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Patented Aug. 21, 1900.

W. H. BAKER & F. E. KIP.
WARP STOP MECHANISM FOR LOOMS.

(Application filed Nov. 2, 1899.)

(No Model.)

3 Sheets—Sheet 1.

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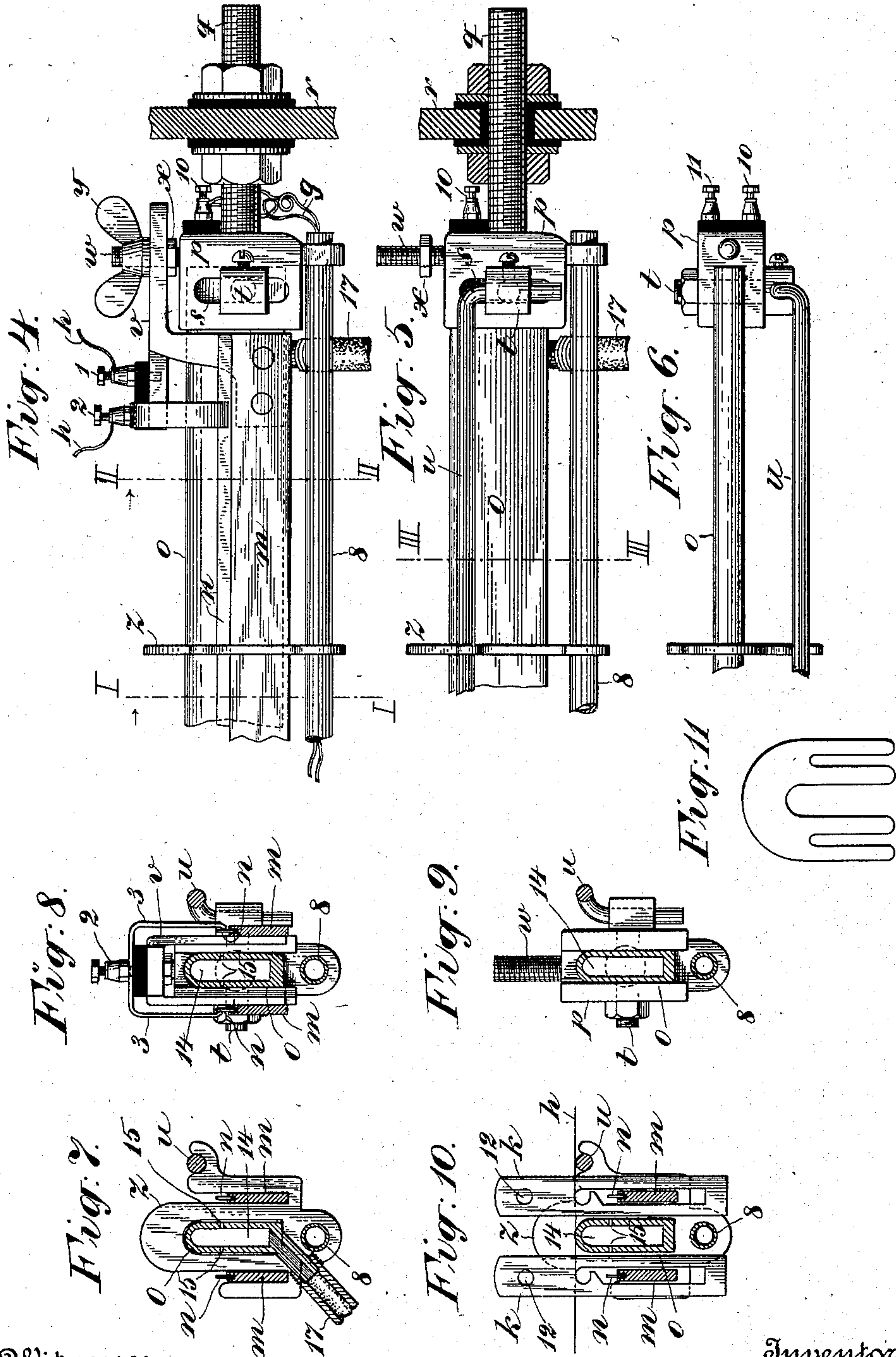
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3 Sheets—Sheet 2.



