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E. H. MUMFORD.
FLUID PRESSURE PLUNGER.
APPLICATION FILED NOV. 9, 1905.

2 SHEETS—SHEET 1.

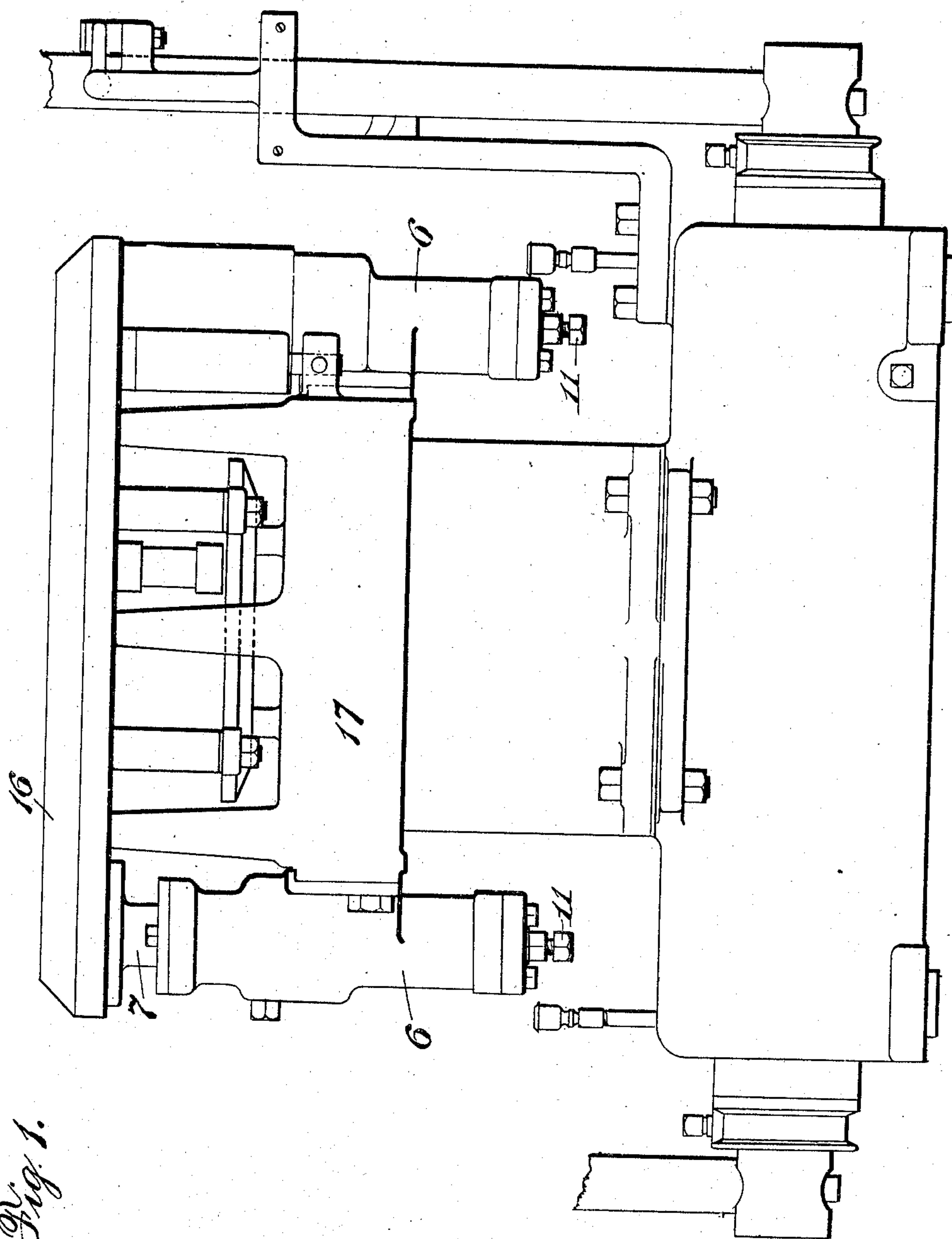


Fig. 1.

