(No Model.) 3 Sheets—Sheet 1.

W. W. WALLACE & R. C. PENFIELD.

PRESS.

No. 548,937. Patented Oct. 29, 1895.

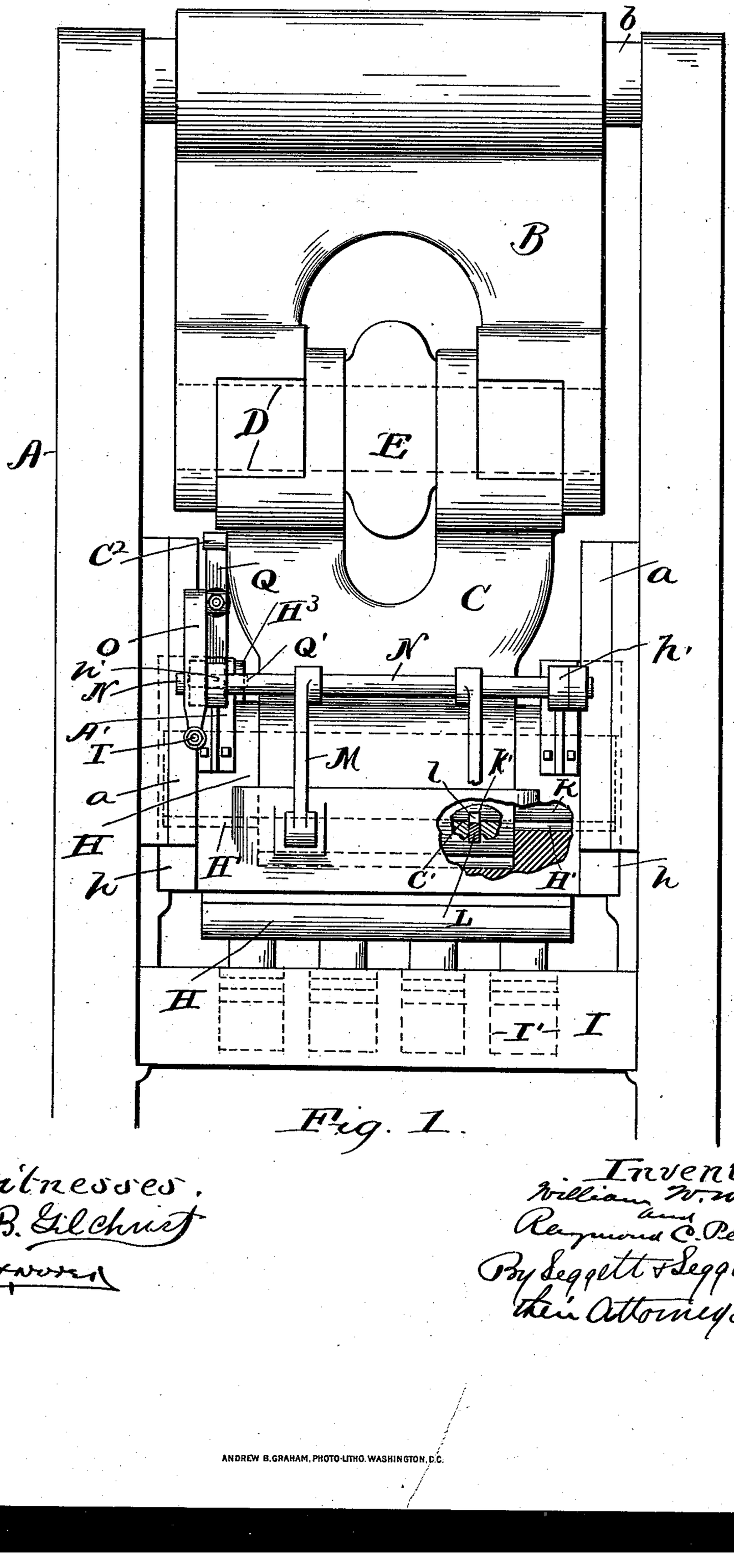

Fig. 1.