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3 Sheets—Sheet 3.

Fig. 18.

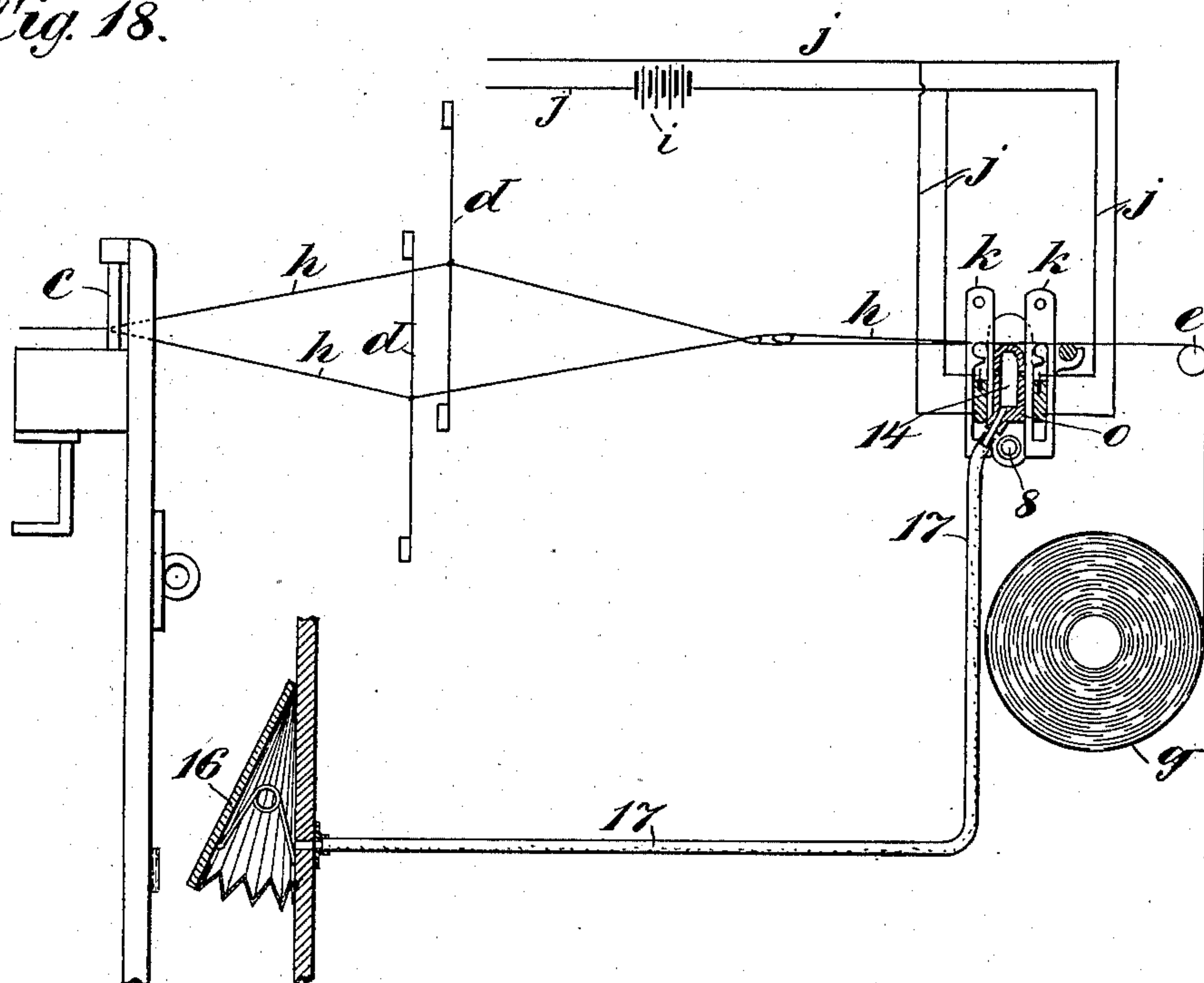


Fig. 12 v

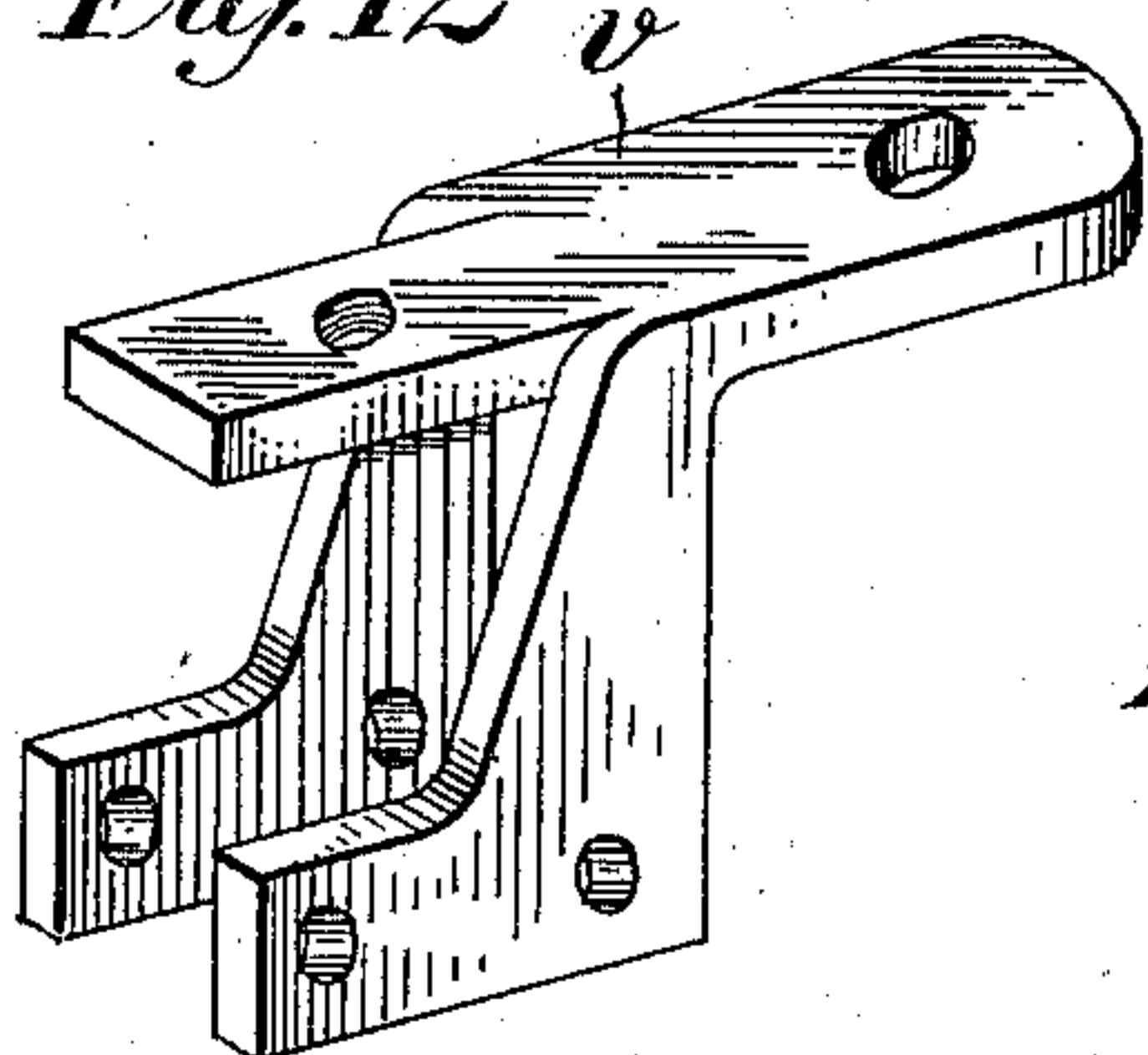


Fig.13 Fig.14 Fig.15 