WITNESSES

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2 SHEETS—SHEET 2.

Fig. 2.

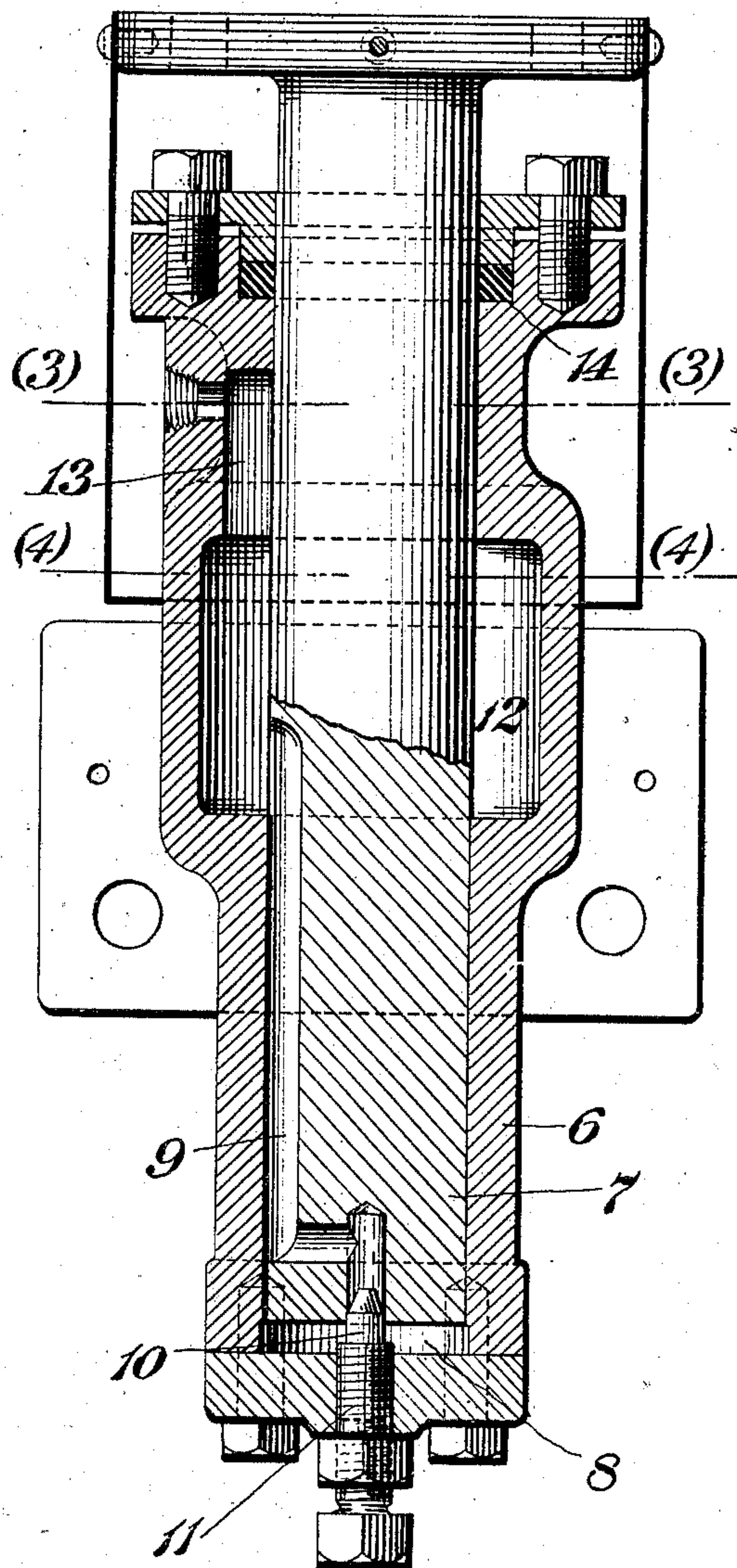


Fig. 3.

