

V. B. CONVIS.
STEAM TRAP.
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978,701.

Patented Dec. 13, 1910.

2 SHEETS—SHEET 1.

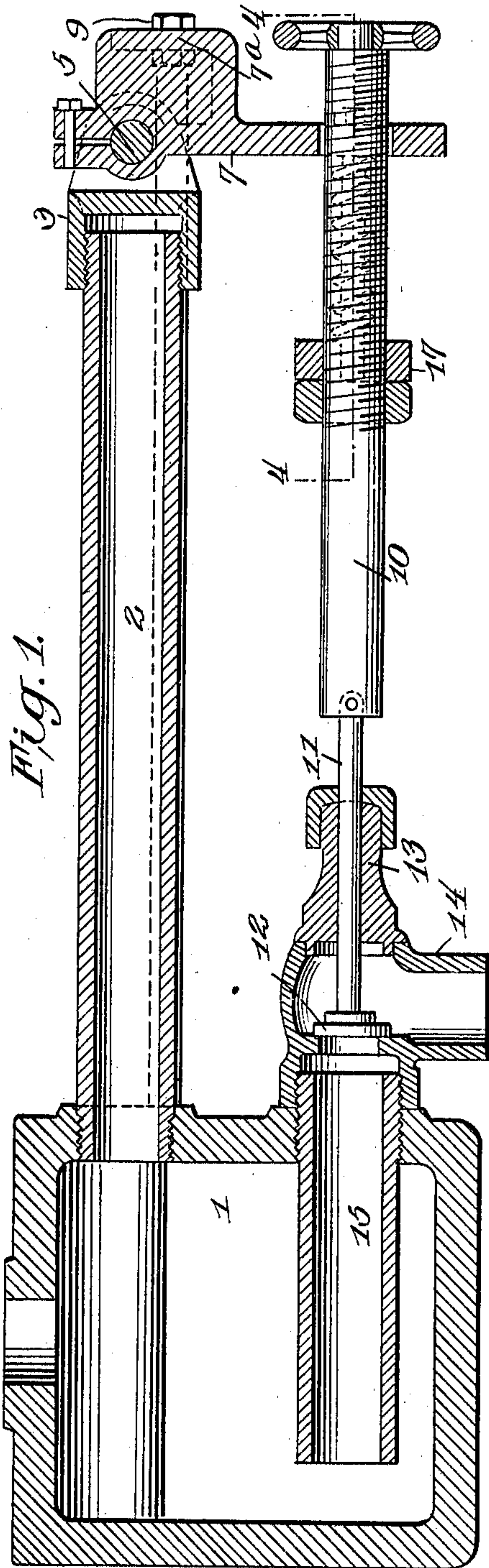


Fig. 1.

