F. E. STEVENSON & H. C. LITTLE.

PRESS.

APPLICATION FILED JULY 3, 1915.

1,166,558.

Patented Jan. 4, 1916.

2 SHEETS—SHEET 1.

Fig. 1.

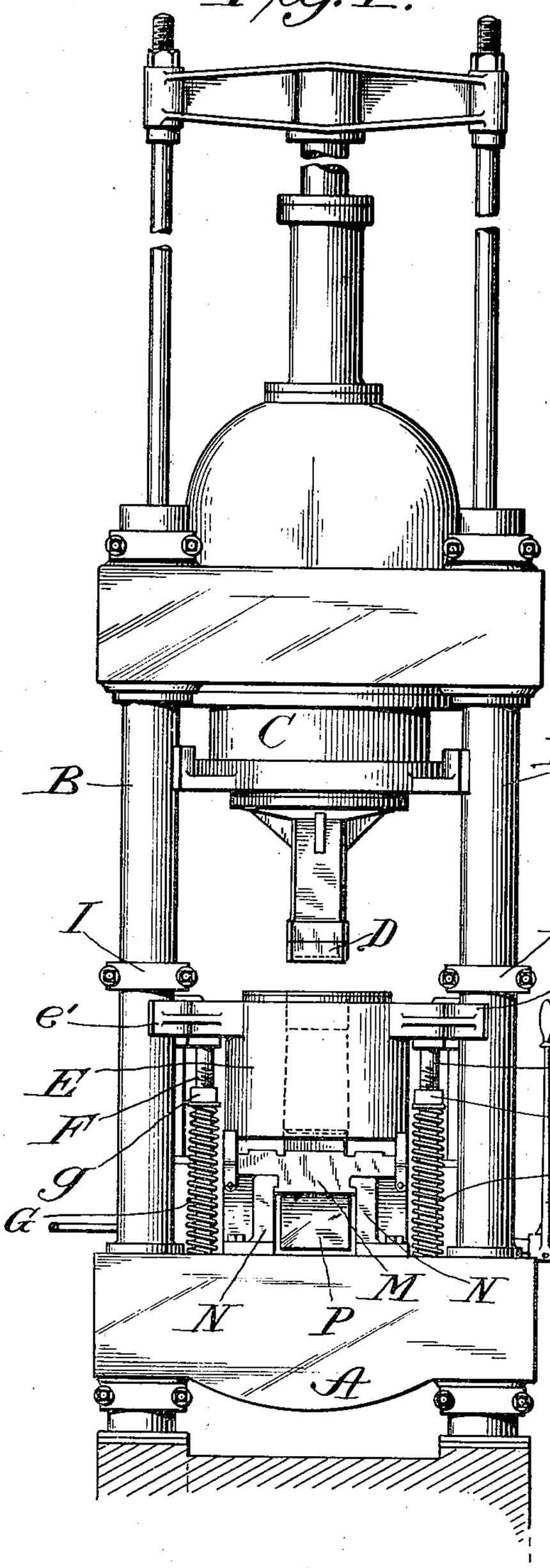
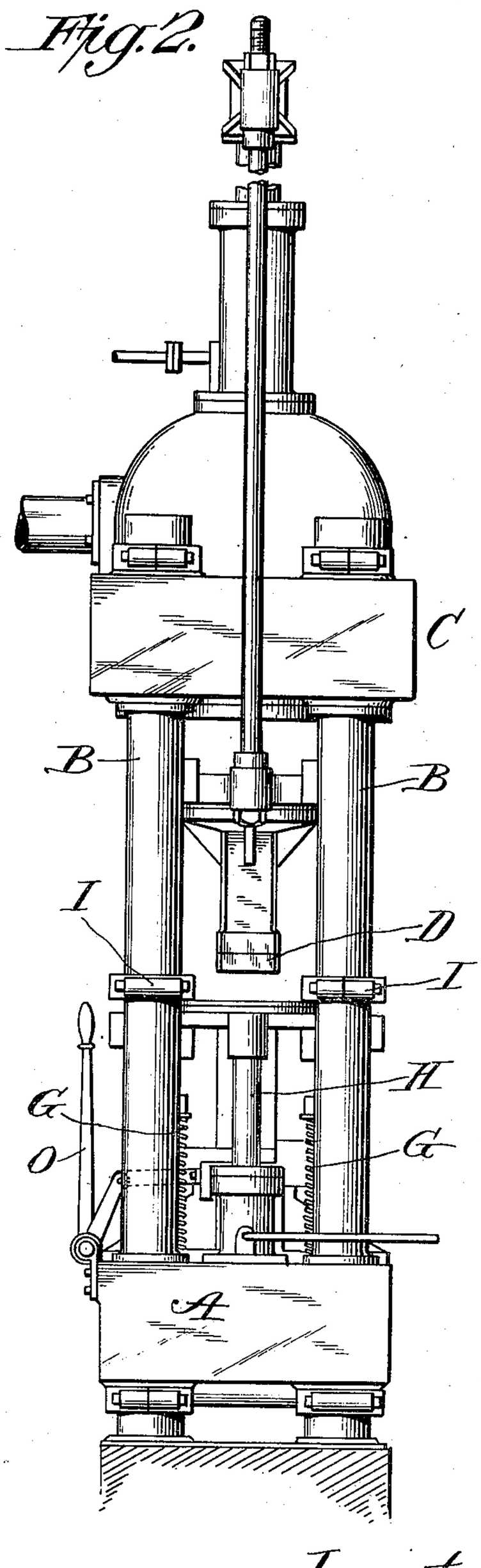


