No. 666,245.

Patented Jan. 15, 1901.

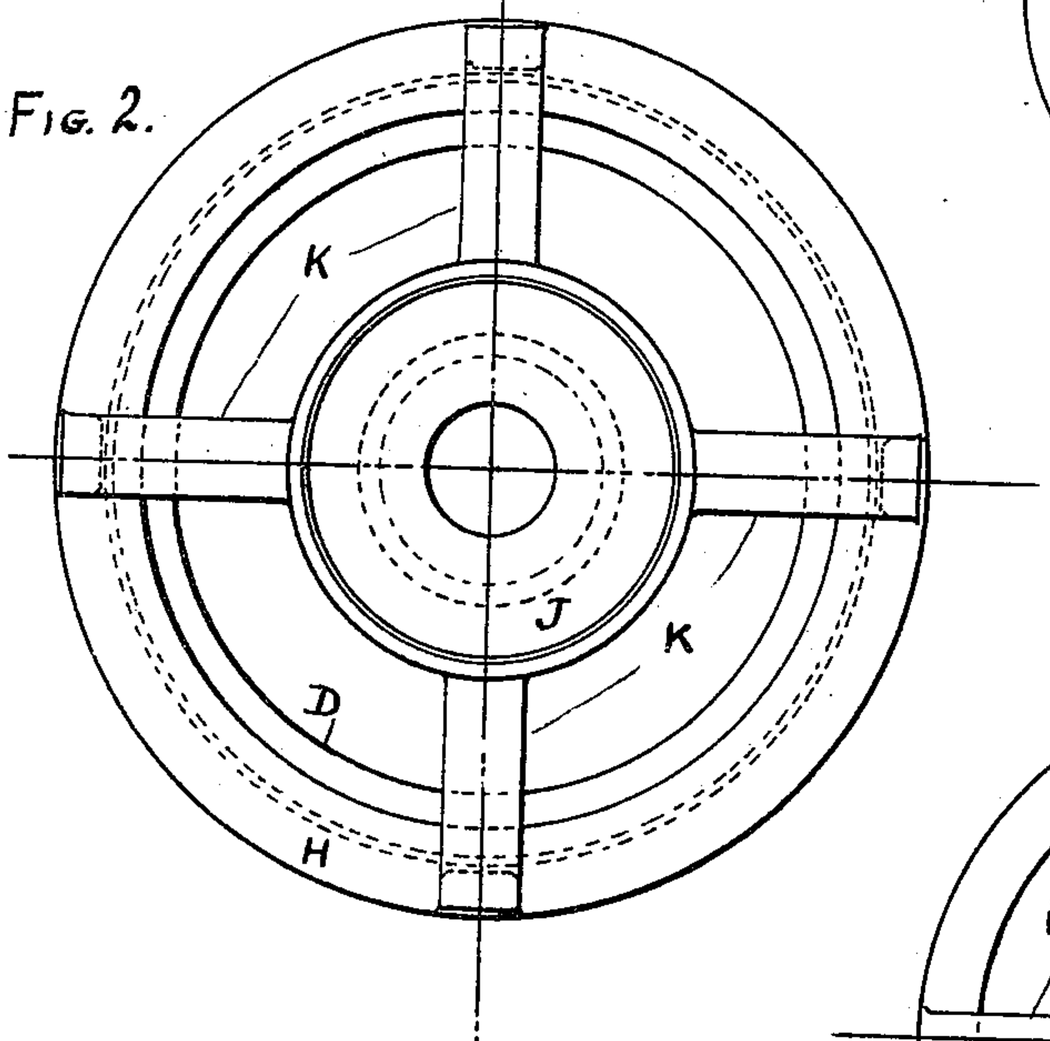
H. G. GINACA.

VALVE.

(Application filed Jan. 10, 1900.)

(No Model.)

FIG. 2.



