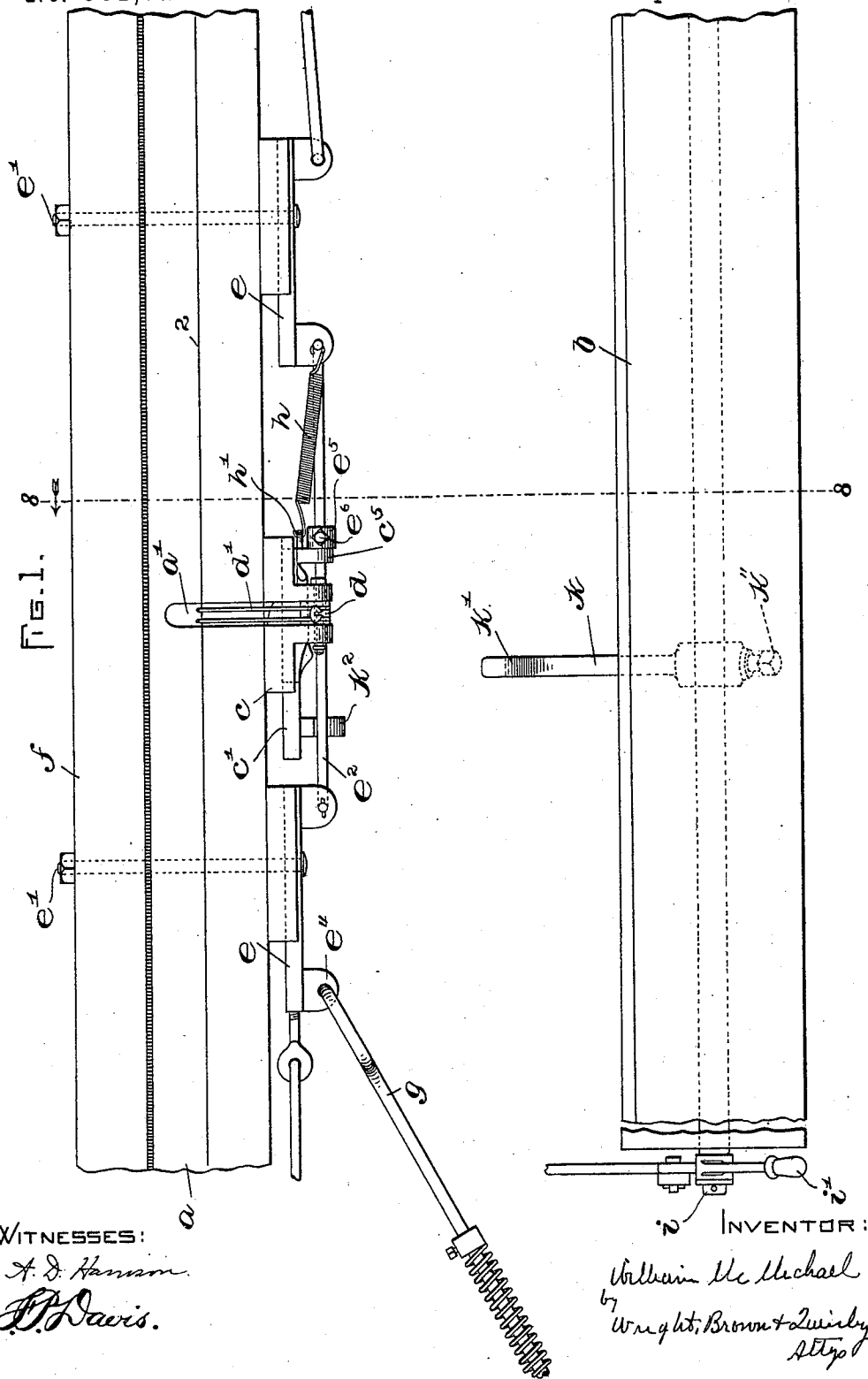


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WEFT STOP MOTION FOR LOOMS.

No. 581,515.