Fig. 2.



Inventors:
F. E. Stevenson and
H. C. Little.
By their Attorneys:
Baldwin & Wright

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2 SHEETS—SHEET 2.

Fig. 3.

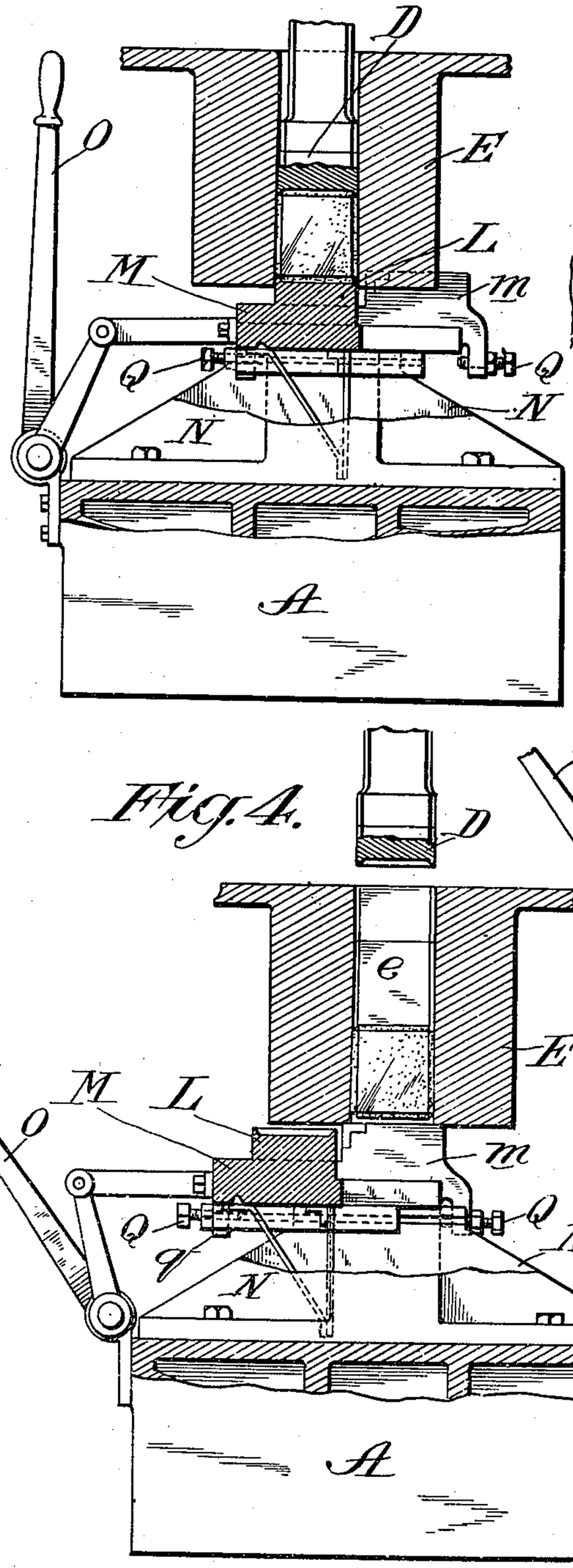


Fig. 6.

