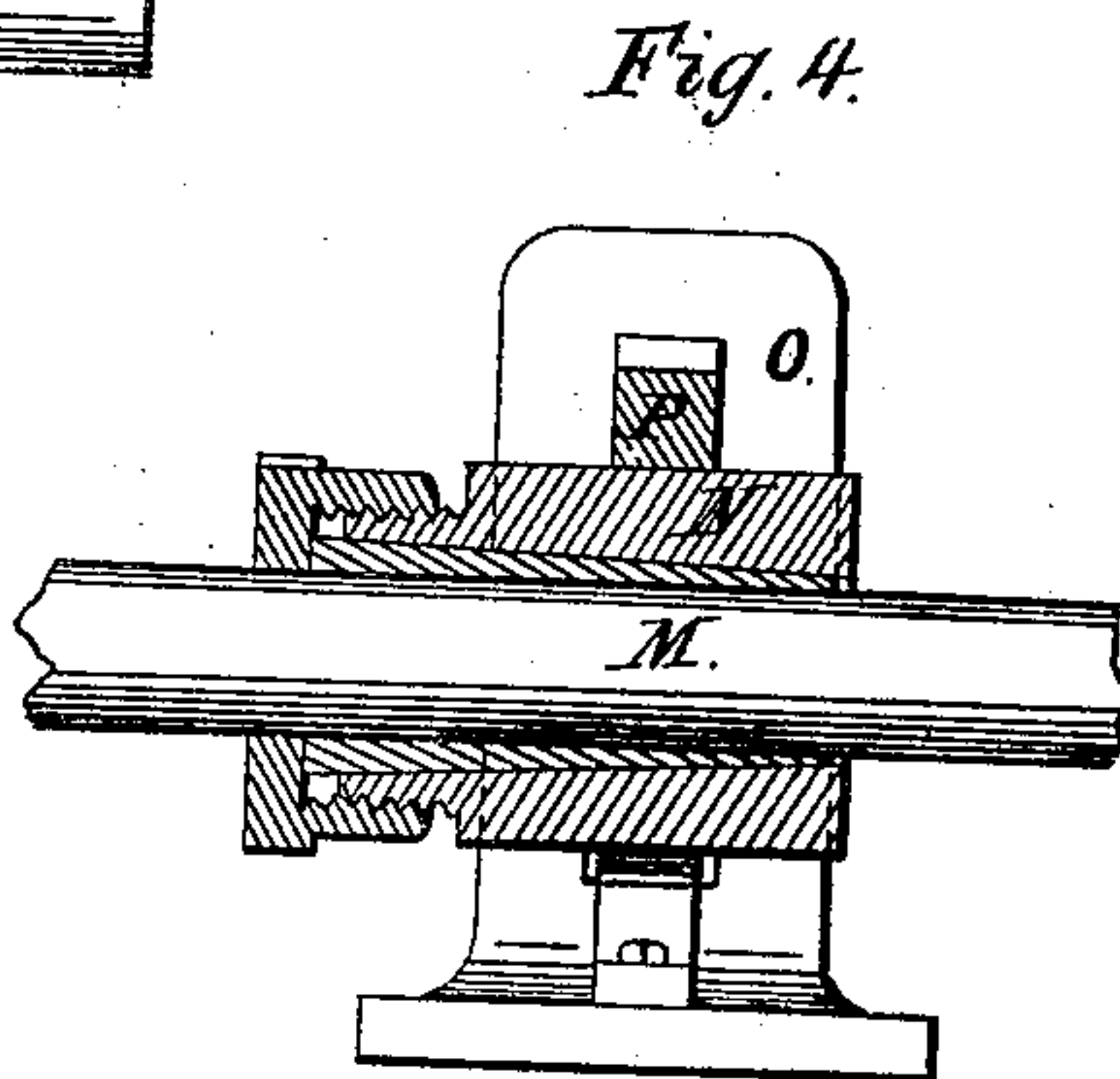
