

No. 680,565.

Patented Aug. 13, 1901.

F. D. CLINGER.
PUMP BUCKET OR PISTON.

(Application filed Sept. 4, 1900.)

(No Model.)

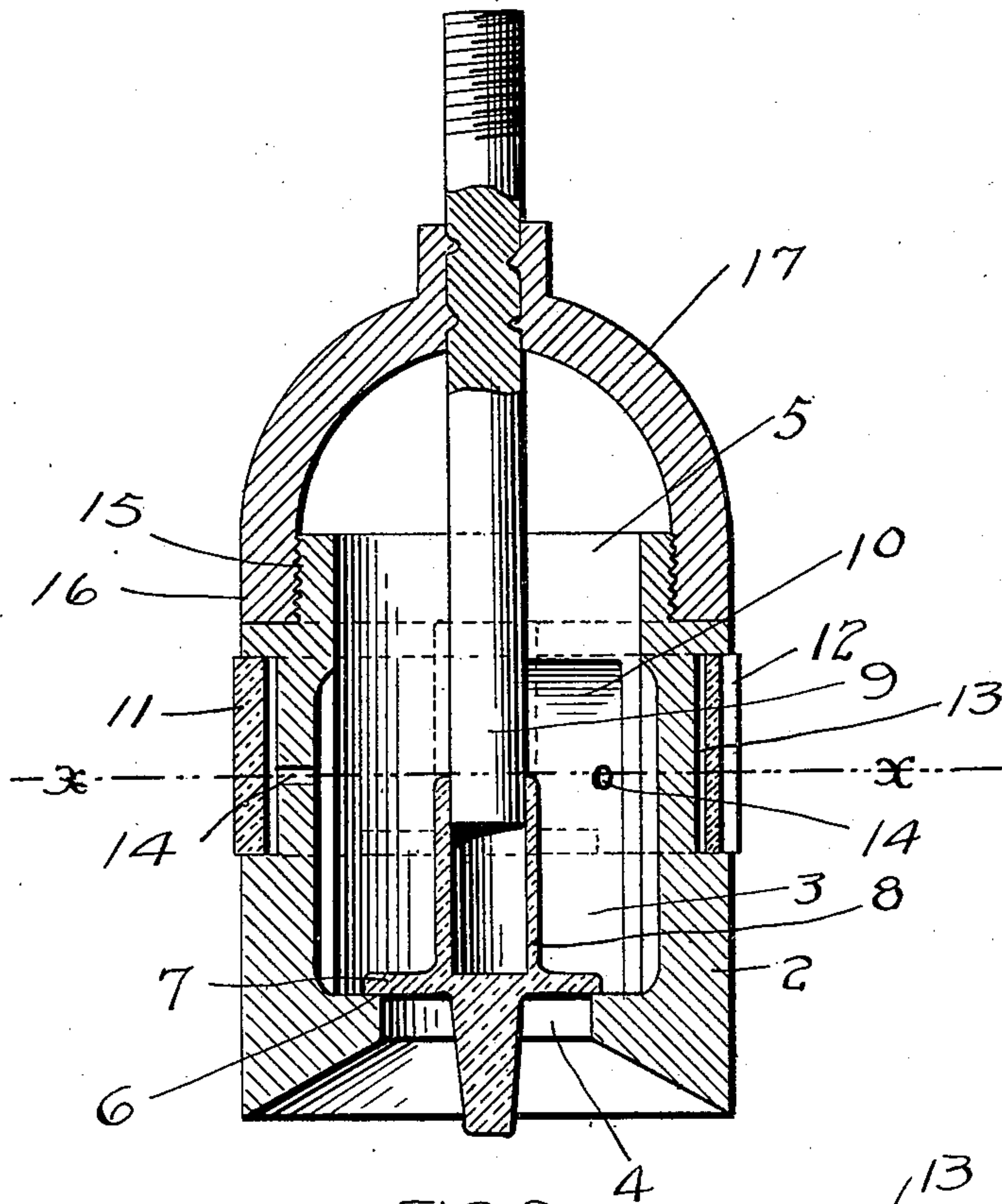


FIG. 2

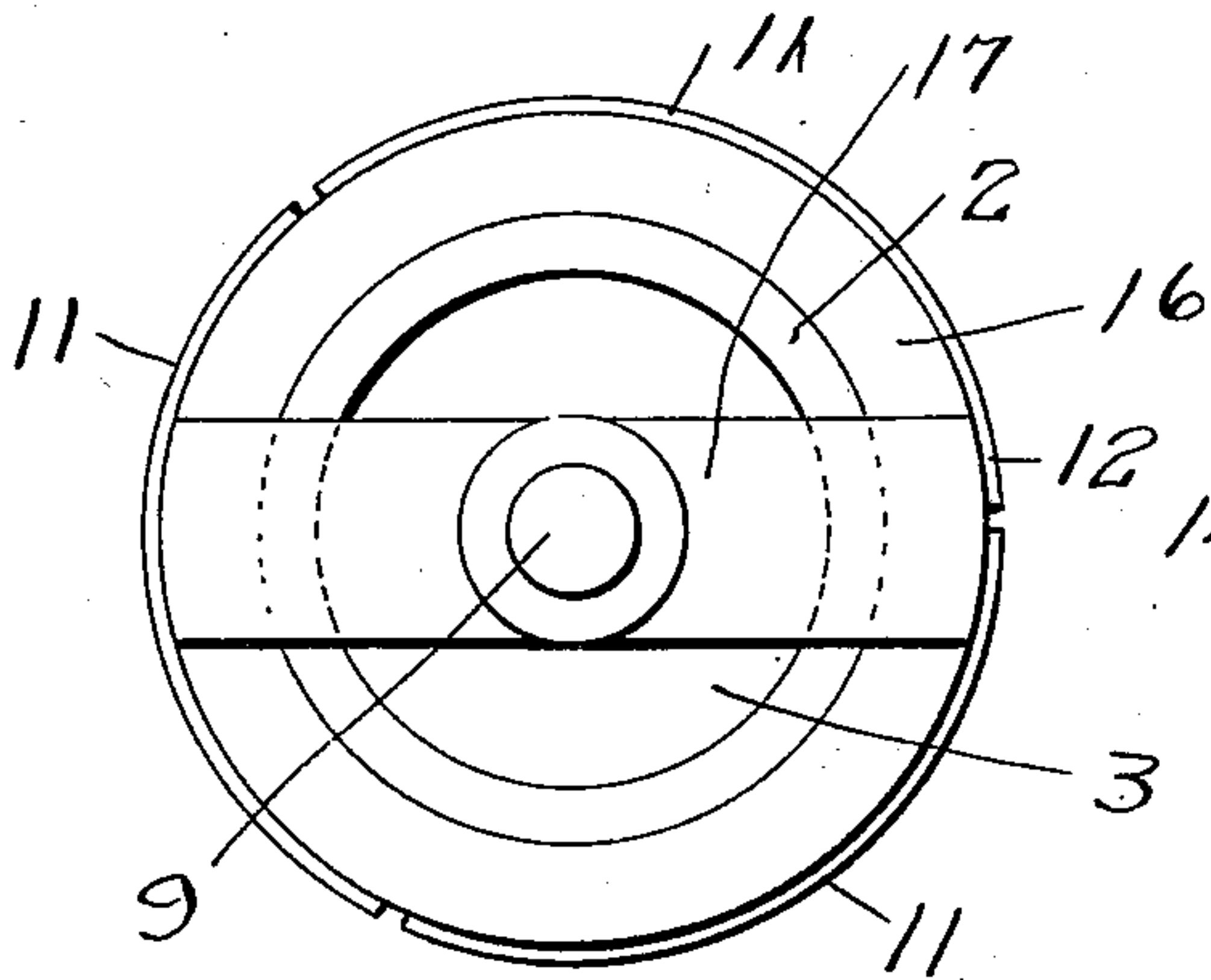


FIG. 1.

