

No. 755,925.

PATENTED MAR. 29, 1904.

S. R. PAINTER.
VALVE AND VALVE SEAT.
APPLICATION FILED SEPT. 12, 1903.

NO MODEL.

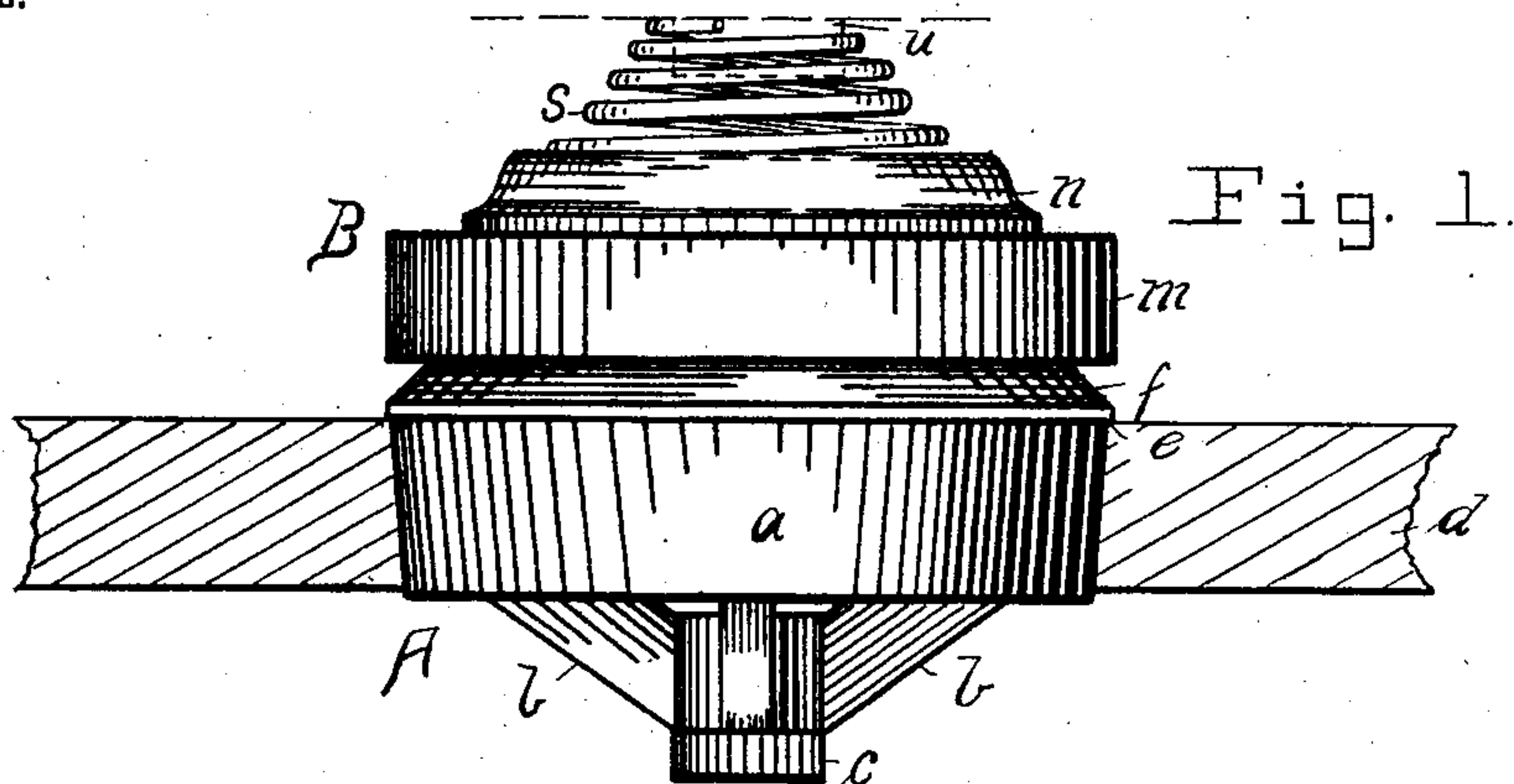


Fig. 1.

