H. J. FLOOD.

BRICK PRESS.

APPLICATION FILED AUG. 29, 1910.

987,124.

Patented Mar. 21, 1911.

4 SHEETS—SHEET 1.

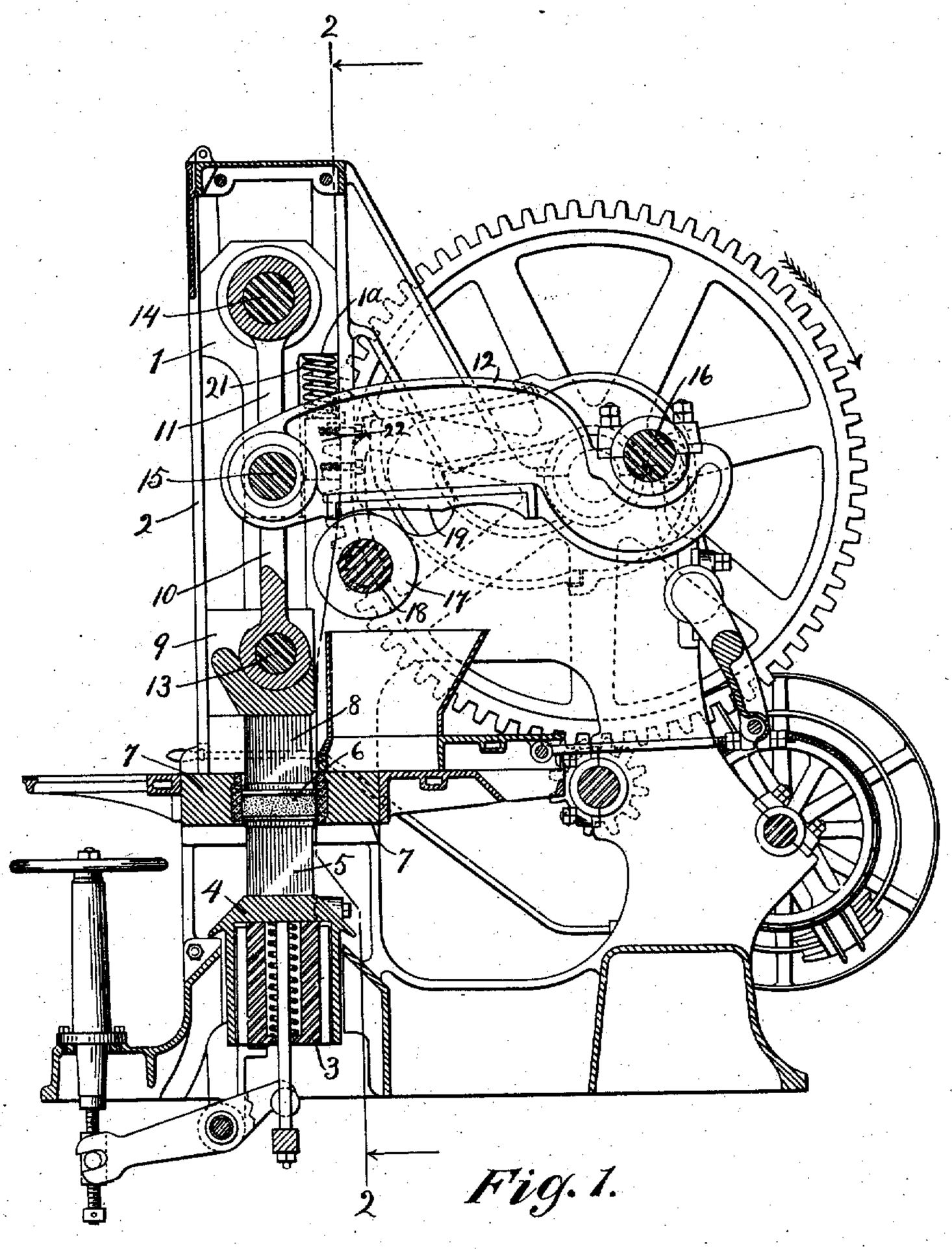

Fig. 1.