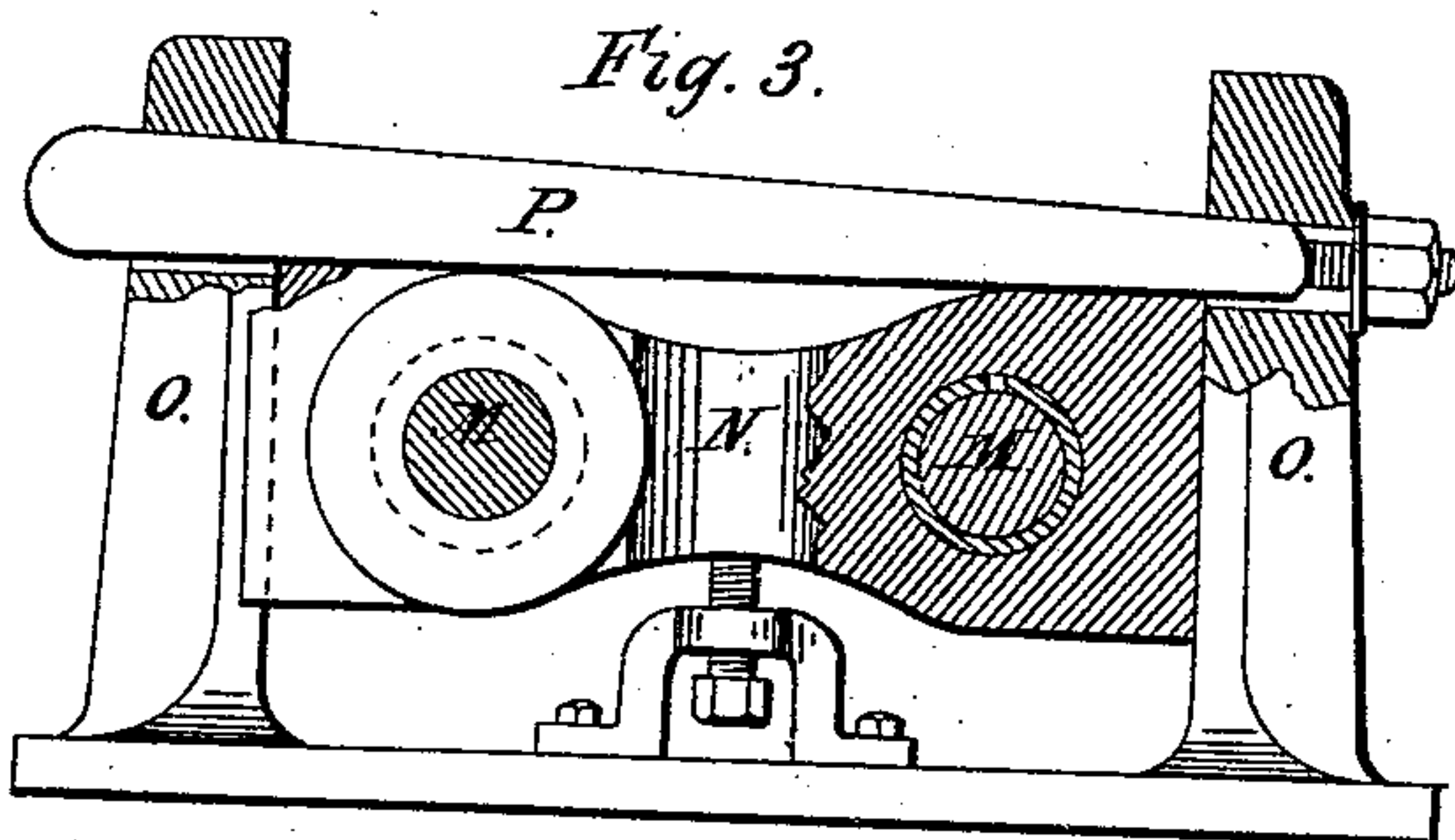
