

No. 753,828.

PATENTED MAR. 1, 1904.

J. HAHN.
PUMP.

APPLICATION FILED JAN. 20, 1903.

NO MODEL.

Fig. I

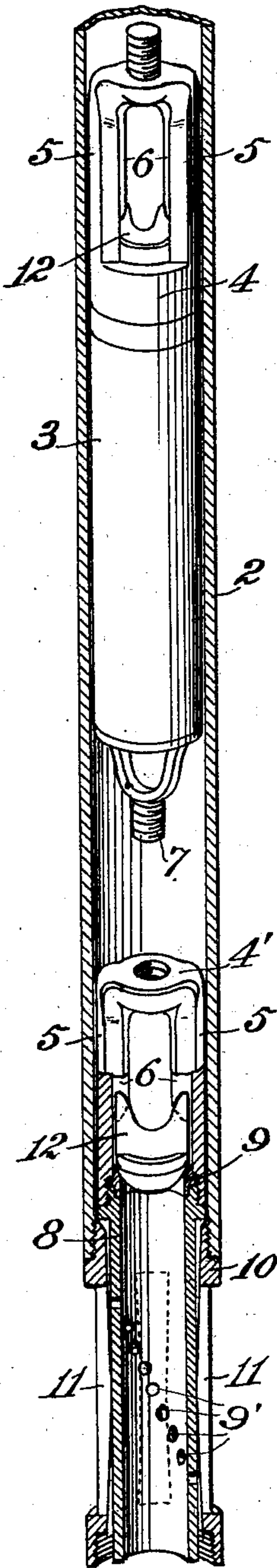


Fig. II

