

(No Model.)

J. A. WRIGHT & T. J. HOPLEY.  
AUTOMATIC DRIP COCK FOR STEAM ENGINES.

No. 551,025.

Patented Dec. 10, 1895.

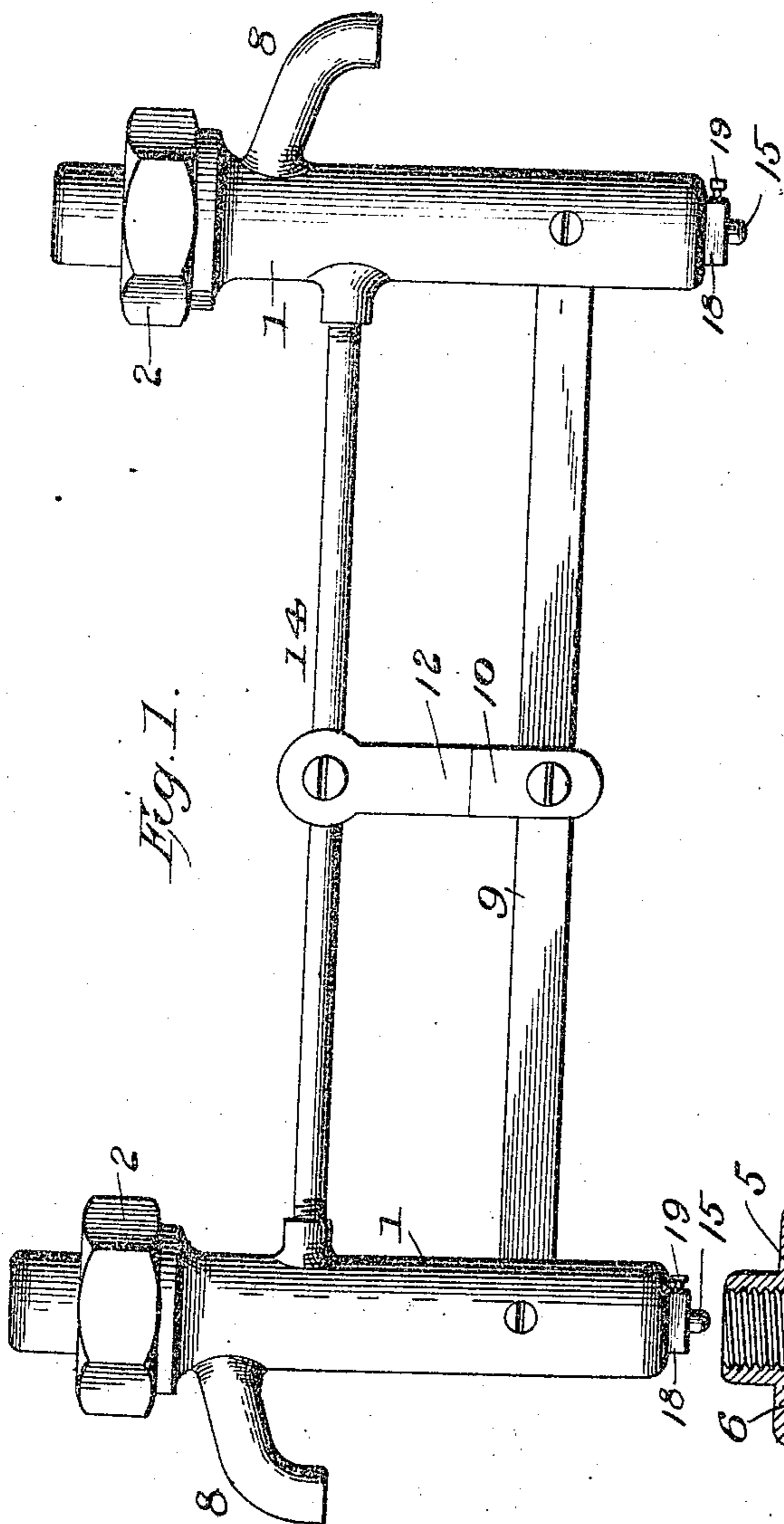


Fig. 1.