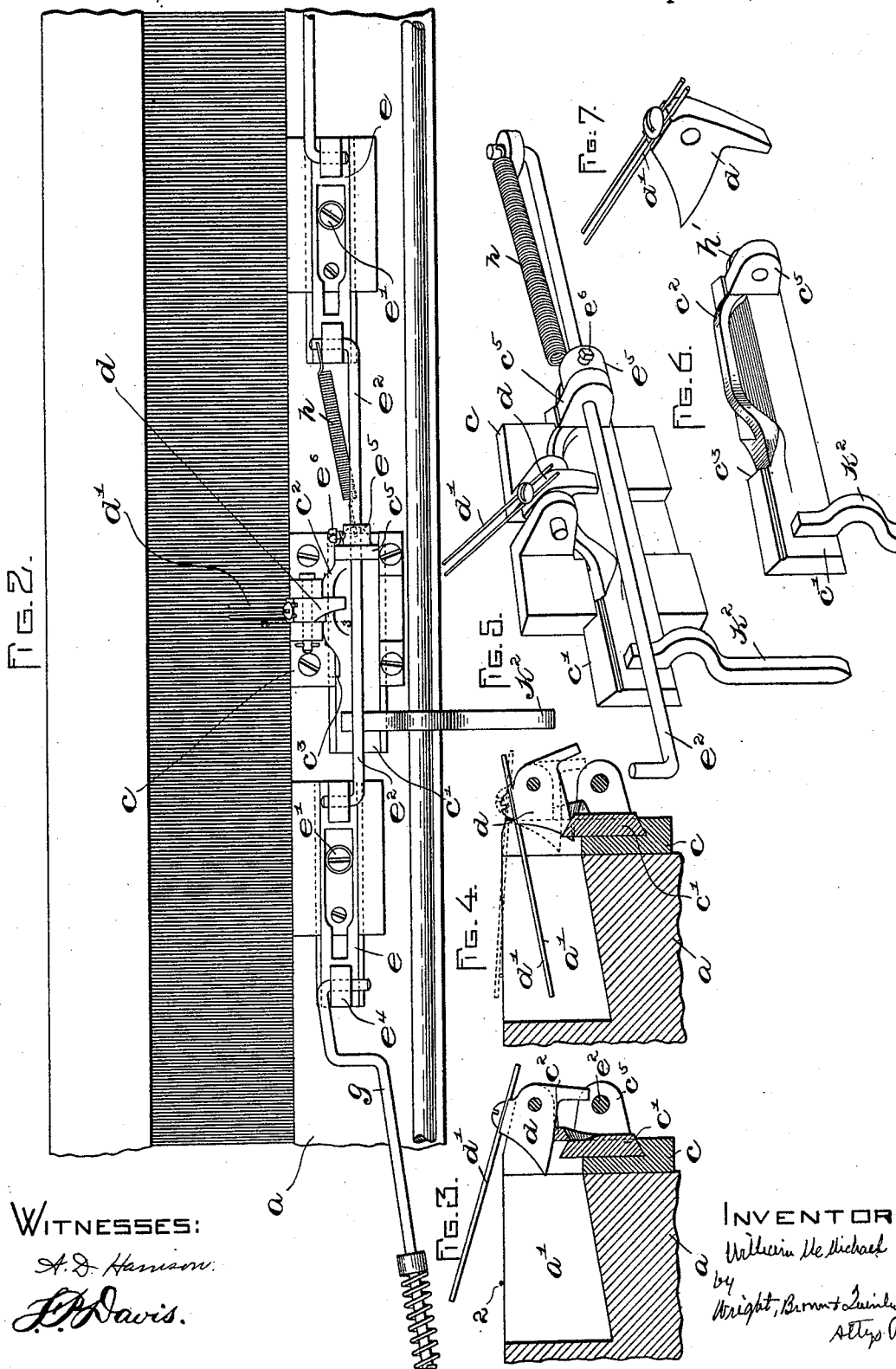
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FIG. 8.