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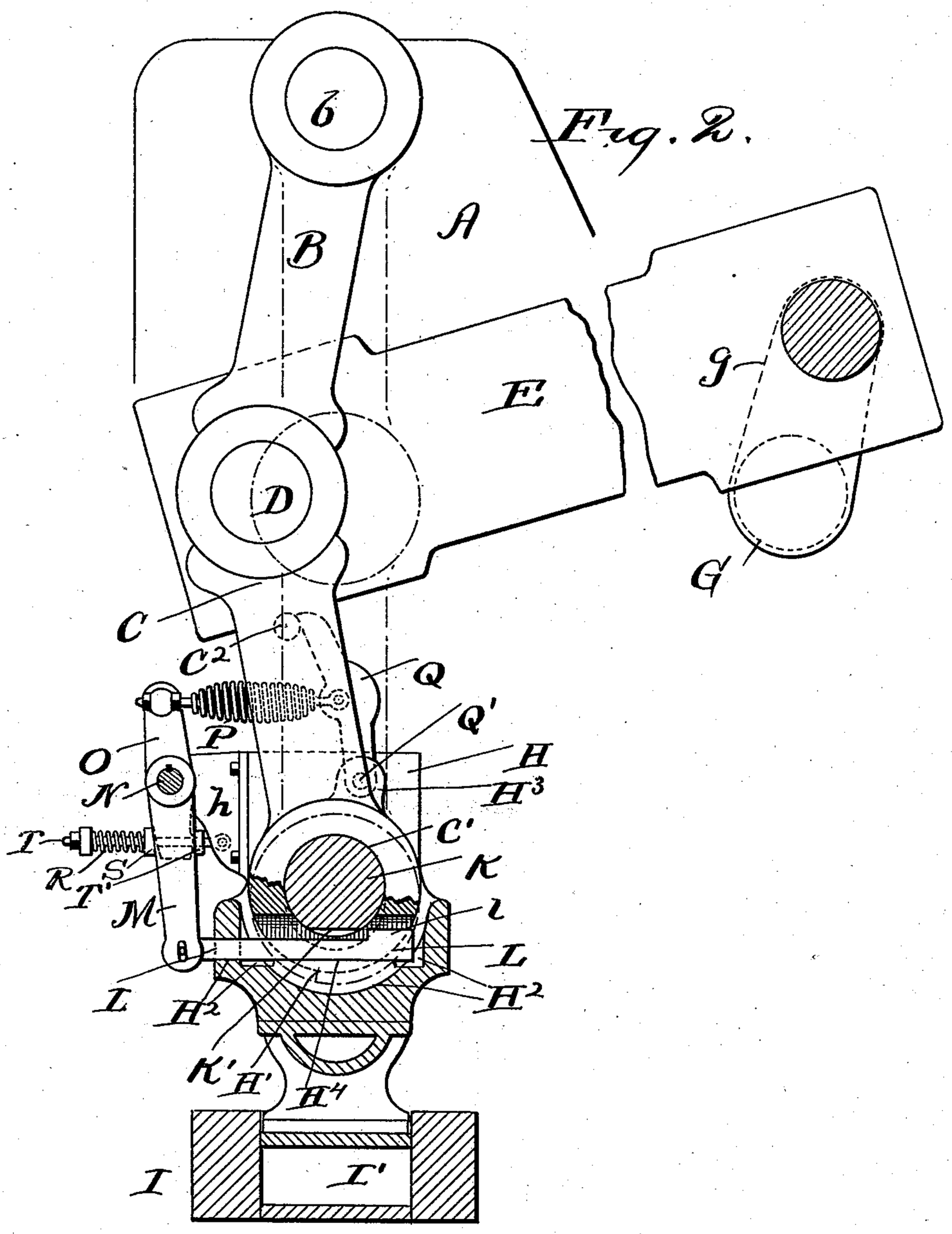

Fig. 2.

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(No Model.) 3 Sheets—Sheet 3.

W. W. WALLACE & R. C. PENFIELD.

PRESS.

