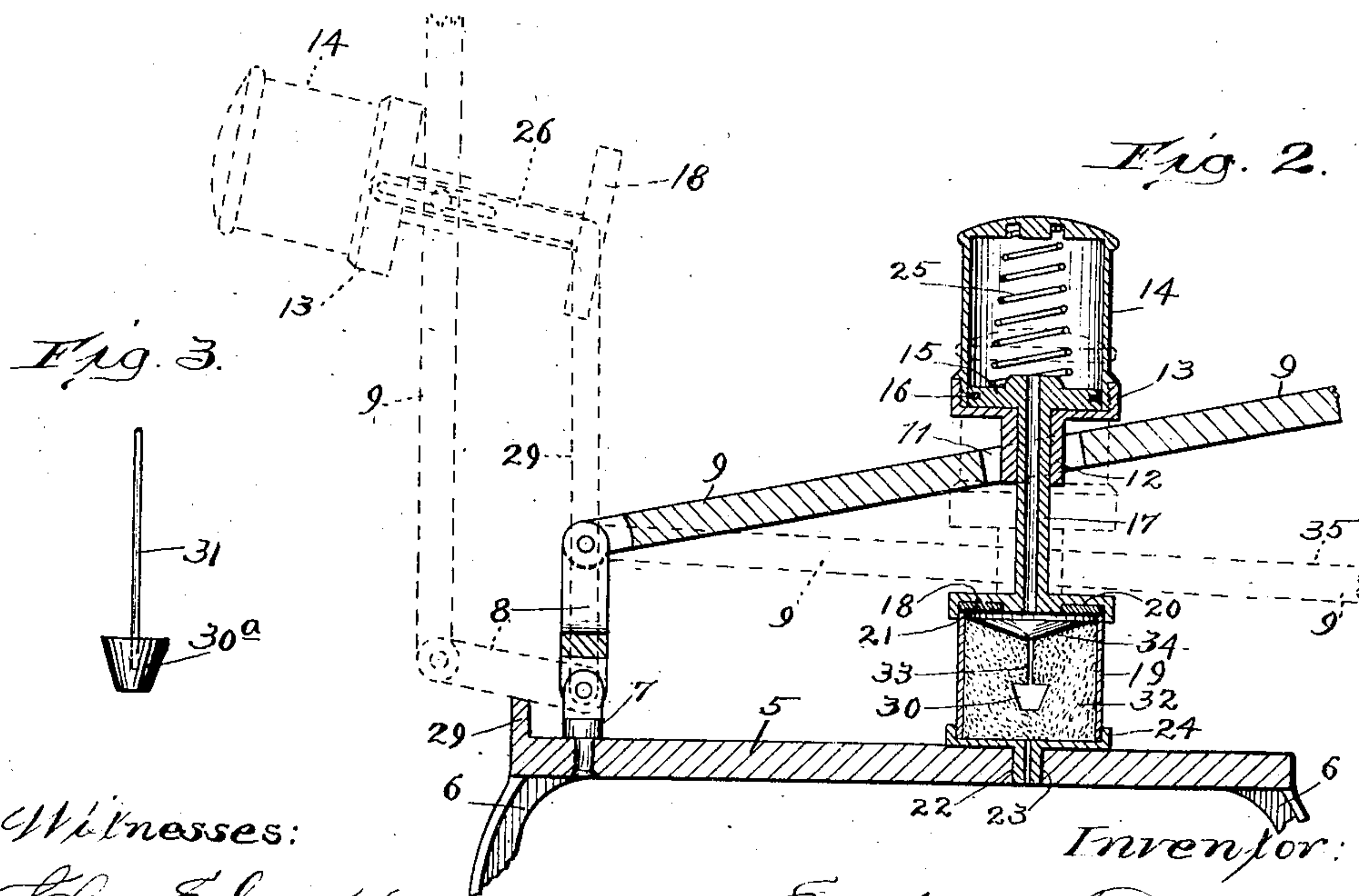