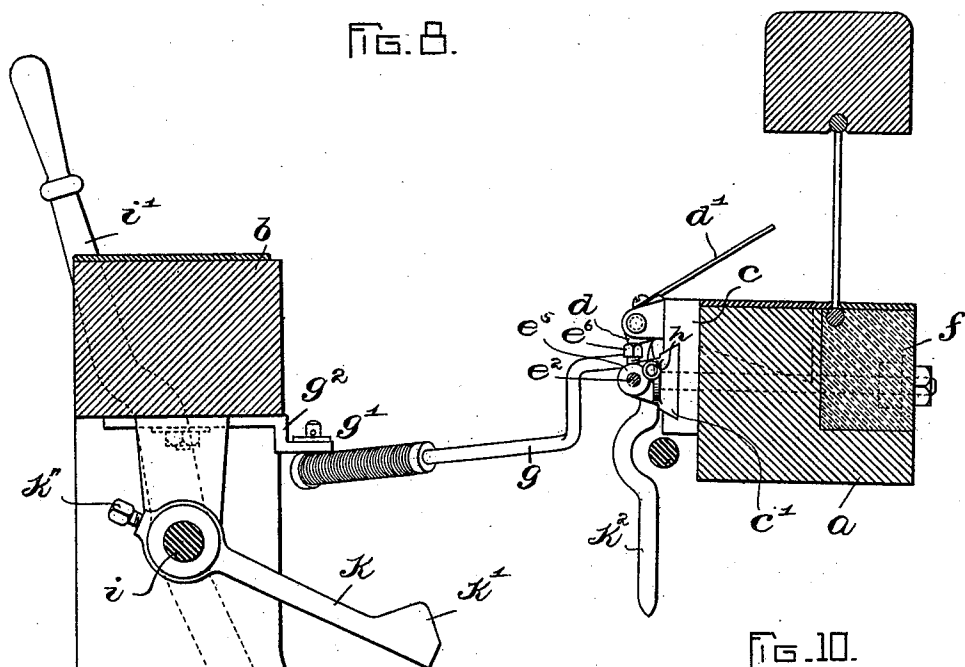


FIG. 10.

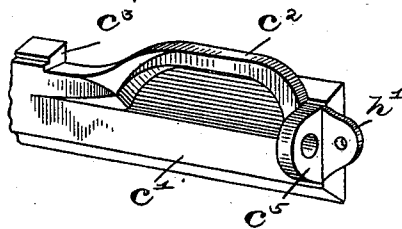
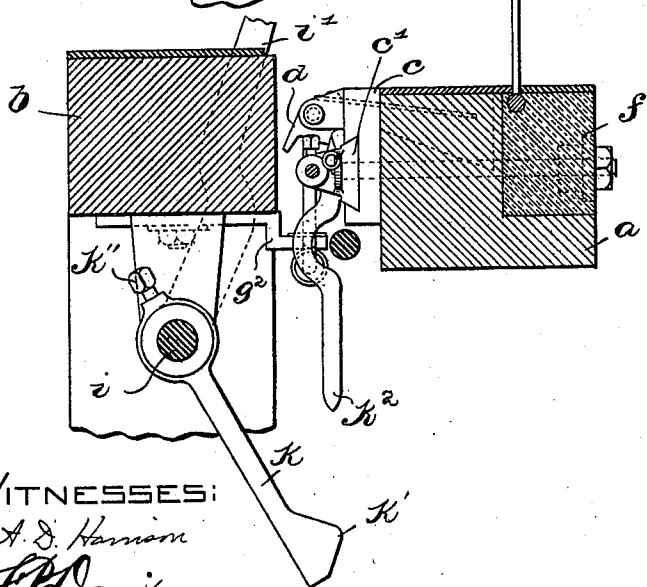


FIG. 9.



