

(No Model.)

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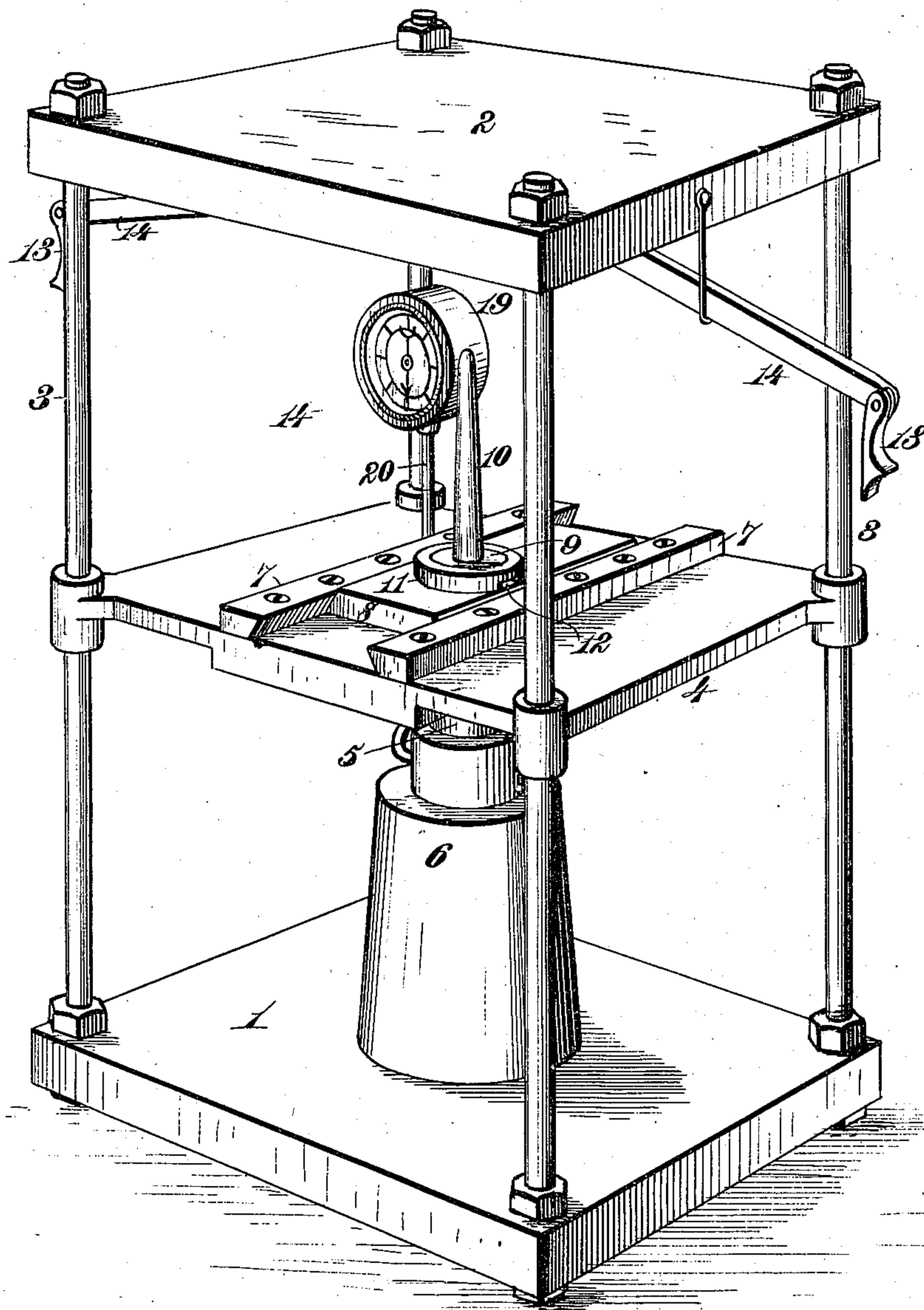
C. B. LINTON.

MACHINE FOR CHARGING FIRE WORKS.

No. 376,004.

Patented Jan. 3, 1888.

Fig. 1.



Witnesses.

Robert Everett
J. A. Mulherford.

Inventor:

Charles B. Linton.
By

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(No Model.)