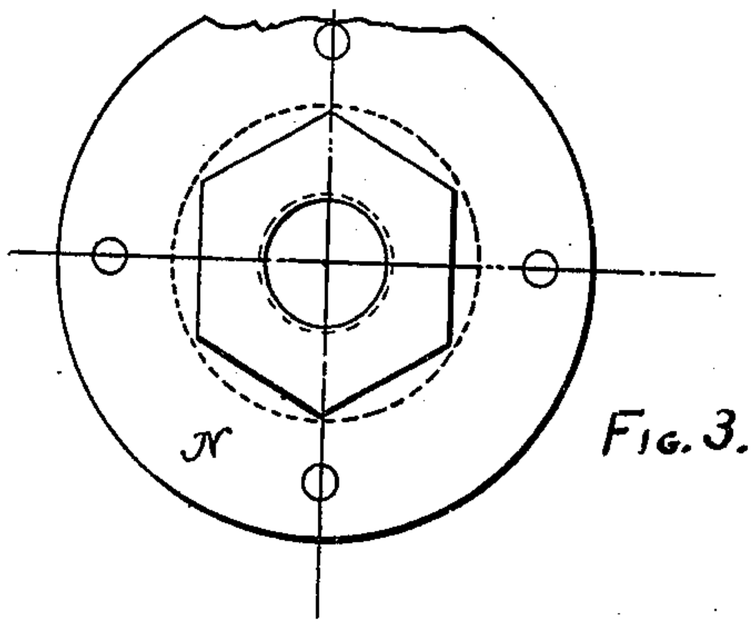


FIG. 3.

FIG. 4.

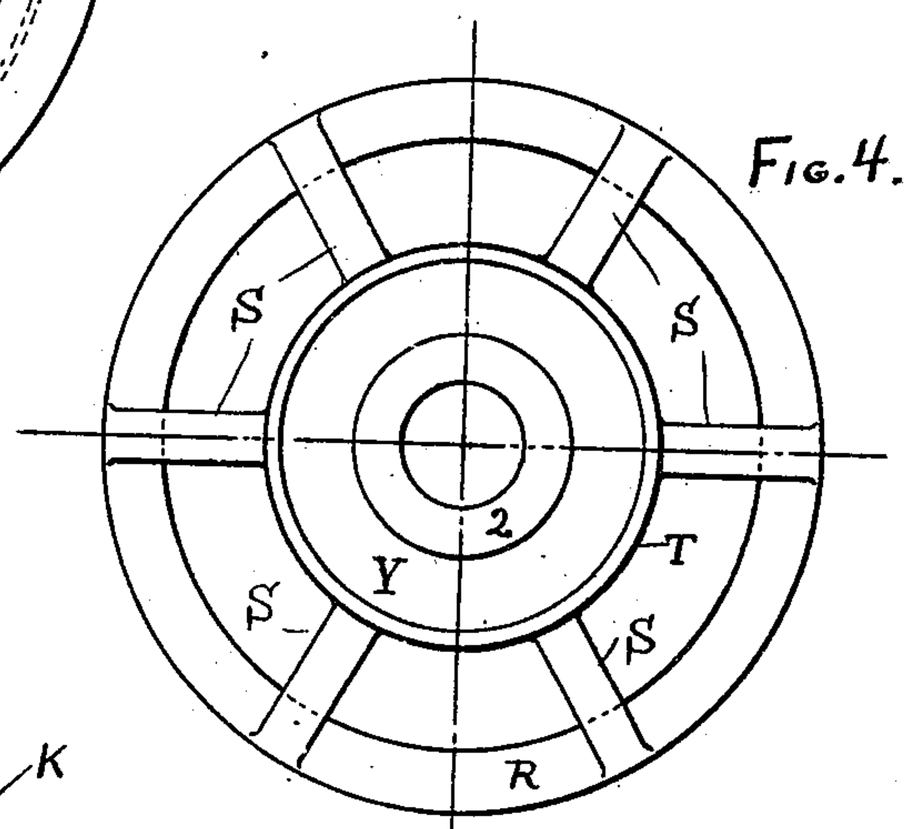
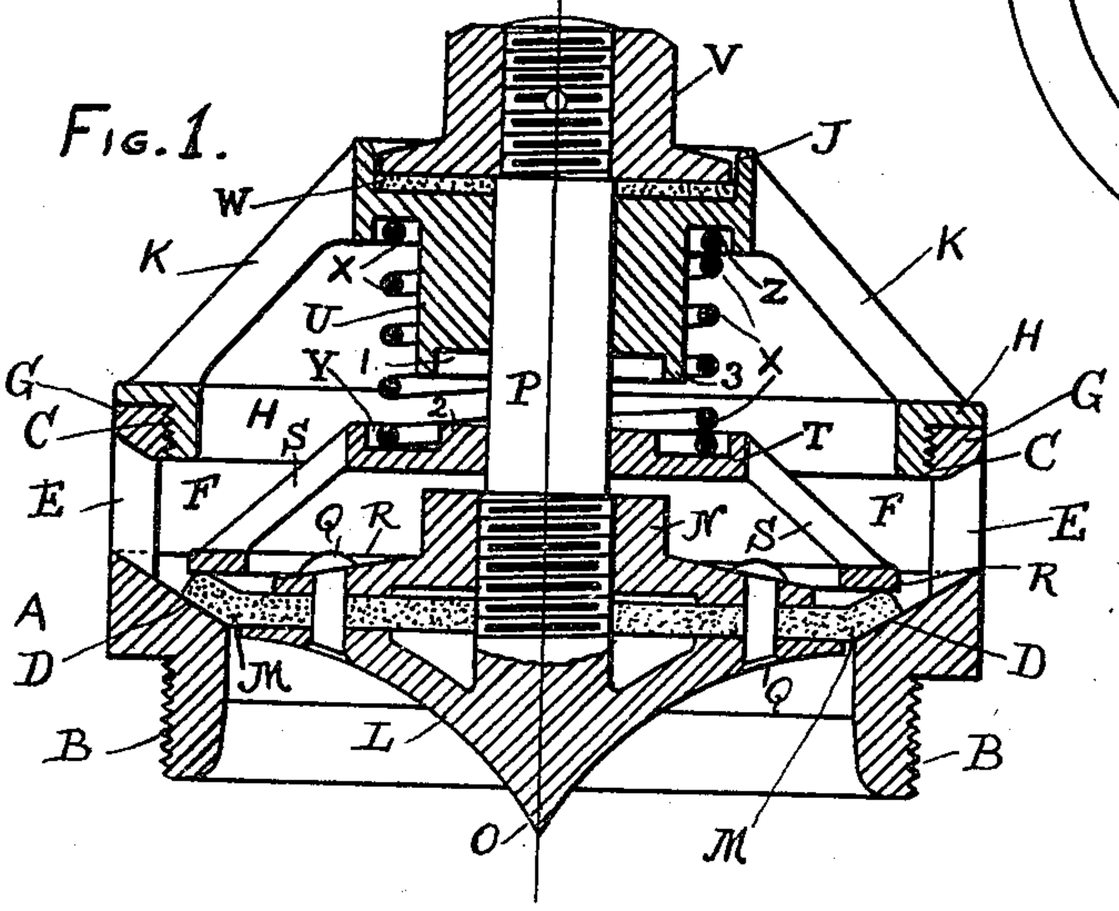