Fig.16 Fig.17

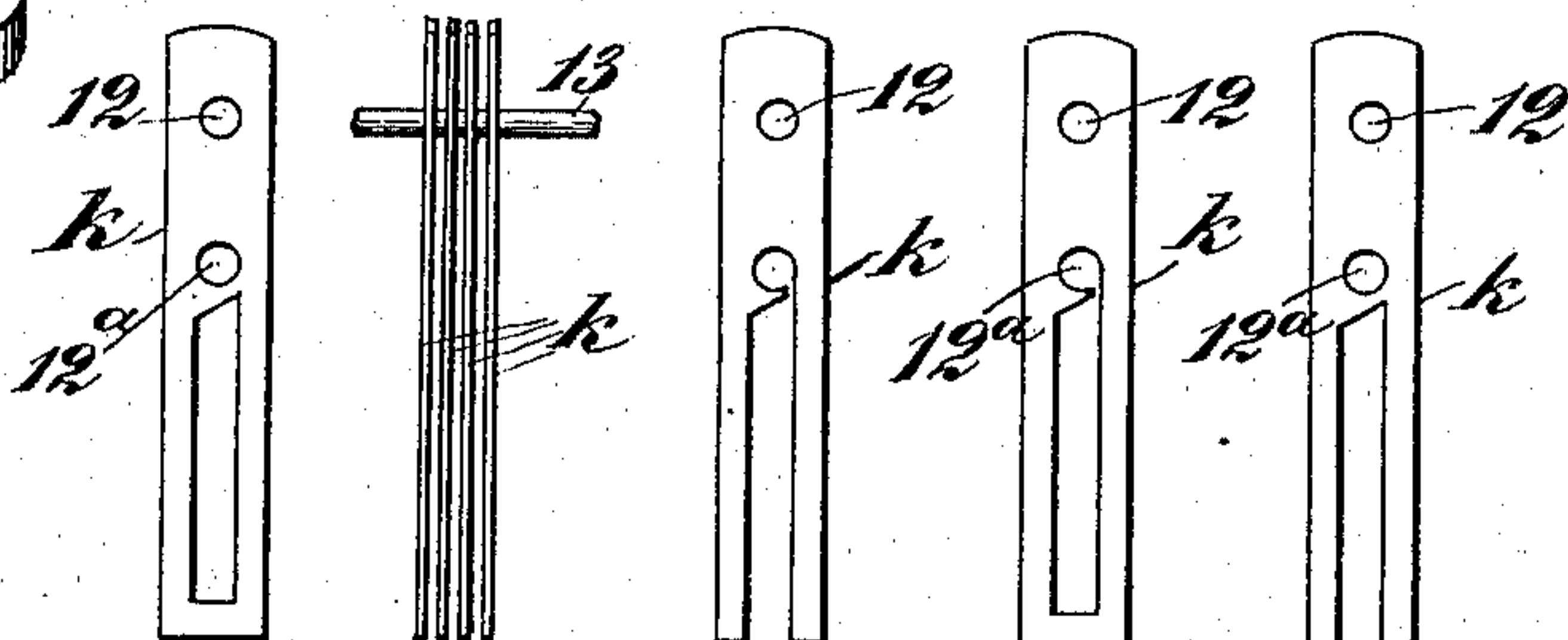
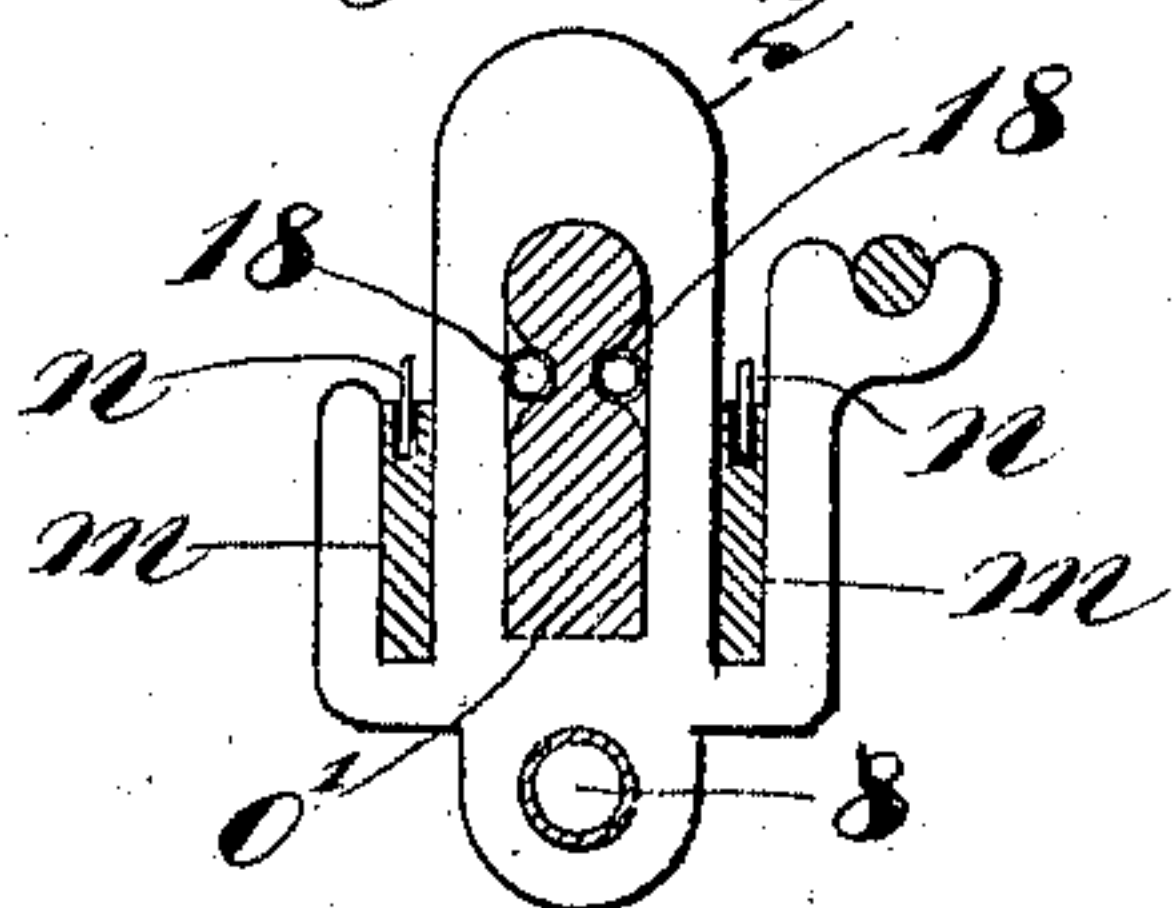