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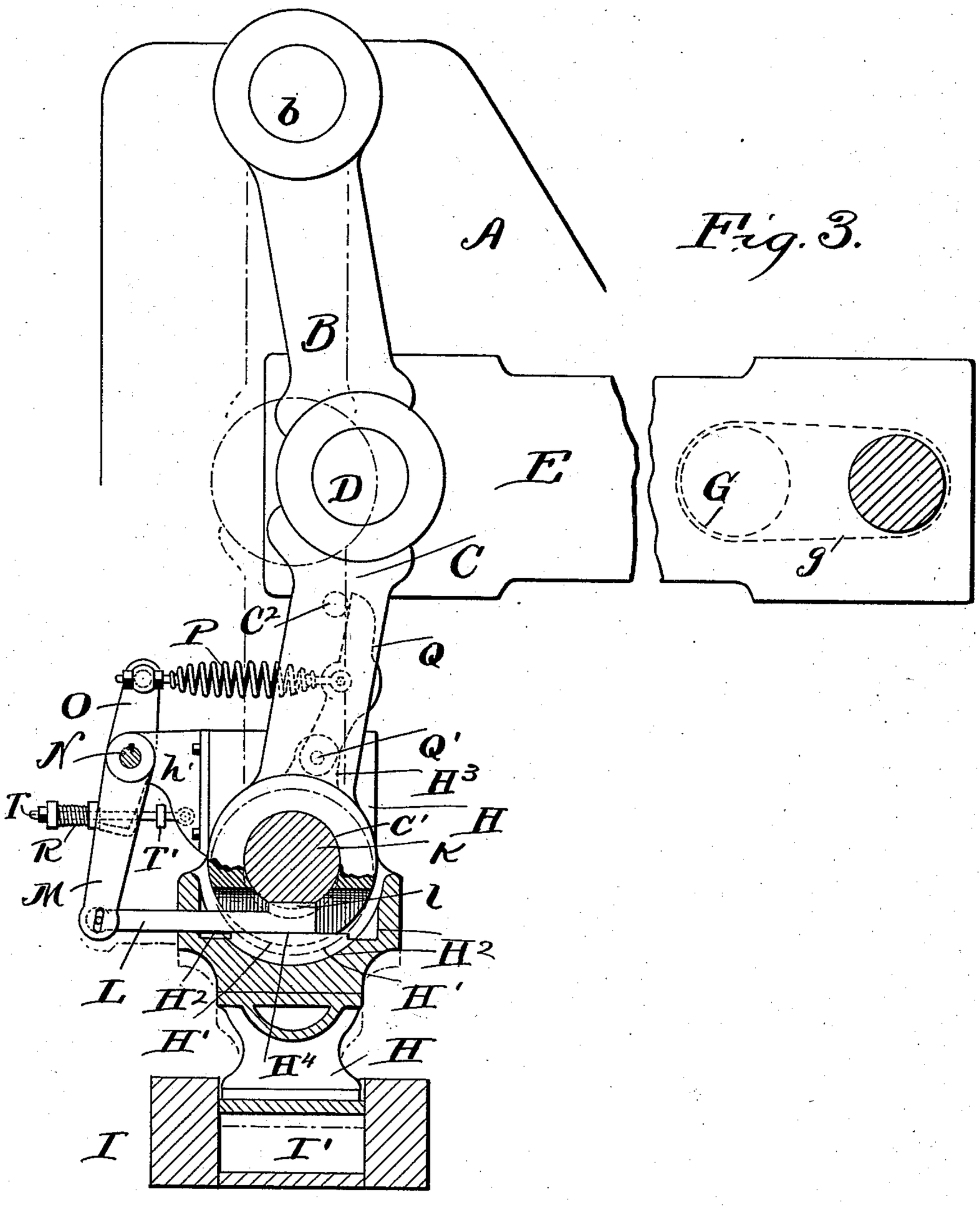

Fig. 3.

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UNITED STATES PATENT OFFICE.

WILLIAM W. WALLACE AND RAYMOND C. PENFIELD, OF WILLOUGHBY, OHIO, ASSIGNORS TO J. W. PENFIELD & SON, OF SAME PLACE.

PRESS.

SPECIFICATION forming part of Letters Patent No. 548,937, dated October 29, 1895.