FIG. 1.



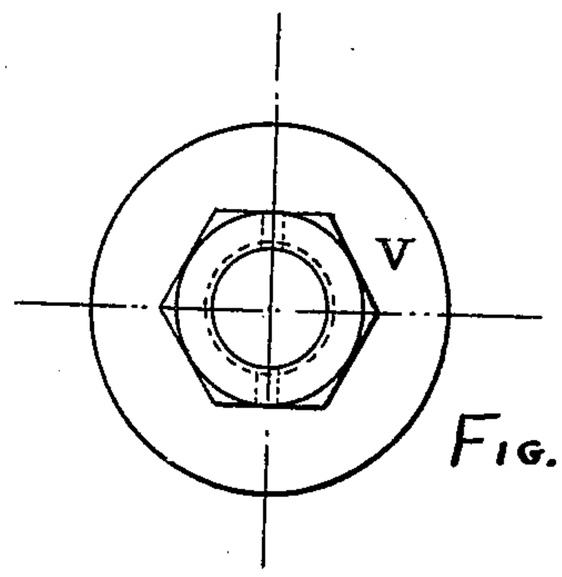


FIG. 5.

Witnesses
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UNITED STATES PATENT OFFICE.

HENRY GABRIEL GINACA, OF SAN FRANCISCO, CALIFORNIA.

VALVE.

SPECIFICATION forming part of Letters Patent No. 666,245, dated January 15, 1901.