Fig. 19.



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WARP STOP MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 656,612, dated August 21, 1900.

Application filed November 2, 1899. Serial No. 735,569. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM H. BAKER, residing at Central Falls, Providence county, Rhode Island, and FREDERIC E. KIP, residing at Montclair, Essex county, New Jersey, citizens of the United States, have invented certain new and useful Improvements in Warp Stop Mechanism for Looms, of which the following is a specification.

10 This invention relates to looms employing an electrical warp stop mechanism or mechanism for stopping the loom when a warp-thread breaks; and the object is in part to provide a means for mounting the compound terminals so that they and the drops thereon may be the more conveniently lifted out for drawing in or replenishing the warp, in part to provide for removing fluff or lint from the terminals, and in part to provide other details of improvement, which will be hereinafter more fully described.

In the accompanying drawings, which illustrate an embodiment of the invention, Figure 1 is a diagrammatical side view of a loom embodying the invention. Fig. 2 is a perspective view illustrating the knock-off or loom-stopping mechanism. Fig. 3 is a face view of the supporting-bar which extends across the loom and which includes the warp-supports and supports for the compound terminals. Fig. 4 is a side elevation of one end of the supporting-bar with the compound terminals in place. Fig. 5 is a side elevation of same, the compound terminals being omitted; and Fig. 6 is a plan of the parts seen in Fig. 5. Figs. 7 and 8 are cross-sections at lines I and II in Fig. 4. Fig. 9 is a cross-section at line III in Fig. 5. Fig. 10 is a cross-section similar to Fig. 7, but showing the circuit-closing drops in place on the warp-threads. Fig. 11 is a view showing a bridge-piece which differs somewhat from that illustrated in Fig. 7. Fig. 12 is a perspective view of the saddle-piece which connects the compound terminals at their ends. Figs. 13 and 14 are views illustrating the means for lifting the drops, and Figs. 15, 16, and 17 show different forms of the drops. Fig. 18 is a diagrammatic view of a loom, showing means for supplying air for blowing fluff or lint from the terminals. Fig. 19 is a cross-section similar

to Fig. 7, illustrating a modification of the means shown in Fig. 7 for distributing the air.

