

No. 682,469.

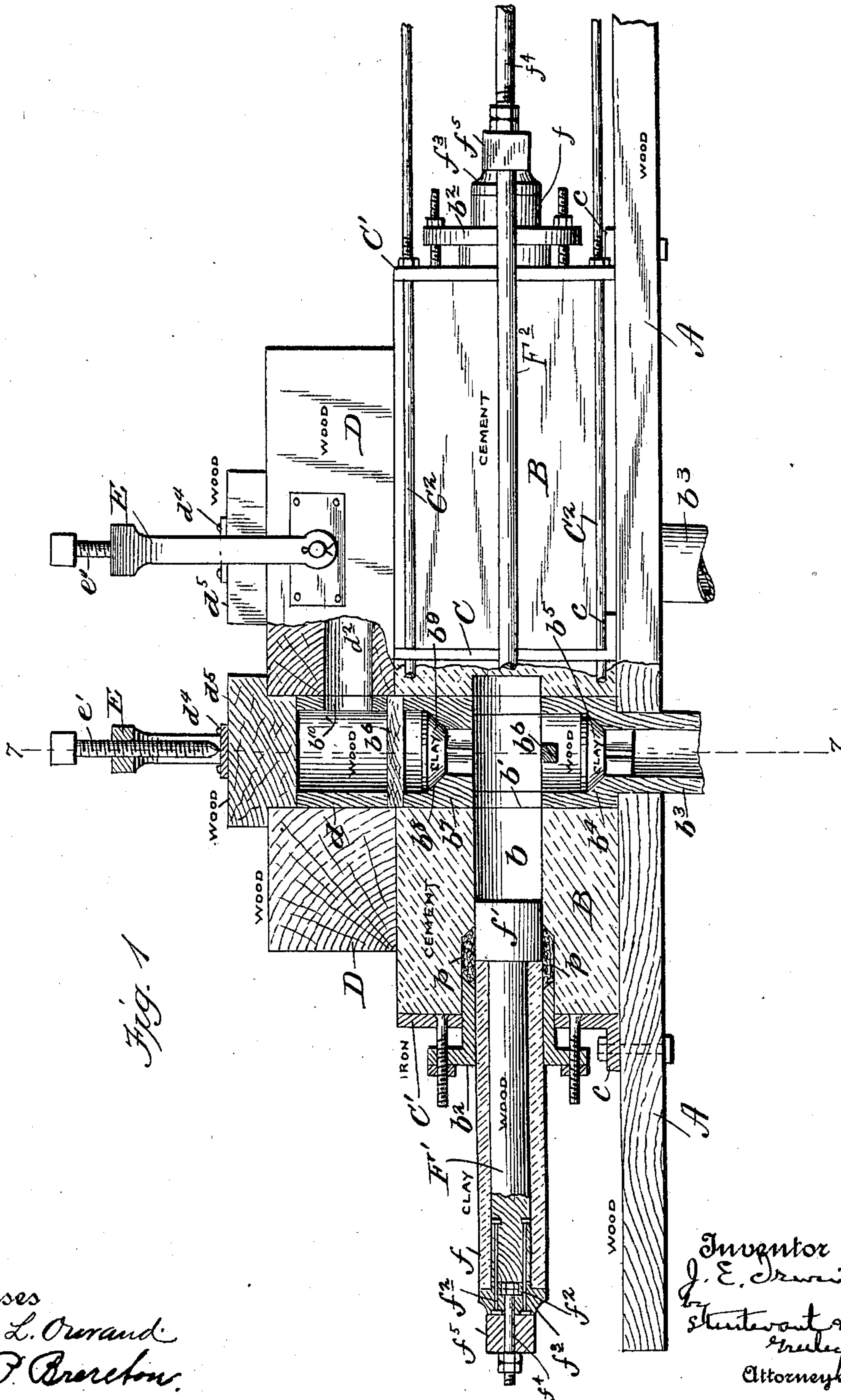
Patented Sept. 10, 1901.

J. E. IRWIN.  
PUMP.

(Application filed Mar. 5, 1901.)

(No Model.)

3 Sheets—Sheet I.











# UNITED STATES PATENT OFFICE.

JOSEPH EARL IRWIN, OF MARIETTA, OHIO.

## PUMP.

SPECIFICATION forming part of Letters Patent No. 682,469, dated September 10, 1901.

Application filed March 5, 1901. Serial No. 49,782. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH EARL IRWIN, a citizen of the United States, residing at Marietta, in the county of Washington, State of Ohio, have invented certain new and useful Improvements in Pumps, of which the following is a description, reference being had to the accompanying drawings and to the letters of reference marked thereon.