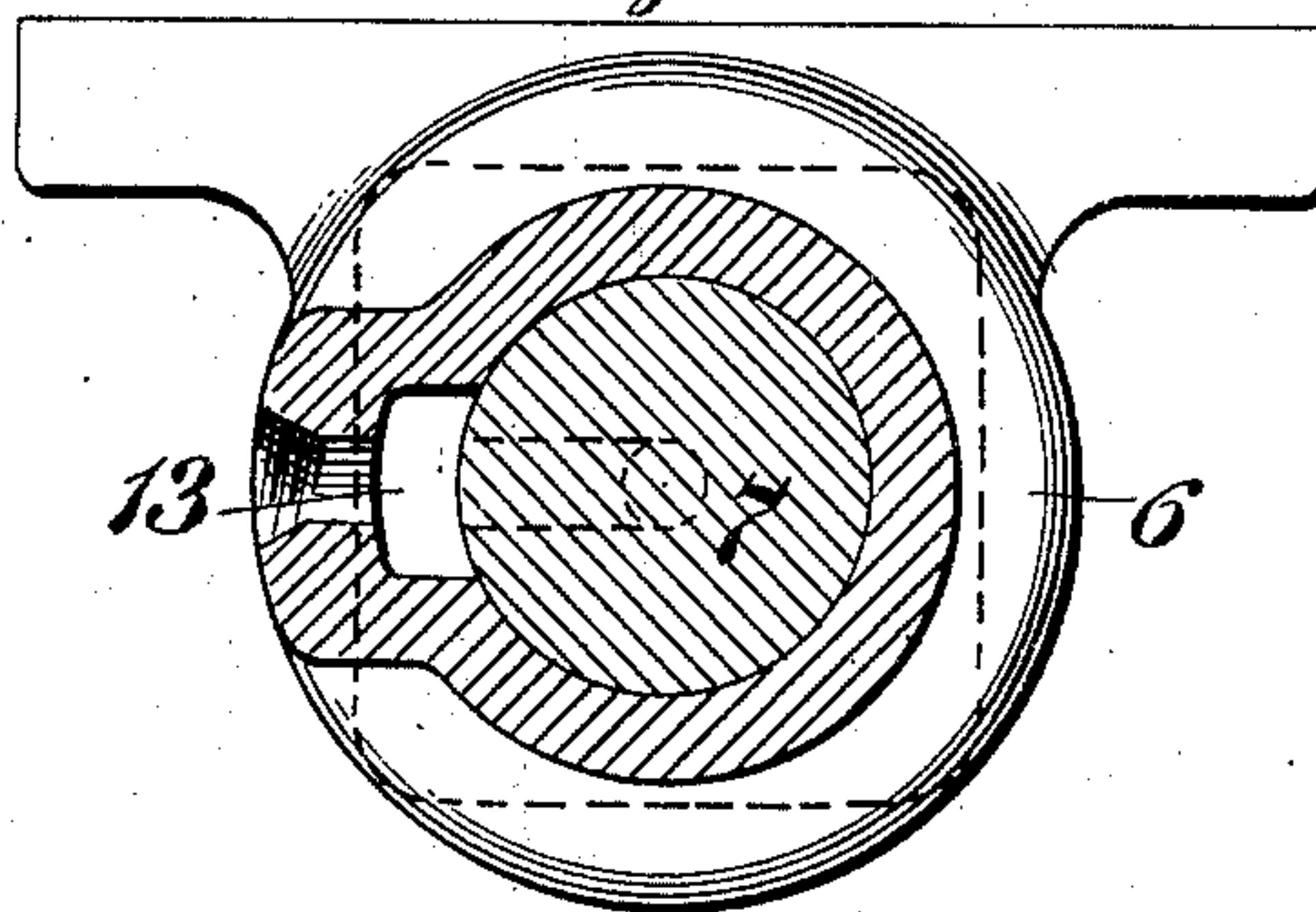


Fig. 4.