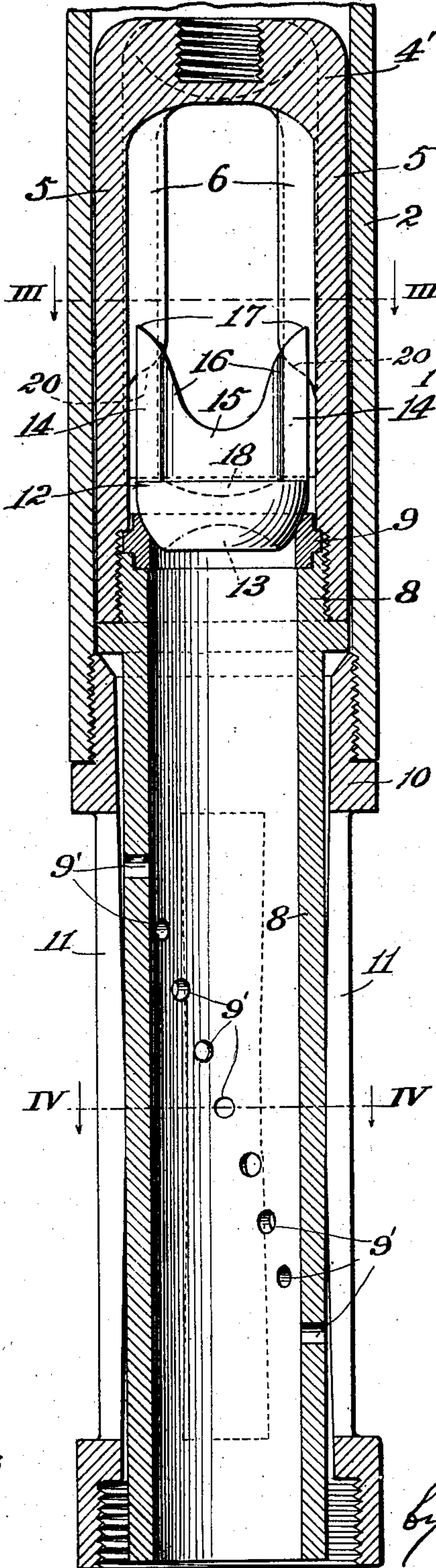


Fig. III

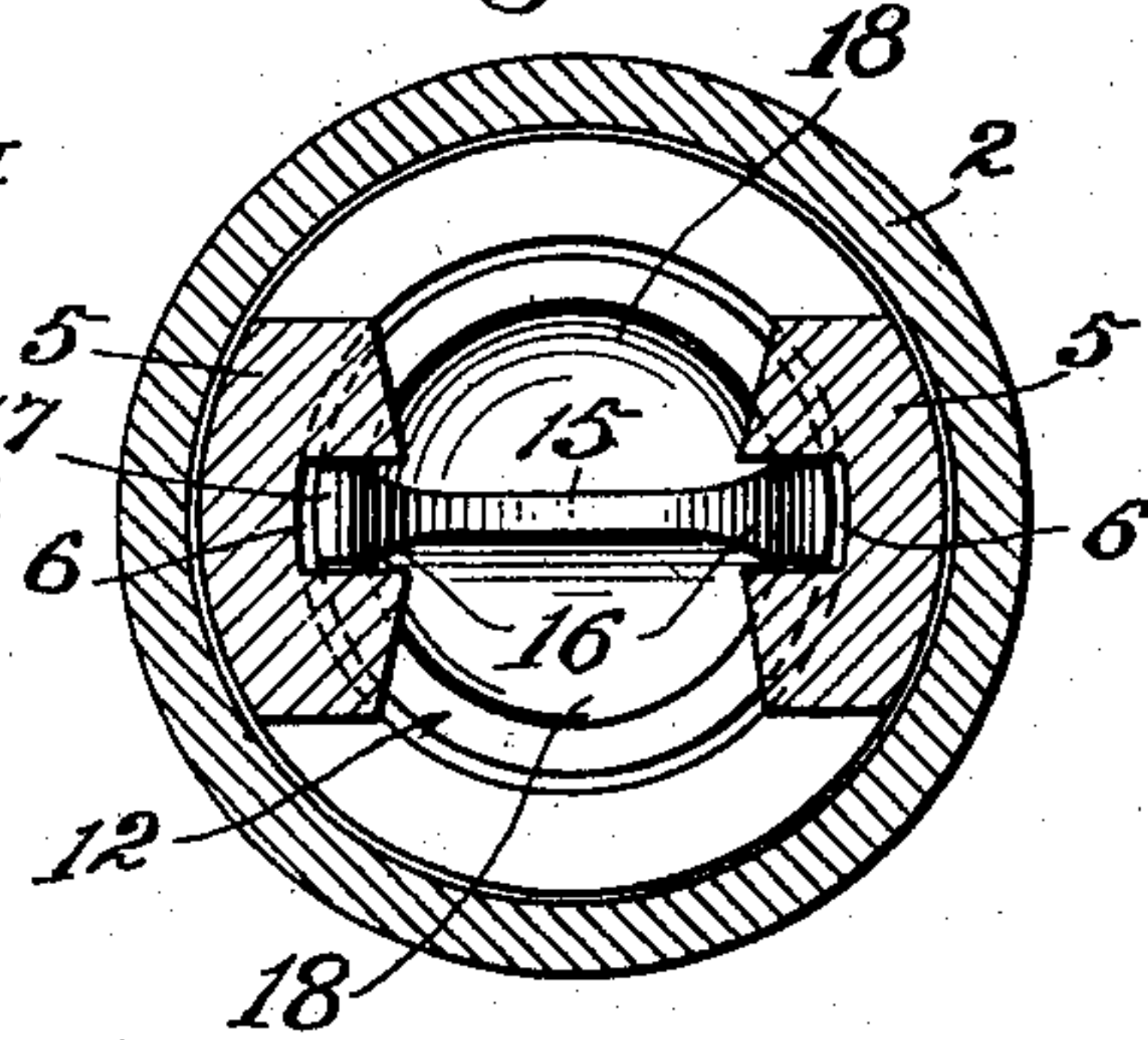


Fig. IV

