

(No Model.)

3 Sheets—Sheet 1.

E. SMITH.  
WARP STOP MOTION FOR LOOMS.

No. 509,494.

Patented Nov. 28, 1893.

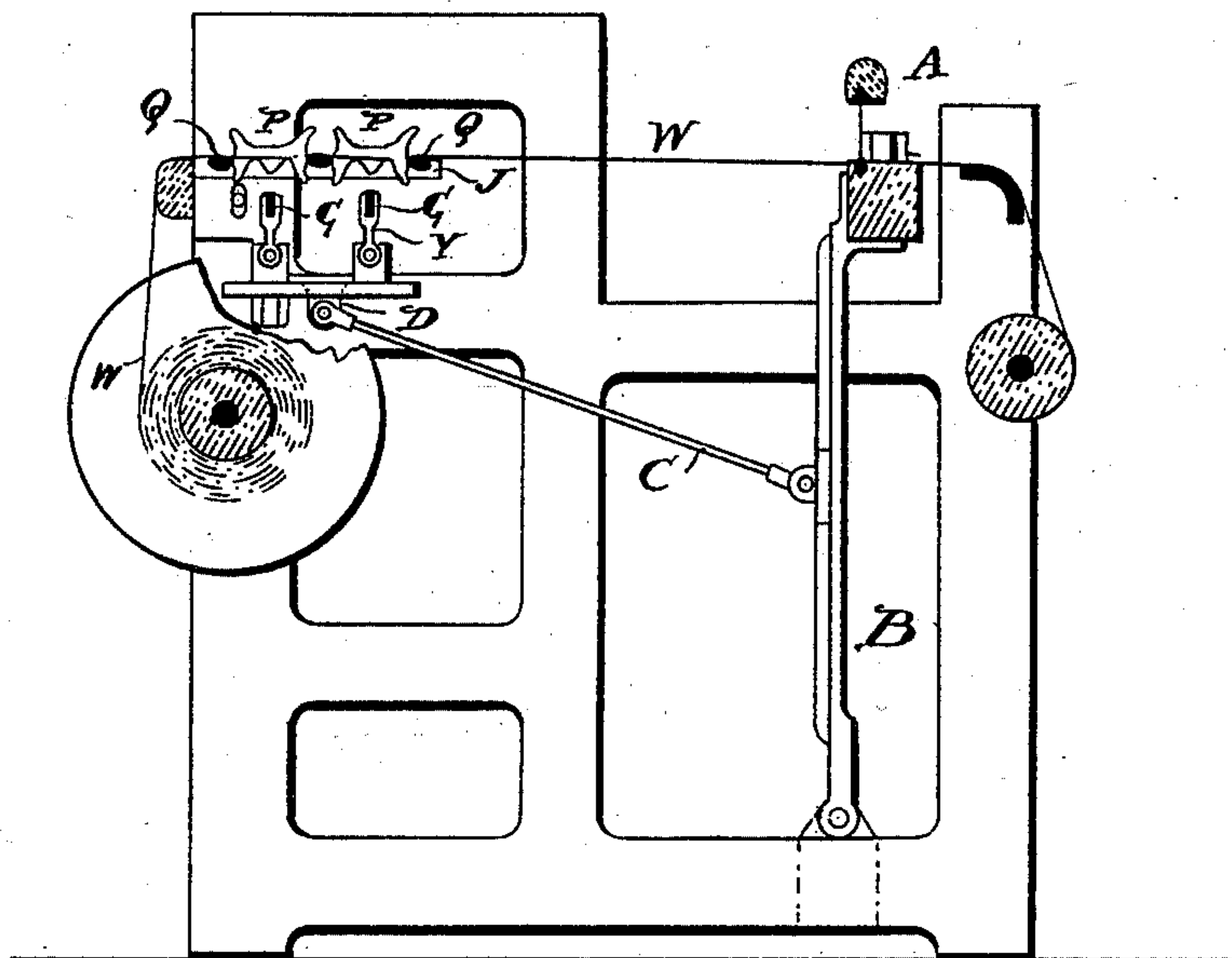


Fig. 1.