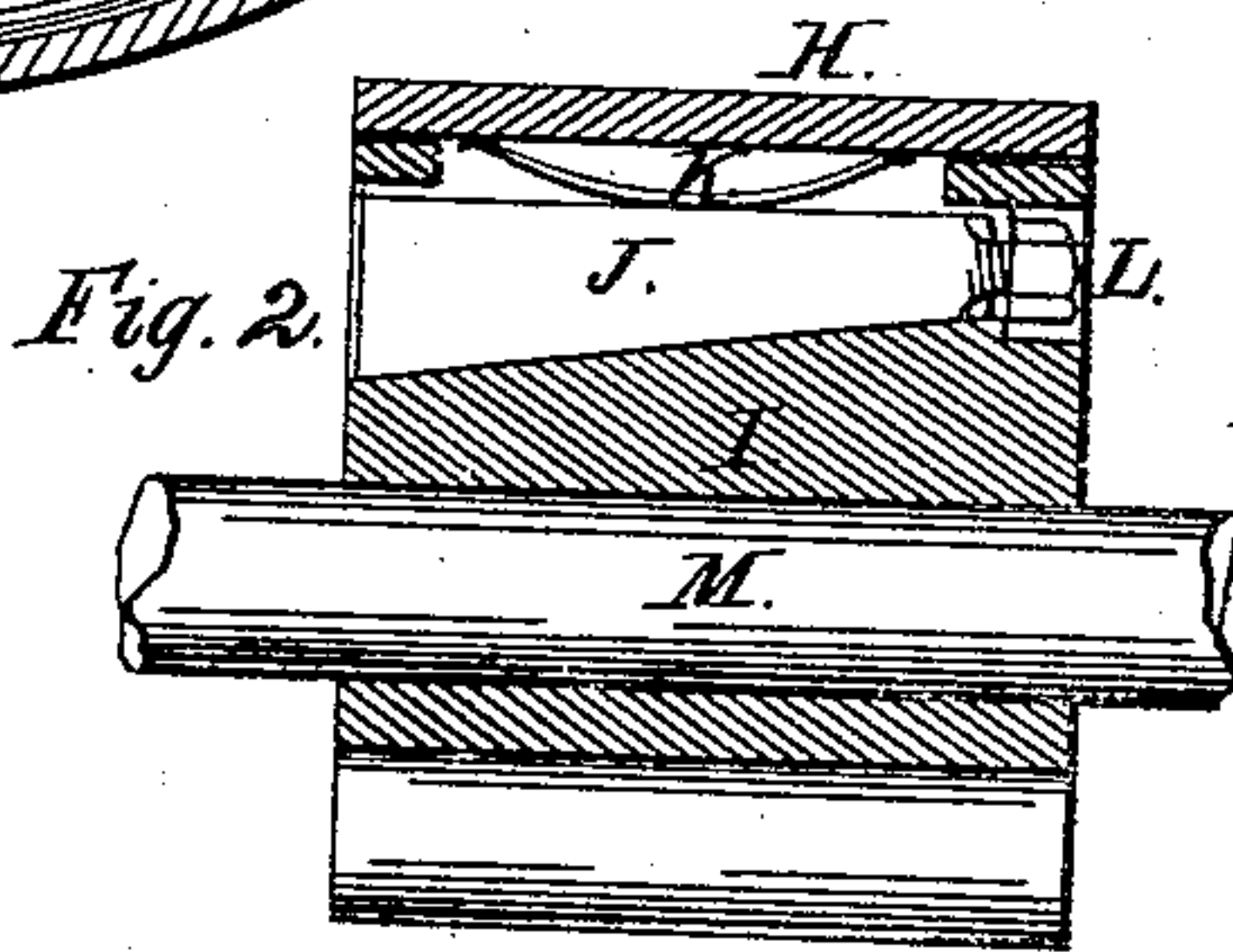