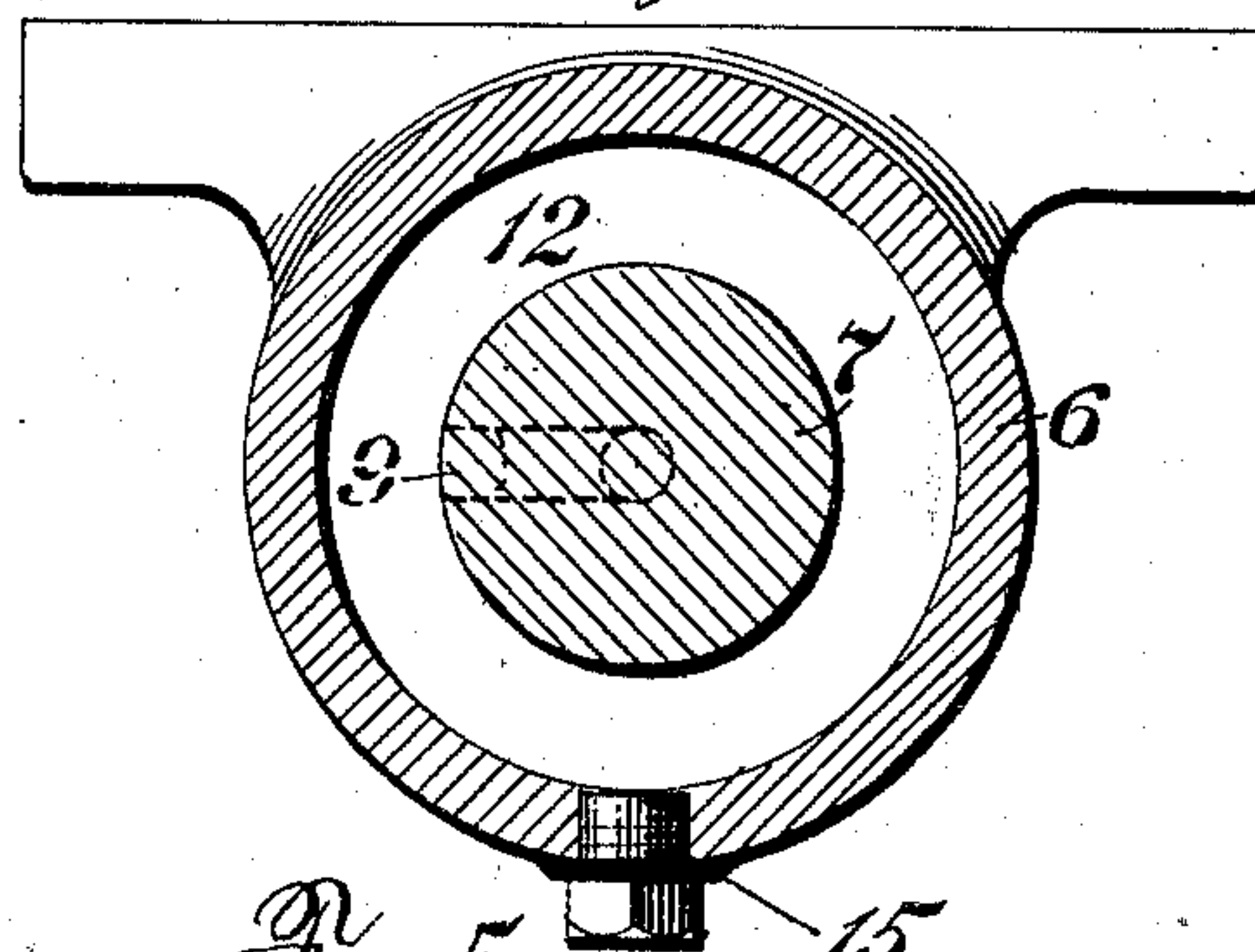