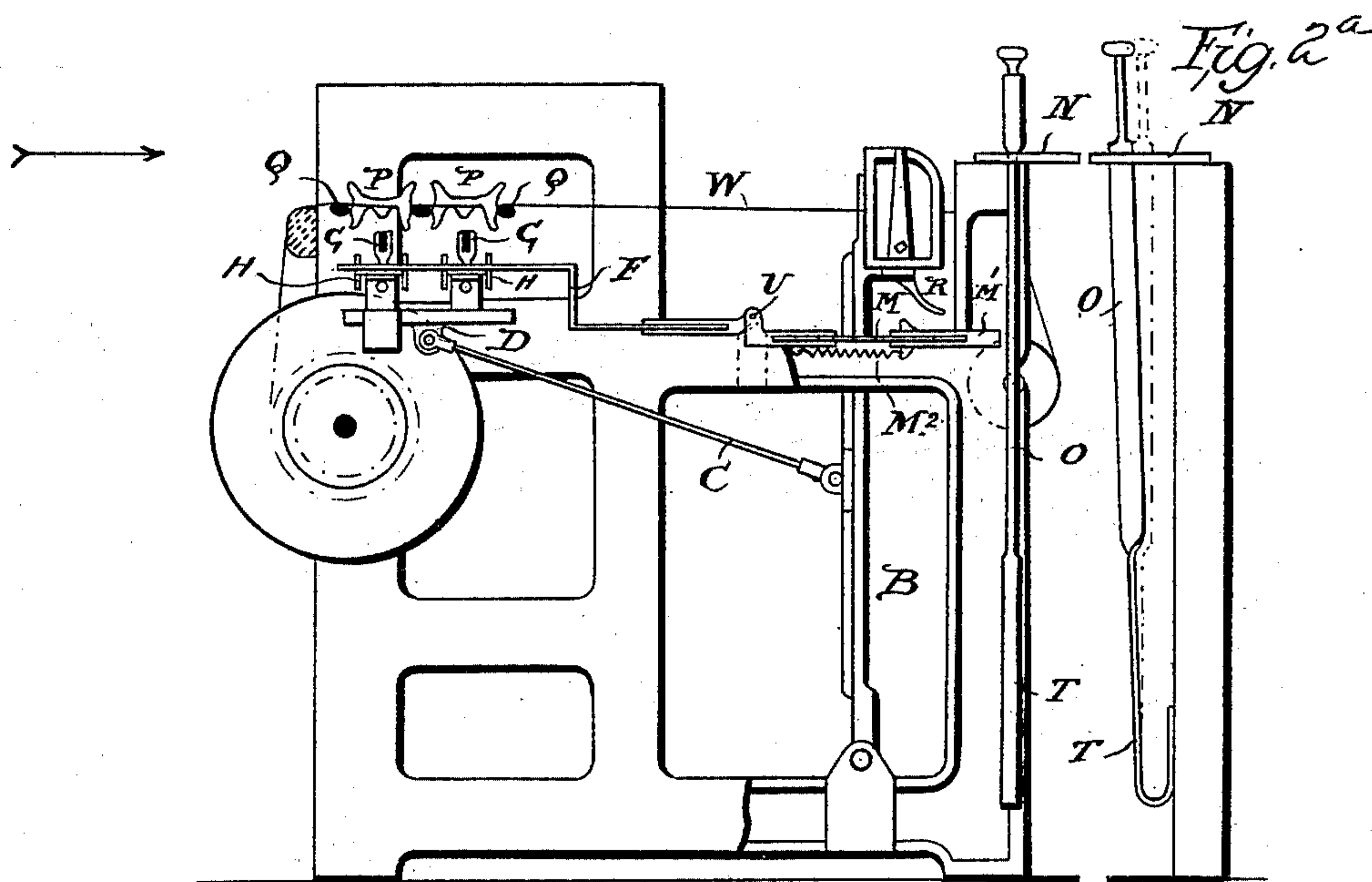


Fig. 2. Inventor:

Witnesses:

E. R. Bolton  
E. H. Sturtevant

Edward Smith  
By Richard P.  
his Attorneys.

(No Model.)

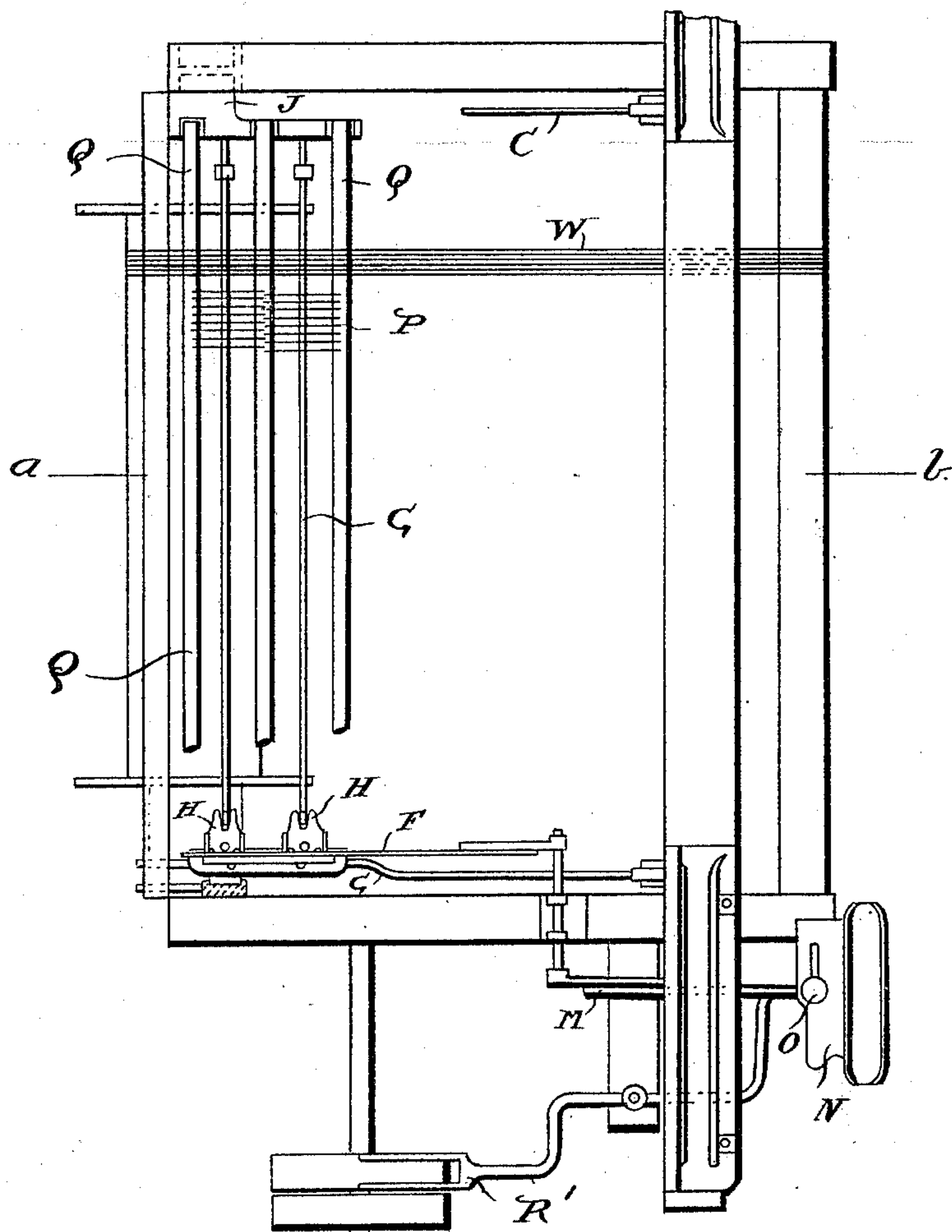
3 Sheets—Sheet 2.