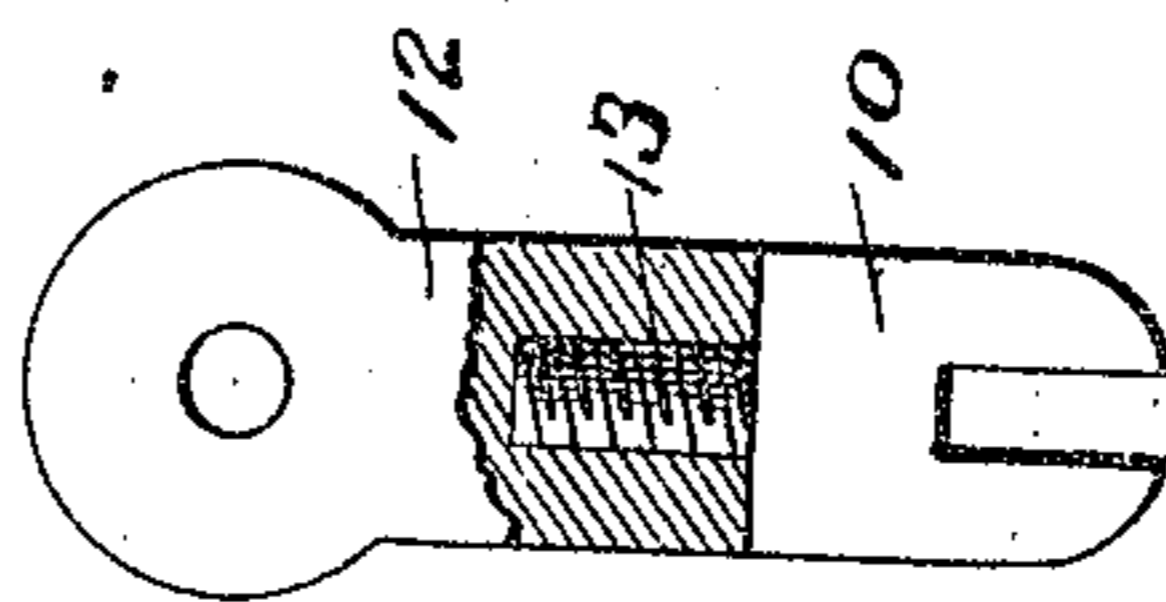


Fig. 3.

