

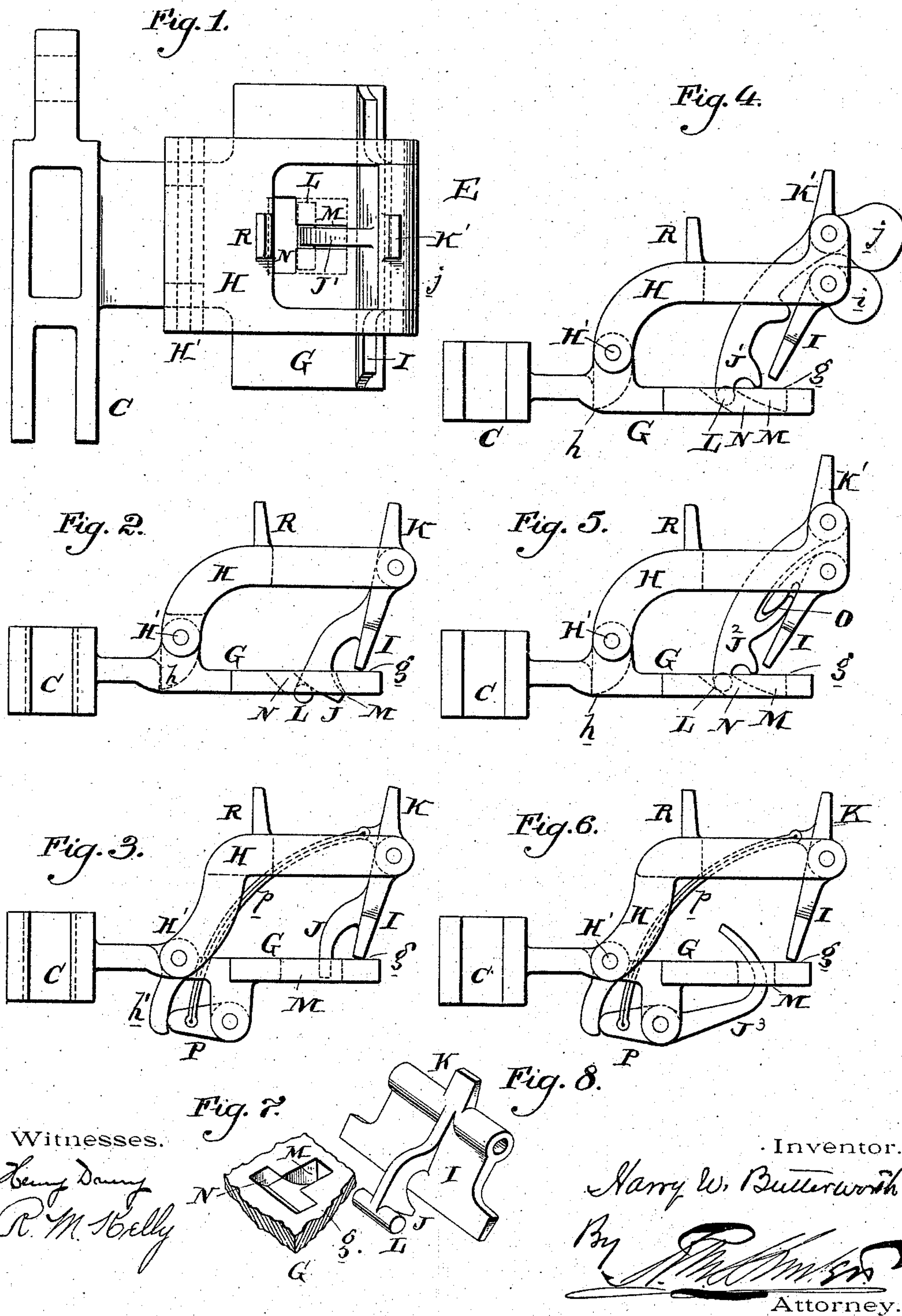
(No Model.)