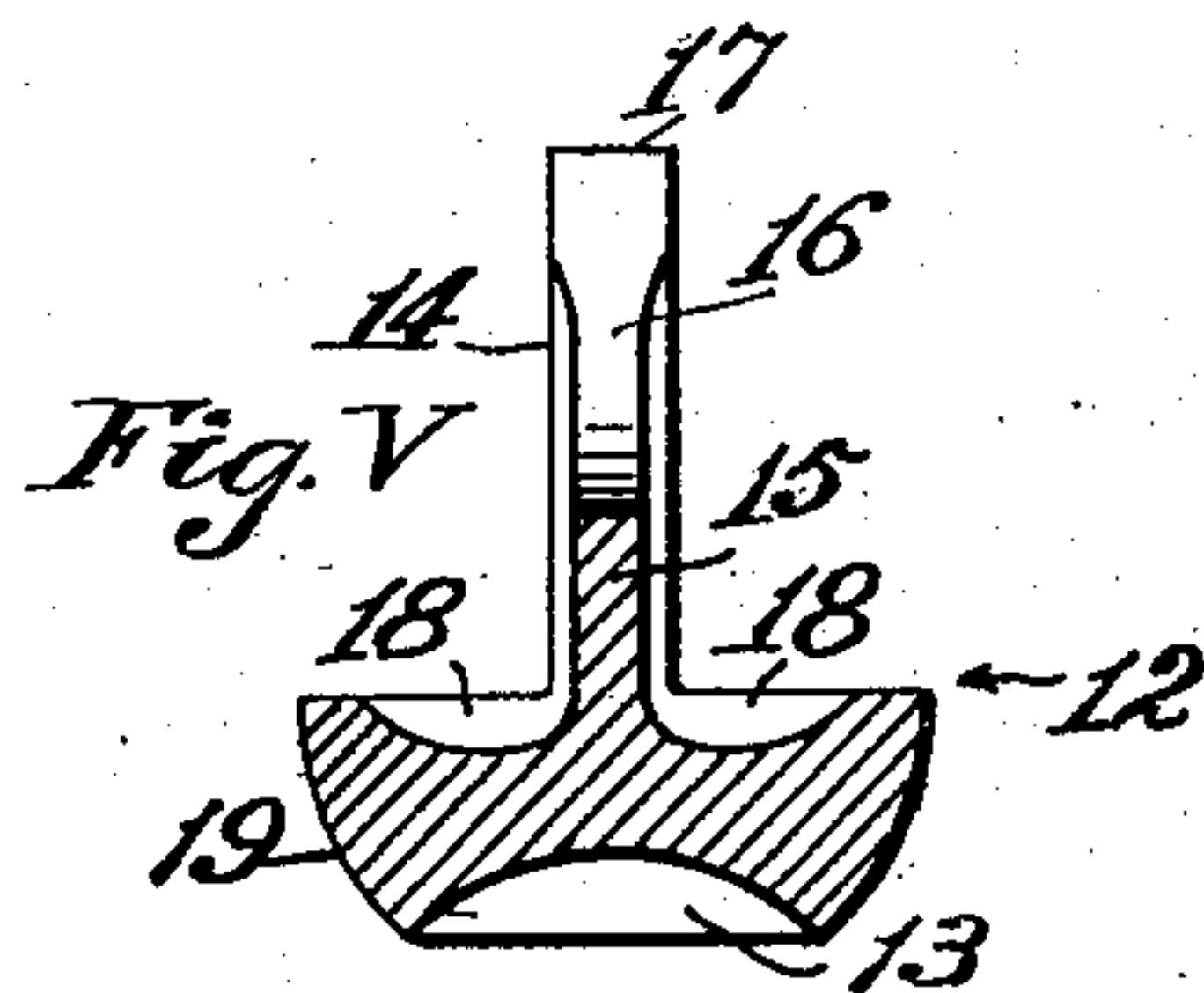
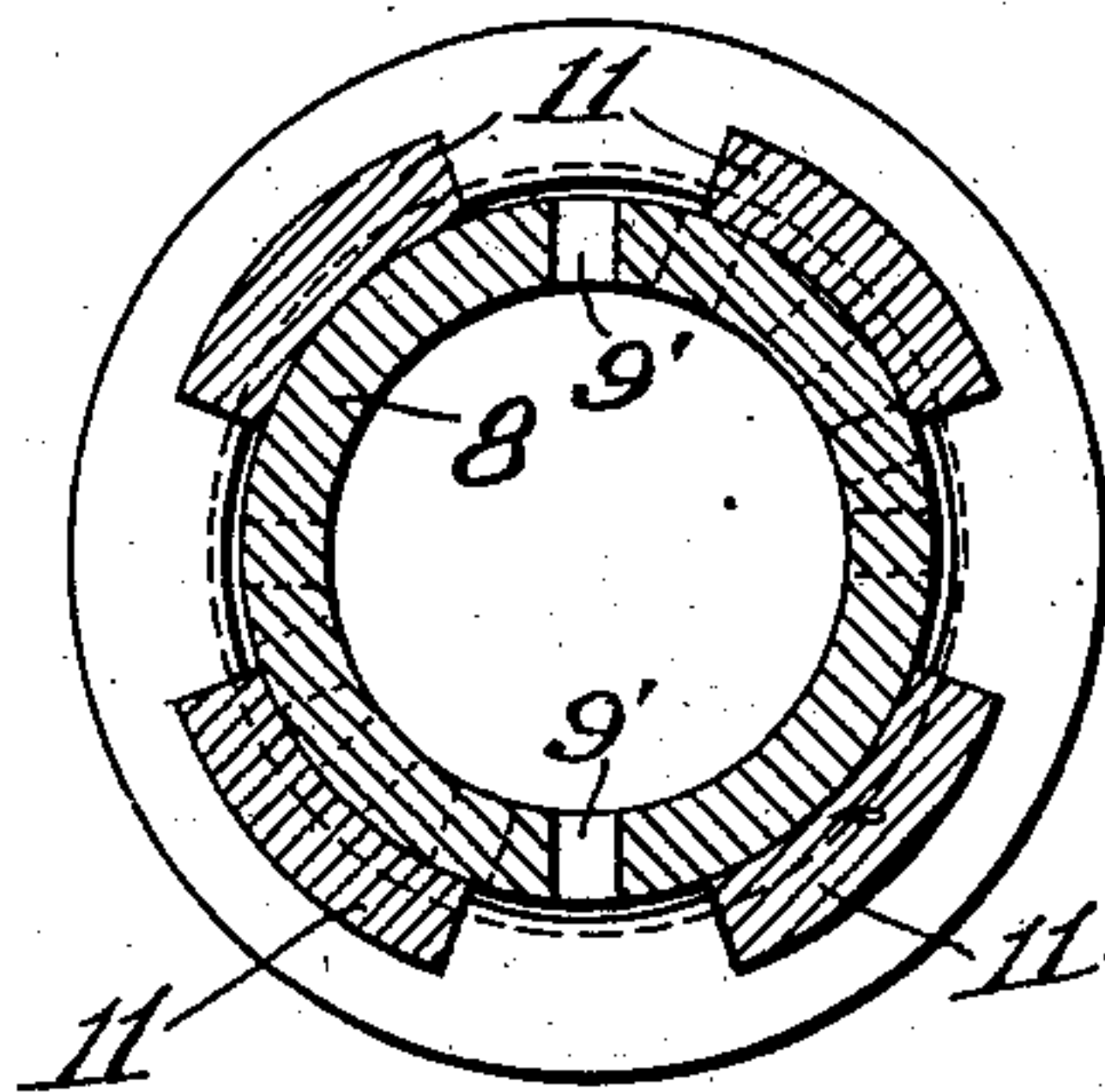