Application filed January 10, 1900. Serial No. 1,009. (No model.)

To all whom it may concern:

Be it known that I, HENRY GABRIEL GINACA, a citizen of the United States of America, and a resident of the city and county of San Francisco, in the State of California, have invented a new and useful Improvement in Valves, of which the following is a specification.

This invention relates to improvements in pump-valves, particularly high-pressure valves; and the object of my improvement is to provide a valve of larger working area, giving an easier flow of water or other fluid, making a better joint, and producing less friction than any valve hitherto devised.

In describing the construction and working of my improved valve I shall refer to the different figures of the drawings hereto annexed, in which—

Figure 1 represents a sectional elevation of the valve in complete working order with all its component parts; Fig. 2, a top view of the valve-casing; Fig. 3, a plan of a lock-nut which forms the top part of the valve; Fig. 4, a top view of a spider used in connection with said valve, and Fig. 5 a plan of a nut from which the valve is suspended.

Like letters and numerals of reference indicate like parts throughout the several figures.

Referring to the sectional elevation, A indicates the valve-casing, which is composed of two parts, as there shown—viz., a lower part having external threads B, by means of which it can be screwed into the body or barrel of a pump, and a top similarly adapted to be screwed into the said lower part, as at C. The base of this casing is circular, preferably, and in it is formed the valve-seat D, which is beveled or inclined inwardly and downwardly. From the valve-seat rise a suitable number of standards or uprights E—say four or more—having open spaces F between them and supporting a ring G, to which the casing-top is fastened by the screw-threads C aforesaid. The upper part of the casing or casing-top consists of a flanged ring H, screwing over and into the ring G, and of a dash-pot J, carried by inclined supports K from said ring H. (See Fig. 2.)

The valve consists of three parts L M N. The bottom part L is pointed at its lowest extremity centrally, as at O, and from there runs up in a gentle curve to very nearly the rim of the opening in the valve-seat D, leading when raised directly into the open spaces or discharge-openings F, hereinbefore mentioned. This construction, it will be observed, causes the valve to be properly centered on its seat and insures an easy flow of the water or other fluid passing therethrough. From the bottom piece L upward extends a stem P, made integral with it, these two parts being made, by preference, of one solid piece of bronze metal. Over this stem P is slipped the second or middle part M of the valve, the same consisting of a circular piece of flexible material—such as leather, india-rubber, or something similar—a hole of the size of the stem being provided therefor in the center of the said circular piece. This piece M is made to extend some distance beyond the circumference of the opening in the valve-seat, so as to make a joint therewith. On the piece M is placed the third or top part N of the valve, which part consists of a lock-nut that screws over the lower end of the stem P and operates to press tightly together the three pieces composing said valve. After the lock-nut or top piece N has been screwed down on the other pieces M and L the three parts are bound together by rivets Q, provided for the purpose, which effectually prevent any possible displacement of said parts with relation to one another and keep the valve in good shape always. The said lock-nut is shown in detail in Fig. 3.

A spider (shown in Figs. 1 and 4 and formed of a bottom ring R, legs S, and a circular top piece T) is slipped over the stem P of the valve for the purpose of holding the latter to its seat and controlling the working thereof, as will be hereinafter more fully described.

The valve, with the spider thereon, is supported and guided in its movements within the casing A by the stem P, which passes through a guide U, projecting downwardly from the dash-pot J, and is provided with a nut V, screwed on its upper end, which nut bears on a washer W, preferably leather, placed in the bottom of said dash-pot.

X is a spiral spring which is placed on the spider for the purpose of keeping it down normally and causing the ring H thereof to press

firmly against the top edge of the flexible piece M of the valve. This spring is coiled around the guide U and runs at its lower end in a circular groove Y, made in the upper surface of the top T of said spider. At its upper end the said spring is fitted in a circular groove or recess Z, provided in the under side of the dash-pot J, around the guide U.

The numeral 1 indicates a recess formed in the bottom of the guide U and adapted to receive the central upper part 2 of the spider-top when the valve is moving upward, carrying up the said spider with it. The groove Y in the spider-top is made sufficiently wide to receive the rim or flange 3 of the recessed guide-bottom within the spring X when the valve and spider thus ascend.