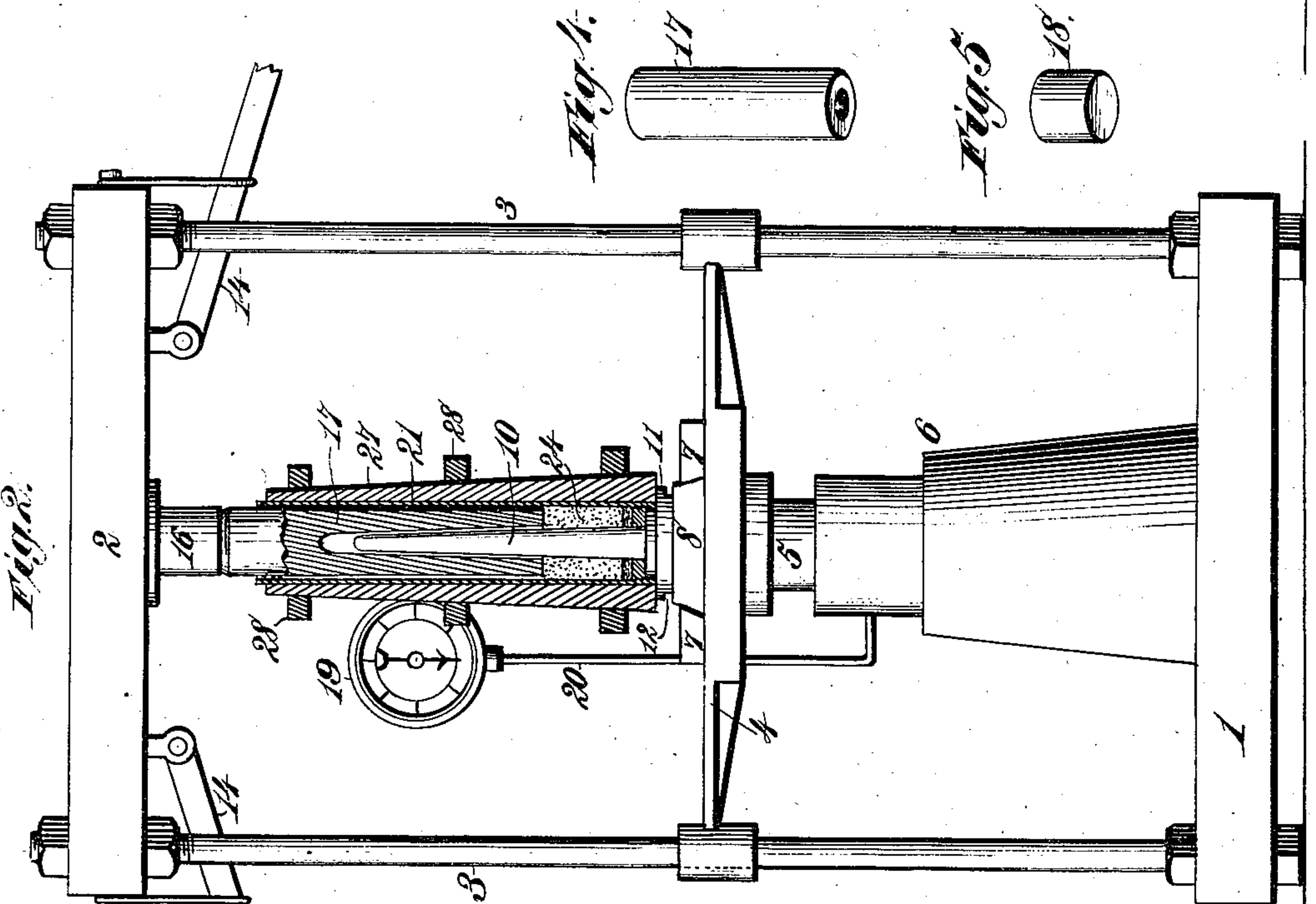
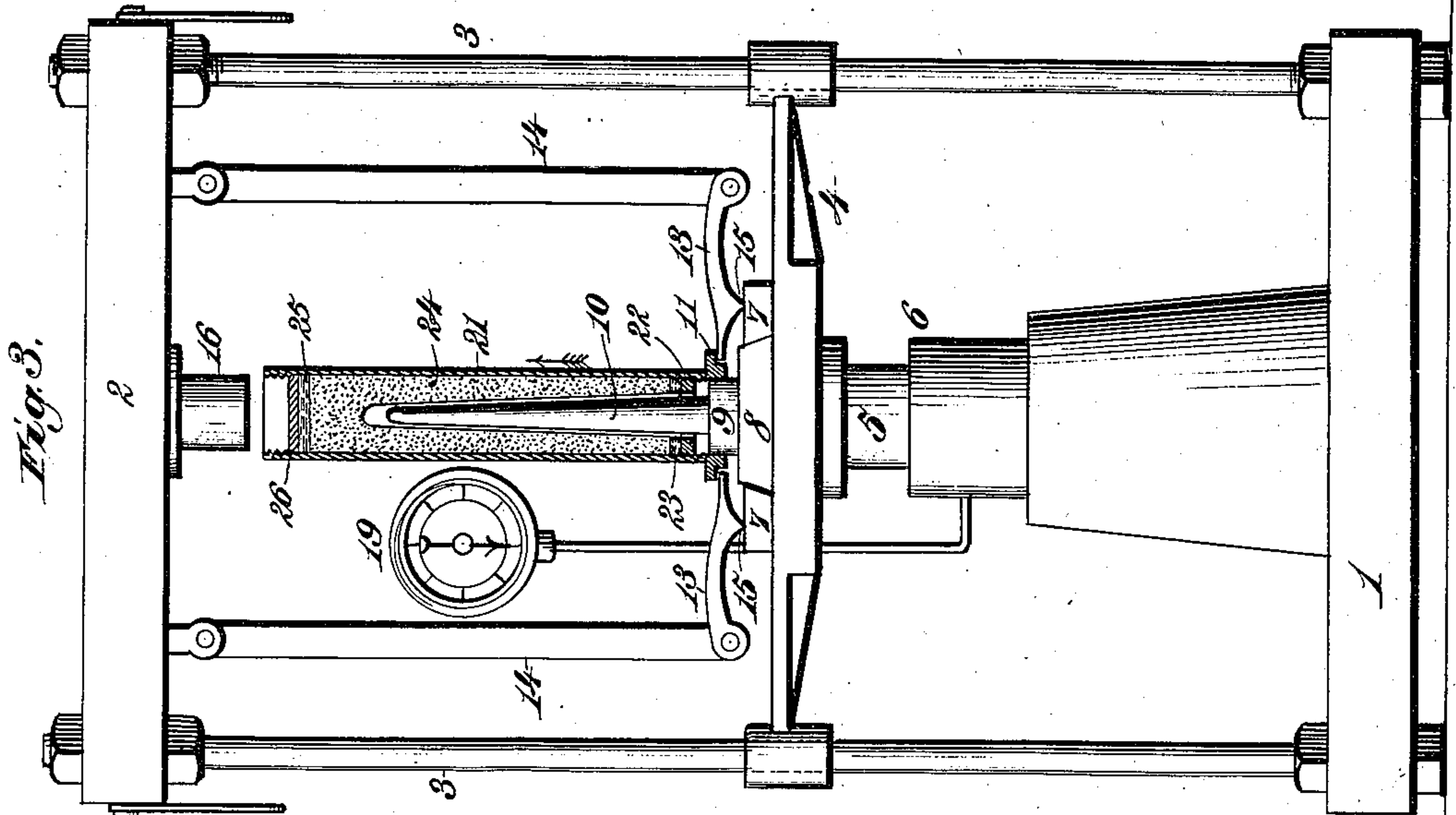
2 Sheets—Sheet 2.