Fig. V

Witnesses

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UNITED STATES PATENT OFFICE.

JOHN HAHN, OF LOS ANGELES, CALIFORNIA, ASSIGNOR OF ONE-FOURTH
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PUMP.

SPECIFICATION forming part of Letters Patent No. 753,828, dated March 1, 1904.

Application filed January 20, 1903. Serial No. 139,822. (No model.)

To all whom it may concern:

Be it known that I, JOHN HAHN, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented certain new and useful Improvements in Pumps, of which the following is a specification.

This invention relates to pumps, and particularly to pumps applicable for deep wells, and has for its primary object the provision of a pump which may be particularly adapted for pumping oil or water mixed with sand or other solids with ease and effectiveness and which will not clog or become stuck.

A further object is to provide such a pump of most simple, cheap, and durable construction which shall be extremely positive and efficient in operation.

To these ends the invention consists in the constructions and in the general and specific combinations of parts hereinafter described, and set forth in the claims.

The invention will be more readily understood by reference to the accompanying drawings, forming part of this specification, in which—

Figure I is a longitudinal sectional view of a pump embodying my invention. Fig. II is an enlarged fragmental longitudinal sectional view thereof. Fig. III is a plan view on the line III III of Fig. II. Fig. IV is a plan view on the line IV IV of Fig. II. Fig. V is a sectional view of the valve which I employ.

As shown in the drawings, 2 represents the working barrel of the pump; 3, the pump-piston; 4, the cage for the upper or piston-valve. This cage 4 preferably consists of the upward extensions or standards 5, which are provided on their inner faces with guides 6. The cage 4 is suitably connected with the piston 3, as by a suitable threaded portion (not shown) adapted to engage a threaded portion (not shown) of the piston in the ordinary or any preferred manner.

The lower end of the piston 3 is provided with an engaging portion 7, adapted to engage the upper end of the lower valve-cage 4', similar in construction to the upper valve-cage 4, having, as shown, similar standards 5 and

guides 6. The lower end of this cage 4' is connected with the barrel or pipe 8 by means of threads, as shown. A removable valve-seat 9 is provided at the upper end of the barrel or pipe 8. This barrel or pipe 8 is preferably provided with small fine holes 9' for the outlet of any gas that may accumulate in the pipe 8.

10 represents an extension of the working barrel, connected thereto by suitable threads and threaded portion, as shown. This extension 10 has a series of ribs 11 with open spaces or slots therebetween. The inner faces of these ribs are inwardly inclined, as shown, so that they form springs to retain the barrel or pipe 8 in place. By lowering the piston 3 and engaging its screw-piston 7 with the upper end of the valve-cage 4 the pipe or barrel 8 may be raised.

12 represents the valves, the upper and lower valves and valve-cages being preferably of the same construction and are so indicated in the drawings. The valves 12 are preferably recessed at 13 on their under sides, as shown best in Fig. V, and provided on the top with an upwardly-extending feather-web 14, which may be of reduced thickness at 15 midway between its wings 16, which terminate in upwardly-projecting points 17. The wings 16 of the feather-web play in the guideways 6, which are preferably of a materially greater width than the edges of the wings 16, the parts being thus constructed to avoid any liability of jamming or clogging with sand or other solid matters.

The valves 12 preferably have cavities 18 on opposite sides of the feather-web. The under side of the valves may be beveled or rounded, as at 19, around the edge to fit in the valve-seat. They are preferably semispherical, as shown.

In practical operation the downstroke of the piston in a liquid will cause the valve to be upborne by the liquid, the concavity on the under side of the valve serving to prevent the ready downward movement of the valve through the liquid. This allows the plunger to pass down through the liquid, which flows freely through the valve-seat and around the valve and passes up on each side of the feather-

web 14 and acting thereon tends to hold the valve in true vertical position. The liquid is deflected outwardly by the valve - bottom against the valve-seat and will keep the seat free from any accumulation of sediment, so that on the return stroke the valve may seat truly. Upon the upstroke of the piston the liquid is caught in the cavities or cups on the opposite sides of the feather-web, and the weight of the liquid therefore assists to quickly seat the valve, thus making the action of the valve very quick. The pressure of the fluid upon the opposite sides of the feather-web and in the top cavities tends to hold the valve true, so that the beveled or rounded rim 19 will seat true in the valve-seat. On a return downstroke of the piston the valve is again upheld by the liquid, and in case there may be any solid material in the guides 6 the points 17 will pass the obstruction and force it out of the way between the guides without any danger of packing or jamming of the parts.

A convenient and effective form of construction is shown in which the edges of the feather-web terminate in chisel-points, the edges of which extend transverse the feather-web at the outside thereof. The lower ends of the guides 6 may also be beveled, as indicated at 20, in order to avoid clogging.

It is seen that I surely seat the valve at the upstroke of this piston, and in attaining this object I furnish the upper end of the valve with a tail or feather-web corresponding in function to that of the feather-web of an arrow, whereby the liquid through which the valve passes serves to hold the valve true in guides in which the edges of the feather-web move.

The valves and ways herein shown and described originally formed part of the subject-matter of my application filed January 30, 1902, Serial No. 90,530.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. In a pump-piston, a valve having a cavity in its under side, and an upwardly-projecting feather terminating in chisel-points at its opposite edges, and provided in its top with cavities on opposite sides of the feather.