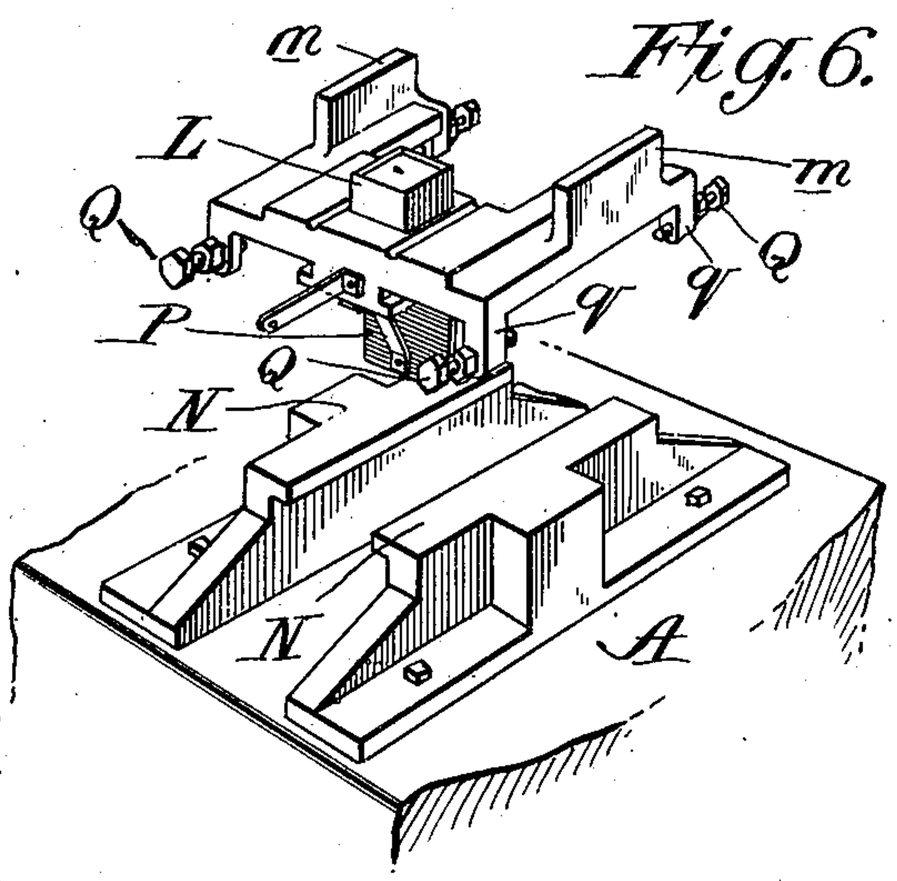
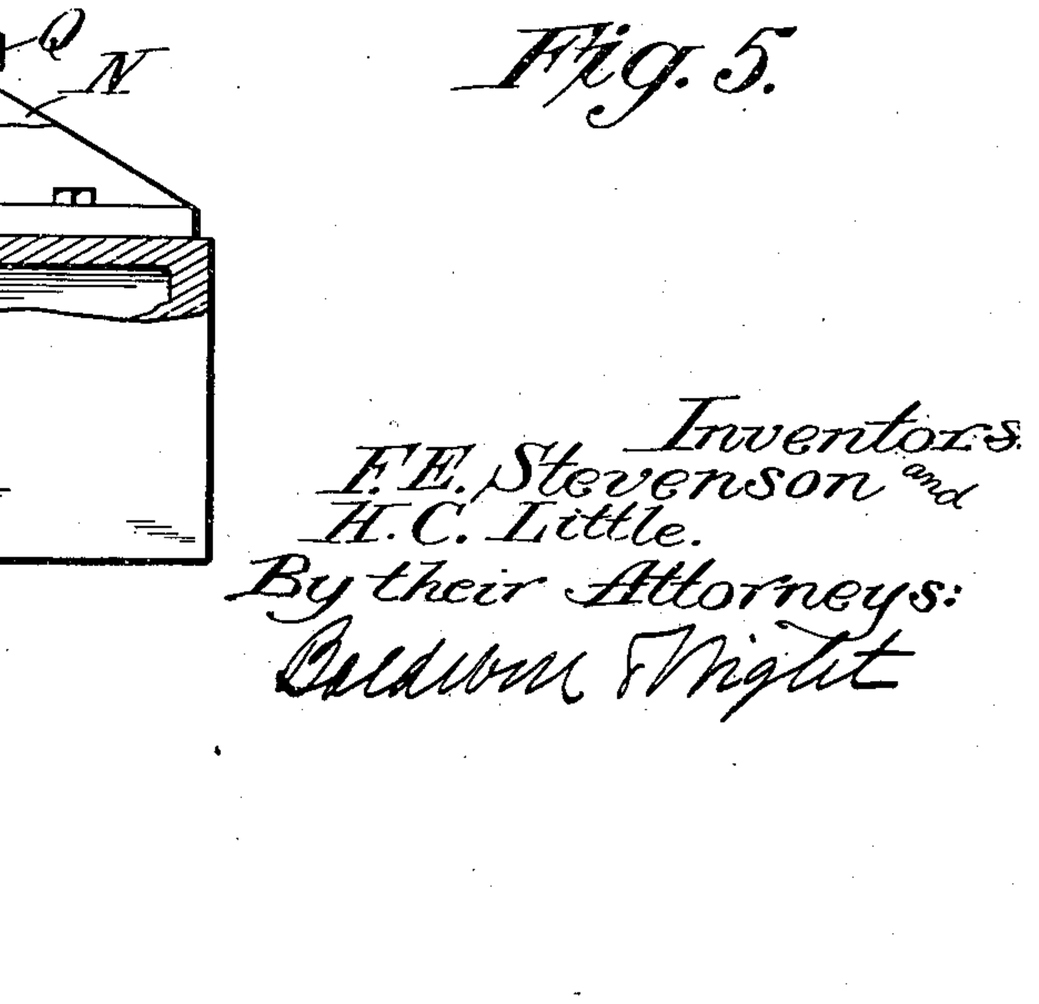