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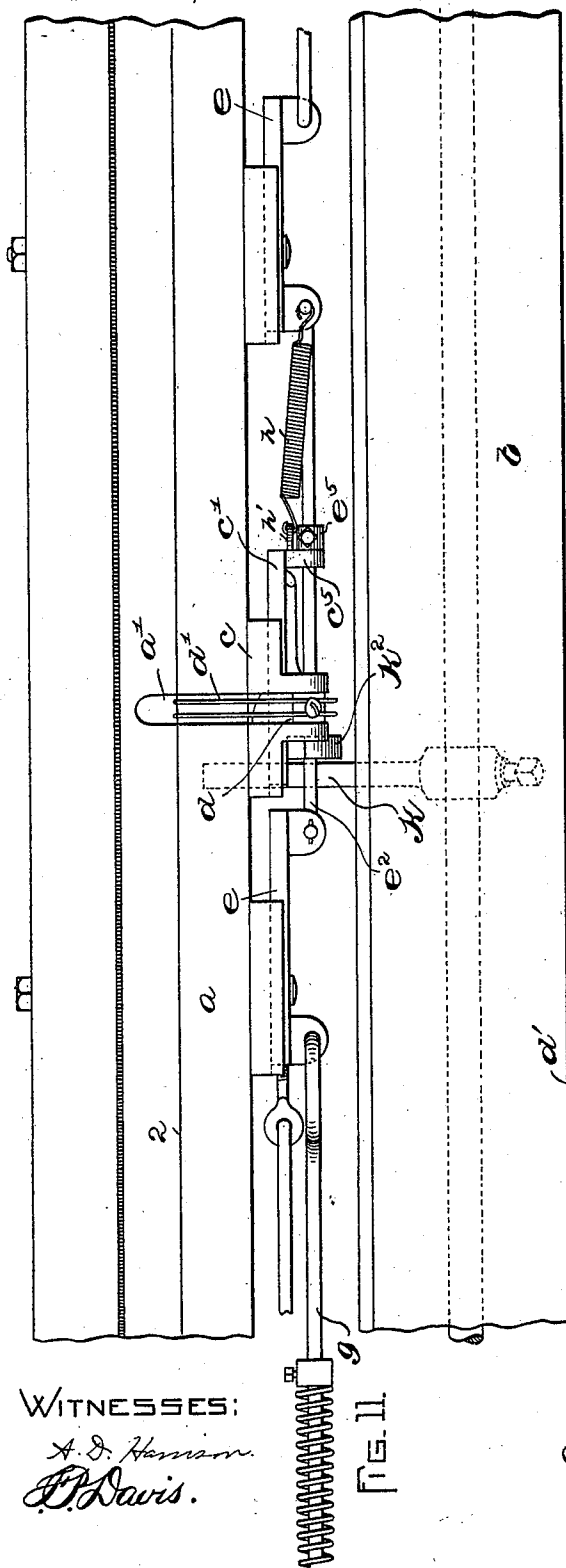
(No Model.)

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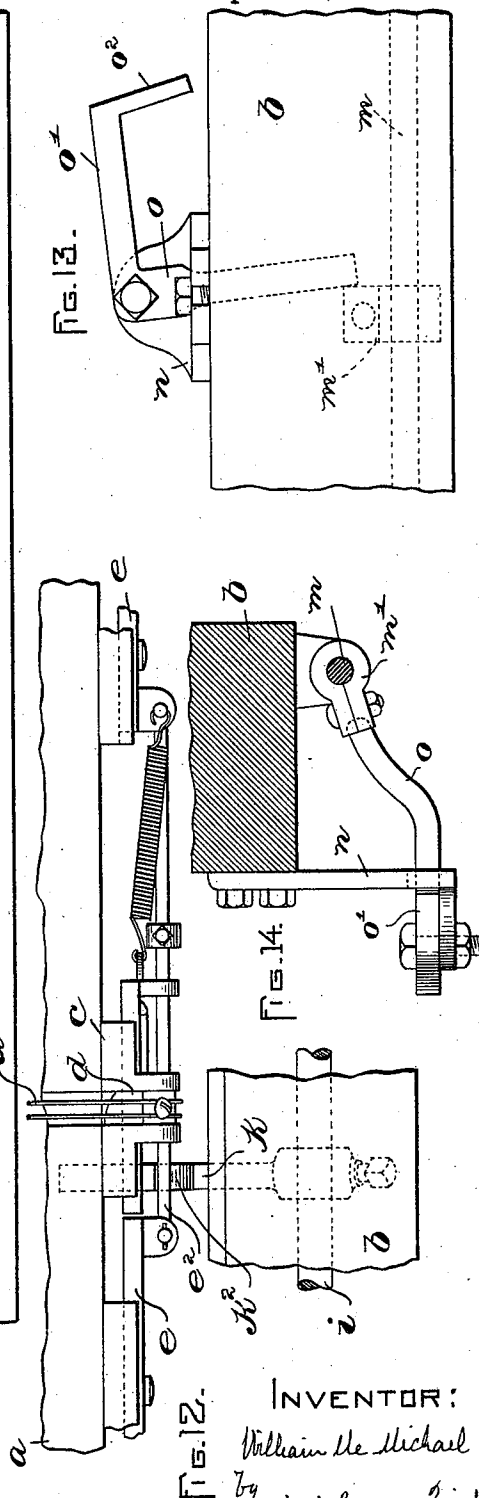
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UNITED STATES PATENT OFFICE.