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*Fig. 3.*

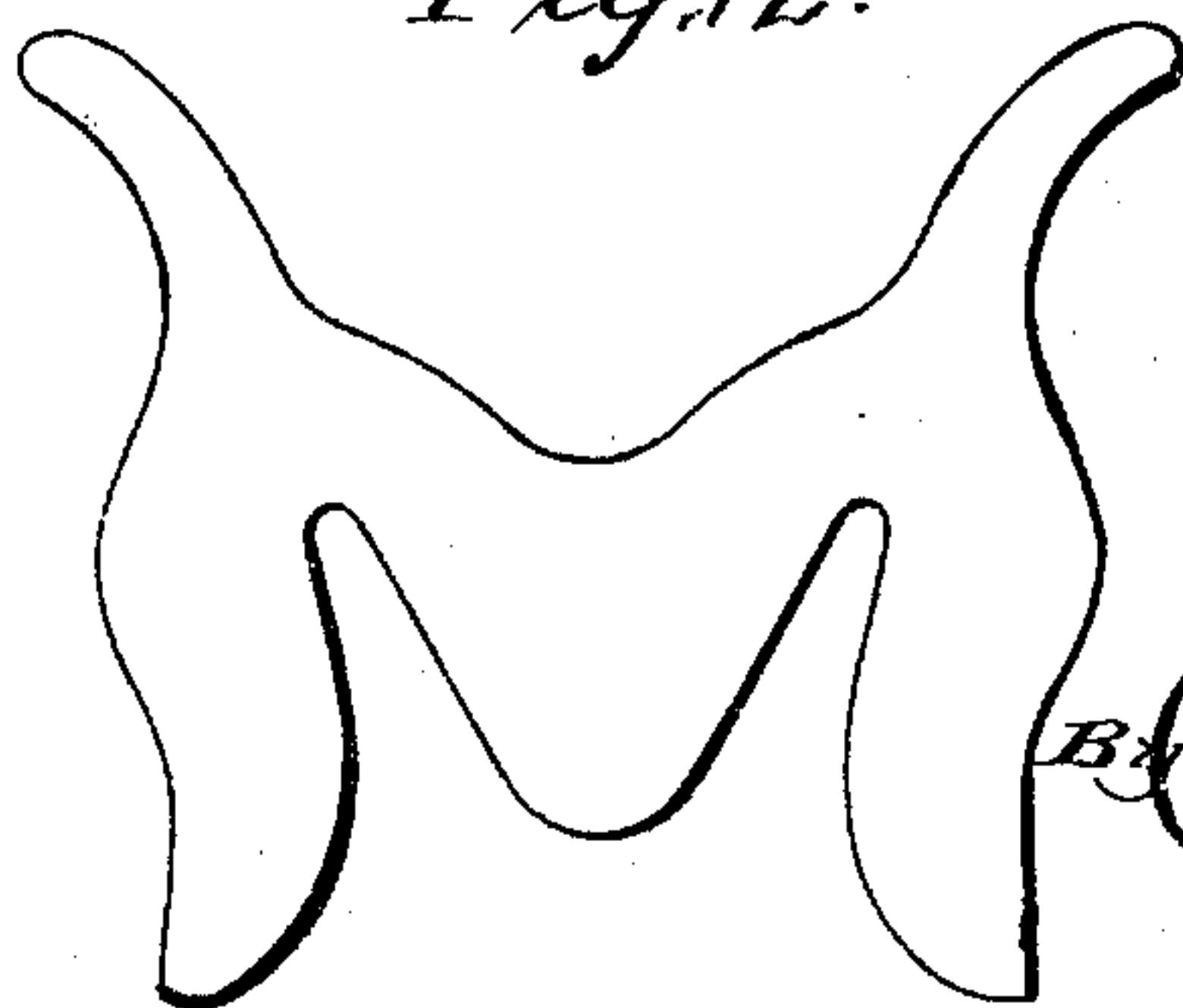


*Fig. 12.*

Witnesses:

*E. B. Bolton*

*E. H. Stewart*



Inventor  
*Edward Smith*

By *Richard A.*  
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(No Model.)

3 Sheets—Sheet 3.

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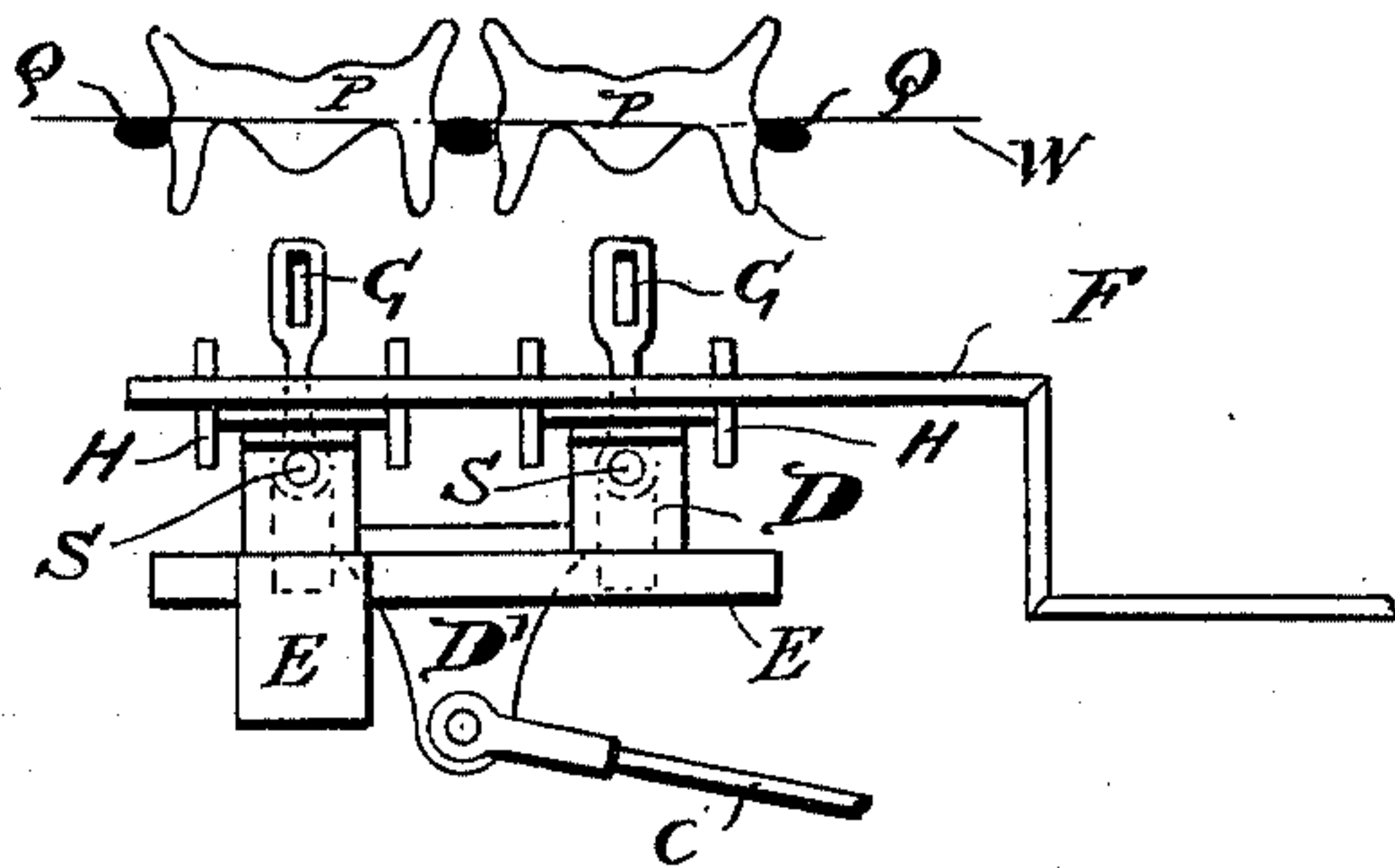