Application filed December 30, 1893. Renewed April 6, 1895. Serial No. 544,826. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM W. WALLACE and RAYMOND C. PENFIELD, of Willoughby, in the county of Lake and State of Ohio, have invented certain new and useful Improvements in Presses; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

Our invention relates to improvements in presses for compressing clay, brick to be re-pressed, and other materials, the object being to more effectually compress the material and to increase the capacity of the machine, and especially to more solidly compress elastic material—such, for instance, as clay—in the making or re-pressing of brick and produce a product that is not liable to crack, burst, or break when the pressure is removed from the product.

With this object in view our invention consists in certain features of construction and in combinations of parts hereinafter described, and pointed out in the claims.

A preferable construction of machine embodying our invention is illustrated in the accompanying drawings, wherein—

Figure 1 is a front side elevation of the same, portions being broken away and in section to more clearly show the construction. Figs. 2 and 3 are right-hand side elevations of the machine with the adjacent housing, standard, or supporting-frame removed and with portions broken away and in section to more clearly show the construction, Fig. 2 showing, in solid lines, the toggle-arms and connected mechanism ready for effecting the first compression of the material to be compressed, and Fig. 3 showing, in solid lines, the position of said parts preparatory to the second compression of the material, the toggle-arms in dotted lines, Fig. 2, being shown in the straightened position they pass through in their rearward movement and the plunger being shown in dotted lines, Fig. 3, in the position it assumes upon the straightening of the toggle-arms during their forward movement.

Referring to the drawings, A A designate the two upright housings, standards, or supporting-frames, between which the toggle-arms and connected parts and the mold are suitably supported. The toggle-arms B and C are shown arranged uprightly and are pivoted together at their adjacent ends, as at D, in any suitable manner, and the toggle-arm joint is shown operatively connected by means of a link E with the crank *g* of a crank-shaft G, that is driven in any suitable manner and supported from the supporting housings or frames. The upper toggle-arm B is pivotally connected at its upper end, as at *b*, with the supporting-frames, and the lower toggle-arm C is pivotally connected at its lower end with the compressing-plunger H, that is adapted to enter the compartment or compartments I′ in mold I and compress the material introduced or placed into said mold. The plunger is shown provided with slides *h*, adapted to reciprocate endwise of suitable slideways *a*, formed upon the inner sides of the supporting frames or housings. The pivotal connection of the plunger-carrying toggle-arm with the plunger is by means of a pin K, and said arm and plunger are suitably bored, as at C′ and H′, respectively, for the reception of said pin.

By the parts thus far described it will be observed that but one compression would be had with each revolution of the operating-shaft and the machine would be substantially the same as the machines heretofore devised. We, however, make the throw of the crank-shaft such that when the toggle-arms are actuated rearwardly from their extreme forward position (shown in solid lines, Fig. 2) to effect the first compression of the material within the mold they will be carried beyond a vertical position, as shown in Fig. 3; and, furthermore, we not only elongate the holes H′ in the plunger, through which the pivotal pin K extends vertically or in the direction lengthwise of the plunger-carrying toggle-arm to accommodate the movement of the toggle-arms beyond a straightened position, but provide suitable means whereby said pin upon being elevated into the upper portion of holes H′ in the plunger during the travel of the toggle-arms beyond a straightened position upon their actuation of the plunger to make the first compression of the material in the mold (and thereby lengthening the dis-

tance between the axis of the toggle-arm joint and the compressing-surface of the plunger) is held elevated until the toggle-arms are again actuated beyond a straightened position in the opposite direction, said pin preferably fitting nicely but easily in holes C′ in toggle-arm C. It will readily be observed that by actuating the toggle-arms beyond a straightened position upon their first stroke to compress and causing the compressing-surface of the plunger to assume and maintain a position farther from the axis of the toggle-arm joint during their next succeeding return-stroke additional pressure will be brought to bear upon the material in the mold.