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WOONSOCKET MACHINE & PRESS COMPANY, OF SAME PLACE.

WEFT STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 581,515, dated April 27, 1897.

Application filed August 9, 1894. Serial No. 519,845. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM McMICHAEL, of Woonsocket, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Weft Stop-Motions for Looms, of which the following is a specification.

This invention relates to that class of loom appliances known as "weft stop-motions," whereby upon breakage or depletion of the weft-thread the loom is automatically thrown out of operation. In devices of this character heretofore devised difficulty has been experienced from the fact that the stop-motion was found to offer an obstruction to starting up the loom again when it had been stopped with the lay up close to the breast-beam, and it was found necessary for the weaver to move back the lay by manual exertion before the loom could be set in motion. To overcome this difficulty, additional devices were employed to remove the obstruction offered by the stop-motion, in the first pick of the loom, when no weft-thread is present to sustain the fork of the locking-dog.

My invention provides a stop-motion which requires no such additional devices and at the same time allows for starting up the loom, with the lay in any position, without obstruction being offered by any part of the stop-motion, although it may have just operated to throw the loom out of action.

In addition to the above the invention has in view the combination of the weft stop-motion with a loose-reed motion of the type shown in my prior patent, No. 533,314, issued January 29, 1895, in such a manner that the operation of the stop-motion to throw the loom out of action does not affect the operation of the loose-reed motion.

The invention which produces the above-stated results consists in certain novel combinations of elements which are recited in the appended claims.

The accompanying drawings, which form part of this specification, illustrate an embodiment of the invention.

Figure 1 shows a top plan view of a sufficient portion of a loom to illustrate the application of my invention thereto. Fig. 2 shows

a front elevation of the lay of the loom. Fig. 3 shows a section on line 3 3 of Fig. 2. Fig. 4 shows a similar sectional view with the detector-fork lowered. Fig. 5 shows a perspective view of the stop-motion devices which are attached to the lay. Figs. 6 and 7 show perspective views of two of these devices. Fig. 8 shows a section on line 8 8 of Fig. 1. Fig. 9 shows a similar sectional view with the lay up to the breast-beam and the stop-motion represented as having acted. Fig. 10 shows a perspective view of the device seen in Fig. 6. Fig. 11 shows a view similar to Fig. 1, with the lay close up to the breast-beam and the weft-thread unbroken. Fig. 12 shows a similar view with the parts in the adjustment they assume when the weft-thread breaks or gives out. Fig. 13 shows a plan view of a modification in the shipping connections. Fig. 14 shows an edge view of the same with the breast-beam in cross-section.

The letter *a* designates the rail or beam of the lay of the loom, and *b* the breast-beam. A plate *c*, fastened to the front side of the said rail of the lay, is formed with a dove-tailed slideway which receives a plate *c'*, having a raised cam-surface *c²* along a portion of its upper edge and a vertical shoulder *c³*, adjacent to one end of said cam-surface. A dog *d* is pivoted between ears on the plate *c'* and rests by gravity on the cam *c²*, and said dog is provided with a detector fork or finger *d'*, which extends over a depression *a'* in the lay and is designed to be sustained by the weft-thread 2 crossing said depression, so as to prevent the dog entering into engagement with the shoulder *c³*.

The design is to cause the plate *c'* to reciprocate in the slideway of the plate *c* as the lay moves to and fro, and so long as the weft is unbroken and extending under the fork *d'* the reciprocations of the plate *c'* carry its shoulder *c³* past the dog *d*. The cam *c²*, riding under the dog, elevates the fork *d'* to allow the shuttle to pass under it, and after the shuttle passes the fork drops upon the weft-thread left by the shuttle. Should the weft-thread be absent over the depression *a'*, the dog will be free to gravitate into the path

of the shoulder c^3 and the plate c' is thereby prevented from completing its stroke and is held at a position to effect the discontinuance of the loom's operation in a manner herein-
5 after described.