It will be noticed, looking at Fig. 1, that the valve is bent at the edges, conforming to the shape of the bevel of the valve-seat D, and consequently making a good and water-tight joint. This is due to the fact that in my improved valve there are no metallic surfaces at all in contact, inasmuch as the metal of the valve does not reach the seat, on which only the flexible part of said valve is brought to bear. There is no need of a metallic contact, since the upper nut V on the valve-stem P carries the weight of the valve and pressure of the water, there being practically no pressure on the flexible edge of the valve other than that exerted thereon by the spring-pressed spider, which holds it to its seat. It will further be noticed that the opening in the base of the valve-casing is wholly unobstructed, having no cross-bars or such devices as are usually met with in other valve-casings. This, coupled with the peculiar shape given to the under surface of the valve, as before described, favors the natural flow of water through the valve, and therefore helps to increase its working area, which is greater for a given diameter than is afforded by common valves. I am thereby enabled to reduce the number of valves needed to pump a given quantity or volume of water or other fluids.

The operation of the valve will be readily understood. When the piston is worked in the pump-barrel—to pump water, for instance—the valve will be drawn upward by the suction caused thereby until the top part of the lock-nut N will touch the under side of the top piece T of the spider, when the flexible piece M will be straightened out, so as to leave the bevel of the valve-seat D and lay itself flat against the bottom ring of said spider. The valve will still continue to work up, compelled to do so by the action of the piston, combined with the pressure of the water against the valve-bottom L, until the top part of the lock-nut N will touch the lower surface of the spider-top T, when both valve and spider will go up together, the spiral spring X being compressed thereby till the center 2 of the spider-top will enter the recess 1 in the bottom of the guide U made to receive it and butt against the lower end of said guide. The water will be turned with hardly any friction on account of the gentle curve at the bottom L of the valve and will easily flow through the discharge-openings F above the valve-seat D until the piston will be reversed. Upon the reversal of the piston the valve will be pressed down through the action of the spring X on the spider, combined with the back pressure of the water, the flexible portion of said valve touching the valve-seat D, with the ring R of the spider pressing on it, and forming at once a water-tight joint, which is made tighter yet when the flexible material M readjusts itself to the bevel of said valve-seat. As the valve moves downward any possible jar or shock will be prevented by the dash-pot J, which fills with water as the valve is being operated and in which plays the nut V, whose impact is further taken up by the washer W, placed under it in the bottom of said dash-pot. A similar dash-pot effect is produced on the rise of the valve, when the center 2 of the spider-top enters the recessed bottom of the guide U, owing to the water that works up into the same. The valve is thus protected by dash-pots both during its rise and during its descent, which cause it to seat gently and insure its smooth working.

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

1. The combination of a valve-seat, a valve-piece of smaller diameter than said seat and out of contact therewith, a flexible flange supported on said valve-piece and projecting beyond the valve-piece and adapted to rest on said valve-seat, means for supporting the weight of the valve and yielding means for pressing said flexible flange onto said seat, substantially as described.

2. The combination of a valve-seat, a valve having a flexible marginal flange projecting beyond the valve-body and being the only part contacting with said seat, means for supporting the valve, and means for yieldingly pressing said flexible flange onto said seat, substantially as described.

3. A valve having a flexible marginal flange, a casing therefor with a suitable seat for said flexible edge, and a spider pressing against the flexible flange only oppositely to the valve-seat, substantially as described.

4. The combination of a casing provided with a valve-seat, a valve having a stem slidably mounted in said casing, a flexible flange projecting beyond the valve and being the only part of the valve contacting with said seat, a spider movable on said stem and engaging said flexible flange and means for pressing said spider against said flexible flange, substantially as described.

5. The combination of a valve-casing having a valve-seat, and a valve-guide, a valve having a stem guided by said guide, a flexible flange projecting beyond the valve-body and engaging said valve-seat, a spider mov-

able on said stem and engaging said flexible flange, a spring between said spider, and said guide for pressing the spider against the flexible flange, and a nut secured to said stem above said guide and adapted to carry the weight of the valve, substantially as described.

Signed by me at San Francisco, California, this 30th day of December, 1899.

HENRY GABRIEL GINACA. [L. S.]

Witnesses:
A. H. STE. MARIE,
CHAS. T. STANLEY.