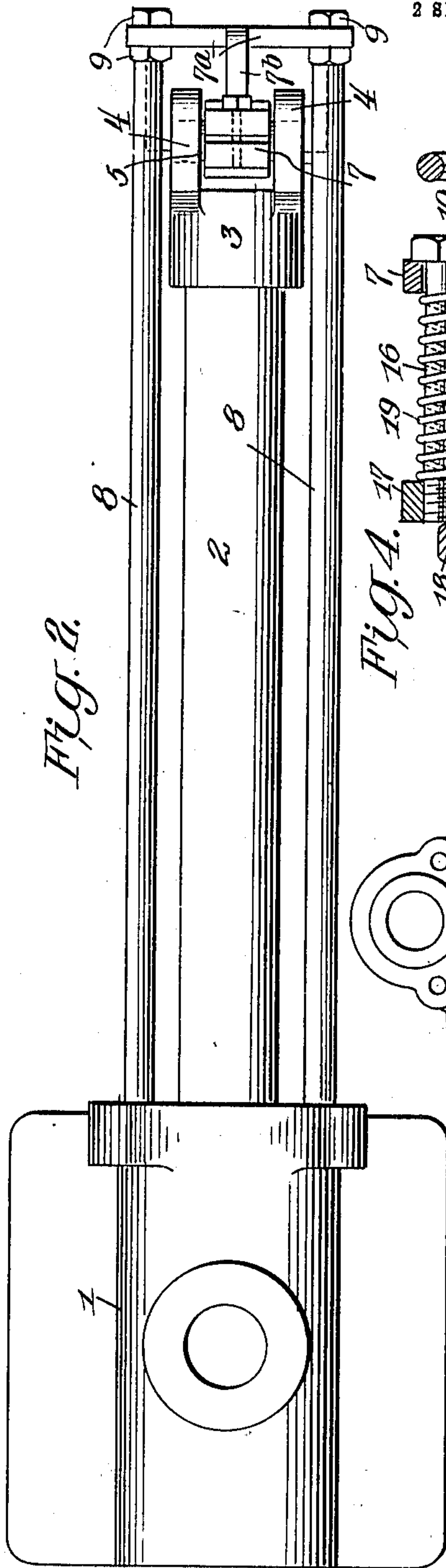


Fig. 2.

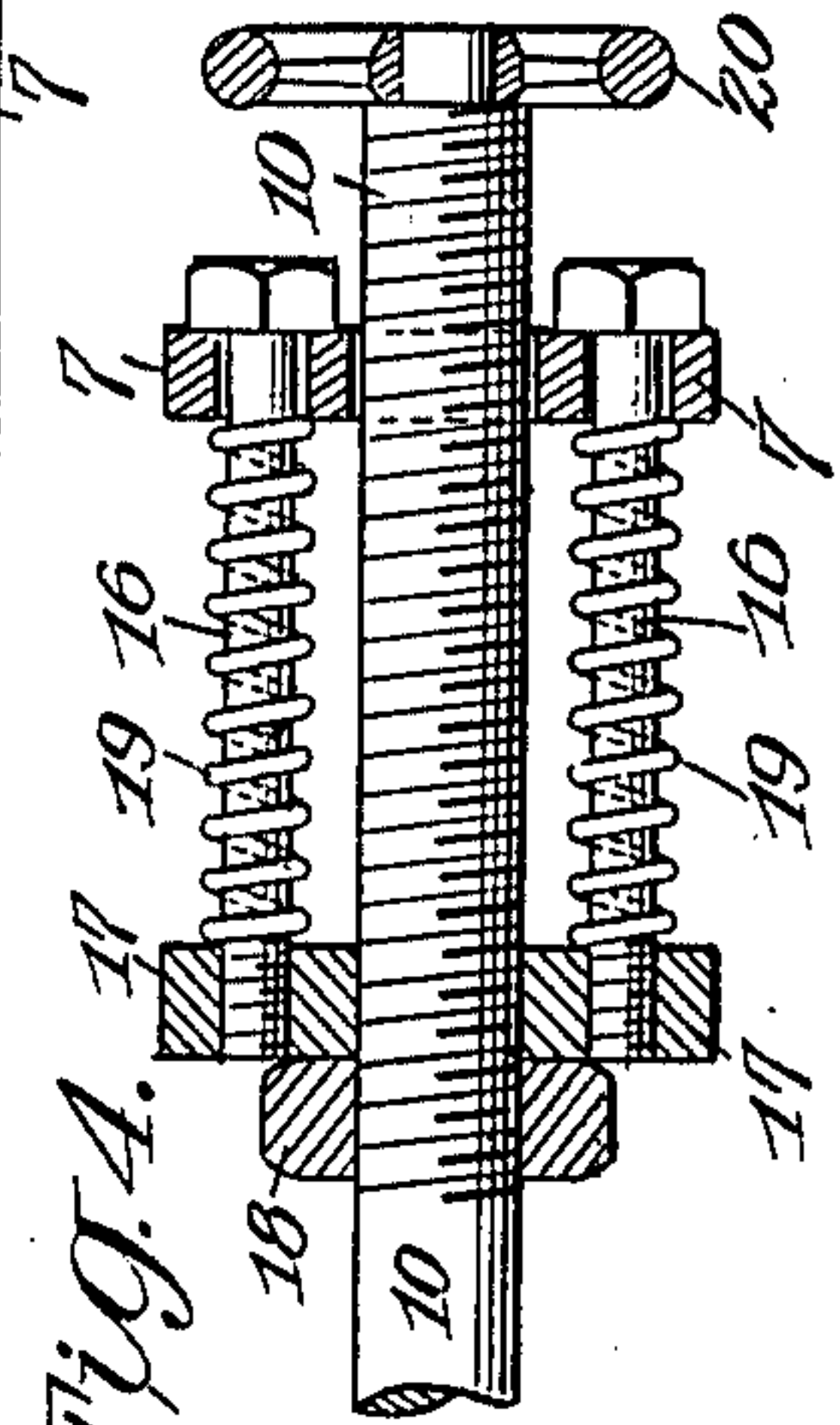


Fig. 4.