Fig. 4.

Fig. 5.



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UNITED STATES PATENT OFFICE.

FRANCIS E. STEVENSON AND HARRY C. LITTLE, OF MOUNT GILEAD, OHIO, ASSIGNORS TO THE HYDRAULIC PRESS MANUFACTURING COMPANY, OF MOUNT GILEAD, OHIO.

PRESS.

1,166,558. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed July 3, 1915. Serial No. 38,009.

To all whom it may concern:

Be it known that we, FRANCIS E. STEVENSON and HARRY C. LITTLE, both citizens of the United States, and both residing in Mount Gilead, in the county of Morrow and State of Ohio, have invented certain new and useful Improvements in Presses, of which the following is a specification.

This invention relates especially to presses of the kind used for compressing materials of different kinds into blocks or briquets of convenient size and it relates particularly to a press designed to compress salt into block or briquet form whether it be of the evaporated kind or crushed rock salt.

Rock salt in lumps of comparatively large size is commonly fed to cattle and other stock and it is also not uncommon to compress crushed or fine salt into blocks or briquets for the same use, but presses of ordinary construction are not well adapted for this purpose because when such material is subjected to great pressure in one direction uniform density cannot be obtained in the block or briquet owing to the cohesion of the particles of salt and the friction produced on the side walls of the chamber in which the block or briquet is formed which causes the material to become arched while resisting the power of the press. In this way one end of the block, *i.* e., that to which the pressure is directly applied, is made harder than the other. To remedy these defects we have provided a press equipped with a floating spring-supported mold or die into the lower end of which extends a die supported on a transversely movable carrier and the opposite end of which receives a hydraulically operated ram. The material to be compressed is fed to the mold chamber while the bottom thereof is closed by the lower die and then the hydraulic ram carrying the upper die is operated to compress the material to the desired extent. In so doing the floating die or mold is depressed against the force of its supporting springs owing to the cohesion of the particles and their adhesion to the side walls of the mold chamber. The effect is to cause the lower die to enter part way into the mold chamber and thus cooperate with the upper die to compress the material uniformly to the desired extent. When pressure is removed and the ram is elevated the supporting springs cause the floating die or mold to return to its normal position and in order to eject the finished block or briquet hydraulic plungers or jacks are employed to lift the floating die above the plane of the lower die so that the latter with its carrier may be withdrawn to one side of the press leaving a clear space to receive the block or briquet which is ejected by a downward movement of the upper die. The die carrier is fitted with an apron which serves to move the block when ejected from the press to one side thereof.

Other features of the invention will be hereinafter described.