The means employed for effecting the further compression of the material just hereinbefore referred to is preferably as follows: L L designate two horizontally-reciprocating bars that extend into the upper part of the plunger and at their rear ends are enlarged upwardly, as at *l*, which enlarged portions are adapted to engage the lower side of pivotal pin K and to hold said pin in the upper portion of the pin-holes H′ in the plunger, and the upper part of the plunger is suitably bored and chambered, as shown at H^2, to accommodate the location and operation of said reciprocating bars. To afford a larger bearing for pin K when the latter is held by bars L L, as just indicated, the pin is recessed, as at K′, to receive said enlarged portions of bars L L. Bars L L, at their forward or outer ends, are operatively connected with the lower or outer ends of arms or levers M M, that depend from and are operatively mounted upon a shaft N, arranged horizontally at the forward side of the machine and suitably supported from arms or brackets *h′* projecting forwardly from and rigid with the slides of the compressing-plunger. Upon shaft N is also operatively mounted an upright tilting lever O, to the upper end whereof is suitably connected the forward end of a coil-spring P. The rear end of said spring is connected with a lever Q, (preferably to the central portion of said lever, as shown,) that is fulcrumed at its lower end, as at Q′, to a lug H^3, formed upon the plunger, and the lower toggle-arm is provided with a laterally-projecting lug or member C^2, that is adapted to engage the forward side of the upper end of lever Q and tilt the latter rearwardly as the toggle-arms are swung in that direction from a vertical or straightened position. The arrangement of parts is such that when the toggle-arms are in the forwardly-swung position reciprocating bars L L are in their rearward position—that is, in position with their enlarged portions *l* rearwardly of pivotal pin K, as shown in solid lines, Fig. 2—and when the toggle-arms are moved from the position just indicated to their rearwardly-actuated position, as shown in solid lines in Fig. 3, the laterally-projecting lug or member C^2 on the lower toggle-arm shall actuate lever Q rearwardly, thereby pulling spring P in that direction and in turn actuating lever O, shaft N, arms or levers M M, and bars L L into position to bring the upwardly-enlarged portion of bars L L in engagement with the under side of pin K, as hereinbefore described; and in this position of parts it will be observed that the lost motion that would otherwise be had by the vertical elongation of holes H′ in plunger H is taken up by bars L L in the rearwardly-actuated position of the toggle-arms, and as the toggle-arms are again actuated forwardly the enlarged portions of said bars will be tightly confined and held in position between the under side of pin K and the bearing-surfaces H^4, formed within the plunger for said bars, until the toggle-arms have again reached a straightened position in their forward movement. The result is a lengthening of the distance between the axis of the toggle-arm joint and compressing-surfaces of the plunger during the interval of time required to move the toggle-arms in their forward actuation to a straightened position, as already indicated, and, consequently, a further compression of the contents of the mold. As soon as the toggle-arms are again actuated to their extreme forward position, the spring P and connected parts will again have assumed their normal position and bars L L will have been released and also positively returned to their normal position (shown in solid lines, Fig. 2) by the action of suitable means, preferably a spring R. Spring R is preferably confined between the lower end of tilting lever M and a nut S, mounted upon the screw-threaded shank of an eyebolt T, that extends through said end of the lever and has its eye pivoted to one of supporting-brackets A′, said bolt being preferably provided with a shoulder or stop T′, adapted to limit the action of spring R.

We would here remark that heretofore—for instance, in the manufacture of brick—much difficulty was encountered in obtaining a product that would not crack or burst. By the use of a press embodying our invention for compressing the material we not only obtain a more solid and durable product, but we are also enabled to largely increase the output of the machine, in that a more rapid movement of the toggle-arms is possible without liability of impairing the solidity and durability of the product by thus enlarging the output of the machine.

What we claim is—

1. In a press of the variety indicated, the combination with the toggle-arms, compressing-plunger, pin pivotally connecting the plunger to the outer end of one of the toggle-arms, and suitable means for actuating the toggle-arms beyond a straightened position in either direction, the holes in the plunger that are engaged by said pin being elongated in the direction indicated, of one or more bars or members for holding or locking said pivotal pin in the portions of said holes nearest the axis of the toggle-arm-joint, suitable mechanism for actuating said pin-holding or locking-

bars or members to cause the latter to perform their function, and suitable means acting to actuate said pin-holding or locking bars or members to release the pin, the arrangement of parts being such that the toggle-arms will cause the plunger to compress with each stroke of said arm, substantially as set forth.