2 Sheets—Sheet 1.

H. W. BUTTERWORTH.
AUTOMATIC CLAMP FOR TEXTILE MACHINERY.

No. 571,508.

Patented Nov. 17, 1896.



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2 Sheets—Sheet 2.

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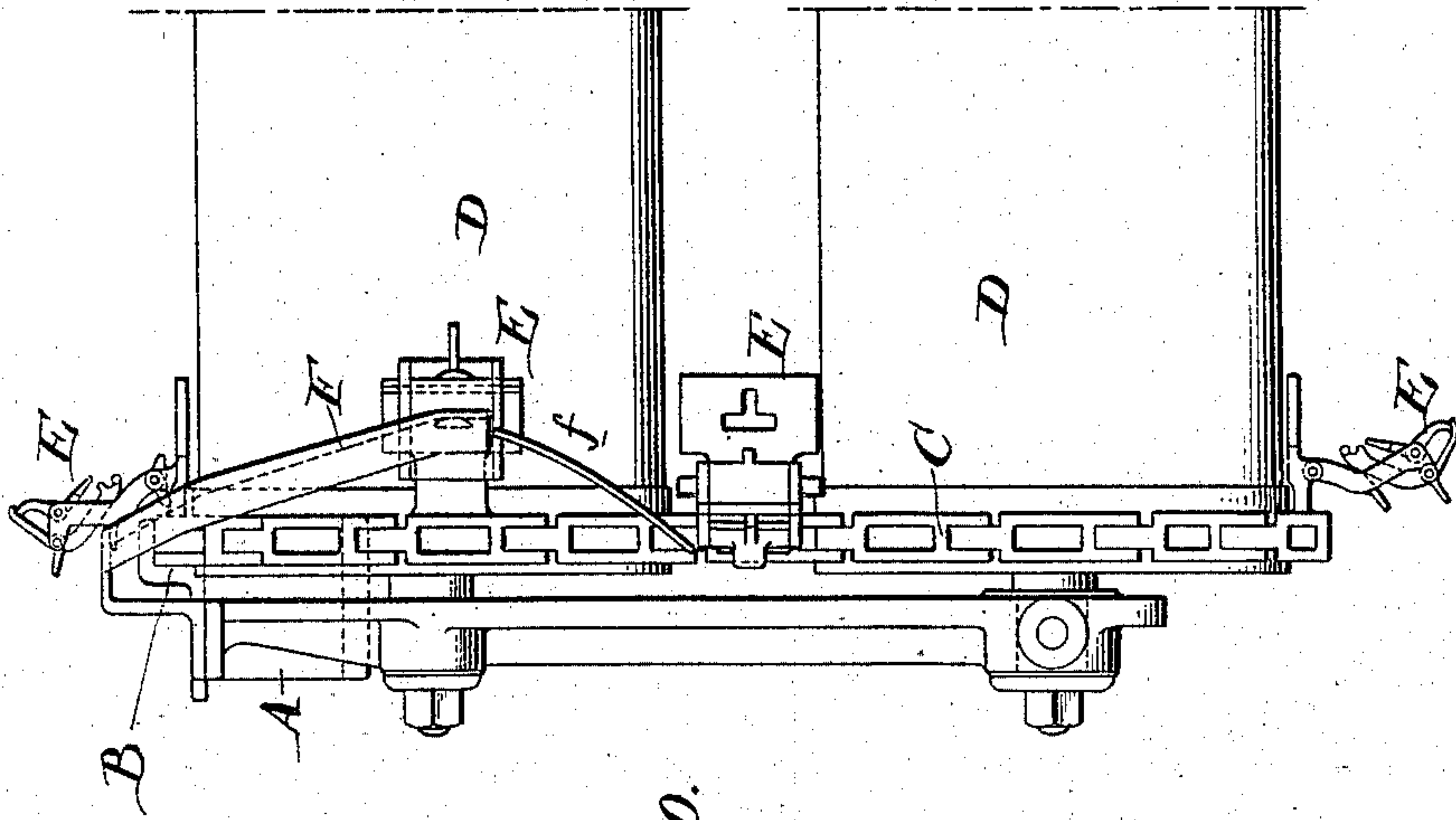


Fig. 10.