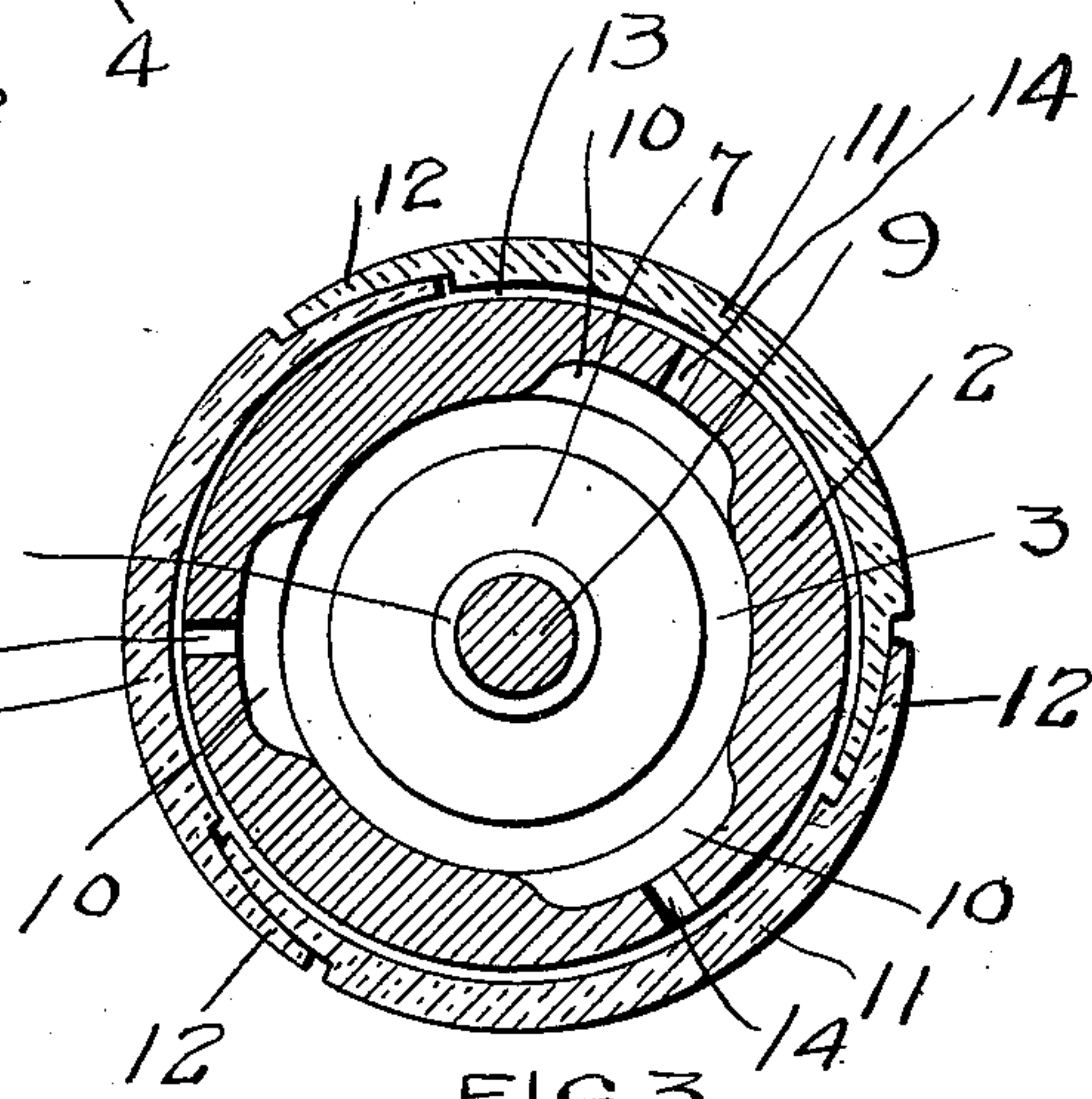


FIG. 3.

WITNESSES:

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BY

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FRED D. CLINGER, OF OWATONNA, MINNESOTA, ASSIGNOR OF THREE-FOURTHS TO OLIVER N. OLSON, WILLIS SPERRY, AND SILAS E. WARE, OF SAME PLACE.

PUMP BUCKET OR PISTON.

SPECIFICATION forming part of Letters Patent No. 680,565, dated August 13, 1901.

Application filed September 4, 1900. Serial No. 28,868. (No model.)

To all whom it may concern:

Be it known that I, FRED D. CLINGER, of Owatonna, Steele county, Minnesota, have invented certain new and useful Improvements in Pump Buckets or Pistons, of which the following is a specification.

The invention relates to pistons or plungers for bucket-pumps.

One object of the invention is to provide a pump bucket or piston that will during its ascent form a close water-tight joint with the walls of the pump-cylinder even though the cylinder is not perfectly round in cross-section.

A further object is to provide improved means for guiding and retaining the piston-valve in its proper position.

A still further object is to provide an improved connecting means between the pump-rod and the piston.

Other objects of the invention will appear from the following detailed description.

The invention consists generally in various constructions and combinations, all as hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, Figure 1 is a plan view of a pump bucket or piston embodying my invention. Fig. 2 is a vertical section of the same. Fig. 3 is a horizontal section on the line *x x* of Fig. 2.

In the drawings, 2 represents a bucket or piston proper, provided with a water-chamber 3, having an inlet or valve opening 4 at the bottom of the bucket and an outlet-opening 5 at the top. Around the opening 4 I provide a valve-seat 6 for a vertically-movable valve 7, that is provided with a hollow stem 8, adapted to telescope with the lower end of a guide-rod 9. The valve 7 normally rests upon its seat and forms a close joint therewith, but is adapted to slide upward on its guide-rod when the piston descends to permit water to flow into the chamber. To facilitate the passage of water by the valve, I prefer to provide a series of vertical channels 10 in the walls of the chamber 3. In the drawings I have shown three of these channels extending from the valve-seat to the top of