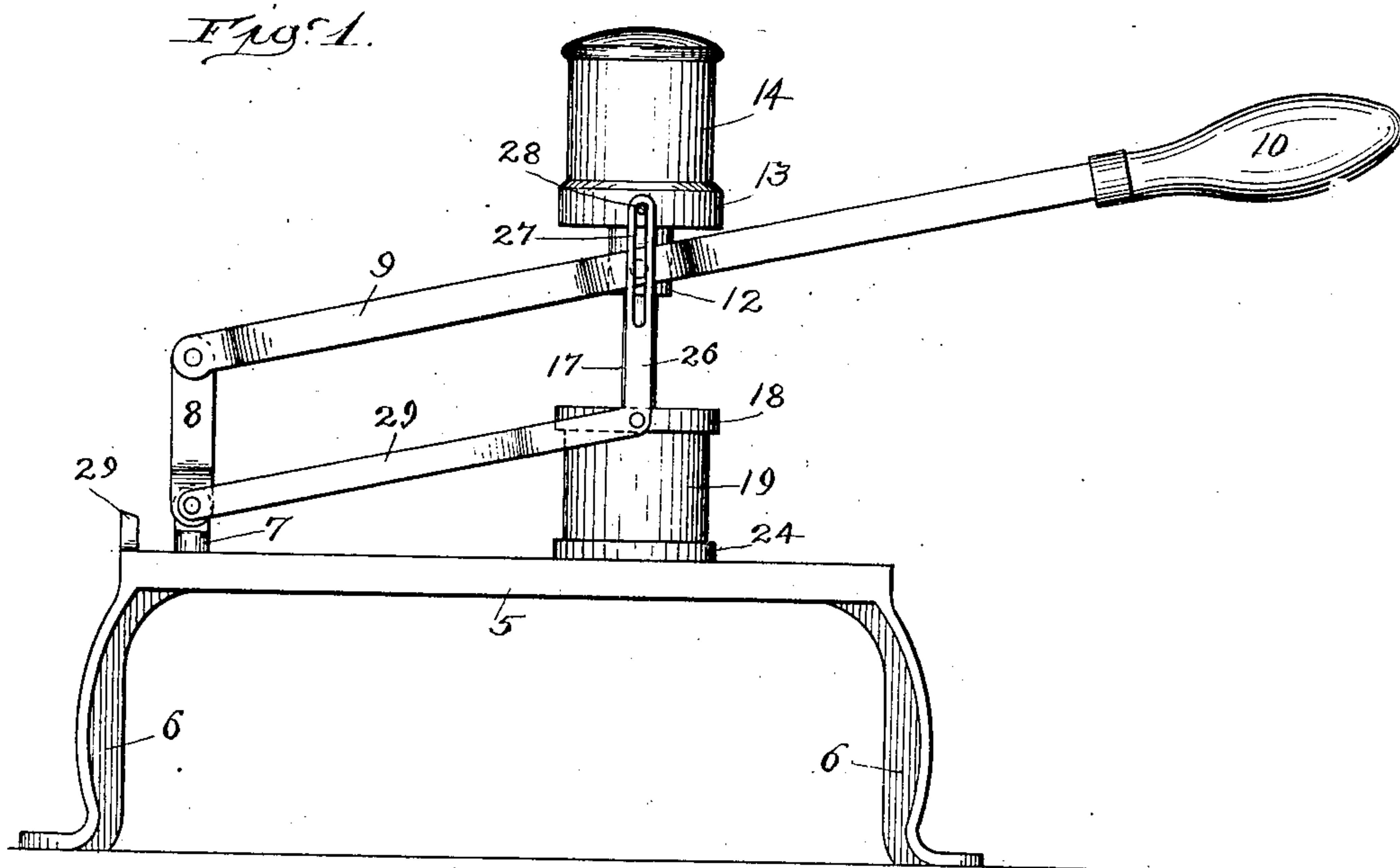