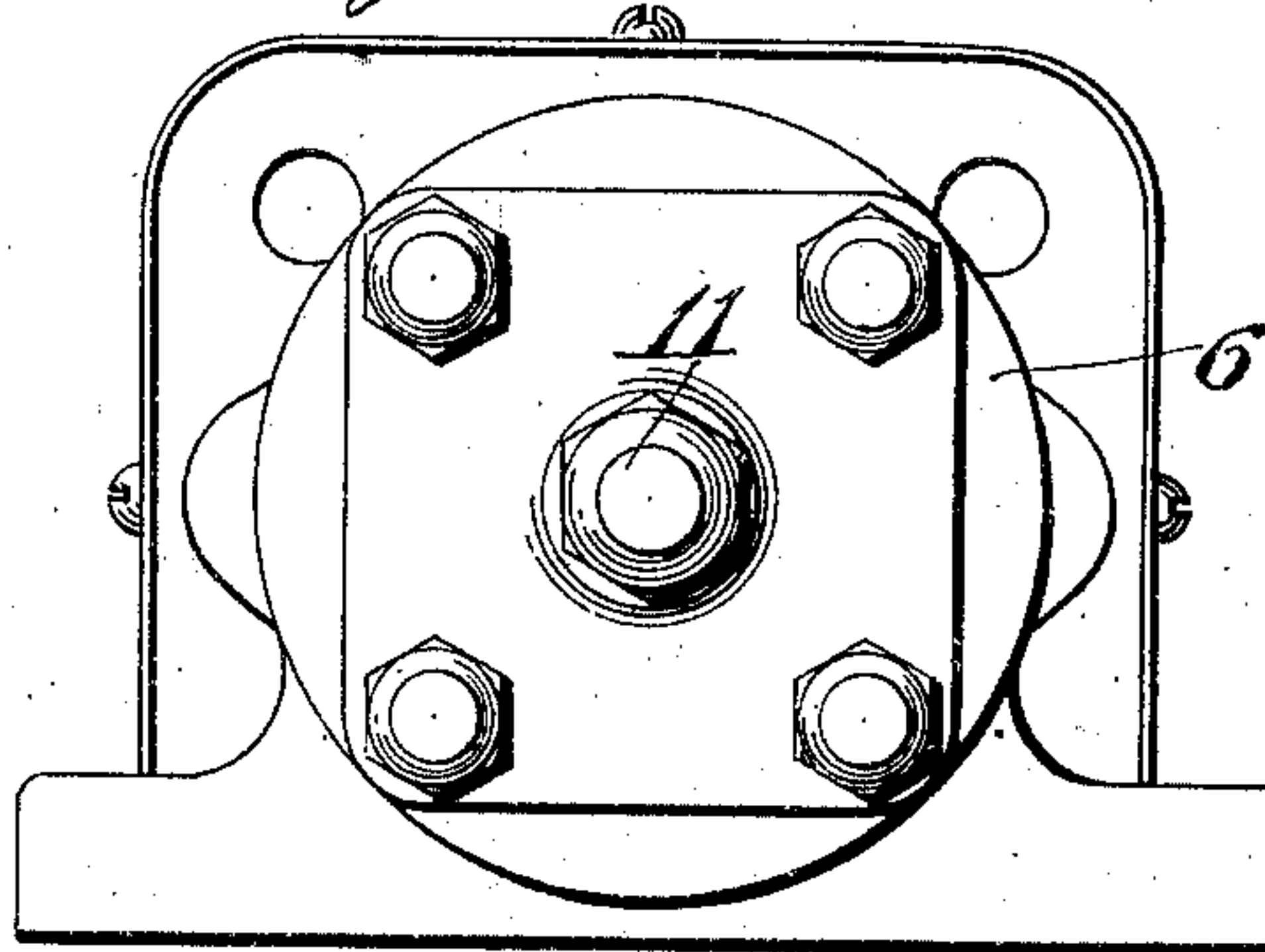