Fig. 6

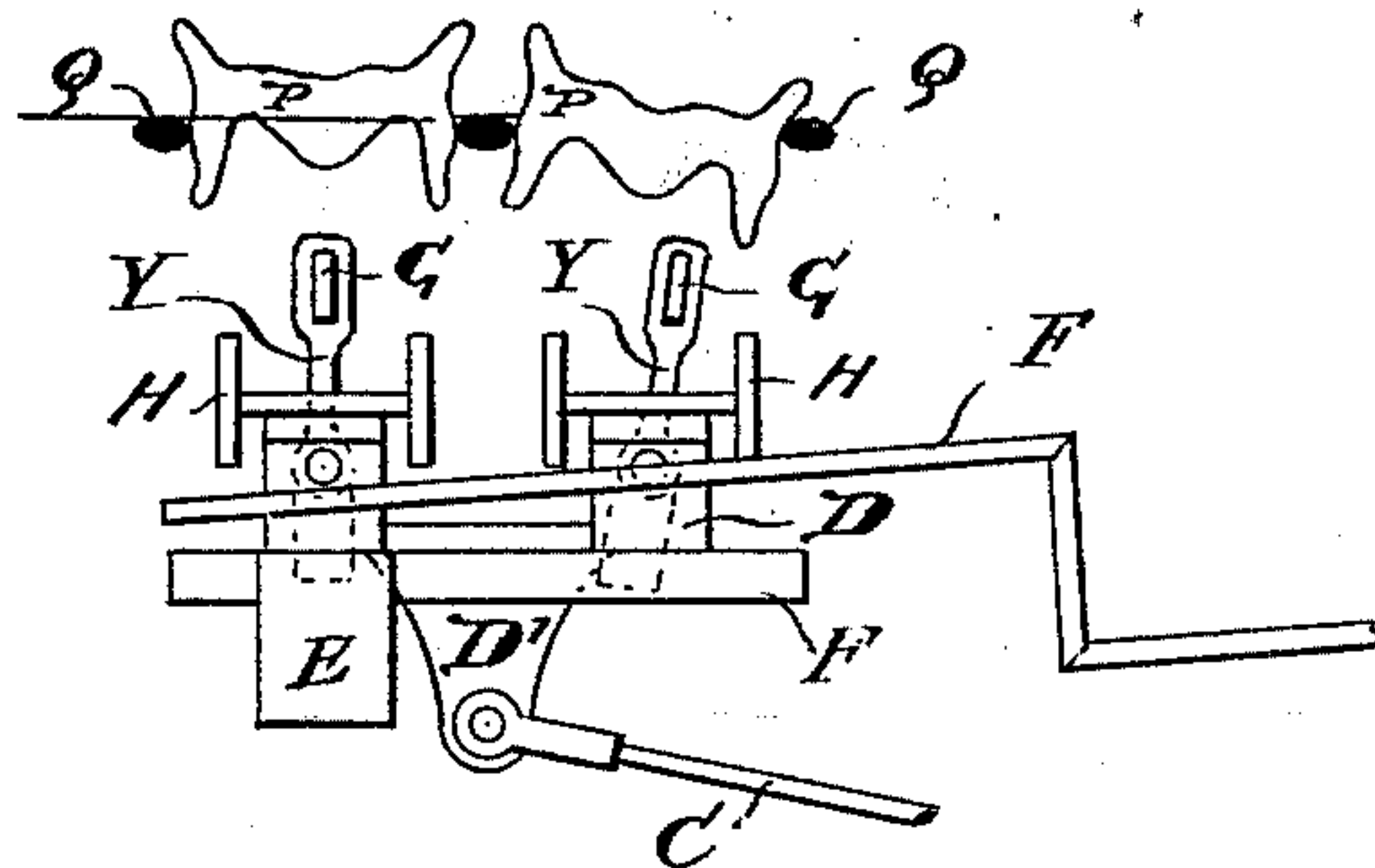


Fig. 9.