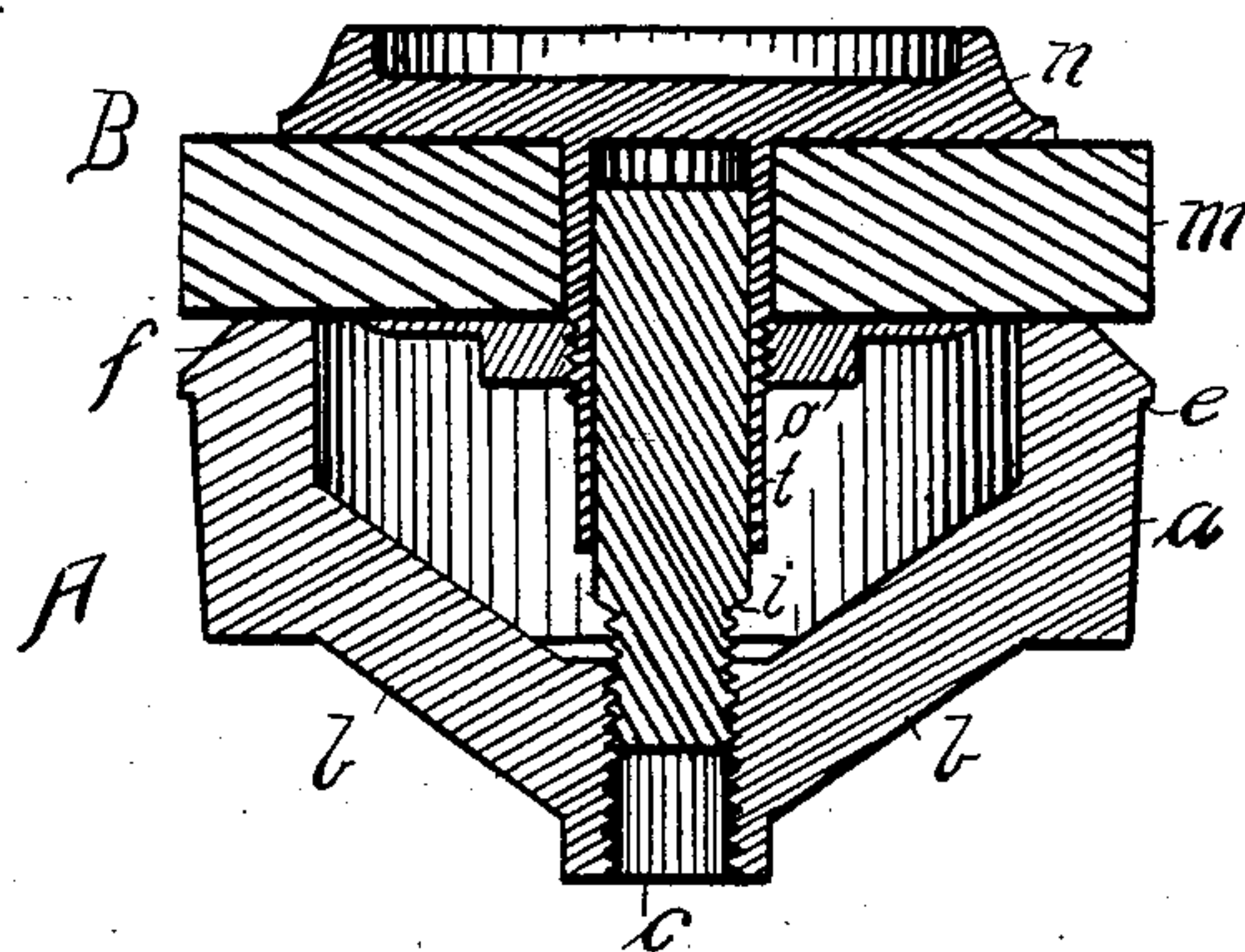


Fig. 2.