C. B. LINTON.

MACHINE FOR CHARGING FIRE WORKS.

No. 376,004.

Patented Jan. 3, 1888.



Witnesses.
Robert Smith,
J. A. Kutherford.

Fig. 5.

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UNITED STATES PATENT OFFICE.

CHARLES B. LINTON, OF BROOKLYN, ASSIGNOR TO THE UNEXCELLED FIRE-
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MACHINE FOR CHARGING FIRE-WORKS.

SPECIFICATION forming part of Letters Patent No. 376,004, dated January 3, 1888.

Application filed November 10, 1887. Serial No. 254,807. (No model.)

To all whom it may concern:

Be it known that I, CHARLES B. LINTON, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Machines for Charging Fire-Works, of which the following is a specification.

My invention relates to a machine for charging rockets and similar fire-works, preferably by hydraulic power; and it consists in the construction and combination of devices, hereinafter specified, whereby a cylindrical casing can be conveniently and rapidly charged with an explosive or burning composition under a regulated pressure and the charged casing readily disengaged from the machine without injury to said casing or displacement of the contents.

The invention is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of my improved machine for charging fire-works. Fig. 2 is an elevation of the machine, showing a rocket-case partly charged. Fig. 3 is a similar view showing a charged rocket-case in the act of being removed from the mandrel-block. Figs. 4 and 5 are perspective views of rammers used in charging a rocket case. Fig. 6 represents a metal jacket for inclosing the rocket-case while it is being charged.