2. In a press of the variety indicated, the combination with the toggle-arms, compressing-plunger, pin pivotally connecting said plunger with the outer end of the toggle-arms, and suitable means for actuating the toggle-arms beyond a straightened position in either direction, the holes in the plunger that are engaged by the aforesaid pin being elongated in the direction indicated, of one or more reciprocating-bars adapted to bear upon said pin laterally in the direction indicated, suitable mechanism for actuating said reciprocating-bar or bars, suitable means carried by the pin-bearing toggle-arm for operating said bar-actuating-mechanism to cause the bar or bars to perform their function, and suitable means for returning said bar or bars to their normal position, the arrangement of parts being such that the plunger shall be actuated to compress with each stroke of the toggle-arms, substantially as set forth.

3. In a press of the variety indicated, the combination with the toggle-arms, compressing-plunger, pin pivotally connecting said plunger with the outer end of one of the toggle-arms, and suitable means for actuating the toggle-arms beyond a straightened position in each direction, the holes in the plunger that are engaged by the aforesaid pin being elongated in the direction indicated, of one or more reciprocating-bars or members L extending into the plunger and enlarged within the plunger, as at *l*, with said enlargement adapted to engage a recess in the aforesaid pin and bear laterally upon the pin in the direction indicated, suitable mechanism for actuating said reciprocating-member or members to cause the latter to perform their function, and suitable means for returning said reciprocating-member or members to their normal position, the arrangement of parts being such that the plunger shall be actuated to compress with each stroke of the toggle-arm, and the plunger being suitably chambered to accommodate the location and operation of the aforesaid reciprocating member or members, substantially as set forth.

4. In a press of the variety indicated, the combination with the supporting-frames having slideways *a a*, toggle-arms, compressing-plunger provided with slides engaging said ways, and chambered, as at H^2, pin pivotally connecting said plunger with the outer end of one of the toggle-arms, the outer end of the other toggle-arm being pivotally connected to the supporting-frames and suitable means for actuating the toggle-arms beyond a straightened position in either direction, the holes in the plunger that are engaged by the aforesaid pin being elongated to accommodate said actuation of the toggle-arms, of one or more reciprocating-bars L extending into the plunger and enlarged within the plunger, as at *l*, with said enlargement adapted to engage and bear laterally upon the aforesaid pin in the direction indicated, brackets rigid with the plunger or plunger-slides, a shaft supported by said bracket, one or more arms operatively mounted upon said shaft and operatively connecting with the aforesaid reciprocating-bar or bars, a tilting-lever fulcrumed to the plunger and operatively connected with the aforesaid shaft, and a lug or member on the plunger-carrying-toggle-arm for actuating said lever in the direction to cause the aforesaid reciprocating-bar or bars to perform their function, and suitable means for returning said bar or bars to their normal position, the arrangement of parts being substantially as and for the purpose set forth.

5. In a press of the variety indicated, the combination with the supporting-frames A A having slideways *a a*, toggle-arms B C, compressing-plunger H provided with slides *h* and chambered, as at H^2, toggle-arm B being pivoted at its outer end to the supporting-frames, a pin K pivotally connecting the compressing-plunger with the outer end of the toggle-arm C, and suitable means for actuating the toggle-arms beyond a straightened position in either direction, the holes in the plunger engaged by said pin being elongated to accommodate the movement of the toggle-arms beyond the straightened position in either direction, of reciprocating-bars L L, brackets rigid with the plunger-slides, shaft supported from said brackets, arms operatively mounted upon said shafts and operatively connected with the aforesaid reciprocating-bars, a tilting-lever O operatively mounted upon said shaft, another tilting-lever Q fulcrumed to the plunger, a spring connecting the two levers with each other, and the spring R, all arranged and operating substantially as shown, for the purpose specified.

In testimony whereof we sign this specification, in the presence of two witnesses, this 11th day of December, 1893.

WILLIAM W. WALLACE.
RAYMOND C. PENFIELD.

Witnesses:
J. W. PENFIELD,
J. A. GREEN.