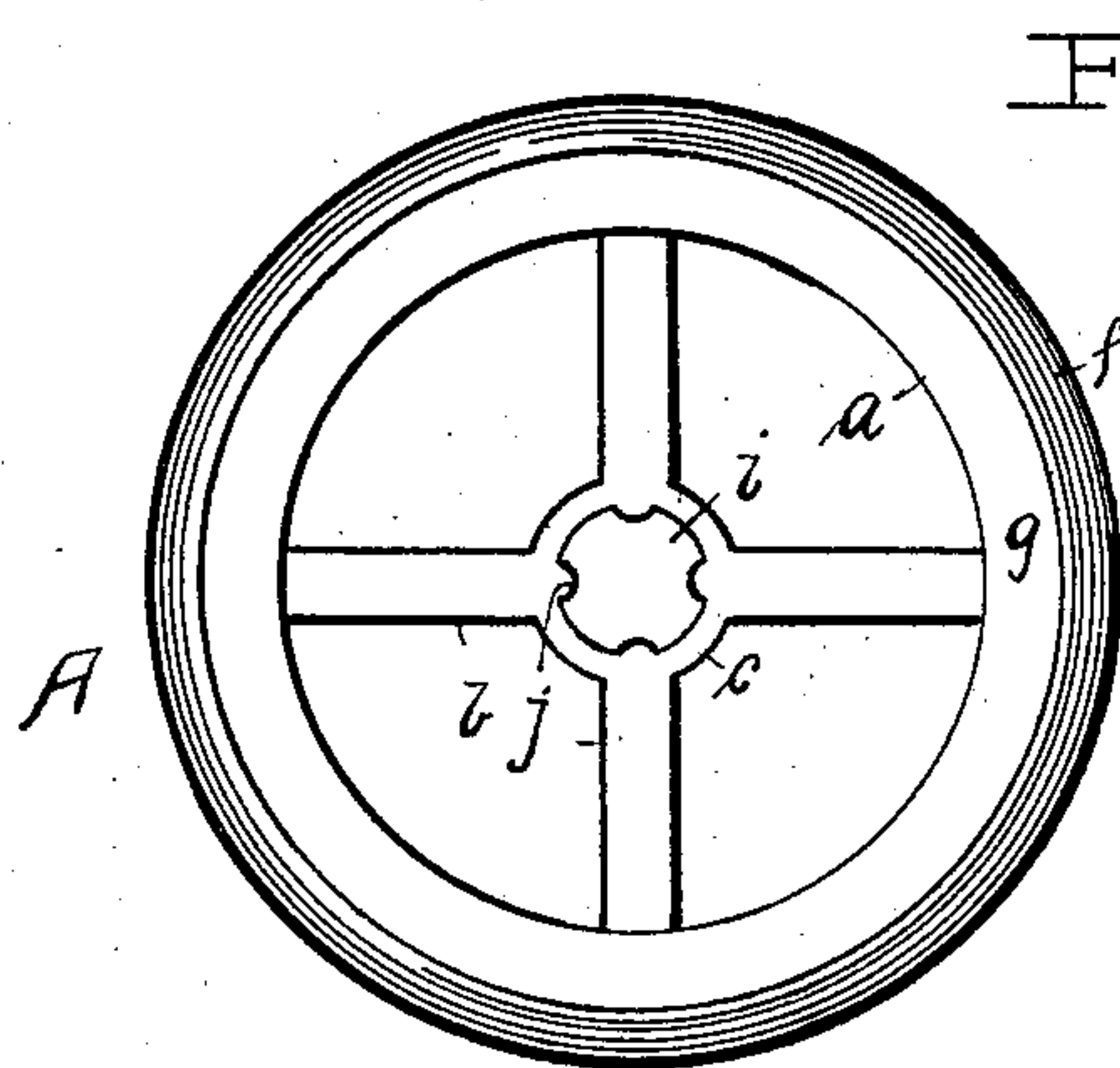


Fig. 3.

