

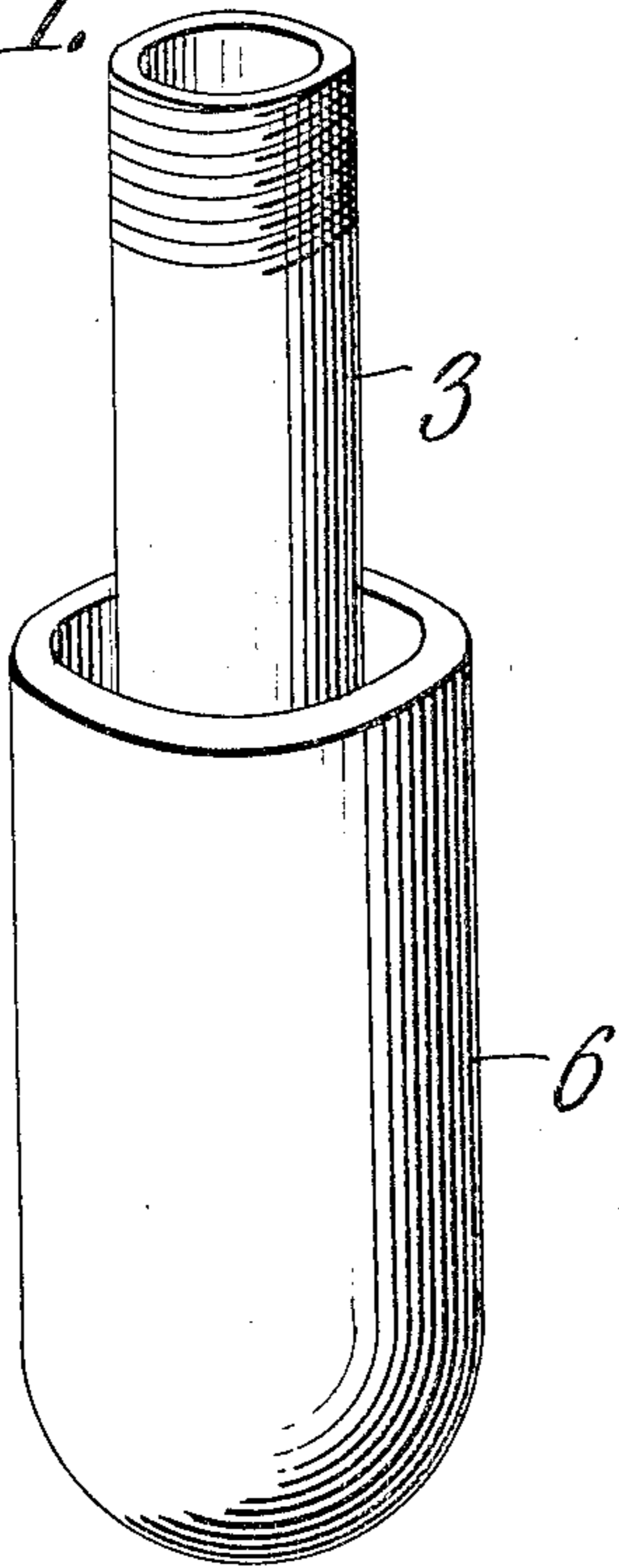
No. 869,559.

PATENTED OCT. 29, 1907.