E. M. FREDERICKS.
DENTAL INLAY CASTING MACHINE.
APPLICATION FILED MAR. 7, 1908.

920,561.

Patented May 4, 1909.



Witnesses:

Chas. E. Gorton.
M.A. Nymman

Inventor:

Enoch M. Frederick

By Chas. C. Hillman *Att'y*

UNITED STATES PATENT OFFICE.

ENOCH M. FREDERICKS, OF CHICAGO, ILLINOIS.

DENTAL-INLAY-CASTING MACHINE.

No. 920,561.

Specification of Letters Patent.

Patented May 4, 1909.

Application filed March 7, 1908. Serial No. 419,721.

To all whom it may concern:

Be it known that I, ENOCH M. FREDERICKS, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in a Dental-Inlay-Casting Machine, of which the following is a specification.

This invention relates to improvements in a machine to be employed by dentists for producing certain articles or devices required in their work, and while it is more especially intended to be used for casting dental inlays of metal, yet it is applicable for casting tooth-crowns, bridges and clasps; and it consists in certain peculiarities of the construction, novel arrangement, and operation of the various parts thereof, as will be hereinafter more fully set forth and specifically claimed.

The principal object of the invention is to provide a machine for casting dental inlays and the like, which shall be simple and inexpensive in construction, strong, durable and effective in operation, the parts of which shall be so made and arranged with respect to one another that in the operation of forming the casting the gold or other material will be forced into the matrix by means of compressed air, and in such a manner as to readily and quickly provide inlays or castings which shall be perfect and without flaws.

Another object of the invention is to so construct the machine that flasks of various sizes for holding the investing material may be employed without the necessity of changing other parts of the machine.

Other objects and advantages of the invention will be disclosed in the subjoined description and explanation.

In order to enable others skilled in the art to which my invention pertains, to make and use the same, I will now proceed to describe it, referring to the accompanying drawing, in which—

Figure 1 is a view in side elevation of a casting machine embodying the invention, showing the parts in the positions they will assume when ready to apply pressure to the molten metal or liquid material out of which the casting is made; Fig. 2 is a central vertical sectional view of the device, showing by continuous lines the parts in the positions illustrated in Fig. 1 and by dotted lines the positions to which they may be moved in the act of applying compressed air to the flask,

and when it is desired to remove the flask from the base or to place the same in position thereon; and Fig. 3 is a side view of a model and sprue-former to be used in producing the matrix in the investing material.

Like numerals of reference, refer to corresponding parts throughout the different views of the drawing.

The reference numeral 5 designates the base of the machine, which may be made of any suitable size, shape and material, but preferably of metal and rectangular in shape, and with supporting-legs 6 at each of its corners. Near one of its ends the base 5 is provided with an upwardly extending projection 7 to which is pivotally secured at its lower end a link 8, the upper end of which has pivotally secured thereto one end of the hand-lever 9 the other end of which may be provided with a handle 10, of any suitable material. The hand-lever 9 is provided near its middle with an opening 11 for the reception and operation of a depending neck or extension 12 on the internally screw-threaded cap 13 of the air compressor or cylinder 14, which has its lower portion externally screw-threaded to engage the threads of the cap 13, as will be readily understood by reference to Fig. 2 of the drawing. The neck 12 is pivotally secured to the hand-lever 9 within the opening 11 thereof, which opening is slightly elongated to permit of the free movement of the neck when the handle is turned on its fulcrum. Fitted in the cylinder 14 is a piston 15 which has at its periphery suitable packing 16, and is provided centrally with a hollow piston-rod 17 which extends through the neck or extension 12 and has on its lower end an inverted hollow plate or cup 18 to fit on the top of the flask 19, which may be made of any suitable size and shape, but preferably cylindrical and with each of its ends open.

As shown in Fig. 2 of the drawing the plate 18 is provided on its lower surface with an annular recess 20 in which is located packing 21, of any suitable heat resisting material such as asbestos. By providing the plate 18, which it will be understood may be of any desired shape, with a recess or cavity 20 in its lower surface, which recess extends from near the center of the plate to near its outer edges, that flasks 19 of different sizes and shapes may be used in connection therewith and that the packing 21 in the recess will tightly close the upper end of

the flask. At a suitable point, to be directly beneath the piston-rod 17 when in its operative position, the base 5 is provided with an opening 22 for the reception of an aper-
 5 tured extension 23 on the lower portion of the flask-holder 24, which is cup-shaped when a cylindrical flask is employed, and of sufficient size to receive the lower end thereof. When other shaped flasks are employed,
 10 it is evident that the holder 24 may be made of a corresponding shape. Located in the cylinder 14 and seated at one of its ends in the top thereof is a spring 25, the other end of which is seated against the inner or upper
 15 surface of the piston 15 and serves to normally hold the latter and its piston-rod 17 in their projected positions, thus permitting the cylinder 14 to be filled with air through the opening in the piston-rod.
 20 Fulcrumed on the plate 18 is a bell-crank-lever, the shorter arm 26 of which is provided with a longitudinally extending slot 27 to receive a pin 28 on the cap 13 of the compression cylinder. The longer arm 29
 25 of the bell-crank-lever is pivotally connected at its free end to the projection 7 on the base of the machine. By employing the bell-crank-lever and connecting it to the parts 7, 13 and 18 as above set forth, it is evident
 30 that in the act of applying compressed air to the flask 19 the compression cylinder 14 and the piston-rod 17 will be held in a true vertical position, thus causing the plate 18 to properly fit on the top of the flask so as
 35 to prevent the escape of air. To form a rest or support for the link 8 and the other member of the machine which it carries when the parts are raised to the positions shown by dotted lines at the left of Fig. 2, the base 5
 40 may be provided with an upward extension 29 at its end adjacent to the projection 7 to which the link 8 is secured.