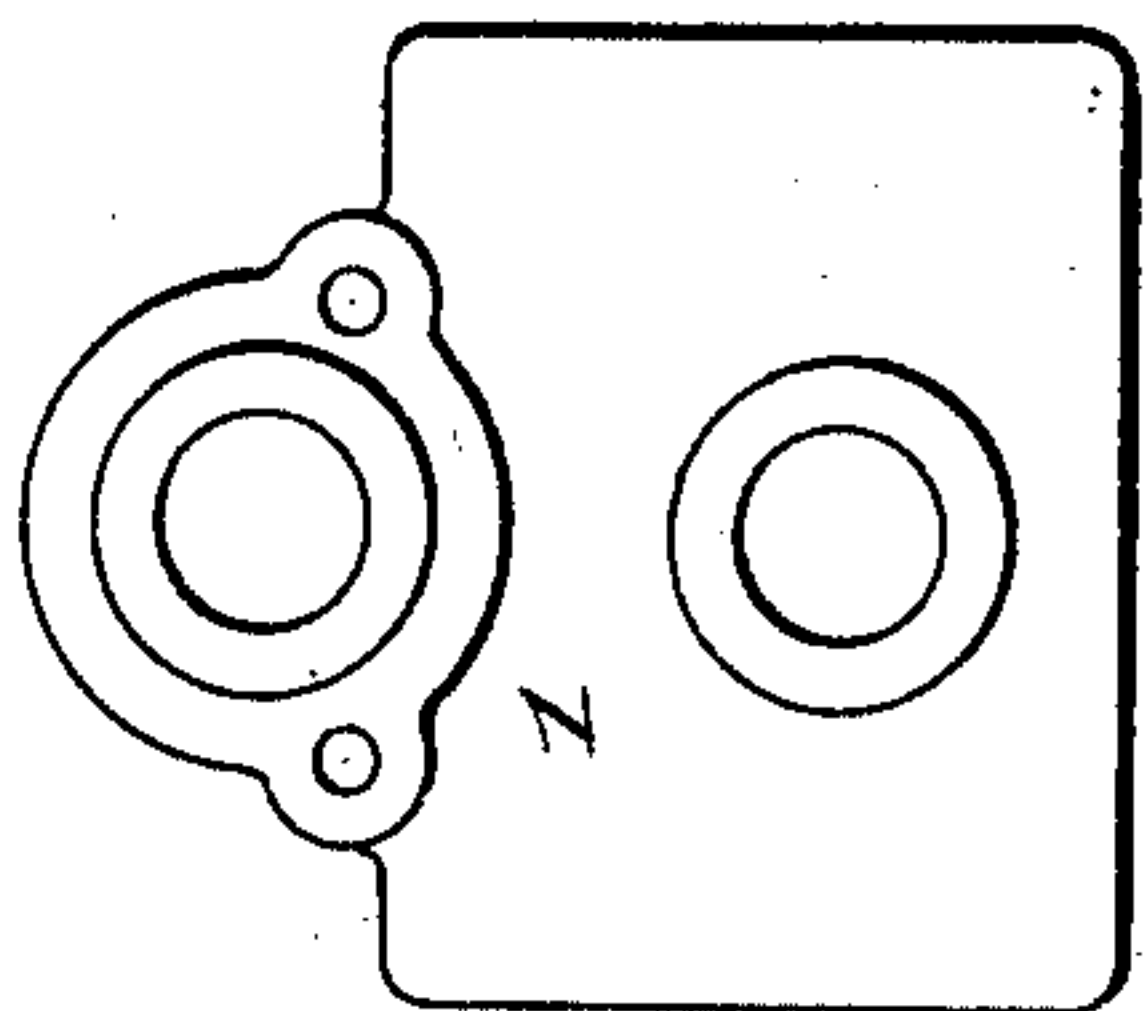


Fig. 3.