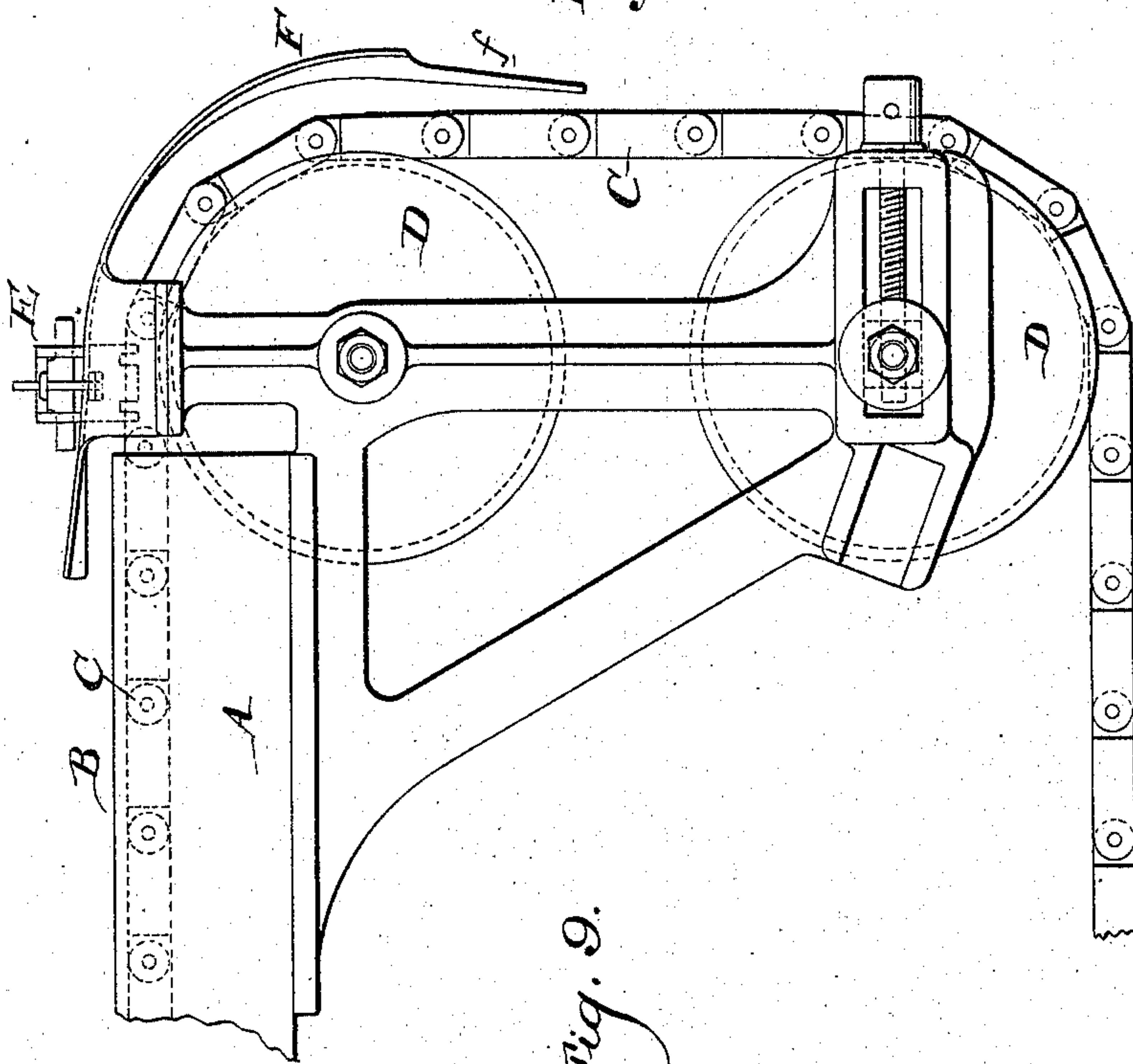


Fig. 9.