In the accompanying drawings, Figure 1 is a front elevation of a press embodying our improvements. Fig. 2 is a side elevation thereof. Fig. 3 is a detail view partly in elevation and partly in section showing particularly the condition of the dies during the compressing operation. Fig. 4 is a similar view showing the position of the parts after the block has been compressed and the upper and lower dies removed from the chamber of the floating die and in which position the upper die may be operated to eject the compressed block. Fig. 5 is a view similar to Fig. 4 but showing how the upper die ejects the compressed block and how the apron operates to remove the block to one side of the press. Fig. 6 is a detail view in perspective showing particularly the construction and relation of the lower die, its carrier and the supports or rails on which the die-carrier is mounted.

The main frame of the press may be of any suitable construction and need not be described in detail. The base A supports the pillars or strain rods B which in turn support the hydraulic ram C that operates the upper die D.

The floating die E has a chamber *e*, the walls of which are slightly tapered or inclined, as shown, from bottom upward and the corners of the walls of this chamber are suitably beveled to avoid sharp edges on the briquet or block. The lower face of the die D is recessed, as shown, and has beveled edges in order to give proper shape to the top of the compressed block. The floating die E is provided with arms *e'* engaging the pillars or strain rods B and these arms carry downwardly projecting rods F which extend through springs G resting on the base A of the press. The rods are adapted to move vertically through

the base A and they carry adjustable collars *g* which rest on the tops of the springs.

By these devices the floating die is adapted to be depressed against the force of the springs during the compressing operation. It will be observed that there are four rods F and four corresponding springs G and that the arms *e'* are adapted to move vertically on the pillars or strain rods B which serve as guides for the floating die.

Hydraulic jacks H are connected to the arms of the floating die and these serve to lift the die above its normal spring-supported position just before the block or briquet is ejected. Stop collars I secured to the press strain rods limit the upward movement of the floating die when raised by the jacks. The lower die L is mounted on a die-carrier M which rests on rails N secured to the base of the press. Normally the die L projects to a small extent into the floating die, as shown in Fig. 3, but after the block has been formed and compressed the floating die is raised by the jacks in such manner as to withdraw the lower die from the chamber of the floating die and then by means of the lever O the carrier M may be moved to the position shown in Fig. 4 at which time press supports *m* extending upwardly from the carrier M come below the floating die and take the strain of the press when the floating die is depressed during the operation of ejecting the block or briquet. This is clearly shown in Fig. 4, and Fig. 5 shows how the block is received on the base of the press in front of an apron P extending downwardly from the die-carrier in such relation to the block that when the carrier is moved back to its normal position the block will be pushed to one side of the press. The movement of the die-carrier is limited by means of adjustable bolts Q fitted in lugs *q* projecting downwardly from the die-carrier and which abut against the ends of the rails N.

While we have shown four springs for supporting the floating die, it is, of course, understood that we are not limited to this number of springs, and it is also obvious that the springs may be omitted and the hydraulic jacks or rams H may serve to take their place, these rams being used to yieldingly support the floating die and also to elevate it to the desired extent to clear the lower die just before the ejecting operation. Other details of construction may also be varied.

What we claim is:

1. A press comprising a floating chambered die, an upper die coöperating therewith and which when it descends lowers the floating die, a lower die extending into the chamber of the floating die and means for withdrawing the floating die from the lower die and for moving the lower die laterally to one side of the press.

2. A press comprising a floating chambered die, springs on which it is supported, an upper die coöperating with the floating die and which when it descends lowers the floating die, a lower die extending into the chamber of the floating die, means for lifting the floating die above the plane of the lower die and means for moving the lower die laterally to one side of the press.

3. A press comprising a floating chambered die, an upper die cooperating therewith and which when it descends lowers the floating die, a lower die extending into the chamber of the floating die, a die-carrier on which the lower die is mounted, means for raising the floating die above the plane of the lower die, means for moving the lower die laterally, and means on the die-carrier for supporting the floating die when the lower die is moved to one side of the chamber of the floating die.

4. A press comprising a floating chambered die, an upper die coöperating therewith and which when it descends lowers the floating die, a lower die extending into the chamber of the floating die, a die-carrier for the lower die, an apron carried thereby for pushing the compressed material to one side of the press, means for raising the floating die above the plane of the lower die, and means for moving the lower die and its carrier sidewise relatively to the vertical axis of the floating die.

In testimony whereof, we have hereunto subscribed our names.

FRANCIS E. STEVENSON.
HARRY C. LITTLE.

Witnesses:
HELEN G. CARR,
C. W. PURCELL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."