My invention relates particularly to that class of pumps employed in pumping mine-water or other liquids containing acids or chemicals that will corrode metal.

The object of my invention is to construct the water ends or parts containing and forming the cylinders, plungers, valves, &c., of non-corrodible materials, such as wood, cement, and clay.

This object is accomplished by the construction illustrated in the accompanying drawings, in which—

Figure 1 shows a side elevation of my improved pump, the left-hand half being in central vertical longitudinal section. Fig. 2 is a horizontal section through both cylinders and pistons. Fig. 3 is a central vertical longitudinal section of one of the cement pump-cylinders. Fig. 4 is a similar view of its discharge-valve seat. Fig. 5 is a similar view of its inlet-valve seat. Fig. 6 is a horizontal section through the wooden top piece containing the discharge-opening. Fig. 7 is a transverse vertical section on line 7 7 of Fig. 1, and Fig. 8 is a detail view of one of the pump-plungers with its parts separated.

A designates the base foundation-timber of the pump, on which are mounted end to end the two pump-cylinders B B, formed in suitable molds from the best Portland cement. These pump-cylinders are clamped between a central metallic division-plate C and metallic end plates C' C', all firmly bolted to base-timber A through their bottom flanges c c c. The clamping of the cylinders B B is effected by the long bolts or rods C<sup>2</sup> C<sup>2</sup>, extending through all three plates C C' C' and extended, as in the right of Fig. 1, for connection with the steam-cylinder. (Not shown.) These two cement cylinders are just alike,

and each has a longitudinal bore *b*, forming the cylinder proper, and a vertical intersecting valve-chamber bore *b'* at the inner end of the bore *b*, so that the bore as a whole is T-shaped. In the outer enlarged end of the bore *b* is placed a metallic gland *b*<sup>2</sup>, bolted by its outer flange to the end plate C', and packing *p* is placed at the inner end of said gland, as shown at the left in Fig. 1. In the bottom of the valve-chamber bore *b'* is inserted the tubular lining-sleeve *b*<sup>3</sup>, formed of wood bored in the direction of its grain and in two diameters, so as to form the annular valve-seat *b*<sup>4</sup>, on which seats the inlet-valve *b*<sup>5</sup>, formed of pottery, such as sewer-pipes are made from. This valve is prevented from moving upwardly too far by means of a transverse stop *b*<sup>6</sup>, formed of a wooden cross-piece inserted through lateral openings in said sleeve *b*<sup>3</sup>. The lower end of lining *b*<sup>3</sup> registers with an opening in base A. Into the upper end of the valve-chamber *b'* is inserted the lower end of the upper lining-sleeve *b*<sup>7</sup>, of wood, having a valve-seat *b*<sup>8</sup> for the outlet-valve *b*<sup>9</sup>, also of pottery or glass. Above the valve *b*<sup>9</sup> is a cross-bar *b*<sup>6</sup>, of wood, to form a stop therefor, and above this bar is formed a lateral opening *b*<sup>10</sup>.

D is the wooden cover or top, having two vertical holes *d d*, receiving the upper ends of the sleeves *b*<sup>7</sup> *b*<sup>7</sup> and also provided with a transverse outlet *d'*, provided with lateral branches *d*<sup>2</sup> *d*<sup>2</sup>, registering with the lateral outlet-openings *b*<sup>10</sup> of said sleeves. The open upper ends of the holes *d d* are closed by the shouldered wooden plugs *d*<sup>5</sup>, the lower ends of which engage the upper ends of said lining-sleeves and hold all the sleeves and valves in place. These plugs *d*<sup>5</sup> are cut endwise of the grain and are held securely in place by the swinging bails E, pivoted at *e* to the opposite sides of the cover-blocks D and provided at their middle portions with screws *e'*, which bear upon the wear-plates *d*<sup>4</sup> on the upper ends of the plugs. The wooden cover-blocks D and the cement cylinders B B are provided with vertical registering bolt-apertures *x x* to receive the vertical bolts *d*<sup>3</sup>, which also pass down through the wooden base A.



F F designate the pump-plungers, each formed of an earthenware cylinder  $f$ , working through the gland  $b^2$ , as shown in Fig. 1, and having a wooden filler  $F'$ , with its enlarged inner end  $f'$  forming the head of the plunger. This plunger filler or core  $F'$  is provided at the outer end with several longitudinally-extending bolts  $f^2$ , to the outer ends of which is secured by nuts a centrally-apertured cap-plate  $f^3$ , through which extends a central bolt or rod  $f^4$ , having securing-nuts at the inner side of the plate  $f^3$ . The two pistons F F are connected by the parallel longitudinal rods  $F^2 F^2$ , extending exterior to the pump and provided at their ends with connecting cross-heads  $f^5$ , which in turn are secured to the central end bolts  $f^4 f^4$ , the right-hand bolt or rod  $f^4$  being extended in practice to a cross-head (not shown) which receives motion from the engine piston-rod.