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Inventor:
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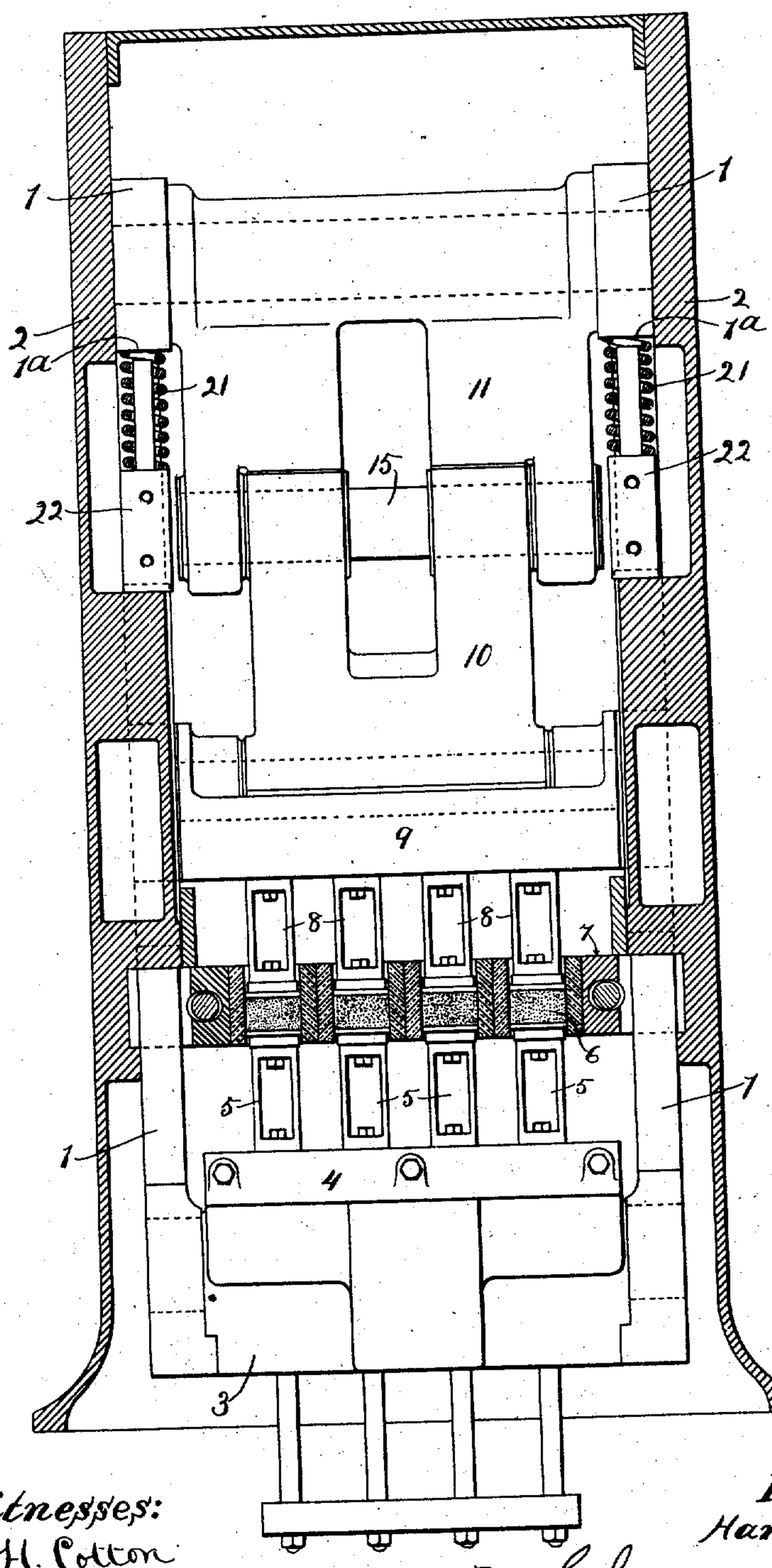

Fig. 2.

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4 SHEETS—SHEET 3.