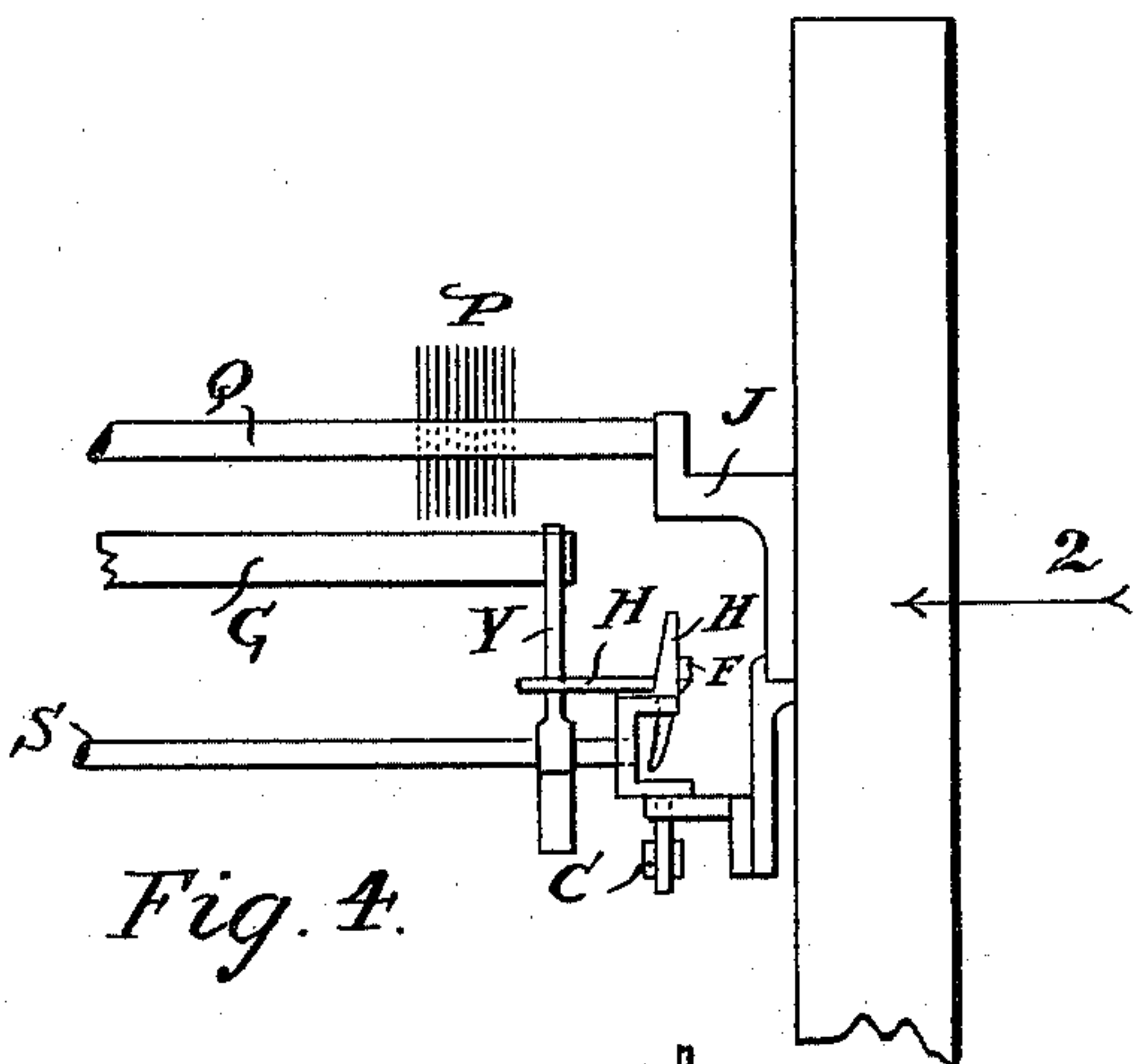


Fig. 4.

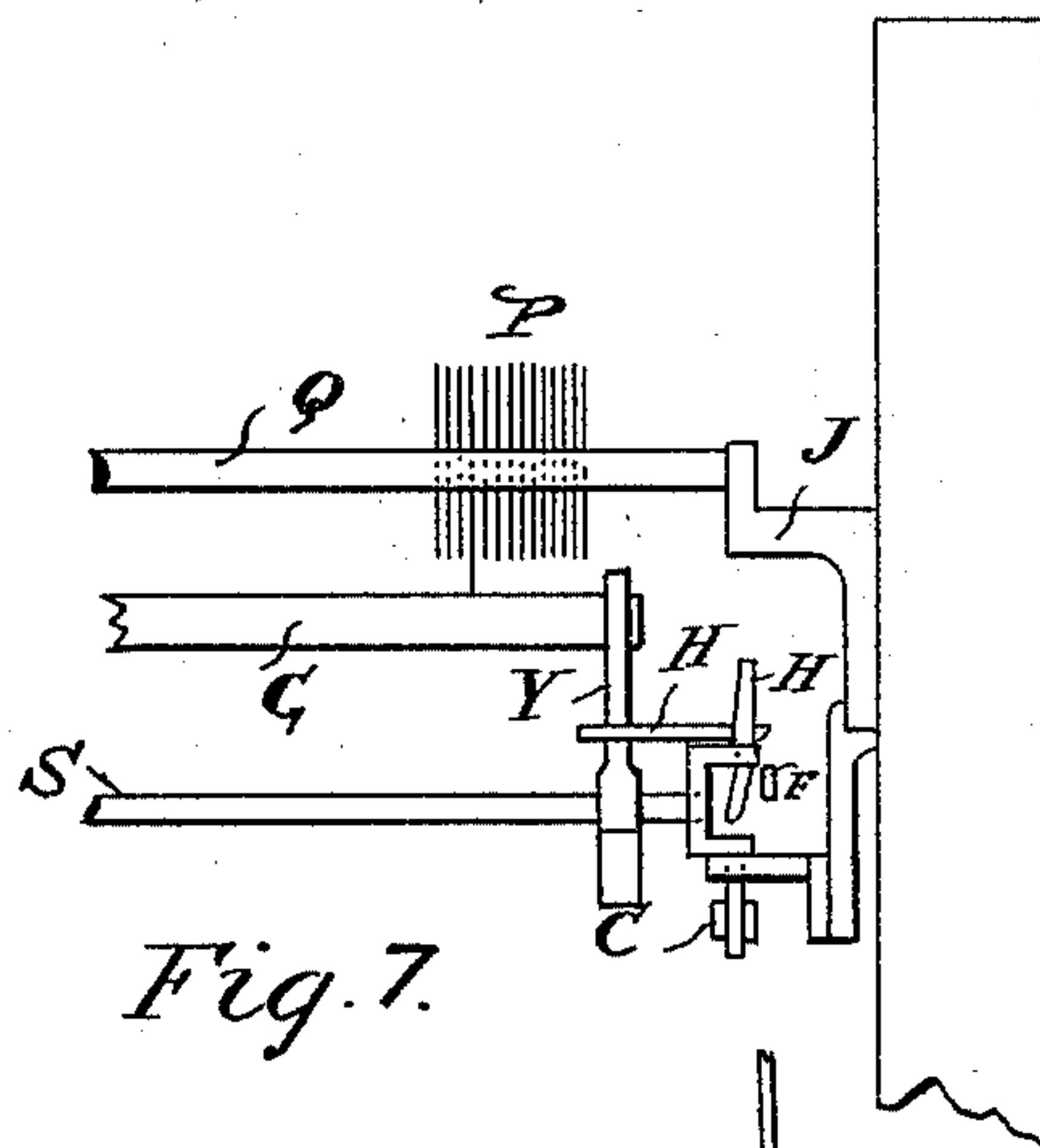


Fig. 7.