I have here shown the lay as equipped with a loose-reed motion of the type shown and described in my former patent, above referred to, and the letter e designates two of the slot-
10 ted locking-plates of this loose-reed motion, which plates are arranged to reciprocate lengthwise of the lay and alternately lock and release the reed by registry of different-sized portions of their slots with heads of bolts e' ,
15 which connect with a holding-bar f back of the reed. The two plates e are connected together by a rod e^2 , whose ends are bent at right angles and entered through ears on the plates, and one of the said plates is connected
20 by a rod g with the breast-beam, the said rod g having a bent end passed loosely through an ear e^4 on the plate and being connected, through a swivel g' , with an ear g^2 on the breast-beam. (See Fig. 8.)

By reason of the above-described connection between the locking-plates of the loose-reed motion and the breast-beam it will be readily seen that reciprocations of said plates will be produced by the to-and-fro movement
30 of the lay. It is the design to also reciprocate the plate c' through the same agency, but as it is not desirable to restrict the movement of the plates e by the locking of the plate c' , provisions are made permitting continued
35 movement of said plates e after the plate c' has been locked by the dog d .

The rod e^2 passes loosely through an ear c^5 on the plate c' and carries a collar e^5 , fastened by a set-screw e^6 and arranged to abut one
40 side of the ear c^5 , and by acting against said ear under one direction of movement of the plates e to impel the plate c' unyieldingly in that direction.

A spiral spring h is connected at one end
45 to an ear h' on the plate c' and at the opposite end to one of the bent ends of the rod e^2 , and this spring exerts itself to hold the ear c^5 against the collar e^5 and cause the plate c' to travel with the plates e in the reverse direc-
50 tion to that above mentioned in the absence of any obstruction such as the dog d presents when it has dropped down in front of the shoulder c^3 .

The letter i designates a rock-shaft or rotary shipping-rod such as common to certain
55 styles of looms, and which is located under the breast-beam and carries a handle i' , whose turning operates a belt-shipping or clutch mechanism, so as to throw the loom into and
60 out of action. The arrangement usually employed provides for completion of the movement in shipping either off or on by a spring after the handle has been moved a certain distance, but such an arrangement is so com-
65 mon in looms generally that it requires no illustration or specific description here. However, it will be understood that in order to

throw the loom out of action it is necessary to move the rocker i through that distance. An arm k is affixed to the shaft i by a set-
70 screw k'' and projects out in front of the breast-beam, and it is formed at its free end on the upper side with a V-shaped cam k' . The plate c' has a pendent arm k^2 , which when
75 said plate is locked by the dog d encounters the cam k' in the movement of the lay toward the breast-beam, but at all other times clears said cam by passing around the end of the same.

In the operation of the loom when the weft
80 is running properly there is no operation of the stop-motion to throw the loom out of action, for the weft-thread extending over the depression a' in the lay serves to support the fork d' and prevent the dog d from dropping
85 far enough to take it into engagement with the shoulder c^3 . The plate c' receives its full movement and the cam c^2 raises the fork each time for the passage of the shuttle, allowing
90 said fork to lower after the shuttle has passed and rest on the weft. As long as the plate c' makes its full stroke lengthwise of the lay, its arm k^2 is carried around the cam k' in the
95 to-and-fro movement of the lay. Upon breakage or depletion of the weft or other cause preventing its extending across the depres-
100 sion a' , so as to support the fork d' , the latter will fall into the said depression and the dog d will then drop in front of the shoulder c^3 and prevent completion of the stroke of the
105 plate c' . When the said plate is thus locked, its pendent arm k^2 is directly in line with the cam k' , and as the lay approaches the breast-beam said pendent arm, by action against the
110 said cam, moves the arm k sufficiently to throw the clutch or shipper, the said arm k then taking a position some distance below the arm k^2 .