The flask 19 may be provided with a mold or matrix 30 of the desired shape in the pre-
 45 ferred or any well known manner, but in Figs. 2 and 3 of the drawing I have shown one method of doing the same, which consists in producing a wax model 30^a of the shape of the cavity to be filled or of the form of the
 50 desired casting, and attaching thereto a sprue-rod or former 31 which may be suspended in the flask 19, when suitable investing material 32, such as asbestos and plaster of paris, may be placed in the flask around
 55 the model 30^a and sprue-rod 31, and after the same has become "set" or hardened the rod 31 may be removed, thus leaving the sprue 33 which leads from the model to a cavity 34 formed in the upper portion of the investing
 60 material, in which gold or other material out of which it is desired to form the casting may be placed, when by heating the flask the wax model will be caused to melt and will be evaporated or absorbed into the investing
 65 material, thus leaving the matrix 30 open to

receive the metal or other material. When the metal has been melted the plate 18 is placed on the top of the flask 19, when, by forcing the hand-lever 9 downwardly in the direction shown by dotted lines at 35 of Fig. 70
 2, the air in the cylinder 14 will be compressed and supplied through the hollow piston-rod 17 to the cavity in the upper portion of the flask, thus forcing the molten metal or liquid material into the matrix to form the desired
 75 casting or inlay.

As the investing material 32 is more or less porous, and as it will rest closely on the upper surface of the flask-holder 24, I prefer to provide the extension 23 on the flask-
 80 holder with an opening for the passage of air confined in the matrix, thus permitting the material out of which the casting is being formed to fill the same without flaws or im-
 85 perfections.

From the above description of my improvements it will be understood that the device is susceptible of considerable modification without material departure from the principles and spirit of the invention, and for
 90 this reason I do not desire to be understood as limiting myself to the precise form and arrangement of the several parts of the device as herein set forth in carrying out my invention in practice.
 95

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

1. The combination with a base, of a hand-lever loosely connected thereto at one of its
 100 ends, an air compression cylinder connected to the hand-lever between its ends, a piston in said cylinder, a hollow piston-rod connected at one of its ends to the piston and having at its other end a plate, and a flask adapted
 105 for location on the base so as to have its upper end closed by said plate.

2. The combination with a base, of a hand-lever loosely connected thereto at one of its
 110 ends, an air compression cylinder pivotally connected to the hand-lever between its ends, a piston in said cylinder, a hollow piston-rod connected at one of its ends to the piston and having at its other end a plate, means connecting the base, said plate and the
 115 compression cylinder whereby the piston-rod and plate will have a true vertical movement in the downward movement of the hand-lever, and a flask adapted for location on the base so as to have its top closed by
 120 said plate.

3. The combination with a base, of a hand-lever loosely connected thereto at one of its
 125 ends and having an opening intermediate of its ends, an air compression cylinder having on its lower portion an extension pivotally secured in the opening of the hand-lever, a piston in said cylinder, a hollow piston-rod connected at one of its ends to the piston and
 130 having at its other end a plate provided on

its lower surface with packing, and a flask adapted for location on the base so as to have its upper end closed by said plate.

4. The combination with a base, of a hand-lever loosely connected at one of its ends thereto and having an opening intermediate of its ends, an air compression cylinder having an extension on its lower portion pivotally secured in the opening of the hand-lever, a spring-actuated piston in the cylinder, a hollow piston-rod connected at one of its ends to the piston and having at its other end a plate provided on its lower surface with packing, a bell-crank-lever fulcrumed on said plate and having one of its arms pivotally connected to a support on the base and its other arm in loose engagement with the cylinder, and a flask adapted for location on the base so as to have its top closed by said plate.

5. The combination with a base having

near one of its ends an upwardly extending projection and near its other end an opening, a link pivotally secured at its lower end to said projection, a hand-lever pivoted at one of its ends to the upper end of the link and having an opening between its ends, an air compression cylinder having on its lower portion an extension pivotally secured in the opening of the hand-lever, a spring-actuated piston in said cylinder, a hollow piston-rod connected at one of its ends to the piston and having on its other end a plate provided on its lower surface with a recess, cushioning material located in said recess, a flask-holder having an apertured extension fitted in the opening of the base, and a flask mounted on said holder.

ENOCH M. FREDERICKS.

Witnesses:

CHAS. A. TILLMAN,
M. A. NYMAN.