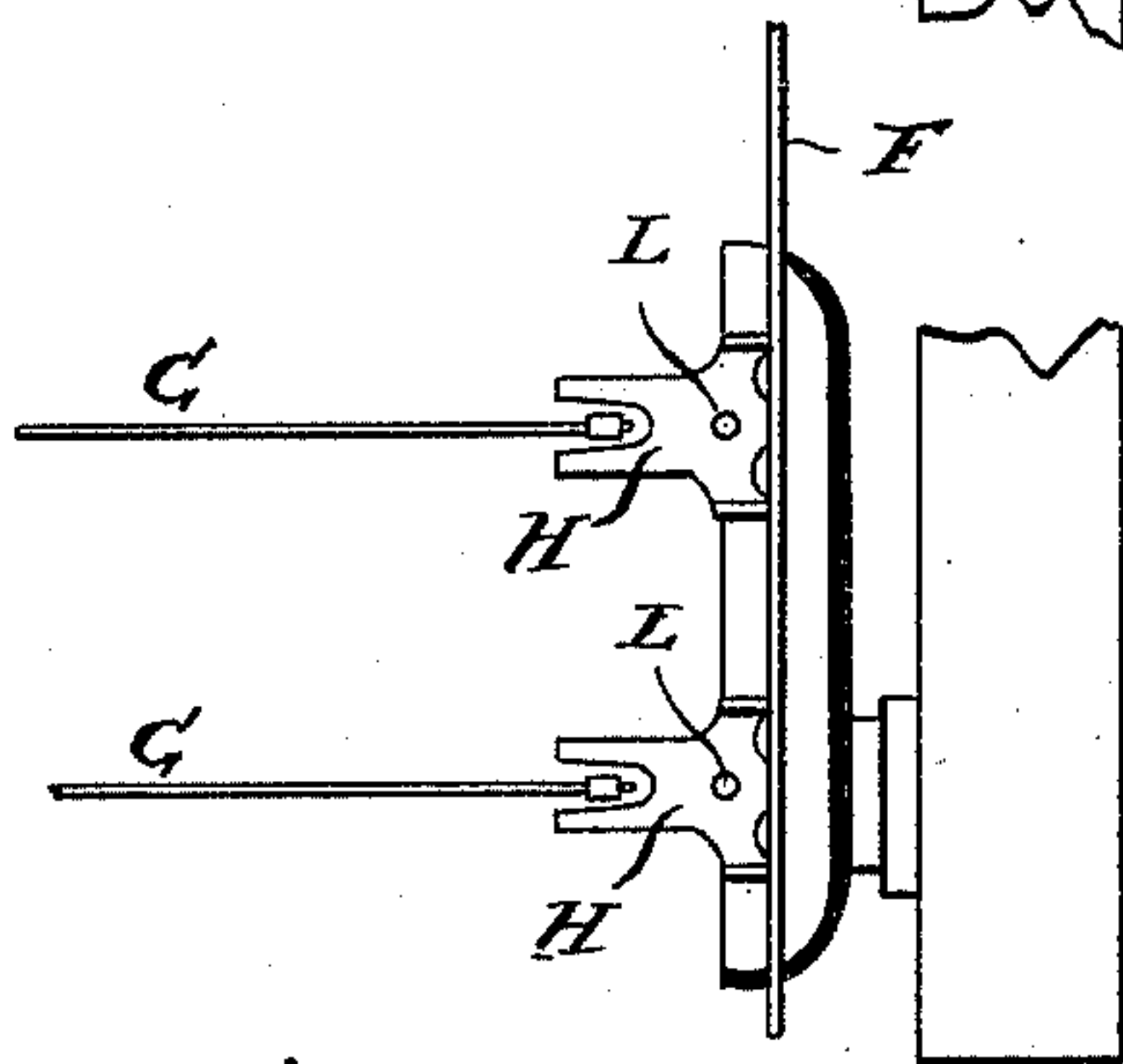


Fig. 5.