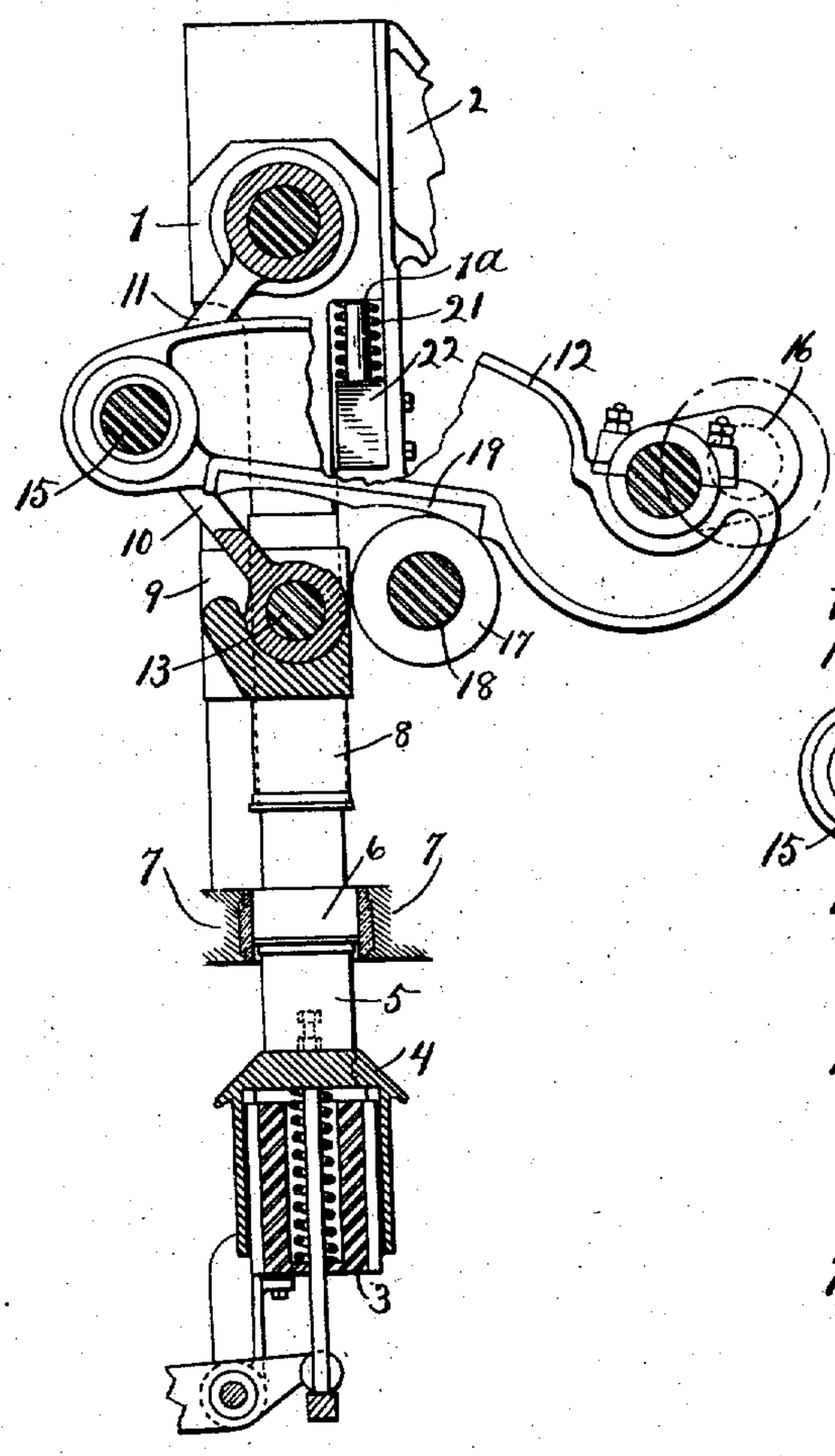

Fig. 3.