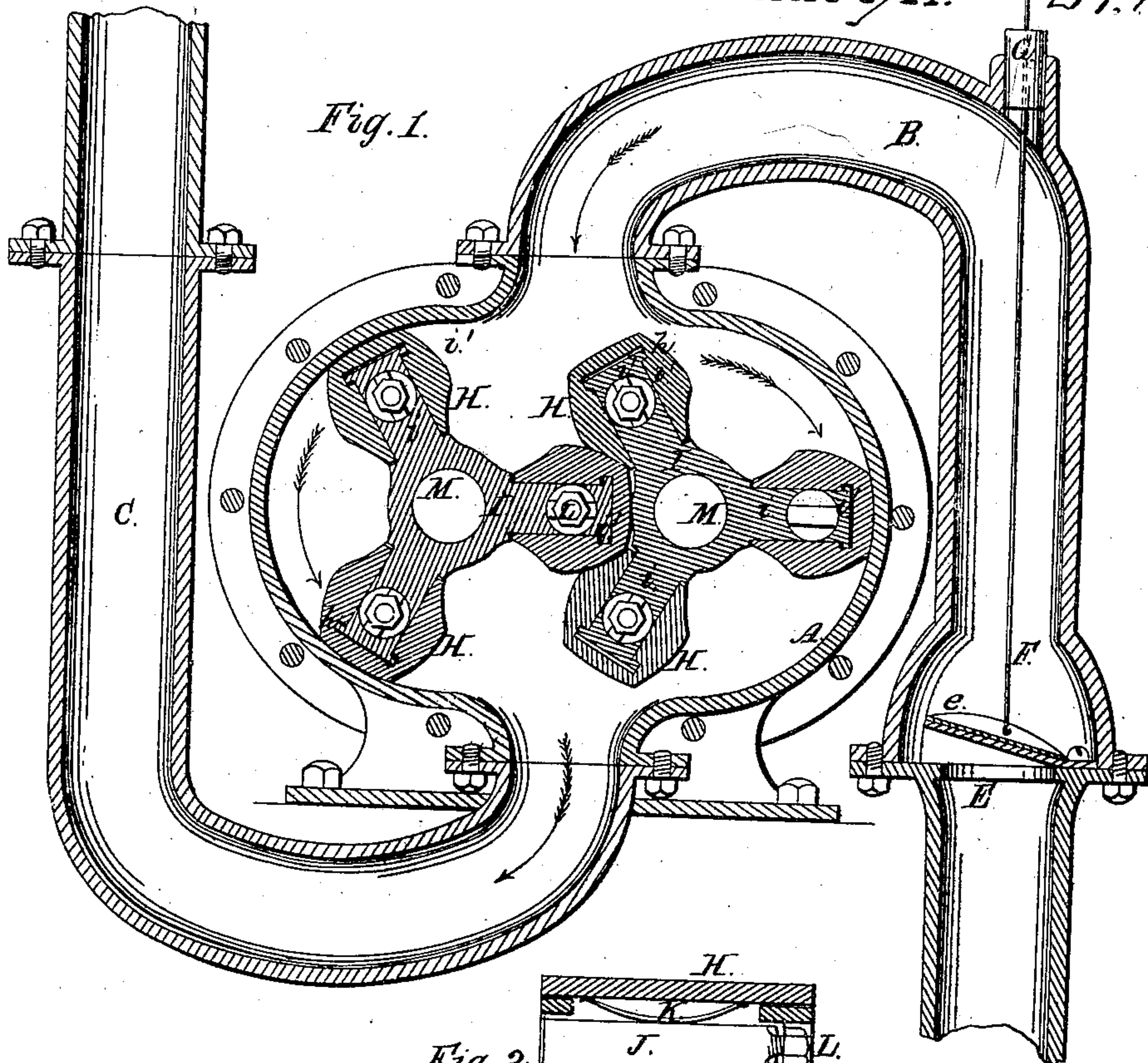