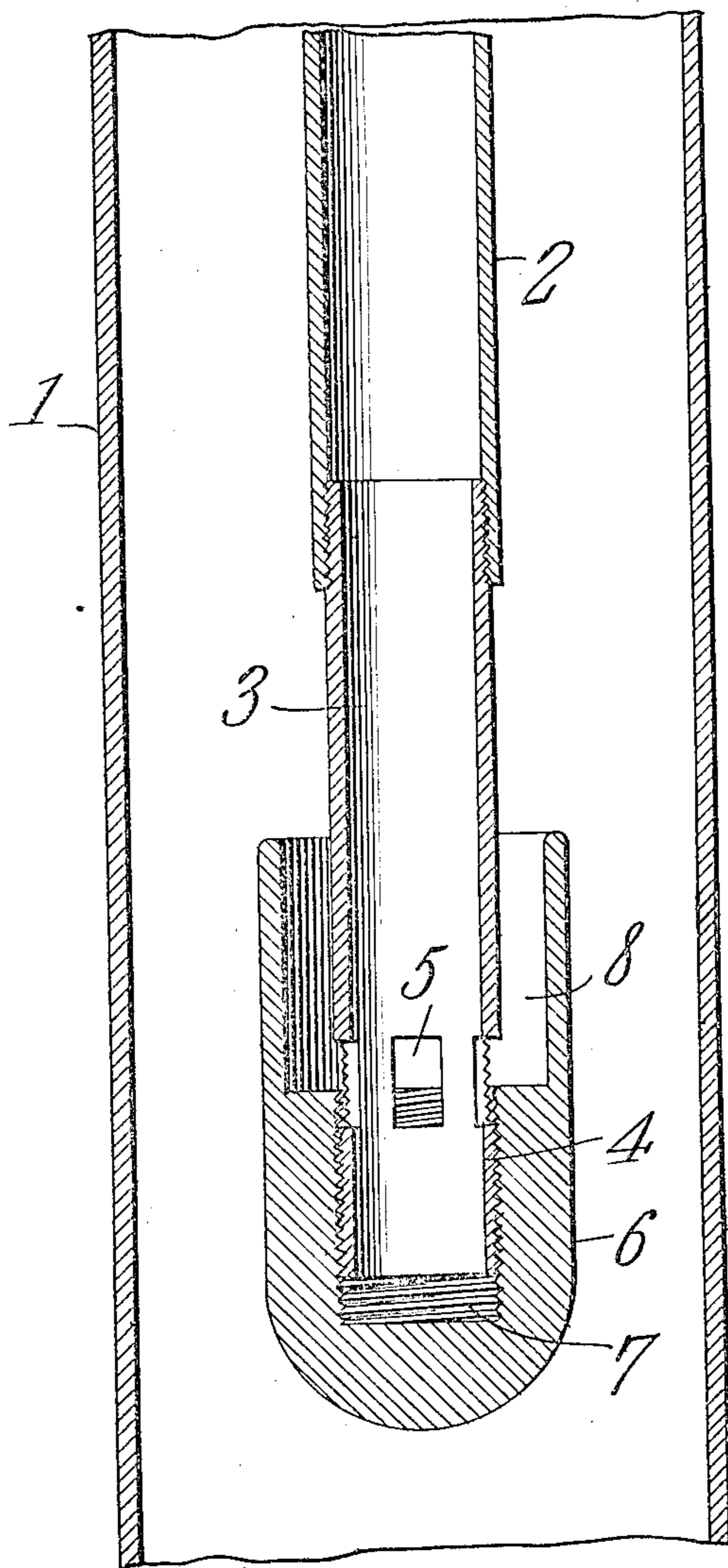
T. FOY.  
PUMP.

APPLICATION FILED JULY 16, 1907.