Witnesses.

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UNITED STATES PATENT OFFICE.

HARRY W. BUTTERWORTH, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR
TO THE H. W. BUTTERWORTH & SONS COMPANY.

AUTOMATIC CLAMP FOR TEXTILE MACHINERY.

SPECIFICATION forming part of Letters Patent No. 571,508, dated November 17, 1896.

Application filed June 8, 1896. Serial No. 594,695. (No model.)

To all whom it may concern:

Be it known that I, HARRY W. BUTTERWORTH, of the city and county of Philadelphia, and State of Pennsylvania, have invented an Improvement in Automatic Clamps for Textile Machinery, of which the following is a specification.

My invention has reference to automatic clamps for textile machinery; and it consists of certain improvements, which are fully set forth in the following specification and shown in the accompanying drawings, which form a part thereof.

My improvements comprehend certain constructions of a clamp adapted to textile-machines, and especially to tentering-machines, which shall have capacity for a portion thereof being turned out of the way to permit the ready passage of the fabric into the clamp, and then automatically adjust itself for the proper gripping or clamping of the edge of the fabric. The special application of my improvements to tentering-machines will make the advantageous features of my improvements more apparent. In tentering-machines the edges of the fabric have heretofore been inserted by hand. The clamps, as heretofore made, have been impractical to permit the fabric to be inserted automatically within the grasp of the clamp, because the upper jaw of the clamp cannot secure a position above the fabric in passing about the end cylinders of the machine. By my improvements I support the gripping or upper jaw of the clamps upon a movable frame carried with the lower jaw, and combine therewith automatic locking devices which lock or unlock the lower jaw and movable frame relatively in position at or about the time the clamping operation takes place. In this manner the upper part of the clamp is thrown back and permits the lower jaw to readily pass under the fabric, after which by a suitable guide the upper part of the clamp is turned down into position and locked and the upper gripping jaw thrown into action to grip the extreme edge of the fabric. It is customary in practice to form these clamps upon links of a chain, so that there is a series of the clamps hinged together, though my in-

vention may be employed in other connections than with the chain-clamps.

My improvements will be better understood by reference to the accompanying drawings, in which—

Figure 1 is a plan view of the link and clamp complete. Fig. 2 is an end elevation thereof. Figs. 3 to 6, inclusive, are end elevations of modifications of the same invention. Fig. 9 is a side elevation of one end of a tentering-machine. Fig. 10 is an end elevation of a portion of same. Fig. 8 is a perspective view of the clamping-jaw shown in Fig. 2; and Fig. 7 is a perspective view of the aperture in the stationary jaw of Figs. 2, 4, and 5.

A is one of the longitudinal main frames of a tentering-machine, and is provided with a conveyer-guide B, in which the endless chain or conveyer C moves. The conveyer C is guided about guiding rolls or cylinders D D. The conveyer C is made up of links, all or a portion of which are provided with clamps E. In Figs. 9 and 10 only a few of these clamps are illustrated, though they may be upon every link or every other link, as desired.

In all of the constructions of clamps illustrated the link is provided with a stationary jaw G, having a gripping-surface *g*, combined with a pivoted frame H, hinged to the lower jaw at H' and having hinged or journaled at its free end a movable jaw I, the lower end of which is adapted to grip the fabric resting upon the surface *g*. In addition to these elements there is a locking device for positively locking the frame H relatively to the lower jaw, so that it cannot be thrown upward or away from said lower jaw when the gripping operation of the movable jaw comes into action.