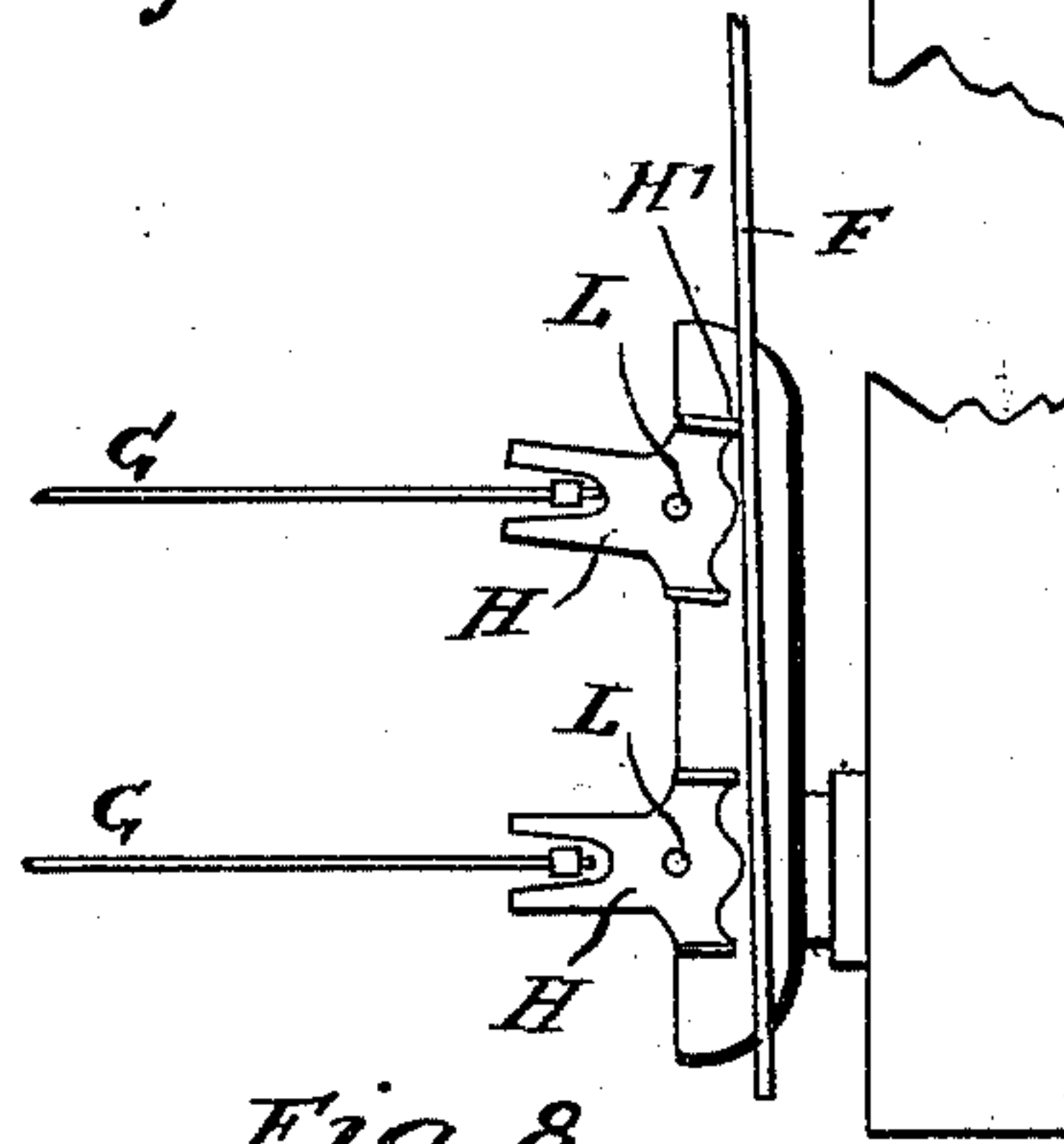


Fig. 8.

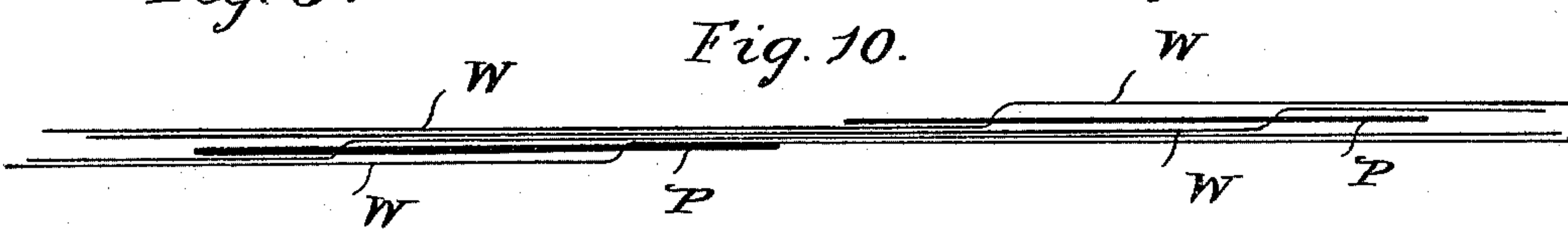


Fig. 10.

Witnesses:

E. B. Bolton

C. H. Sturtevant

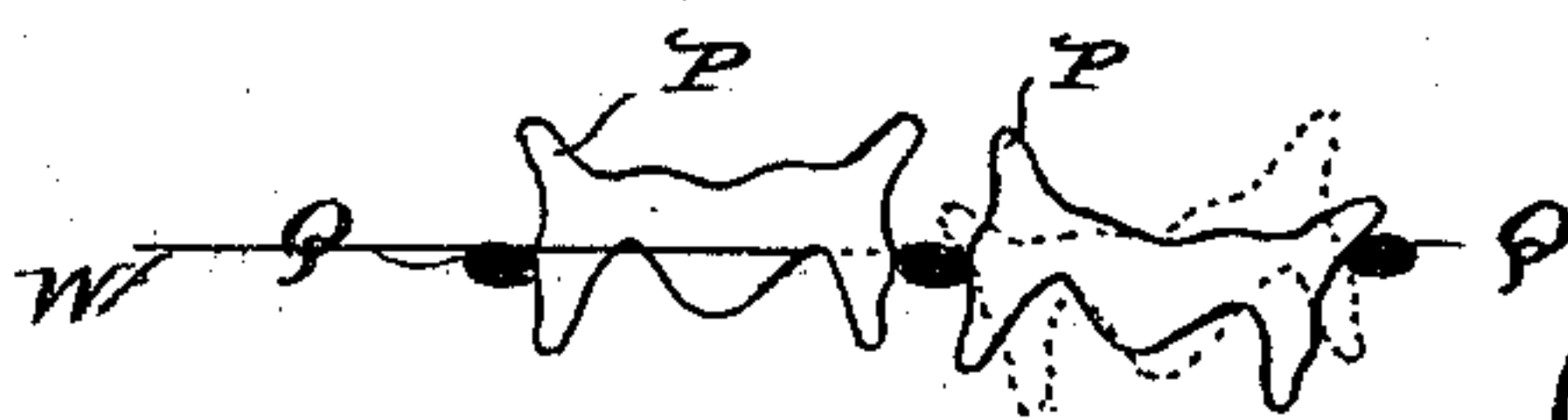


Fig. 11.

Inventor:

Edward Smith

By

Richard A. [Signature]  
his Attorneys.



# UNITED STATES PATENT OFFICE.

EDWARD SMITH, OF BRADFORD, ENGLAND, ASSIGNOR OF ONE-HALF TO  
HARRISON BENN, OF SAME PLACE.

## WARP STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 509,494, dated November 28, 1893.

Application filed May 5, 1893. Serial No. 473,169. (No model.) Patented in England October 18, 1890, No. 16,587; in Germany July 19, 1891, No. 62,437; in France September 10, 1891, No. 216,034, and in Belgium September 10, 1891, No. 96,344.

*To all whom it may concern:*

Be it known that I, EDWARD SMITH, a subject of the Queen of Great Britain and Ireland, residing at Bradford, in the county of York, England, have invented new and useful Improvements in Warp Stop-Motions for Looms, (for which I have obtained Letters Patent in England, No. 16,587, dated October 18, 1890; in Belgium, No. 96,344, dated September 10, 1891; in France, No. 216,034, dated September 10, 1891, and in Germany, No. 62,437, dated July 19, 1891,) of which the following is a specification.

This invention has for its object the arrangement and combination with looms for weaving textile fabrics, of certain mechanism whereby the loom is automatically stopped when a warp thread breaks.