the chamber above and below the limit of the upstroke of the valve. There may, however, be a greater or less number of these channels, and they may vary in size according to the dimensions of the piston. As soon as the piston begins its upstroke the valve will slide down on the guide-rod 9 and close the valve-opening 4. The chamber 3 will then be filled with water, as well as the pump-cylinder above the piston. Ordinarily during the ascent of the piston considerable leakage will occur between its walls and the walls of the cylinder, and this is especially true when the pump-cylinder is not substantially circular in cross-section. It therefore frequently happens that by the time the piston has reached the limit of its upstroke a considerable quantity of the water raised thereby will have escaped and run back into the well. To obviate this difficulty, I prefer to provide automatically-adjustable packing means between the piston and the walls of the cylinder. This packing means consists, preferably, of a series of curved sections 11, preferably of Babbitt metal, having overlapping rabbeted ends 12. These sections are adapted to fit within an annular groove 13 in the walls of the piston and when placed therein form a continuous sectional ring around the piston, with its surface normally flush with the surface of the same. In the bottom of each channel, preferably opposite the lower end of the guide-rod, I provide a port 14, communicating with the annular groove 13, so that during the ascent of the plunger the water will flow out through the port and force the loose packing-sections against the walls of the cylinder and hold them there and prevent any leakage around the piston during its upward stroke. As soon as the piston begins its downward stroke the pressure on the packing-sections will be relieved and they will return to their normal position. This sectional packing is preferably arranged opposite the lower end of the guiding-rod 9, so that when the valve is at the limit of its upstroke it will be near but below the water-outlet ports, and the water flowing past the valve will pass out through the top of the chamber without entering the ports or forcing out the

sectional packing during the descent of the plunger. The upper end of the piston is provided with an annular groove or recess, and the reduced end portion 15 formed thereby is threaded to receive an interiorly-threaded ring 16, that is formed integrally with a bridge or yoke 17 and constitutes therewith the bail or handle of the bucket or piston. When the ring and yoke are cast, being preferably formed in that way, the guiding-rod 9 is placed in the mold and the yoke cast around it. The upper end of the guiding-rod is threaded, as shown, to permit its convenient attachment to a pump-rod. The yoke and guiding-rod may be removed at any time from the piston to permit access to the valve or its seat.

The construction described above permits me to produce a very compact and durable bucket or piston, and the relative positions of the valve and water-ports renders the packing particularly efficient to prevent leakage around the piston.

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

1. The combination with a pump-piston having a chamber provided with a water-outlet opening and an unobstructed inlet-opening, of a guide-rod, a vertically-movable valve adapted to close said inlet-opening and telescope with the said guide-rod to present the unobstructed inlet-opening to the free passage of water, said chamber being provided with water-channels extending above and below the limit of the upstroke of said valve to present a cross-sectional area around the edge of the valve for the free flow of water entering the unobstructed inlet-opening.

2. A pump-bucket, comprising a cylinder having a chamber provided with unobstructed inlet and outlet openings, a guide-rod depending within said chamber above the inlet-opening, a valve vertically movable within the walls of said cylinder and normally closing the inlet-opening, said valve having a hollow upwardly-projecting stem to telescope with said guide-rod and water-channels provided in the walls of said cylinder and ex-

tending above and below the limit of the upstroke of said valve to provide a cross-sectional area around the edge of the valve for the free flow of water passing through the unobstructed inlet-opening.

3. In a pump-bucket, the combination with the cylinder having a water-chamber provided with unobstructed inlet and discharge openings, of a valve fitting said chamber and adapted to close said inlet-opening, said valve slidable vertically within the chamber above said opening, vertical water-channels provided in the walls of said chamber to form a cross-sectional area for the free flow of water past the edge of the valve and extending above and below the limit of the upstroke of said valve, an annular groove provided in the outer surface of said cylinder, sectional packing-rings fitting closely therein, and ports leading from the water-channels into said annular groove above the limit of the upstroke of said valve.

4. A pump piston or bucket comprising a hollow cylinder 2, having an unobstructed water-inlet opening 4 in its lower end and open at the top, said cylinder having a reduced threaded end, in combination with the threaded ring 16 fitting said reduced end and having its outer periphery flush with the surface of the cylinder, a yoke 17 integral with said ring 16, a guide and attachment rod 9, secured in said yoke and concentric with said cylinder, the valve 7 normally seated in said opening 4 and smaller than the inner diameter of said cylinder, said valve having the sleeve telescoping upon the lower end of said rod 9, vertical water-channels provided in the inner wall of said cylinder, said cylinder having a packing-groove, and a suitable packing provided therein, substantially as described.

In witness whereof I have hereunto set my hand this 27th day of August, 1900.

FRED D. CLINGER.

In presence of—

W. F. SAWYER,
M. W. COONEY.