2. A cage having an annular valve-seat and vertical guideways at opposite sides of said valve-seat, a head at the top of the cage constructed to provide open ways above the valve-seat at opposite sides of the plane in which said guideways extend; and a valve constructed to seat in the valve-seat and having a transverse upwardly-extending web constructed to move in the guideways and to form a barrier which will prevent liquid from flowing across the face of the valve transverse said plane in which the guides extend.

3. A cage having an annular valve-seat and vertical guideways at opposite sides of said valve-seat, a head at the top of the cage constructed to provide open ways above the valve-seat at opposite sides of the plane in which

said guideways extend; and a valve constructed to seat in the valve-seat and having a transverse upwardly-extending web constructed to move in the guideways and to prevent liquid from flowing across the face of the valve transverse said plane in which the guides extend, the top of said valve being also provided with means to retain liquid on the opposite sides of the web.

4. A cage having a valve-seat, vertical guides extending up from opposite sides of the valve-seat and a head mounted on the top of the guides and constructed to provide open ways above the valve-seat on opposite sides of the plane in which the guides extend, and a valve for the valve-seat, provided with means above the valve to move freely in the guides, said valve having a barrier across the top of the valve in the plane in which the guides extend, to prevent the liquid from flowing across the top of the valve transverse said plane.

5. A cage having a valve-seat, vertical guides and a head constructed to provide open ways above the valve-seat on opposite sides of the plane in which the guides extend, and a valve for the valve-seat provided with means above the valve to move freely in the guides, said valve having a barrier across the top of the valve in the plane in which the guides extend to prevent liquid from flowing across the top of the valve transverse said plane, the top of said valve being constructed to retain liquid on opposite sides of said barrier.

6. The combination of a valve provided with a centering-web extending diametrically across the top thereof, said web having an upwardly-projecting wing at each side thereof; with guides allowing the web material lateral play, each of said guides being beveled away at its foot.

7. A check-valve provided with an integral upwardly-extending imperforate transverse web the side edges of which reciprocate in vertical guideways and are provided with chisel-points arranged to clear said guideways.

8. A check-valve provided with an integral upwardly-extending imperforate transverse web the side edges of which reciprocate in vertical guideways and are provided with chisel-points which are beveled toward the base of said guideways, stops being provided to engage the upper face of the valve.

9. A check-valve provided with an integral imperforate upwardly-extending transverse web the side edges of which reciprocate in vertical guideways and are provided with chisel-points for clearing the guideways, the foot of said guideways forming stops which engage the upper face of the valve.

10. In a pump-piston, the combination of a valve-seat and vertical ways thereabove, with a valve adapted to seat therein and slide vertically thereabove, said valve having a convex lower face which slopes inwardly and downwardly across the seating-line and has a

concavity extending upwardly from the lower extremity of said face and having an integral imperforate upwardly - extending transverse web slidable in said ways.

5 11. In a pump-piston, the combination of a valve-seat and vertical ways thereabove, with a valve adapted to seat therein and slide vertically thereabove, said valve having a convex lower face with a cavity normally lying
10 below the level of the top of the valve-seat and having an integral imperforate upwardly-extending transverse web slidable in said ways.

12. In a pump-piston, in combination, a
15 valve-seat, a check-valve adapted to seat therein and to slide vertically thereabove, said valve having a lower face which slopes inwardly and downwardly across the seating-line and has a concavity extending upwardly from the
20 lower extremity of said face and a web extending diametrically across the top of the valve, and means for guiding the web by its side edges.

13. The combination of a valve provided
25 with a centering-web extending diametrically across the top thereof, said web having an upwardly-projecting wing at each side thereof, with guideways which embrace the side edges of said web, said guideways being materially
30 wider than the web edge.

14. In a pump-piston, in combination, a valve-cage provided with upward extensions providing open ways at the sides, said extensions having internal guides forming ways, a
35 valve-seat therein, and a valve adapted to seat therein and provided with a feather-web extending across its center and terminating in points adapted to travel in said ways.

15. In a pump-piston, in combination, a valve-
40 cage provided with upward extensions providing open ways at the sides, said extensions having internal guides forming ways, a valve-cage therein, and a valve adapted to seat therein and provided with a feather-web extending
45 across its center and terminating in points adapted to travel in said ways, and provided with cavities in its top at the sides of said feather-web.