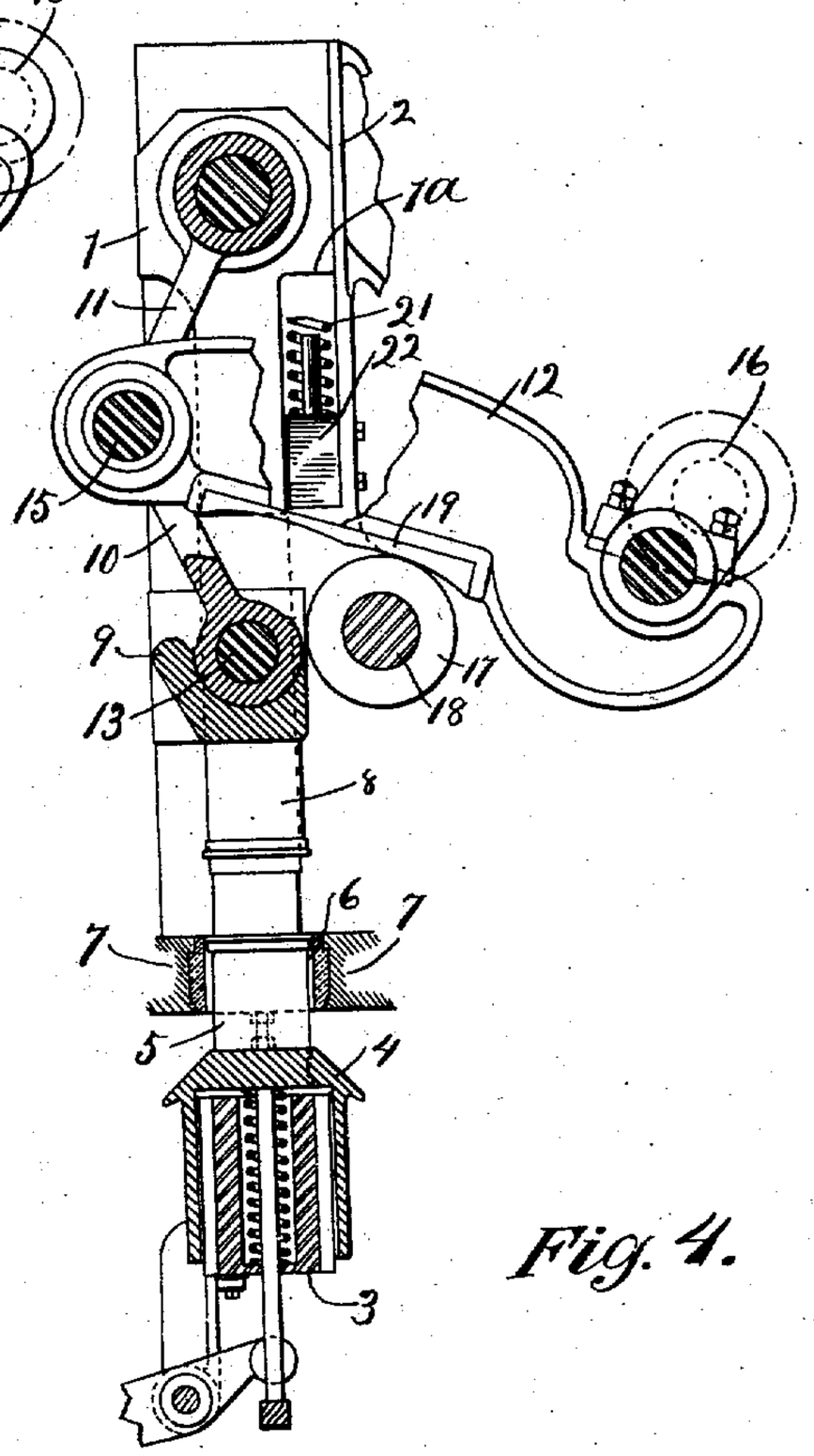

Fig. 4.

Witnesses:
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4 SHEETS—SHEET 4.