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2 SHEETS—SHEET 2.

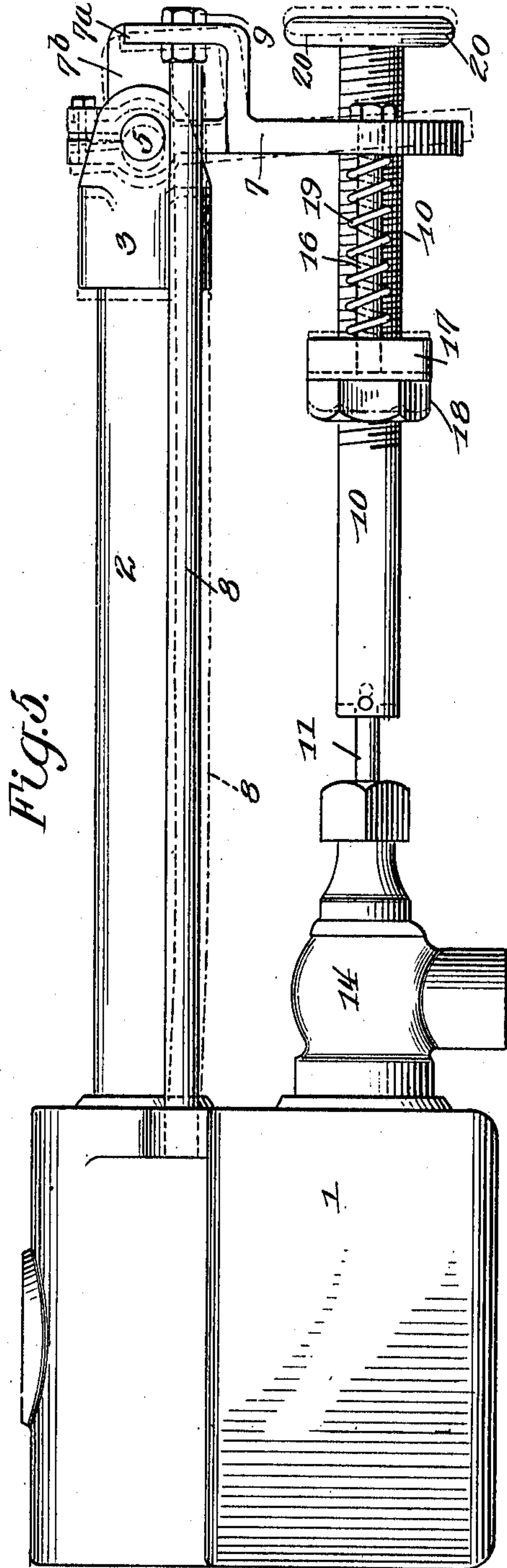


Fig. 5.