*M. L. Andrew*

*Pump.*

*N<sup>o</sup> 89,269.*

*Patented Apr. 27, 1869.*



*Witnesses.*  
*Charles Bauer*  
*C. Trump*

*Inventor.*  
*Moses L. Andrew*  
*By*  
*Frank Millward*  
*Attorney*



# United States Patent Office.

MOSES L. ANDREW, OF CINCINNATI, OHIO, ASSIGNOR TO HIMSELF  
AND GEORGE BURROWS, OF SAME PLACE.

Letters Patent No. 89,269, dated April 27, 1869.

## IMPROVEMENT IN ROTARY PUMP.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, MOSES L. ANDREW, of Cincinnati, Hamilton county, State of Ohio, have invented certain new and useful Improvements in Rotary Pumps; and I do hereby declare the following to be a sufficiently full, clear, and exact description thereof, to enable one skilled in the art to which my invention appertains, to make and use it, reference being had to the accompanying drawings, making part of this specification.

My invention consists of the following devices:

First. In the provision and arrangement of a siphon suction-pipe, and inverted siphon discharge-pipe, which together form a "water-trap," or "priming-chamber," and also adapt the pump to pass solid substances of large size with the water, without injuring any of its parts.

Second. A check-valve and rod, for controlling the water in the suction-pipe.

Third. A journal-frame, fitted with sliding bearings and adjustable key, for the purpose of taking up the wear on the opposite side to the pressure on the pump.

Fourth. A key and spring, for adjusting the expansion-pistons.

Fifth. The construction of the revolving pistons, with detachable pieces or caps, which may be removed and renewed when worn. This device was shown but not claimed in Letters Patent granted to me for "Improvement in Rotary Engines," October 1st, 1867.

In the accompanying drawings—

Figure 1 is a section of pump and pipes.

Figure 2 is a section of one piston, exhibiting the device for expansion.

Figures 3 and 4 represent the sliding-journal bearings.

A is the casing, or double cylinder of the pump;

B is the siphon suction-pipe; and

C, the inverted siphon discharge-pipe.

The suction-pipe B is provided with a valve-seat, E, check-valve *e*, connecting-wire F, and stopper G, through which the wire passes.

The check-valve *e* is devised for the purpose of retaining the water in the suction-pipe, throughout its entire length, when the pump is at rest.

The pump itself, when in the best condition, and at rest, will not, without the aid of the check-valve, be sufficiently tight to hold the water in the suction-pipe.

In cold weather, if the pump is in doors, and the suction-pipe only exposed to frost, it will be only necessary to remove the cork G, and lift the check-valve *e*. The suction-water will then flow into the well, and the pump will be left primed, or charged with water, to enable it to lift easily when again in operation.

When necessary, the pump and discharge-pipe can be emptied by a few backward turns of the pump-pistons.

In addition to the feature of forming a priming-chamber, the arrangement of the pipes B C adapts the pump to pass solid substances of large size, without risk of choking. As such matter is delivered on top of the pump, it will be passed partly round by the pistons, and dropped into the discharge-pipe.

The pistons H are fitted, as shown, over the wings *i* of the hubs I, the grooves *h* of the pistons fitting the lips *i'* of the wings *i*.

The lip *i'* serves to prevent the pistons H from being thrown off by centrifugal force.

The pistons H, being detachable, can be renewed, when worn, without any change being necessary in the hubs I *i* *i'*.

Slots are cut in the wings *i* for the insertion of the keys J, and springs K.

The keys are adjusted by nuts L, and press against the springs K, the springs K serving to expand the pistons H.

The springs K expand the pistons, yet permit them to pass slight inequalities in the surface of the cylinder.

The journals M of the pump-pistons run in the double bearing, or box N, which is made to slide vertically within the frame O.

The frame O is fitted with a key, P, which is used to adjust the bearings.

The purpose of this adjustment of the bearings is, that the pistons may be kept well up to the pressure-side of the pump, and not be allowed, by the spring of the shafts, or wearing of the boxes, to scrub hard on the suction side.

I claim herein as new, and of my invention—

1. The arrangement of the curved pipes B C, as set forth, and for the purpose specified.

2. In combination with the elements of the preceding clause, the check-valve *e*, wire F, and stopper G, for the purpose stated.

3. The sliding bearing N, frame O, and key P, in combination with the journals M M, for the purpose described.

4. The keys J, and springs K, in combination with the hubs I, for the purpose described.

In testimony of which invention, I hereunto set my hand.

MOSES L. ANDREW.

Witnesses:

E. TRUMP,

CHAS. E. OALLAHAN.