16. In a pump-piston, in combination, a valve-
50 cage provided with upward extensions providing open ways at the sides, said extensions having internal guides forming ways, a valve-cage therein, and a valve adapted to seat therein and provided with a feather-web ex-
55 tending across its center and terminating in points adapted to travel in said ways, and provided with cavities in its top at the sides of said feather-web, and also having a concavity on its under side.

60 17. In a pump-piston, in combination, a valve-cage provided with upward extensions providing open ways at the sides, said extensions having internal guides forming ways, a valve-cage therein, and a valve adapted to seat
65 therein and provided with a feather-web ex-

tending across its center and terminating in points adapted to travel in said ways, and having a concavity on its under side.

18. A check-valve rounded on its under face and having across the center of its top an im-
70 perforate feather-web extending above the level of its upper face and edge, the sides of said feather-web constructed and arranged to be acted upon by the liquid through which the valve passes to truly center the valve. 75

19. A check-valve rounded on its under face and having across the center of its top an imperforate feather-web extending above the level of its upper face and edge, the sides of
80 said feather-web constructed and arranged to be acted upon by the liquid through which the valve passes to truly center the valve, and said valve provided with cavities in its top at the sides of said feather-web.

20. In a pump, the combination of a check-
85 valve rounded on its under side and having across the center of its top an imperforate feather-web extending above the level of its upper face and edge, the sides of said feather-web adapted to receive the resistance of the
90 liquid to center the valve, said feather-web having chisel-points upwardly forming a conical edge for said feather-web, with a plunger having upward standards or extensions forming open ways and having internal guides
95 forming ways within which said chisel-points play, stops being formed at the lower end of said guides.

21. In combination, with vertical guideways, of a check-valve provided with an imperforate
100 upwardly-extending feather-web adapted to reciprocate in said guideways, said feather-web provided with upwardly-curved ends terminating in chisel-points for clearing said
105 ways, the lower ends of said ways forming stops which engage the upper face of the valve.

22. In a pump, the combination, with the working barrel, of an extension having a series of ribs having inwardly-inclined faces forming
110 springs, of a barrel or pipe extending therein and held by said springs.

23. In a pump, the combination, with the working barrel, an extension having a series of ribs having inwardly-inclined faces forming
115 springs, of a barrel or pipe extending therein and held by said springs, said barrel or pipe provided with gas outlets or perforations.

24. In a pump, the combination with the working barrel, of an extension having a series of ribs with open ways therebetween, said ribs
120 having inner spring-faces, of a barrel or pipe extending therein and removably held therein by said ribs.

25. The combination, with a working barrel provided with ribs having inner faces forming
125 springs, of a barrel or pipe extending into said ribbed portion and removably held therein by said ribs, a valve-seat at the top of said barrel or pipe, a valve-cage secured on said barrel or
130 pipe, a valve therein, a movable piston, means

for detachably connecting said piston and cage to raise said cage and barrel or pipe, and a valve-cage in connection with said piston, a valve-seat in connection therewith and a valve therein, and means for operating said piston.

26. The combination, with a working barrel provided with ribs having inner faces forming springs, of a barrel or pipe extending into said ribbed portion and removably held therein by said ribs, said barrel or pipe provided with gas perforations or outlets, a valve-seat at the top of said barrel or pipe, a valve-cage secured on said barrel or pipe, a valve therein, a movable piston, means for detachably connecting said piston and cage to raise said cage and barrel or pipe, and a valve-cage in connection with said piston, a valve-seat in connection therewith and a valve therein, and means for operating said piston.

27. The combination with a working barrel, of a barrel or pipe, means for retaining said barrel or pipe in the working barrel, said barrel or pipe being provided with gas-outlets, a valve-seat on said barrel or pipe, a valve co-operating with said valve-seat, a movable piston having a valve, means for detachably connecting said piston with the barrel or pipe, and means for operating the piston.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, at Los Angeles, in the county of Los Angeles and State of California, this 15th day of January, 1903.

JOHN HAHN.

Witnesses:

FREDERICK S. LYON,
GEORGE T. HACKLEY.