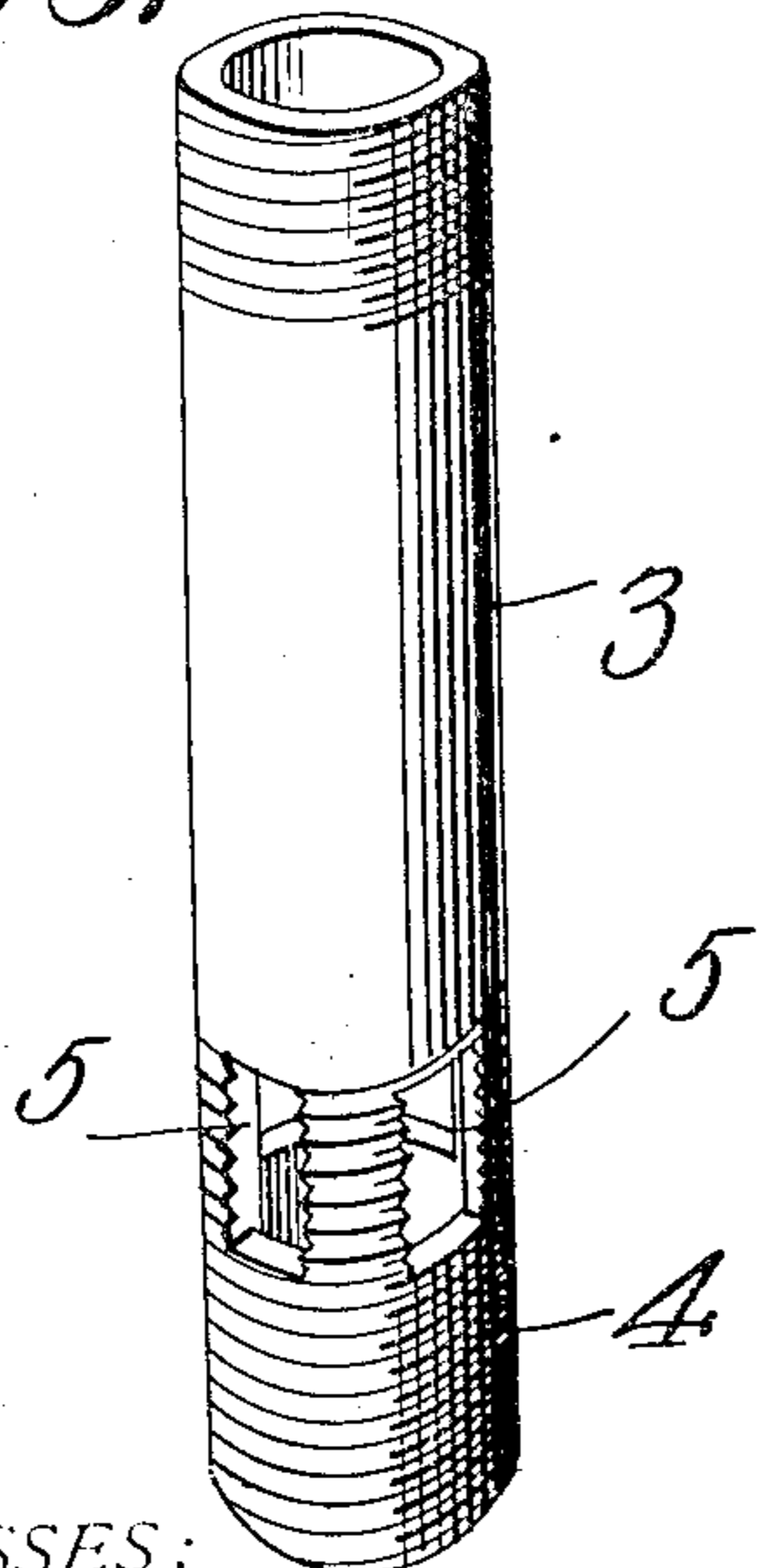
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



WITNESSES:

*E. J. Stewart*  
*H. J. Chapman*

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INVENTOR.

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# UNITED STATES PATENT OFFICE.

THOMAS FOY, OF FREEHOLD, NEW JERSEY.

## PUMP.

No. 889,559.

Specification of Letters Patent.

Patented Oct. 29, 1907.

Application filed July 15, 1907. Serial No. 383,778.

*To all whom it may concern:*

Be it known that I, THOMAS FOY, a citizen of the United States, residing at Freehold, in the county of Monmouth and State of New Jersey, have invented a new and useful Pump, of which the following is a specification:

This invention has reference to improvements in pumps, designed more particularly for use in deep wells, and its object is to provide a means whereby a stream of air under pressure may be introduced below the column of water to be lifted and force the water upward and outward through the upper end of the tube or casing into which the air is allowed to escape.