By referring to the drawings it will be seen that the machine comprises a press having a lower stationary bed, 1, and an upper stationary platen, 2. These stationary parts are firmly connected by vertical rods or standards 3, which also serve as guides for a vertically-movable platen, 4, that normally rests on the piston or plunger 5 of a hydraulic ram, 6, that may be constructed and arranged in any well-known manner. Instead of the hydraulic ram, however, it will be understood that the movable platen 4 may be supported and actuated by other suitable means.

The upper surface of the movable platen 4 is provided with parallel guideways 7 for a slide, 8, on which is formed or secured a cylindrical boss or block, 9, having a tapering mandrel, 10, projecting vertically from the center. A loose collar, 11, surrounds the circular block 9 and rests normally on the slide. This collar 11 forms a support for the rocket-case or other

similar tube to be charged, and after the case or tube has been filled it is readily lifted from its engagement with the mandrel-block 9, by simply raising the collar 11, without any injury to the case and its contents, which would be liable to occur should the rocket-case be lifted by other than a directly-vertical movement.

In order to provide a convenient means for lifting the collar 11, recesses 12 are formed in opposite sides thereof, to receive the ends of lifting-dogs 13, pivoted to the lower ends of swinging arms 14, that are suspended from the upper stationary platen. On the under sides of the dogs 13 are shoulders 15, which rest on the movable platen 4 or guides 7 when the dogs 13 and arms 14 are swung inward. By swinging the arms 14 inward, with the dogs 13 resting on the guides 7 and engaged in the recesses 12 of the collar 11, the charged rocket-case can be lifted vertically from the circular boss or mandrel-block 9, as shown in Fig. 3, by applying power to raise the movable platen.

It will be observed that when the dogs 13 are swung inward to engage the collar 11 the arms 14 assume a vertical position, and their lower ends, to which the dogs are pivoted, thus serve as fixed points, on which the dogs turn in lifting the collar 11 under the action of the upward-moving platen.

While a rocket-case or other tube is being charged the arms 14 and dogs 13 are swung outward and secured by any suitable means clear of the movable platen. Secured to the under side of the upper stationary platen, 2, is a short cylindrical bearing-block, 16, for the loose rammer 17, Fig. 4, or 18, Fig. 5, used in compacting or pressing the charge placed in the rocket-case.

A pressure-gage, 19, is connected with the hydraulic ram by means of a pipe, 20, so that the pressure to which the composition is subjected can be observed and regulated as required.

To charge a rocket case or similar tube, the movable platen 4 is lowered, the slide 8 withdrawn, and a suitable cylindrical casing or tube, 21, placed in a vertical position on the loose collar 11 and around the circular mandrel block or boss 9, which it fits closely. The circular block or boss 9 projects above the col-

lar 11 and into the lower end of the casing 21 a distance equal to the thickness of the fuse-piece which is to occupy that end of the rocket-case. Before placing the rocket-case on the block 9 and collar 11 a metal choke, 22, should be inserted into the case or tube, and this choke will rest on the block 9 and surround the mandrel 10, as shown in Fig. 2. After the rocket-case has been attached to the block 9, a small quantity of clay, 23, will be placed in the lower end of the case above the metal choke 22, and a rammer having a hollow core to fit over and around the mandrel 10 is also inserted into the rocket-casing over the clay. This rammer is in form similar to the rammer 17, (shown in Figs. 2 and 4,) and must be sufficiently long to rest on the clay and project beyond the upper end of the rocket-case. The slide 8 will now be moved inward along the guides 7 until the mandrel 10 is centered beneath the block 16, that projects down from the upper stationary platen. Power is then applied to raise the movable platen 4 and compress the clay 23 by the pressure of the rammer bearing against the block or boss 16 on the upper platen. By lowering the platen 4 and withdrawing the slide 8 access will be afforded for removing the long rammer from the mandrel and rocket-casing. The burning composition or explosive 24 will now be introduced into the casing 21 in suitable quantities at intervals, each portion of the charge being separately compacted by hollow-cored rammers 17, successively diminished in length, until the casing has been filled to the top of the mandrel. A short solid rammer, 18, Fig. 5, will then be used to compact the composition in the upper end of the rocket-case. In pressing each separate portion of the charge the slide 8 will be moved into its proper position and the movable platen 4 elevated to bring the upper end of the rammer in contact with the boss or bearing-block on the upper stationary platen. The degree of pressure exerted will be indicated by the pressure-gage 19, and can thus be easily regulated to secure uniform results or to compact the composition more or less closely, as desired. After all the pyrotechnic composition has been placed in the tube or casing 21, a layer of clay, 25, will be placed over the composition and compressed with a short rammer, and a metal disk, 26, as shown in Fig. 3, may also be inserted. In a metal rocket-case it is preferable to have the ends internally threaded to engage a fuse-piece and metal choke at one end, and a ring and conical head at the other end, and in filling the case these internal threads will be left exposed, as shown.