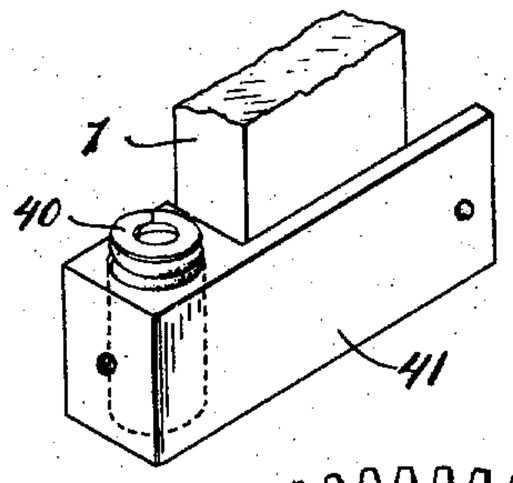

Fig. 6.

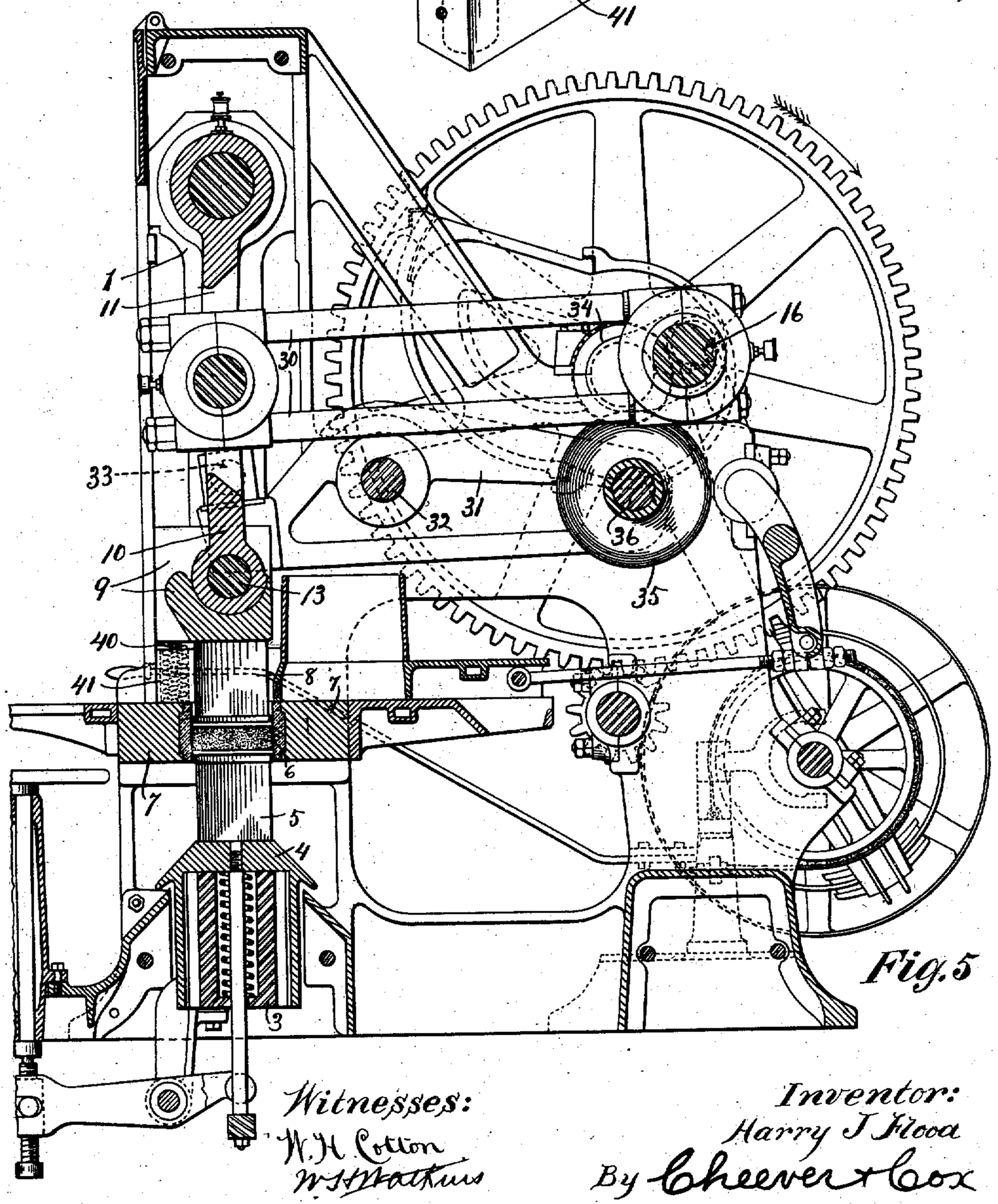

Fig. 5

Witnesses:
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UNITED STATES PATENT OFFICE.