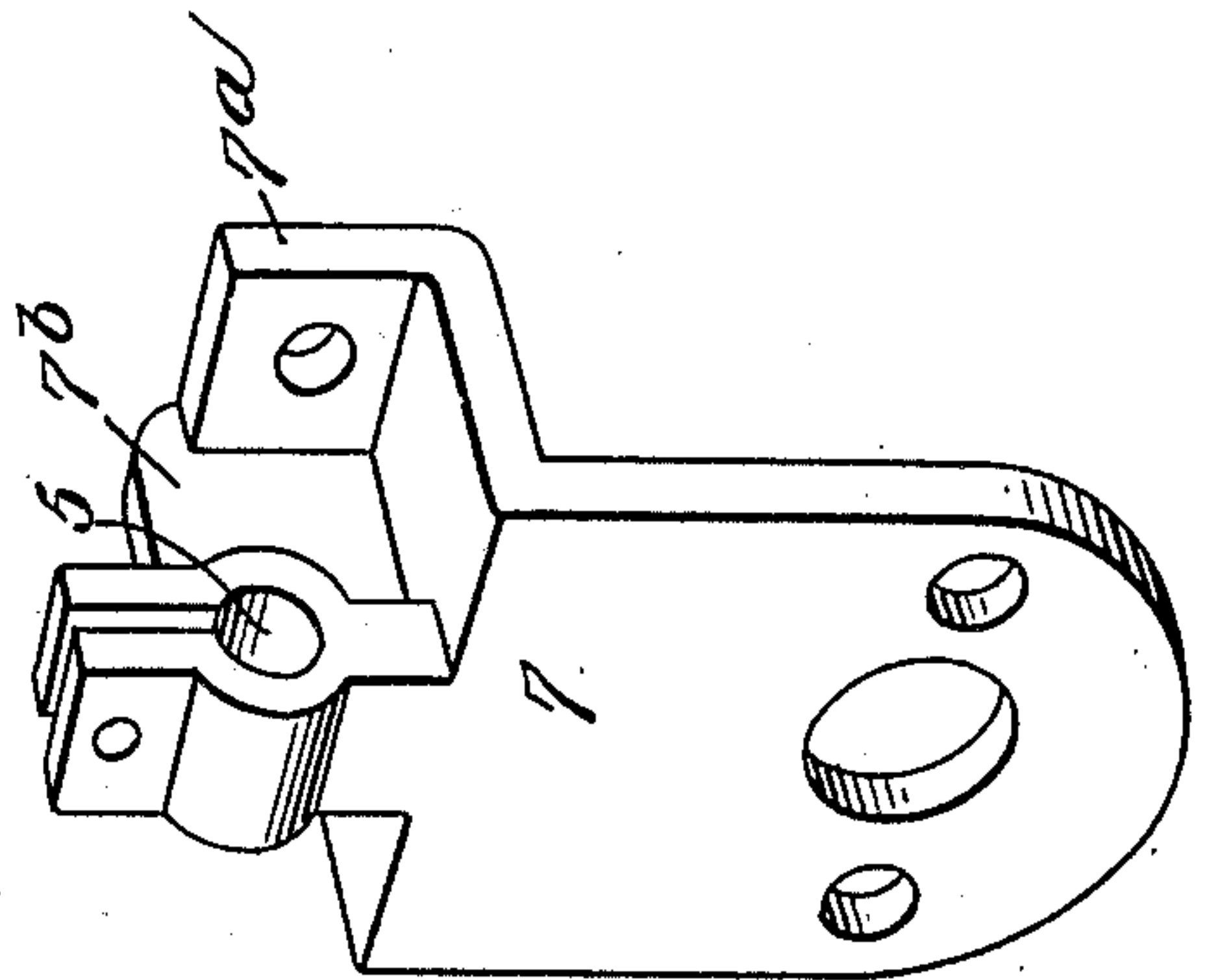


Fig. 7.