Referring to the general view Fig. 1, *a* represents the breast-beam of a loom; *b*, the lay; *c*, the reed; *d*, the heddles; *e*, the whip-roll, and *f* the shipper-lever. These parts are common in looms and are represented somewhat diagrammatically in this figure.

g is the warp-beam, and *h* the warps, which may be mounted in the usual manner.

Any form of electrical generator *i* feeds or supplies a normally-open circuit represented by conductors *j*, this circuit being closed, whenever a warp-thread breaks, by the fall of a drop *k*, one of which is suspended on each thread. The terminals or electrodes of the circuit are substantially the same as the compound terminals shown in our United States Letters Patent Nos. 632,004 and 624,155, and the drops *k* are also in their general form similar to those shown in these patents. Therefore a brief description thereof will suffice. Each compound terminal comprises a terminal or electrode *m*, in the upper edge of which is set and properly insulated the other terminal *n*, the former being a rather substantial piece or strip and the latter a thinner strip of metal. The two terminals *m* and *n* form the compound terminal. The drop *k* is of thin metal of elongated form, with a slot to receive the compound terminal and an aperture above the slot for the passage of the warp-thread which normally supports the drop. When the thread breaks, the drop falls and closes the circuit at the terminals.

In order to provide a support for the compound terminals and also to provide for the ready removal of the latter, together with the drops, means are employed which will now be described with especial reference to the detail views of the drawings.

The warp-support or supporting-bar *o* is secured at its respective ends in yokes *p*, which have each a screw or bolt *q*, which passes through the loom-frame *r*, as seen in Figs. 4 and 5, being insulated from the frame and provided with securing-nuts, as shown. In order to permit of adjusting the bar *o* up or down to accommodate it to the warps, the jaws of the yoke *p* have slots *s*, through which passes the bolt *t*, which secures the end of the

bar *o*. An auxiliary warp-support *u* may be employed, and this may be formed of a rod having its end bent down and secured adjustably in the head of the bolt *t*. By the means
5 above described the warp-supports may be strained longitudinally in the loom-frame and adapted for vertical adjustment.

The two compound terminals are properly spaced and connected together at their ends
10 by saddle-pieces *v*, which take over the yokes *p*. Each saddle-piece has pendent lugs, (clearly shown in Fig. 12,) to which the ends of the terminals are secured. In the top of the yoke is set an upright screw *w*, which
15 passes through a hole in the saddle-piece *v*, and on this screw are a supporting-nut *x* and a clamping-nut *y*. The nut *x* enables the compound terminals to be set higher or lower with respect to the warp-support; but it is
20 not essential to the invention.

In order to distance the compound terminals and maintain them parallel with the warp-support, bridge-pieces *z* are employed, the form of which may be seen in Fig. 7.
25 Each bridge-piece has in it an aperture by which it is threaded on the supporting-bar *o* and slots open above to receive the compound terminals. At the side it has also a bracket to support the auxiliary warp-support *u*.
30 These bridge-pieces *z* are placed at suitable intervals along the bar *o*. The bridge-pieces *z*, in combination with a compound terminal or plurality of terminals and with a warp-support parallel with the latter, are broadly
35 claimed in our copending divisional application, Serial No. 24,133, filed July 19, 1900, and therefore are not claimed herein. They are merely shown herein for purposes of illustration.

40 With the construction above described the connected compound terminals may be lifted off from the loom by merely removing the clamping-nuts *y*.

The electrical devices will now be described.
45

On one of the saddle-pieces *v* are mounted the binding-posts 1 and 2. The post 1 is electrically connected with the metallic saddle-piece and through it with the terminals *m*,
50 and the post 2 is insulated from the saddle-piece and electrically connected, through metal blades or strips 3, with the respective terminals *n*.

In the circuit, Figs. 1 and 2, is an electro-
55 magnet 4, which is carried on one arm of a lever 5, fulcrumed on the under side of the breast-beam, the other arm of said lever being situated adjacent to the shipper-lever *f*. This lever 5 is the lever which is employed
60 on looms to operate, in connection with the swell on the shuttle-box, the protecting-finger, the "frog," and a "dagger," to stop the loom in case the shuttle fails to enter the shuttle-box at the proper time. The armature-lever 6 of the magnet 4 falls normally
65 by gravity below the path of a tappet 7 on the vibrating lay; but when the magnet is

excited it lifts said lever into the path of said tappet, and when the lay beats up the tappet impinges on the armature-lever, swings the
70 lever 5, and causes it to free the shipper-lever, thus stopping the loom.