HARRY J. FLOOD, OF CHICAGO, ILLINOIS.

BRICK-PRESS.

987,124. Specification of Letters Patent. Patented Mar. 21, 1911.

Application filed August 29, 1910. Serial No. 579,446.

To all whom it may concern:

Be it known that I, HARRY J. FLOOD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Brick-Presses, of which the following is a specification.

My invention relates to brick presses, particularly those in which vertically reciprocating plungers operate in stationary molds.

The object of the invention is to provide a pressure equalizing device for automatically regulating the amount of pressure applied to the top and bottom of the brick so that both upper and lower sides will be equally pressed.

The type of machine to which my invention is best adapted is one in which the pressing mechanism consists chiefly of an upper and a lower crosshead, side bars, and toggle mechanism, the toggle mechanism consisting of an upper and a lower toggle member operated by a pitman, the upper toggle member being connected at the top to the upper end of the side bars, and the lower toggle member being connected at the lower end to the upper crosshead.

To illustrate the invention I have shown it in connection with two forms of machines, one known as the pitman lever type, and the other as the lifting lever type. In the drawings, the first four figures illustrate the former, and the last two the latter.

Referring to the drawings: Figure 1 is a side sectional elevation of a pitman lever machine embodying my invention. Fig. 2 is a sectional elevation taken in the line 2—2 of Fig. 1. Figs. 3 and 4 show the pressing mechanism more particularly, some of the parts being in section as in Fig. 1. Fig. 5 is a side sectional elevation of a lifting lever machine embodying my invention. Fig. 6 is a fragmentary perspective showing the location of an equalizing spring in a block adapted to hold the spring in the path of the descending upper crosshead.

Similar numerals refer to similar parts throughout the several views.

I will first describe the invention as applied to the pitman lever machine illustrated in the first four figures of the drawings.

The general features of this machine are shown in Patent No. 418,099 granted to White and Boyd, and are well known in the art and, therefore, need not be minutely described.

The side bars 1 are arranged to slide vertically in the side frames 2. At the lower end the side bars carry the lower crosshead 3 which is rigidly secured to the side bars, and yieldingly supports the saddle 4 on which are mounted the lower plungers 5. The saddle and its associated parts form the subject of a separate application, filed by me September 11, 1909, Serial No. 517,285. The lower plungers reciprocate vertically within molds 6 formed within the stationary mold table 7. The upper plungers 8 are carried by the upper crosshead 9 which is guided so as to slide vertically in the side frames 2. This upper crosshead is reciprocated vertically by the toggle members 10 and 11 and pitman lever 12, the crosshead being connected to the lower toggle member 10 by the shaft 13. The upper member 11 is connected to the upper end of the side bars by the shaft 14, and the toggles are connected at their center to the forward end of the pitman lever by the shaft 15. The pitman lever is operated by a crank 16 at its rear end and is supported during a portion of the cycle of operation by a roller 17 mounted upon a stationary shaft 18 and adapted to contact the under side of a wavy cam 19 secured to the under side of the pitman lever. It is well known that in a machine of this type the flexing and straightening of the toggles, due to the action of the pitman lever, causes the upper and lower plungers to move away from and toward each other and thereby compress the clay or other material within the mold. The side bars, toggles, upper and lower crossheads and plungers constitute a pressing mechanism which is free to slide vertically, and would fall if not supported. During a portion of the cycle of operation the pressing mechanism is supported by the roller 17 acting upon the under edge of the pitman lever. But, in my machine the pressing mechanism is supported during the remaining portion of the cycle, not by said roller and

lever but by springs 21. In the form shown, said springs are helical compression springs supported upon blocks 22 bolted to the machine frame 2. The springs are located in position to engage shoulders 1ª upon the side bars, and thus support the latter, and in fact the entire pressing mechanism. The springs are held in position by posts 23 placed vertically within them.