An advantage of my invention is that while
110 the latter adjustment of parts obtains and the lay is close up to the breast-beam the loom can be started by turning the handle, substantially three-quarters of a full movement
115 of the latter being allowed without causing the arm k to encounter the arm k^2 and this three-quarters movement being sufficient to put the loom in operation. This is principally due to the formation of the arm k with
120 a V-shaped cam k' , for after the arm k^2 has passed the point of the cam the arm k can be raised to a sufficient distance without encountering the arm k^2 to put the machine in operation.

With my arrangement by holding the han-
125 dle three-quarters on the weaver can run the loom while the detector-fork has no support and the arm k^2 will pass over the cam k' without touching it. This is an advantage, as it is frequently desired to run the loom experi-
130 mentally without doing any work and, therefore, in the absence of a weft-thread.

Figs. 13 and 14 illustrate means for adapt-
ing the invention to a loom in which the shipper-rod moves longitudinally under the

breast-beam instead of rocking. The letter *m* designates such a rod supported under the breast-beam and carrying affixed to it a collar *m'*. A bracket *n* is affixed to the breast-beam and depends therefrom, and a bent lever is pivoted to said bracket so as to move in a horizontal plane. One arm *o* of said lever coacts with the collar *m'*, and the arm *o'* has an angular end portion *o²*, adapted for coaction with the pendent arm *k²* of the cam-plate *c'*. The said pendent arm *k²* in its to-and-fro motion goes around the end portion *o²* the same as it goes around the arm *k* so long as the weft is intact, but when the weft breaks, the arm *k²*, checked in its lateral movement, encounters the said end portion *o²* and, by acting against the same, moves the bent lever and ships the clutch mechanism.

What I claim as my invention is as follows:

1. In a loom, the combination of the lay, the breast-beam, a loose-reed motion employing locking-slides on the lay to stop the loom in the event of the shuttle being caught in the shed, connections between said slides and the breast-beam whereby they are reciprocated longitudinally of the lay by the to-and-fro movement of the latter, a weft stop-motion employing a slide adapted to reciprocate lengthwise of the lay to stop the loom on the failure of a weft-thread, and an elastic connection between the slide of the weft stop-motion and the slides of the loose-reed motion.

2. In a loom, the combination of the lay provided with a depression; the breast-beam; a loose reed, a reed-locking slide on the lay; connections between the reed and said slide; a rod connecting said slide with the breast-beam; a cam-plate on the lay arranged to reciprocate lengthwise thereof and having a stop-shoulder and a pendent arm; connections between said cam-plate and the reed-locking slide, including elastic provisions to permit independent movement of the reed-slides; a gravity-dog pivoted to the lay and coacting with the cam-plate, said dog having a detector-fork to rest on the weft where it crosses the depression in the lay; and shipping

mechanism arranged to be actuated by the pendent arm on the cam-plate.

3. In a loom, the combination of the lay provided with a depression; the breast-beam; a loose reed, reed-locking slides on the lay; connections between the reed and slide, a rod connecting said slides together; a rod connecting one of the slides with the breast-beam; a cam-plate on the lay arranged to reciprocate longitudinally thereof and having a stop-shoulder and a pendent arm and also provided with an ear embracing the rod which connects the reed-locking slides; a collar on said rod for abutting said ear; a spring connecting the cam-plate with the rod; a gravity-dog pivoted to the lay and coacting with the cam-plate, said dog having a detector-fork to rest on the weft-thread where it crosses the depression in the lay, and shipping mechanism arranged to be actuated by the pendent arm of the cam-plate, substantially as described.

4. In a loom, the combination with the lay provided with a depression and the breast-beam, of a weft stop-motion comprising a cam-plate on the lay arranged to reciprocate lengthwise thereof and having a stop-shoulder and a rigid pendent arm, connections between said cam-plate and the breast-beam for producing reciprocations of the said plate by the to-and-fro movement of the lay, a gravity-dog pivoted to the lay and coacting with the cam-plate, said dog having a detector-fork to rest on the weft-thread where it extends over the depression in the lay, and a rocking shipper-rod under the breast-beam and having an arm affixed to it and formed with a substantially V-shaped cam on its upper side for coaction with the pendent arm of the cam-plate.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 1st day of August, A. D. 1894.

WILLIAM McMICHAEL.

Witnesses:

MALCOLM CAMPBELL,
JOHN J. HEFFERNAN.