Fig. 5.



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FLUID-PRESSURE PLUNGER.

No. 846,685.

Specification of Letters Patent.

Patented March 12, 1907.

Application filed November 9, 1905. Serial No. 286,522.

To all whom it may concern:

Be it known that I, EDGAR H. MUMFORD, a citizen of the United States, residing at Newtown township, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Fluid-Pressure Plungers, of which the following is a specification.

This invention has reference to an improved construction of fluid pressure plunger used for exerting pressure, as for example in connection with molding machinery in which connection it is shown in the accompanying drawings, wherein—

Figure 1 shows a side elevation of a molding machine with my improved form of plunger applied on each side thereof;

Figure 2 is a sectional view on a vertical plane;

Figure 3 is a transverse section on the line (3) (3) of Figure 2;

Figure 4 is a transverse section on the line (4) (4) of Figure 2, and

Figure 5 is a bottom plan view of the plunger casing.

The primary object of this present invention is to construct a device of the character specified in which a liquid—as for example oil or water—is used to impart motion and pressure to the plunger or ram and is permitted to act on the lower end thereof, while on the upper surface of such liquid a fluid of a lighter character, as for example air, is allowed to act and form a separating medium between the liquid and the stuffing box or packing for the plunger or ram. In order to afford a means for allowing the liquid to flow back and forth to compensate for movement of the ram and to fix a level above which it shall not rise, a storage chamber is formed in the interior casing, to the upper side whereof the gaseous fluid or air is admitted.

In order to better understand the nature of my present invention, I will explain the same in detail in connection with the accompanying drawings, and particularly Figure 2 thereof in which, as will appear from examination of the same, there is a plunger or ram casing 6 containing a ram 7 adapted to move vertically and having a space 8 at the lower end thereof and a passage 9 through which the liquid may reach said space, the amount of opening of said passage when the ram is in

the lowermost position being capable of adjustment by means of the valve 10 carried on the adjustable stem 11.

About midway of the length of the casing 6 there is a chamber 12 which I call an overflow or storage chamber which communicates with the lower end of the casing by means of the passage 9, and is of sufficient capacity to accommodate all of the liquid used in the operation of the ram. Into the upper end of the casing 6 there is an inlet opening 13 through which air or other fluid of like character under pressure is introduced in order to exert a pressure downward upon the liquid in the lower portion of the casing, and at 15 another opening for the admission of oil or other liquid.

At the extreme upper end of the casing there is a packing 14 contained within a stuffing box of ordinary construction and adapted to prevent leakage of the fluid around the ram or plunger.

The device as shown in the drawings is adapted for attachment to a molding machine in the position indicated in Figure 1, there being in such construction one of the casings, 6, attached to the frame 17 of the machine on either side thereof, and arranged to raise and lower the table 16 above.

It will be readily seen that in the construction above described the pipe connection leading to the passage 13 contains at all times only the lighter fluid, the liquid itself not having to pass into or out of the casing, but only rising as the plunger descends, and occupying the storage recess 12 provided for that purpose. The introduction of the lighter fluid or air on the upper side of the liquid also serves to separate the liquid from the packing 14, and keeps the device tight against leakage of the fluid, since it is practically impossible to prevent some leakage past plunger packing in contact with a liquid and by keeping up the supply of pressure fluid, as air next the packing, any leakage of pressure liquid, as oil, is prevented, and the supply of pressure fluid, as air, is always abundant and its leakage innocuous, whereas the supply of liquid, as oil, is limited and its leakage very troublesome.

Another advantage of this improvement is that the air in the supply passage also facilitates the operation of the device, since air

moves with much less friction than a liquid would, which is most essential in securing the synchronous action of the plungers.

Having thus described my invention and illustrated its use, what I claim as new, and desire to secure by Letters Patent, is the following:

A plunger apparatus comprising in combination, a ram, a casing or chamber therefor, said casing being constructed to stand in vertical position with a liquid chamber at the lower end, and a storage chamber

above the lower end, and a packing above said storage chamber, with means for introducing a lighter fluid, as air, between said packing and said storage chamber, substantially as described. 15

In testimony whereof I have hereunto signed my name in the presence of the two subscribed witnesses.

EDGAR H. MUMFORD.

Witnesses:

A. E. SWEETMAN,
CHAS. H. THUMLERT.