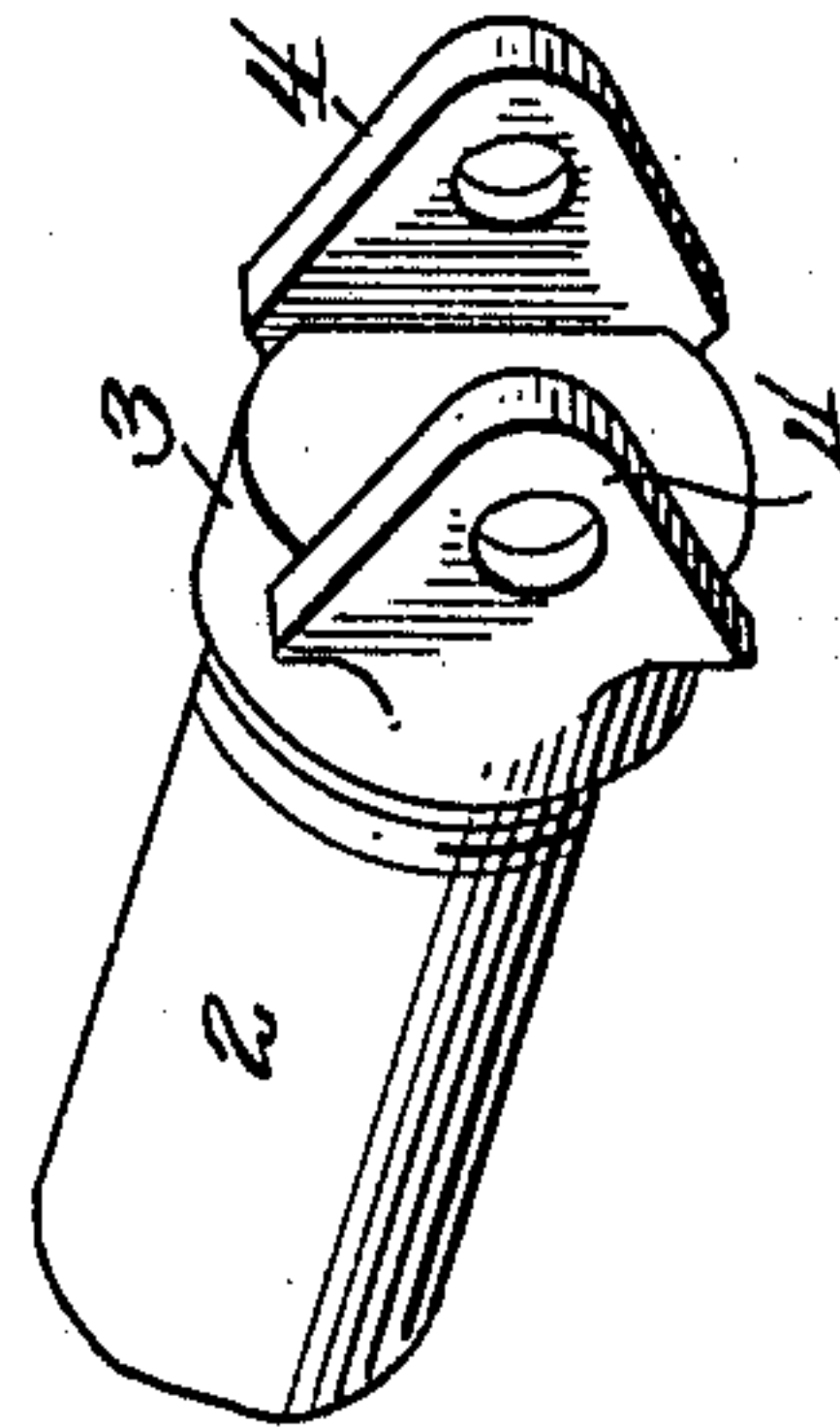


Fig. 6.

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STEAM-TRAP.

978,701.

Specification of Letters Patent.

Patented Dec. 13, 1910.

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To all whom it may concern:

Be it known that I, VERNON BRADLEY CONVIS, a citizen of the United States, and a resident of Toronto, in the Province of Ontario and Dominion of Canada, have invented certain Improvements in Steam-Traps, of which the following is a specification.

My invention is an improvement in the class of automatic steam traps in which the opening and closing of the water-release valve depends upon expansion and contraction of a brass steam tube coacting with a lever that is connected directly with the valve stem, and whose vibration, due to changes in temperature of the aforesaid tube, operates the valve; and the objects of the invention are to increase the sensitiveness, simplify the construction, and reduce the cost of traps of the above type.

My invention is embodied in the construction, arrangement, and combination of parts hereinafter described and claimed, and illustrated in the accompanying drawing in which—

Figure 1 is a longitudinal section of my improved trap. Fig. 2 is a plan view. Fig. 3 is an end view of the tank or steam receptacle. Fig. 4 is a horizontal section on line 4—4 of Fig. 1. Fig. 5 is a side view of the trap. Fig. 6 is a perspective view of the coupling head of the expansion tube. Fig. 7 is a perspective view of the lever fulcrum on the expansion head.

In Figs. 1, 2 and 3, the numeral 1 indicates a tank or receptacle for exhaust steam, and 2, a tube screwed into one end of said tank. This tube is preferably constructed of metal having a good degree or high coefficient of expansion, such as brass. A coupling head 3 having parallel perforated lugs or ears 4, as shown in Fig. 6, is screwed on the outer end of the expansion tube, and is pivotally connected with a lever 7, whose form is shown in detail in Fig. 7. A pin 5 forms the pivot between the two parts 2 and 7 and thus constitutes the fulcrum of the lever.