Referring specifically to Figs. 1 and 2, we have the pivoted jaw I, provided at the rear with a controlling-finger J and a transverse locking-bar L, the said parts being clearly shown in Fig. 8, and adapted to a slot M N in the face of the lower jaw G. The frame H is provided with a heel extension *h*, which limits its downward movement. The upper part of the jaw I is provided with an extension K, while the upper part of the

frame H is also provided with a projection R, the said parts being operated upon by suitable cams for controlling the movements of the parts H and I. The operation of this cam will now be understood. Assuming that the frame H and the jaw I are thrown backward, as indicated in Fig. 10, the cloth is drawn into the machine and allowed to rest directly upon the face *g* of the lower jaw. As the clamp rises the cam *f* operates upon the projection R and throws the frame H over into position indicated in Fig. 2, and this brings the controlling-finger J and the locking-bar L upon the fabric, and thereby holds the jaw I from gripping the fabric. As the fabric is drawn from under the parts J and L it permits said parts to fall into the apertures M N, and thereby throws the gripping edge of the jaw I upon the extreme lateral edge of the fabric. As the locking-bar L falls through the grooved slot N it locks the frame H at substantially the same moment that the jaw I grips the fabric, as it is under the locking operation of the said jaw that the gripping operation takes place. After the tentering operation has been completed suitable cams first operate upon the part K to throw the locking-bar L out of the slot N and then act upon the projection R to raise the frame H, so as to be in position for receiving the fabric upon its return to the starting-place. It will be observed that in this construction the lock for the frame H is combined with the controlling-finger J, and thereby forms a very inexpensive construction.

Referring to Fig. 4, we have the jaw I counterweighted, as at *i*, and pivoted to the frame H independently of the controlling-finger. In this case the controlling-finger J' is also provided with a transverse locking-bar L and is pivoted upon the end of the frame H independently of the movable jaw I. This controlling-finger is also provided with a counterweight *j*, and which operates upon the counterweight of the jaw I, whereby the raising of the controlling-finger will throw the jaw out of clamping action, and vice versa. The jaw I should be so counterweighted that it will fall of its own weight to grip the fabric, and this action may be insured by making the controlling-finger J' positively strike the back of the jaw I and throw it downward. The controlling-finger J' is also provided with a projection K', to be acted on by the cam in place of the projection K of the jaw shown in Fig. 2. The operation of the controlling-finger and locking-bar is precisely the same in this figure as in the construction shown in Fig. 2.

Referring to Fig. 5, we have substantially the construction of Fig. 4, and in this case the controlling-finger J² is connected with the pivoted jaw I by a tooth connection O, which sustains the jaw away from the fabric until the controlling-finger J² has been liberated. In this case the descent of the controlling-finger J² positively causes the jaw I to be pressed down upon the fabric. The locking

action of the parts L N in this construction is the same as that of Figs. 2 and 4.

Referring to Fig. 3, we have the jaw I, provided with the controlling-finger J, as in Fig. 2; but there is no locking-bar L or transverse slot N. In lieu thereof I employ a pivoted lock P, arranged below the jaw G and adapted to be thrown into and out of position relative to the heel extension *h'* of the frame H. The pivoted lock P is connected with the upper end of the jaw I by a light link *p*. It will now be understood that when the fabric is drawn from under the controlling-finger J so as to bring the gripping action of the jaw I into operation the movement of the jaw I draws down the pivoted lock P and thereby simultaneously locks the frame H at the moment the jaw I is gripping the fabric.

In the construction shown in Fig. 6 we have all of the elements the same as in Fig. 3, with the exception that the controlling-finger J is dispensed with and an upwardly-extending controlling-finger J³, attached to and moving with the lock P, is employed. In this case the fabric holds the lock P out of position as well as the jaw I away from the fabric until after the fabric is liberated by the free end of the controlling-finger J³.

It will be observed that in all of these constructions, which are modifications of the same general invention, there is a frame movable relative to one of the jaws and carrying thereon the second or movable jaw, combined with a locking device for locking the movable frame relatively to the first-mentioned jaw to permit the gripping action of the second or movable jaw. It will be observed that in the preferred construction of my improvements there is a relation between the locking devices and the movable gripping-jaw which insures the locking and gripping action to take place simultaneously or about at the same instant, thereby obviating lost motion and simplifying in a great measure the devices.