The operation is as follows: When a warp-thread breaks, the drop *k* falls and closes the circuit at the terminals *m* and *n*, the magnet
75 4 is excited and attracts its armature, the lay beats up, and the tappet 7 impinges on the armature-lever and through the lever 5 sets free the shipper-lever *f* and stops the loom.

As binding-posts 1 and 2 are situated only
80 at one end of the compound terminals and the help may so turn the latter that they will be at either side of the loom indifferently, as most convenient to him, it is desirable to provide circuit connections for said posts, as will
85 now be described.

Mounted in bearings in the yokes *p*, below the bar *o*, is a tube 8, through which extend wires 9, Fig. 4, connected with binding-posts
90 10 and 11, Fig. 6, mounted on and insulated from the yoke *p* at one side of the loom. When the compound terminals are so set that the binding-posts 1 and 2 are on the same side of the loom with the posts 10 and 11, the conductors *j*, which come in on that side, may be
95 coupled directly to the posts 1 and 2; but if the latter be situated at the opposite side of the loom the conductors *j* will be attached to the posts 10 and 11 and connection with the posts 1 and 2 will be established by the con-
100 ductors 9 extending through the tube 8. This tube extends through the several bridge-pieces *z*, as clearly shown. The bridge-pieces *z* shown in the principal views thus remain at all times mounted on the support *o* and
105 tube 8, the compound terminals lifting out of the open slots therein; but we may employ bridge-pieces such as those seen in Fig. 11, which are designed to fit down over the compound terminals and the warp-support, hav-
110 ing three slots to fit over these parts. These bridge-pieces of Fig. 11 lift off with the compound terminals.

We do not limit ourselves to the specific construction above described, as this may be
115 varied somewhat without departing from our invention. The tube 8 and the auxiliary warp-support are not absolute essentials. An important feature is the connecting of the compound terminals and the facility af-
120 forded for removing them from the loom either together with the drops or without the latter.

It is desirable under some conditions in drawing in the warp to thread a rod through
125 all of the circuit-closing drops on the compound terminal in order to line up the drops both edgewise and vertically, and in order to effect this each drop is furnished with an aperture 12, situated above the thread-aperture
130 (12^a in Figs. 13 to 17) therein, and a rod 13 is provided to be threaded through the aligned apertures 12 in the drops. This is illustrated in Figs. 13 and 14, and Figs. 15, 16, and 17.

show several forms of our circuit-closing drop furnished each with an aperture 12.

As fluff or lint may collect on the members of the compound terminal and particularly on the upper edge of the terminal *n*, means may be provided for blowing off the said fluff or lint, thus keeping the terminals free from such insulating material which would be apt to prevent the closure of the circuit when one of the circuit-closing drops falls. We provide a means for blowing off the fluff or lint, and this will be now described with especial reference to Figs. 7, 8, 9, 10, and 18. The warp-support *o* is made hollow or tubular or has in it a bore 14, with lateral jet-apertures 15 directed toward the terminals *n* at either side. Air under tension is admitted to the bore 14 and preferably intermittently and jetting out at the lateral apertures 15 upon the terminals keeps them free from all dust or particles tending to interfere with proper electrical contact. Fig. 18 illustrates one means that may be employed for supplying air intermittently to the jets. This consists of an ordinary bellows 16, set in such a position that it will be collapsed or compressed by the lay or some part thereof when the latter recedes. This bellows is connected by a suitable pipe, hose, or tube 17 with the bore 14. The connection of the tube 17 with the tubular support *o* may be seen in Figs. 4, 5, and 7. Obviously there are many ways of effecting the above object—namely, the blowing of lint, fluff, and the like from the terminals by means of jets or puffs of air. It is not essential that the bore 15 or other air-passages extending across the loom shall be in the warp-support *o*; but this arrangement is convenient. Fig. 19 shows how two tubes 18, placed in exterior recesses in the support *o'* and having suitable perforations, may be employed. Obviously, also, the air may be forced to the transverse tube or air-passage by other means than that shown in Fig. 18, and we do not limit ourselves in this respect.