It will be seen that all of the parts which are exposed to the liquid being pumped are of wood, cement, or earthenware and that the various parts may be readily separated for renewal, &c. It will be understood that the term "cement" includes artificial stone and that "clay" or "earthenware" includes pottery and vitreous material generally.

The two pump-plungers acting in opposite directions alternately suck the fluid through the lower valves  $b^5 b^5$  on their outstroke and on their instroke force it up through the outlet-valves  $b^9 b^9$  after the manner of this class of pumps.

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

1. A pump comprising a block having a longitudinal bore and a transverse vertical bore, a plunger reciprocating in the longitudinal bore, a lining-sleeve in the lower member of the transverse bore with its bore in two diameters to form a valve-seat, a second lining-sleeve within and of greater length than the upper member of the said transverse bore having a lateral opening thereabove and also having its bore in two diameters, valves seated on the two seats, a cover-block secured on top of cylinder-block and having a vertical bore into which the upper end of said upper lining-sleeve projects and also having a lateral outlet registering with the lateral opening in the upper lining-sleeve, and a plug or closure closing the vertical bore in the cover-block and engaging the upper end of the upper lining-sleeve.

2. In a pump of the character described, a plunger comprising a pottery or vitreous tube, and a wooden filler extending through the tube and having its inner end enlarged exterior to the inner end of the tube to form the plunger-head.

3. A pump comprising a horizontal base, two blocks placed end to end and having lon-

gitudinal and vertical bores, end plates and tie rods or bolts securing the blocks together upon the base, oppositely-reciprocating plungers working in said longitudinal bores, cross-heads and tie rods or bolts connecting the outer ends of the plungers, upper and lower valves in both vertical bores, a cover-block secured over the two cylinder-blocks and having an outlet with lateral branches communicating with the upper ends of the two valve-bores.

4. The combination, in a pump, with a cement block formed with a longitudinal and a vertical intersecting bore, of a plunger reciprocating in the longitudinal bore and formed of a wooden core or filler and an outer tube or cylinder of pottery, and inlet and outlet valves formed of pottery and mounted on seats within the said vertical bore; substantially as described.

5. The combination, in a pump, with a cement block formed with a longitudinal and a vertical intersecting bore, of a wood and pottery plunger working in the longitudinal bore, wooden sleeves in the vertical bore and forming upper and lower seats, and pottery valves within said sleeves and seating on their seats; substantially as described.

6. A pump comprising a cement block having a longitudinal and a vertical intersecting bore and a wooden top block secured to the cement block and formed with a transverse opening registering with the said vertical bore and having a lateral outlet or discharge, a removable plug for said transverse block-opening, wooden valve-chamber sleeves in the vertical bore of the cement block, pottery inlet and outlet valves in said sleeves, the upper sleeve extending up into the block-opening against the plug therein and provided with a lateral opening registering with the discharge-opening formed in said top block, and a pump-plunger of wood and pottery operating in the longitudinal bore of the cement block; substantially as described.

7. A double-plunger pump, comprising a suitable base, cement blocks placed end to end thereon and having longitudinal and vertical bores, middle and end plates bolted to the base, rods connecting the said plates and binding the cement blocks firmly together, plungers working in the longitudinal bores, cross-heads and rods connecting the plungers at their outer ends, said plungers being formed of pottery sleeves and wooden cores or fillers, inlet and outlet valves in the vertical bores of the blocks, and a wooden top block bolted to the cement blocks and having vertical holes through it, registering with the spaces above the outlet-valves and communicating with a discharge-passage and removable plugs closing the upper ends of the vertical holes and permitting access to the valves; substantially as described.

8. The combination with the cement pump-  
cylinder, of a plunger formed by a pottery or  
earthenware tube, and a wooden filler or core  
extending through the said tube and having  
5 its inner end enlarged to form the plunger-  
head, bolts secured to the outer end of the  
wooden core and a cap-plate secured on said  
bolts to hold the tube on the filler and also  
serve as a means of connecting the plunger

with its operating mechanism; substantially as  
as described.

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

JOSEPH EARL IRWIN.

Witnesses:

FRANK WILSON,  
CHARLES CURRAN.