Two rods 8 are screwed into the end of the tank 1 on opposite sides of the expansion tube 2, but opposite the lower side of the same, and their outer ends are detachably secured by nuts 9 to the rearwardly extended arm or flange 7^a of the lever 7, at a point below a horizontal plane passing

through the pivot pin 5. Such flange is supported and connected with the pivot-bearing of the lever by means of a central web 7^b, the whole being forged in one solid piece. By the rearward extension of the lever flange 7^a, I provide for utilization of rods 8 of greater length than would be otherwise practicable, which obviously increases their elasticity.

The lower or pendent end of the lever 7 is provided with an opening to receive the screw-threaded rod 10 which is connected with a stem 11 of the disk valve 12. Said stem is adapted to slide in a stuffing-box 13 attached to a hollow coupling 14 that is screwed onto a tube 15 which projects into the chamber of the tank or receptacle 1, as shown in Fig. 1. In Figs. 4 and 5, two small screw rods 16 are shown which pass through the lower end of the lever 7 and are screwed into a yoke 17, which is in the nature of a nut, it being threaded on the rod 10. A jam nut 18 is applied to the rod 10 for holding the yoke 17 in any required adjustment.

Spiral springs 19 are applied to the aforesaid rods 16, their ends bearing against the lever 7 and yoke 17, as shown in Fig. 4. A hand-wheel 20 is applied to the outer end of the rod 10 for convenience in rotating said rod as required to regulate the tension of the springs 19 so that the valve 12 will open more or less easily, or, in other words, is rendered sensitive to greater or less pressure as conditions may require.

The operation of my improved trap is as follows. Steam entering the tank or receptacle 1 has free access to the face of the valve 12 and to the tube 2. The latter expanding under the influence of heat forces the upper end of the lever 7 backward, the rods 8 in such case constituting fulcrum of the lever upon which it shifts slightly, the lower end being moved toward the valve and thereby applying increased pressure thereto through the medium of the rod 16, springs 19, yoke 17, and rod 10, or, in other words, closing the valve 12 tightly on its seat. On the other hand, as condensation takes place, with the accumulation of water the temperature of the tube 2 is reduced and consequently contraction takes place so that the lever 7 is shifted in the opposite direction, as indicated by dotted lines in Fig. 5, and consequently pressure of the lever on the valve through the means already indicated

is lessened so that the valve opens to allow escape of water of condensation. In the first case, that is to say, when the tube 2 expands, the rods 8 are sprung upward slightly; whereas in the second case, to wit, when the tube 2 contracts, the rods are sprung downward. The operation of the valve, therefore, obviously depends upon the resiliency of the rods 8 and the fact that they have a rigid connection with the rearward extension 7^a of the lever. By the rearward extension of the lever flange 7^a, I not only provide for attachment of the rods at a point where they cannot interfere with the pivotal connection at 5, but the leverage, and, what is most important, the elasticity of the rods 8 due to their elongation, are increased. In other words, by connecting the rods with a rearward extension of the lever, their length is greater than would be the case otherwise, and this obviously increases their elasticity or capacity to bend upward or downward as the pipe 2 expands or contracts.

I thus produce a highly sensitive valve attachment which is also distinguished by sim-

plicity, strength, durability, and economy of manufacture.

What I claim is:—

In a steam trap, the combination with a steam receptacle and an extension tube connected therewith, of a pendent lever fulcrumed on the outer end of said tube and having a flange extended rearwardly from the fulcrum, elastic rods rigidly connected with the receptacle and with the aforesaid flange below the lever pivot, a valve closing the water outlet of said receptacle, a screw-threaded rotatable rod connected with the valve stem and passing through the lower end of the lever, a nut yoke threaded on said rod, and other rods attached thereto and slidably connected with the lever, and spiral springs interposed between the lever and yoke and arranged on opposite sides of the screw-threaded rod, as shown and described.

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Witnesses:

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