Witnesses.
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UNITED STATES PATENT OFFICE.

SIMEON R. PAINTER, OF TERRE HAUTE, INDIANA.

VALVE AND VALVE-SEAT.

SPECIFICATION forming part of Letters Patent No. 755,925, dated March 29, 1904.

Application filed September 12, 1903. Serial No. 173,020. (No model.)

To all whom it may concern:

Be it known that I, SIMEON R. PAINTER, a citizen of the United States, residing at Terre Haute, in the county of Vigo and State of Indiana, have invented certain new and useful Improvements in Valves and Valve-Seats; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form part of this specification.

My invention relates to that class of valves and valve-seats which are used in pumps, and particularly in that class of pumps used in pumping water from mines and other similar places where much soil and other foreign matter is found in the water to be pumped.

The objects of my invention are, first, to provide a valve and valve-seat whereby the capacity of a pump provided with the valve and seat will be greatly increased over that afforded by other valves and seats used prior hereto; second, to provide a valve and seat which will by its particular structure avoid the accumulation in the valve of mud, coal, and other foreign substance which is so common in other forms of valves and seats; third, to provide a valve and seat which by reason of its particular structure will be less subject to wear and other injury than other similar devices, and, fourth, to provide a valve which will have a maximum life under usage, which will be easily repaired, and which can be easily removed from the valve-plate of a pump. These objects I attain by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is an elevation of the valve and valve-seat mounted in a section of the valve-plate of a pump. Fig. 2 is a vertical cross-sectional view of the valve and valve-seat. Fig. 3 is a plan view of the valve-seat.

Similar letters of reference refer to similar parts throughout the several views.

The letter A indicates the valve-seat, which is constructed of brass or other suitable material and consists of a cylindrical shell *a*, two or more ribs *b*, said ribs being cast integral with

the internal lower edge of the shell *a* and radiating toward the center thereof and inclined downward to stud *c*, which is cast integral with the internal ends of said ribs *b*, said stud being suspended from the inner wall of the shell *a* by means of the ribs, with the upper end of the stud below the lower edge of the shell *a*, for the purpose hereinafter set forth. The outer wall of the shell is slightly beveled downward for the purpose of affording a cone fit in the valve-plate *d*. A slight shoulder *e* is raised from the outer wall of *a* for the purpose of affording a bearing upon the valve-plate *d* as an additional support for the valve-seat. The extreme upper portion *f* of the outer wall of the shell *a* is slightly beveled inward. The upper edge of the shell *a* is ground flat for the purpose of providing a single annular bearing-surface *g*, upon which the valve rubber is seated. The inner wall of the shell *a* is cylindrical and devoid of all projections or other obstacles except the ribs *b*, which are pendent from the extreme lower portion of the inner wall for the purpose of affording an unobstructed passage for water, wherein foreign matter can find no lodgment.

A guide-stem *i* is mounted centrally upon the stud *c* and projects above the bearing-surface *g* of the valve-seat for the purpose of guiding the hereinafter-described valve-stem. The guide-stem is provided with two or more grooves *j*, extending perpendicularly throughout its length, for the purpose of affording an escape for water above the stem, thereby avoiding a cushion of water in the valve-stem.