The invention consists essentially of an air pipe having a foot piece shaped to direct air from suitable openings in the lower end of the pipe in an upward direction, so as to tend to force the water above it always toward the top or discharge end of the casing.

The invention is applicable to wells of small diameter, or, when introduced into wells of larger diameter, a supplemental casing may be provided into which the air pipe and its foot piece are placed with the foot piece an appropriate distance below the surface of the water, so that when air under pressure escapes at the lower end of the pipe it will fill the main or supplemental casing and the water will be lifted to the top or discharge end.

The invention will be best understood by reference to the accompanying drawings, in which,—

Figure 1 is a perspective view of the foot end of the air pipe, with the air-directing block attached thereto; Fig. 2 is a longitudinal section of a portion of the well casing, showing the air-introducing means in place; and Fig. 3 is a perspective view of the lower end of the air pipe, with the air-directing block removed.

Referring to the drawings, there is shown a casing 1 which may either be the well casing or a supplemental casing introduced within the well. In this casing there is an air pipe 2, coming from the surface of the ground and which is presumed to extend below the surface of the water in the well and, if need be, to approach the bottom of the well. Secured to the lower end of the pipe 2 is a pipe section 3 which may be in the form of a long nipple with a long, threaded, lower end 4, through which, at a distance from the bottom, are formed a number of elongated openings or ports 5, long in the direction of the length of the nipple. Screwed onto the lower end 4 of the pipe 3 is a cylindrical block 6 having a central nut 7 formed in it, and above this nut the block is cored out, as shown at 8,

to form an annular chamber around the pipe 3, which chamber has its upper end open and the walls of the chamber are arranged concentric to the pipe.

The pipe 3 is screwed into the nut 7 until either the lower edge of the openings 5 is flush with the bottom of the chamber 8, or these openings may be partially covered by the threaded portion 7 of the block 6. By this means the free orifice of the openings 5 may be adjusted at will.

The bottom of the block 6 is made hemispherical so as to offer little or no resistance to the upward flow of water into the casing 1. Now, let it be assumed that the block 6 is appropriately located in the well a sufficient distance below the surface of the water in the casing 1, and that air under pressure is coming through the pipes 2 and 3 and escapes through the openings 5 into the chamber 8. Such air under pressure will be directed upwardly against the body of water contained within the casing 1. The body of compressed air, the pressure, of course, being ample, will lift the water above it until it finally escapes through a suitable outlet at the top of the well. The air being directed upwardly, the water has no chance to fall, and the stream of air being constant and fresh water also constantly flowing from below the block 6, there will be delivered at the upper end of the casing a steady stream of water due to the constant inflow of the compressed air.

It will be noted that the effective size of the openings 5 may be adjusted by screwing the block 6 to a greater or less extent upon the nipple 3, and thus the amount of air and the force with which it is ejected through the openings, may be set as desired.

Although not shown in the drawings, it will be understood that suitable means may be provided for locking the block 6 to the pipe 3, if it be found desirable.

It will be observed that the structure herein shown, which is very effective for the purpose designed, is of an extremely simple nature, consisting of two parts which may be very cheaply made and which are not at all liable to get out of order or to fail in operation. At the same time, they may be easily replaced if damaged or if they fail to work properly.

I claim:—

1. A lift pump for deep wells, comprising a pipe having its lower end threaded and provided above its lower end but within the range of the screw-threads with through openings, and a block provided with an axial threaded portion of sufficient extent to receive the threaded end of the pipe including said openings, said block being also provided above the threaded receptacle with a chamber open

at the upper end and having its walls spaced from and concentric with the pipe.

5 2. A lift pump for deep wells, comprising a pipe having its lower end threaded and provided with through passages above said lower end but within the range of the threads, and a block having its lower end rounded and provided with an axial nut of sufficient extent to receive the threaded end of the pipe and the openings therein, said block having an axial chamber above the threaded recep-

tacle or nut formed therein, with the exterior walls concentric with the pipe. 10

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

THOMAS FOY.

Witnesses:

I. CLARENCE CONOVER,  
EDWARD G. FORMAN.