After the rocket case or tube 21 has been charged, as above described, the arms 14 will be swung inward into a vertical position, with the pivoted lifting-dogs 13 engaged in the recesses 12 of the collar 11, and by then raising the lower movable platen, 4, the collar 11 will be elevated sufficiently to start the lower end of the rocket-case and raise it vertically

on the block 9 engaged in its lower end. The movable platen 4 will now be lowered, the arms 14 and dogs 13 swung outward, and the slide 8 withdrawn, so as to enable the charged rocket to be removed from the mandrel 10 by a direct vertical movement without liability of disturbing its contents and without requiring the use of any instrument that would be likely to deface the casing.

As the rammer is placed in the rocket case by hand and forced gradually downward therein by contact with the upper stationary platen, it is obvious that it is not liable to injure the upper end of the case, as might occur if the rocket-case were stationary and the rammer suspended from a movable support or platen.

In order to obviate any tendency to spread the rocket-case under the great pressure to which the composition is subjected, a strong metal jacket, 27, formed in two or more parts, having concaved inner faces and outer tapering surfaces, as shown in Fig. 6, may be placed around the rocket-case, and secured thereon by rings 28, driven down over the conical exterior of the jacket, as shown in Fig. 2. The rocket case is thus protected against any liability of injury from the great pressure to which the pyrotechnic composition is subjected.

What I claim is--

1. In a machine for charging fire-works, the combination, with a press having a stationary upper platen and a lower vertically-movable platen, of a horizontal slide supported on the movable platen, and having on its upper face a circular boss or block, a mandrel projecting vertically from the center of said block, and a loose vertically-movable collar surrounding the lower part of the said boss or block to support the rocket case or tube to be charged and to raise and disengage the same from said block after the operation of charging, substantially as described.

2. In a machine for charging fire-works, the combination, with a press having a stationary upper platen and a lower vertically-movable platen provided with horizontal guides, of a horizontal slide adapted to move in said guides in the upper face of the movable platen, said slide being provided on its upper face with a circular boss or block and a mandrel projecting vertically from the center of said block, a loose collar surrounding the lower part of the circular boss to support a rocket case or tube placed thereon, and pivoted laterally-swinging dogs to engage the said collar and lift it to disengage the charged rocket case or tube from the boss, substantially as described.

3. In a machine for charging fire-works, the combination, with a press having a stationary upper platen and a lower vertically-movable platen, of a horizontal slide supported on the movable platen and provided on its upper face with a circular boss or block having a central vertically-projecting mandrel, and a loose rammer to be placed in a rocket case or

tube engaged on said boss or block in position to be driven into said tube by pressure against the upper platen, substantially as described.

4. In a machine for charging fire-works, the combination of a press having a stationary upper platen and a lower vertically-movable platen, a hydraulic ram to support and actuate the movable platen, a pressure-gage, a horizontal slide supported on the movable platen and provided on its upper face with a circular boss having a central vertically-projecting mandrel, and a loose collar surrounding the lower part of the said boss to support a rocket case or tube engaged with the boss, substantially as described.

5. In a machine for charging fire-works, the combination of the upper stationary platen, 2, the lower movable platen, 4, having guides 7, the slide 8, moving in said guides and provided with circular boss 9 and mandrel 10, the loose collar 11, surrounding the lower part of the boss and provided with recesses 12, the swinging arms 14, suspended from the upper

platen, and the lifting-dogs 13, pivoted to the lower ends of the swinging arms and adapted to be engaged with the recesses in the loose collar to lift said collar and disengage a charged rocket-case from the boss, substantially as described.

6. In a machine for charging fire-works, the combination, with the upper stationary platen, 2, the lower movable platen, 4, the slide 8, provided with boss 9 and mandrel 10, loose collar 11, surrounding said boss, and a loose rammer placed in a rocket-case engaged on said boss in position to be driven into said tube by pressure against the upper platen, of a metal jacket, 27, formed in two or more parts, secured around the rocket-case, substantially as described.

In testimony whereof I have affixed my signature in presence of two witnesses.

CHARLES B. LINTON.

Witnesses:

GEO. T. EGBERT,
HENRY S. CRAFT.