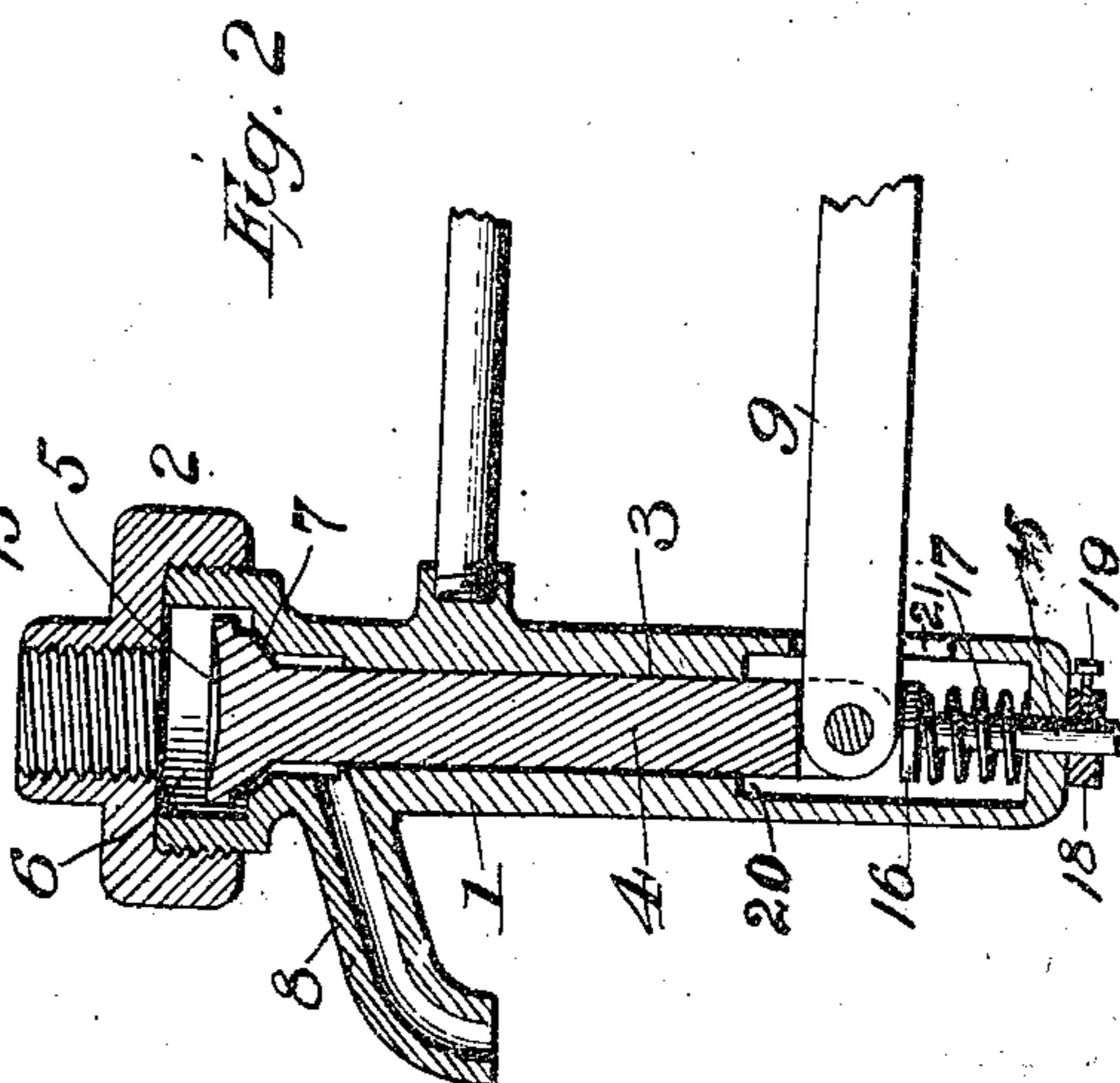


Fig. 2.

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# UNITED STATES PATENT OFFICE.

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## AUTOMATIC DRIP-COCK FOR STEAM-ENGINES.

SPECIFICATION forming part of Letters Patent No. 551,025, dated December 10, 1895.

Application filed March 22, 1895. Serial No. 542,798. (No model.)

*To all whom it may concern:*

Be it known that we, JOHN ALBERT WRIGHT and THOMAS JONES HOPLEY, citizens of the United States, and residents of Wilkinsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Automatic Drip-Cocks for Steam-Engines; and we 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, which form a part of this specification.

Our invention relates to improvements in automatic drip-cocks for the cylinders of steam-engines for drawing off the water of condensation.

In the ordinary cylinder drip-cocks of steam-engines, especially locomotive-engines, it frequently happens through forgetfulness or carelessness that the engineer neglects to open the cocks in starting the engine to allow the water of condensation to escape, which tends to impair the efficiency of the engine and cause accidents. Again, in winter, when the engine is not in action and the drip-cocks are closed, it frequently happens that the water of condensation freezes, so that in starting the engine the joints and cylinder-heads are liable to be blown out.

The object of our invention is to obviate the above and other objections and provide a drip-cock for each end of a steam-engine cylinder, as usual, having automatic valves, which are alternately opened and closed at each stroke of the piston by the steam-pressure in the cylinder, the cock at one end being opened while the cylinder is exhausting at that end and the other cock closed, and vice versa. The construction is also such that when the engine is at rest or inactive both valves will be open, so that the cylinder will be drained of the water of condensation at both sides of the piston.

The invention consists in the novel construction and combination of parts herein-after fully described and claimed.

In the accompanying drawings, Figure 1 is a side elevation of two connected drip-cocks constructed in accordance with our invention:

Fig. 2 is a central longitudinal section of the same. Fig. 3 is a detail sectional view of the two-part hanger.