In describing my invention in detail, reference is made to the accompanying drawings in which—

Figure 1 represents a section of a loom through line *a. b.* in Fig. 3. The parts of the loom not necessary for the elucidation of my invention are not shown, as the apparatus is applicable to any loom of the ordinary construction. Fig. 2 is an end view of certain portions of a loom with part of the end frame cut away. Fig. 2<sup>a</sup> is a detail view showing the knock off lever. Fig. 3 is a plan; Fig. 4 a detached enlarged detail of a portion of the apparatus looking in the direction of arrow in Fig. 2. Fig. 5 is a plan thereof, and Fig. 6 an end view looking in the direction of arrow 2 with the loom end frame removed. Figs. 7, 8 and 9 are similar views showing the apparatus when stopping the loom after a warp thread has been broken. Fig. 10 is a diagrammatic view of two detector plates with the warp threads supporting the same. Fig. 11, shows the action of such plates. Fig. 12, is a detail view of one of the detector plates.

I accomplish my object by mounting in a suitable position behind the healds or other warp thread operating device actuated and mounted in the ordinary manner, a series of detector plates, each plate having two slots therein, through each of which a warp thread passes, the tension of the warp threads retaining the respective detector plates in an ele-

vated position in such a manner that, when a warp thread breaks, the support at one end of the plate is removed. Therefore the detector plate is allowed to descend into such position for the end of same to come into contact with a reciprocating transverse bar, and thereby operate the bar and the connections therewith in such a manner that, the driving belt is moved from the fast to the loose pulley, thereby automatically stopping the loom.

The lay beam or lathe A. of the loom is operated and supported by the lay swords B. in the usual manner, and to each lay sword B. a rod C. is attached, connecting same respectively to a sliding bracket D. placed at each end of the loom and mounted on suitable supports E. through each of which a slot hole is formed for the reception of the lug D' forming part of sliding bracket D. Two shafts S. S. are mounted on the two sliding brackets D. supporting two narrow transverse bars G. G. which extend almost the entire distance between the brackets D. and are held in a vertical position as shown by Figs. 1, 2, 4 and 6, by a counterbalanced arm Y. placed at one end of each shaft S. the arm engaging in a recess formed in the swivel piece H. and by the rod F. resting on a narrow projection on the swivel pieces H. at one end of the loom; the said pieces being connected by a pin L. to the sliding bracket D.

The detector plates P. shown by detail Fig. 12 are supported between the dividing rods Q. by the warp threads W. one warp thread passing through a slot at one end of the plate, and another warp thread through the slot at the other end of the plate in the manner as indicated by diagram plan Fig. 10, so that should any warp thread break, the support at one end of the detector plate P. is removed. Therefore it will drop one way or the other according to the end released, to the position shown by way of example by Fig. 11. one end being down in contact with one of the dividing rods Q. and the other elevated, but in contact with the other dividing rod Q. so that, by the dividing rods Q. having the detector plates P. between them, and held secure by the ends of the rods engaging in recesses formed in the brackets J. secured to



the end frames of loom, and by the transverse bars G. G. reciprocating along with the sliding brackets D. the upper edge of one of the said bars will come in contact with the released and fallen end of the detector plate P. thereby causing the narrow transverse bar G. to fall to the position shown by Fig. 9. or in the opposite direction providing the other end of the detector plate P. is allowed to drop. Thus by means of the arm Y. engaging in the recess of swivel piece H. the latter is operated on its fulcrum pin L. according to the direction in which the transverse bar G. is moved, thereby causing one end of the swivel piece H. say at H' to propel the rod F. from its resting place, and allow it to fall to the position shown by Figs. 7 and 9.

One end of the rod F. is attached to the shaft U. to which is also attached an arm M. so that by the rod F. falling to the position shown, the shaft U. is operated and the end of arm M. elevated and brought into such position that, when the reed in the lay beam A. is beating up the weft, an arm R. secured to the said lay beam engages with a projection on the sliding piece M' on arm M. by which the sliding piece is moved outward such a distance toward the knock off handle or rod O. that it is moved out of the ordinary retaining notch in plate N. thus liberating the said handle which is of the ordinary and well known construction, the bottom portion of which is secured to the loom end frame as shown by Fig. 2<sup>a</sup> so that when liberated in the manner described, the flat curved spring bar T. forming part of the said handle causes the handle to move to the position shown by dotted lines, thereby operating the belt fork R' and transferring the belt from the fast to the loose pulley, thus automatically stopping the loom whenever a warp thread is broken. On the retreat of the lay beam A. after the operation of the knock off handle or rod O. in the manner described, the sliding piece M' is brought back to its original position by means of the contraction of expanded spiral spring M<sup>2</sup> secured to arm M. and sliding piece M'.

What I claim as my invention is—

1. In combination, the lay, the constantly operating slide D having connection thereto,

the swivel plate H, carried by the slide, the cross bar G, the pivoted supports Y for said cross bar also carried with the slide D and arranged to engage and operate the swivel plate, the knock off lever O, the rod F arranged to be operated by the swivel plate, the connections between said rod and the knock off lever and the detector plates arranged to be held up by the warp threads and to fall into the range of the cross bar G when the warp thread breaks, substantially as described.

2. In combination, the lay, the slide D having connections thereto, the swivel plate H carried by the slide, the arm F arranged to be operated by the said swivel plate, the sliding piece M' arranged to be raised by the arm F, the arm R on the lay to operate the sliding piece, the knock off lever O, and the means for operating the swivel plate consisting of the detector plates, the cross rod G and the pivoted arm carrying said rod and arranged to engage and operate the swivel plate upon the breaking of a warp thread, substantially as described.

3. In combination, in a stop motion, the knock off lever O the lay, the sliding plate D, the rod G carried thereby, the detector plates P having front and rear notches to be engaged by different threads and the devices between the sliding plate and the knock off lever arranged to form a connection between said parts when a warp thread breaks substantially as described.

4. In combination, in a stop motion the knock off lever O, the lay, the sliding plate D, the rod G carried thereby, the detector plates having front and rear notches for the warp threads, the rods Q on each side of the detector plates and the devices between the sliding plate D and the knock off lever arranged to form a connection between said parts when a warp thread breaks, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD SMITH.

Witnesses:

JNO. GILL,  
WM. PREST.