The letter B indicates the valve, which consists of a flat rubber disk *m*, which is perforated at the center for the purpose of receiving the valve-stem and which fits down upon the bearing-surface *g* of the valve-seat, thereby perfectly checking all flow of water through the valve-seat, and the spring-plate *n*, which consists of a flat circular plate somewhat smaller in diameter than the rubber valve *m* and concaved upon the upper face for the purpose of affording a seat for the spring *s* and the valve-stem *t*, which is integral with the spring-plate *n* and pendent from the center thereof. The valve-stem is cylindrical and hollow for the purpose of receiving the guide-stem *i*,

over which it fits. The valve-stem is threaded upon the outside for the purpose of receiving a flanged nut *o*, which is threaded internally and is adapted when screwed upon the threads 5 of the valve-stem to bind the rubber valve *m* firmly to the spring-plate *n*. A spiral spring *s* is mounted within the concaved upper face of the spring-plate *n*, and the upper end of the spring is confined by a stud *u*, which is 10 pendent from the top of the water-chest, as shown by dotted lines in the drawings. In case two or more valves are utilized, one above the other, the top of the springs *s* belonging to the lower valves find bearings around 15 the lower ends of the studs *c* of the valve-seat immediately above, the lower ends of the studs *c* being substituted for the stud *u*, used by the spring of the uppermost valve. The spring *s* holds the valve firmly down upon the seat 20 when the valve is closed and compresses upon itself under pressure when the valve is opened.

The particular advantages of my valve and seat over similar devices used heretofore consists, first, in the single annular valve-seat 25 which presents but one even bearing-surface devoid of all unequal points of contact and wear, such as occur in valve-seats where the ribs and central stud are flush with the bearing-surface of the seat, thereby giving an 30 even and smooth wear to the rubber valve; second, the ribs *b* and the studs *c* being pendent from the lower edge of the shell *a* they present less obstruction to the flow of water through the shell *a*, and hence such construction greatly increases the capacity of the valve 35 in proportion to the size thereof over that of other valves; third, the peculiar propped or pendent structure of ribs *b* and stud *c* presents no obstacles whereon soil, coal, or other 40 foreign substance may be deposited in such close proximity to the rubber valve *m*, thereby avoiding wear and tear upon the seat and rubber valve by such deposits, and also avoids clogging of the valve by large accumulations 45 of foreign matter in the valve-seat, which commonly occurs in other forms of valves and valve-seats; fourth, the united action of the guide-stem *i* and the valve-stem *t* affords an

accurate and even perpendicular action which avoids all tilting and lateral play of the valve 50 and uneven wear incident to such play, and, fifth, to remove my valve from a water-chest it is only necessary to compress the spring *s* and remove the same, when the valve is removed by simply lifting the valve-stem *t* free 55 from the guide-stem *i*.

I am aware that valves and valve-seats consisting of rubber disks and annular metallic seats have been long in use, and I therefore make no broad claims upon such device; but 60 what I do consider as new and useful is the peculiar structure of the component parts of the device hereinbefore described and the objects attained thereby, and

What I claim as new, and desire to secure 65 by Letters Patent, is—

The combination, in a valve and valve-seat, of a shell *a* provided with a single annular bearing-surface *g*, pendent ribs *b* and stud *c*, 70 said ribs and stud being below the shell *a*, and the grooved guide-stem *i* mounted upon the stud *c* and adapted to fit into the pendent valve-stem *t* with the rubber valve *m* adapted to seat itself upon the single annular bearing-surface *g*, the spring-plate *n* adapted to rest 75 upon the rubber valve *m* and to support in its concaved upper face the spring *s*, the hollow valve-stem *t* pendent from the spring-plate *n* and threaded upon its outer side for the purpose of supporting the threaded nut or clamp 80 *o*, the internally-threaded nut or clamp *o* adapted to screw upon the threads of the valve-stem *t* and to clamp the rubber valve *m* against the spring-plate *n*, and the spiral spring *s* adapted to bear upon the spring-plate *n* and 85 hold the valve in normal position, all substantially as described and for the purpose set forth.

In testimony that I claim the foregoing as my own I affix my signature in the presence of 90 two witnesses.

SIMEON R. PAINTER.

Witnesses:

GEORGE M. DAVIS,
SYD. B. DAVIS.