In the said drawings the reference-numeral 1 designates two vertical drip-cocks screw-threaded at the upper ends to engage with the boss 2 of the steam-cylinder, one of said cocks being provided at each end thereof. Each of these cocks is formed with a cylindrical bore 3, in which works a vertically-reciprocating valve-rod 4, formed at its upper end with a valve 5. This valve works in a valve-chamber 6 in the upper end of the cock, provided with a seat 7. Connected with this valve-chamber is an outlet 8. Connected with the lower ends of these valve-rods is a lever 9, pivoted at its center to a hanger consisting of two bars 10 and 12, one of which is formed with a screw-shank 13, fitting in a correspondingly-threaded recess in the upper bar 12, whereby the bar 10 can be adjusted vertically. The upper end of bar 12 is secured to a rod 14, secured to the cocks.

The lower end of each drip-cock is formed with an enlarged chamber 20, provided with a slot 21, and located in this chamber is a pin 15, the upper end of which is connected with the valve-rods. This pin, which passes through an aperture in the lower end of the cock, is provided near its upper end with an annular collar 16, between which and the bottom of the cock is a coiled spring 17. The lower or outer ends of these pins are provided with an adjustable collar 18 and a set-screw 19.

The operation is as follows: When the engine is at rest, the coiled springs 19, which are of equal tension, cause the valve-rods to be elevated and the valves raised from their seats, so that any water of condensation in the cylinders will escape through the outlets 8, thus rendering accidents consequent upon accumulation of water in the cylinders impossible. When the engine is started, the steam upon the pressure side of the cylinders will depress the valve at this end, closing the same, and through the medium of the lever will open the valve at the opposite or exhaust side, allowing any water and a portion of the steam therein to escape. This operation will be repeated at each stroke of the piston, the valves being alternately opened and closed.

By means of this two-part hanger the lever connecting the valve-rods can be adjusted vertically, so as to vary the stroke of the valves.

5 The device can be applied to the ordinary cylinders now in use without any alterations being made thereto it being simply necessary to remove the usual drip-cocks connected therewith and replace them with the cocks  
10 described herein.

Having thus fully described our invention, what we claim is—

1. In a drip device for steam engines, the combination with the drip cocks having cy-  
15 lindrical bores, enlarged chambers at the lower ends formed with slots, the valve chambers at the upper ends; the valve seats and the outlets below the valve seats and above the chambers at the lower ends, of the vertically  
20 reciprocating valve rods working in said bores and provided with valves at their upper ends, the lever passing through said slots and pivoted to the valve rods, the hanger to which said lever is pivoted, and the connecting bar  
25 to which the lever is secured, substantially as described.

2. In a drip device for steam engines, the combination with the drip cocks having cy-  
30 lindrical bores and valve chambers and valve seats at the upper ends thereof, and an outlet below the valve seats, of the vertically reciprocating valve rods, the rod connecting said cocks, the hanger secured thereto, the lever pivoted to said hanger and its ends pass-  
35 ing through slots in the lower ends of the cocks and pivoted to the lower ends of the valve

rods, the pins passing through the lower ends of the cocks, the annular collars on the inner ends thereof upon which the valve rods rest, and the coiled springs confined between the  
40 lower ends of the cocks and said collars, substantially as described.

3. In a drip device for steam engines, the combination with the drip cocks having cy-  
45 lindrical bores and a valve chamber and valve seat at the upper ends thereof and an outlet below the valve seats, and the vertically reciprocating valve rods provided with valves, of the rod connecting said cocks, the two part  
50 hanger, the upper section of which is formed with an aperture through which said rod passes, the lower section provided with a screw threaded stem engaging with a correspondingly threaded recess in the upper sec-  
55 tion, so as to be vertically adjustable, the lever pivoted to said lower section and its ends passing through slots in the cocks and pivotally connected with valve rods, the pins pass-  
60 ing through the lower ends of the cocks provided with annular collars at their upper ends on which the valve rods rest, and the coiled springs confined between said collars and the lower ends of the cocks, substantially as de-  
scribed.

In testimony that we claim the foregoing  
65 as our own we have heretunto affixed our signatures in presence of two witnesses.

JOHN ALBERT WRIGHT.

THOMAS JONES HOPLEY.

Witnesses:

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