While I prefer the constructions herein described, I do not confine myself to the details thereof, as they may be modified without departing from the spirit of my invention.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A clamp for textile machinery consisting of a stationary jaw, a frame movably connected to the stationary jaw and adapted to have its free end movable to or from the stationary jaw, a stop to limit the approach of the free end of the movable frame toward the stationary jaws, a loose gravity-actuated jaw loosely pivoted to the free end of the movable frame, and a cloth-controlled locking device freely movable to lock the movable frame except when held out of action by the cloth.

2. A clamp for textile machinery, consisting of a stationary jaw, a frame movably connected to said stationary jaw, a loosely-piv-

oted gravity-actuated jaw carried upon the frame and adapted to operate in connection with the stationary jaw, a locking device for locking the movable frame relatively to the stationary jaw, and a cloth-controlled retaining-finger for simultaneously controlling the movement of the movable jaw and locking device.

3. A clamp for textile machinery, consisting of a stationary jaw, a frame movably connected to said stationary jaw, a loosely-pivoted gravity-actuated jaw carried upon the frame and adapted to operate in connection with the stationary jaw, a locking device for locking the movable frame relatively to the stationary jaw, and a cloth-controlled retaining-finger for simultaneously controlling the movement of the movable jaw and locking device and provided with an extension adapted to be acted upon by cams to move the locking device and movable jaw.

4. A clamp for textile machinery consisting of a stationary jaw, a frame movably connected to the stationary jaw and adapted to have its free end movable to or from the stationary jaw, a stop to limit the approach of the free end of the movable frame toward the stationary jaw, a loose gravity-actuated jaw loosely pivoted to the free end of the movable frame, a cloth-controlled locking device freely movable to lock the movable frame except when held out of action by the cloth, and a connection between the cloth-controlled locking device and gravity-actuated jaw.

5. In a clamp for textile machinery, the combination of a frame having a clamping-jaw, a movable frame carried by said main frame, a loose gravity-actuated gripping-jaw pivoted to the movable frame, means independent of the jaws to limit the movable frame in one direction, and a gravity-actuated locking device to limit the movement of the movable frame in the other direction.

6. In a clamp for textile machinery, the combination of a frame having a clamping-jaw, a movable frame carried by said main frame, a gripping-jaw pivoted to the movable frame, means independent of the jaws to limit the movable frame in one direction, a locking device to limit the movement of the movable

frame in the other direction, and a gravity-actuated and cloth-controlled finger for controlling the gripping action of the movable jaw.

7. In a clamp for textile machinery, the combination of a flat clamping-jaw having a slot in its face, with an overhanging frame hinged to the rear end of the flat clamping-jaw, a pivoted clamping-jaw carried at the overhanging end of the frame, a gravity-actuated and cloth-controlled finger for controlling the clamping operation of the movable jaw, and a lock for locking the overhanging frame relatively to the flat jaw under the control of the controlling-finger.

8. In a clamp for textile machinery, the combination of a flat clamping-jaw having a slot in its face, with an overhanging frame hinged to the rear end of the flat clamping-jaw, a counterweighted pivoted clamping-jaw carried at the overhanging end of the frame, a controlling-finger for controlling the clamping operation of the movable jaw, and a counterweighted lock for locking the overhanging frame relatively to the flat jaw under the control of the controlling-finger.

9. The combination of a stationary jaw, a pivoted frame hinged thereto, a pivoted jaw carried at the free end of the hinged frame, and a cloth-controlled locking device for locking the hinged frame relatively to the stationary jaw adapted to be controlled by the fabric to be clamped.

10. In a tentering-machine, the combination of a chain or conveyer provided with clamps, consisting of a stationary jaw, a hinged frame movable to and from the said jaw, a movable jaw hinged to the free end of the movable frame, and a cloth-controlled locking device for locking the movable frame to the stationary jaw during the clamping operation of the movable jaw, with cams for operating the movable frame when the clamp is receiving the fabric.

In testimony of which invention I hereunto set my hand.

HARRY W. BUTTERWORTH.

Witnesses:

R. M. HUNTER,

R. M. KELLY.