In operation, the parts are so timed that the pressing mechanism is supported upon the springs during the time when the brick is being formed in the mold, and the result is that the springs equalize the top and bottom pressure and thereby produce a brick of uniform density throughout. It will be understood that the weight of the pressing mechanism in an ordinary machine is between 6,000 and 7,000 pounds, and that when the machine is running empty the pressing mechanism will compress the springs until the supporting force of the springs just balances the weight of the pressing mechanism. It will also be understood that as soon as the plungers begin to compress the clay, considerable friction is generated between the clay and the sides of the mold. Now suppose that because of some variation in the condition of the clay or for some other reason the pressure becomes greater on the bottom than on the top of the clay, the excess of resistance to the upward movement of the lower plunger over the resistance to the downward movement of the upper plunger would be the equivalent of a downward force acting upon the pressing mechanism as a whole. As the pressing mechanism, on account of its spring or yielding suspension, is free to move as a whole, this downward force becomes available and acts upon the clay from the top until the resistance at the top equals the resistance at the bottom, or in other words, until the top and bottom pressure become again equal. On the other hand, if for any reason the pressure becomes greater on the top than on the bottom, the excess of resistance to the downward movement of the upper plunger is overcome by the weight of the pressing mechanism which is amply sufficient to take care of all ordinary conditions. In other words the springs when called on exert a tendency upward and the weight of the pressing mechanism when called on exerts a tendency downward.

The lifting lever type of press shown in Figs. 5 and 6 is substantially the same in construction and operation as the pitman lever type above described except that the pitman which, in the present instance, consists of two rods 30, merely flexes and straightens the toggle, and the lifting action, to raise the brick out of the mold, is performed by two lifting levers 31 pivoted upon a fulcrum shaft 32 and adapted to engage pins 33 located upon the inside of the side bars. Said lifting levers are operated by a cam 34 on the main shaft of the machine which is adapted to act upon a roller 35 mounted upon a shaft 36 fastened at the rear end of said levers. As before, the excess of resistance to the upward movement of the lower plunger will be compensated by the supporting springs while the excess of resistance to the downward movement of the upper plunger is compensated by the weight of the pressing mechanism. This type of press need not be described in detail for it is well known in the art and is described in the White Patent No. 488,622.

In the form shown in Figs. 5 and 6 the pressing mechanism is yieldingly supported as before, and thus embodies my invention. In this case helical compression springs 40 are located in suitable apertures in blocks 41 shown in perspective in Fig. 6. In the form shown these blocks are designed to lie close to the side bars 1, and hold the springs in position to engage the upper crosshead. It will be seen that the principle of operation is the same as in the previous case, for the springs 40 will yieldingly support the pressing mechanism when the latter is not otherwise supported. The parts are so timed that said springs support the pressing mechanism at the time that the brick is being formed in the mold, and consequently the springs equalize the pressure upon the top and bottom of the brick as already explained.

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

1. In a brick press the combination of a stationary frame, pressing mechanism comprising side bars, upper and lower crosshead and toggle members, said pressing mechanism being vertically movable in said frame, means for operating said pressing mechanism, and means for yieldingly supporting the same during a portion of the cycle of operation.

2. In a brick press the combination of a stationary frame, a mold therein, an upper crosshead, side bars, toggle members connected to said upper crosshead and to said side bars, means for operating said toggle members, a lower crosshead, plungers mounted on said crossheads, said side bars and connected parts being vertically movable, and springs located in said frame in position to engage the side bars when they descend.

3. In a brick press the combination of a stationary frame, a mold therein, upper and lower plungers, upper and lower crossheads, side bars, toggle members connected to the side bars and upper crosshead, a pitman

lever connected to said toggle members, means for supporting said pitman lever during a portion of the cycle, and springs on the frame adapted to engage the side bars for supporting them during another portion of the cycle.

In witness whereof, I have hereunto subscribed my name in the presence of two witnesses.

HARRY J. FLOOD.

Witnesses:
W. H. COTTON,
HOWARD M. COX.