By the words "compound terminal" as herein employed we mean two strips, both conductors of electricity and forming terminals of an operating-circuit, one of said terminals being the smaller and connected with but insulated from the other or larger strip. This compound terminal or electrode acts as a guiding-bar or stringer-bar for the drops, which embrace it snugly and are thus kept in alignment against the tendency of the moving warp to draw them with it.

It will be obvious that the means herein shown for blowing off the lint or fluff from circuit-closing drops of an electrical stop-motion would be equally effective in the case of a mechanical stop-motion having drops or drop devices and a guiding-bar or stringer-bar. Obviously, also, it is not essential that the walls of the transverse air conduit or conduits, with lateral jet-apertures, shall form an integral part of the warp-supporting bar. Fig. 19, for example, shows a construction

where said conduit is not formed in the warp-supporting bar, and said conduit may be formed in any transverse part of the apparatus.

Having thus described our invention, we claim—

1. In a warp stop-motion for looms, the combination with a warp-support mounted in the loom-frame and having upright screws *w* and nuts *y*, of two saddle-pieces *v*, having holes which take over the respective screws *w*, and two compound terminals secured rigidly at their respective ends to said saddle-pieces.

2. In a warp stop-motion, the combination with the compound terminals and the saddle-pieces rigidly connecting the ends of the same, said saddle-pieces having each two pendent lugs to which the terminals are secured, substantially as set forth.

3. In a warp stop-motion, the combination with the yokes *p*, each provided with means for securing it rigidly in the loom-frame, and the warp-support mounted adjustably in said yokes, of the saddle-pieces *v*, mounted removably on the respective yokes and each having a part which projects over the yoke and pendent portions to receive the compound terminals, and the said terminals secured to the respective pendent portions of the yokes.

4. In a warp stop-motion, the combination with the compound terminals of the saddle-pieces rigidly connecting the same, said saddle-pieces having each an attaching portion by which it is secured and two pendent portions to which the terminals are secured, and means for securing said saddle-pieces adjustably and removably with respect to the loom-frame.

5. In a warp stop-motion, the combination with the compound terminals, of the saddle-pieces rigidly connecting the ends of the same, and the binding-posts mounted on one of said saddle-pieces, said posts being electrically connected to the respective terminals, substantially as set forth.

6. The combination with the compound terminals, each consisting of an electrode *m*, and a narrower electrode *n*, mounted in the upper edge thereof, of the saddle-pieces rigidly connecting the ends of said compound terminals, the binding-post 1, electrically connected with the electrode *m*, the binding-post 2, and the conductors 3, connecting said post with the electrode *n*, substantially as set forth.

7. The combination with the warp-support, having upright screws *w*, of the compound terminals, the saddle-pieces connecting them at their ends and having apertures through which pass the said upright screws, and the nuts on said screws.

8. The combination with the warp-support, having upright screws *w*, of the compound terminals, the saddle-pieces connecting them at their ends and having apertures through

which pass the said upright screws, the adjusting-nuts x on said screws under the saddle-pieces, and the clamping-nuts on said screws.

5 9. The combination with the support o , and the yokes p , at the respective ends of said support, of the tube 8, mounted in bearings in said yokes, substantially as and for the purposes set forth.

10 10. The combination with the warp-support, and means for securing it in the loom-frame, of the compound terminal mounted on said support, the tube 8, carried by said support, the binding-posts, and the conductors extend-
15 ing through said tube and connected with said posts.

11. In an electrical warp stop-motion for looms, the combination with a terminal extending transversely of the loom, and the
20 hollow or tubular warp-support o , extending

across the loom alongside of said terminal, said support having in it lateral jet-apertures, of means for forcing air into the hollow of said support, substantially as set forth.

12. In an electrical warp stop-motion for 25 looms, the combination with the tubular warp-support o , having lateral jet-apertures at both sides, and the pair of compound terminals extending transversely of the loom and adjacent to said support, of means for forcing air 30 into the hollow of said support.

In witness whereof we have hereunto signed our names, this 19th day of September, 1899, in the presence of two subscribing witnesses.

WILLIAM H. BAKER.
FREDERIC E. KIP.

Witnesses:

PETER A. ROSS,
HENRY CONNETT.