J. STUMPF.

DISTRIBUTING VALVE FOR STEAM ENGINES.

APPLICATION FILED MAR. 30, 1912.

1,155,451.

Patented Oct. 5, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

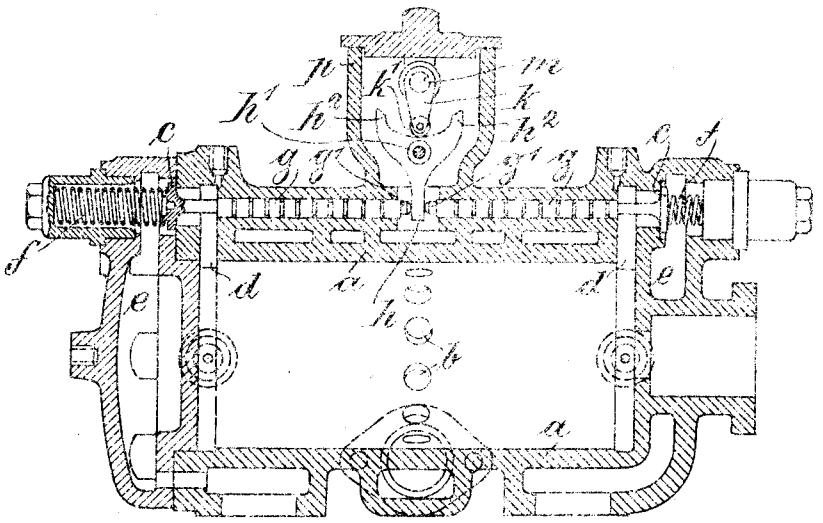
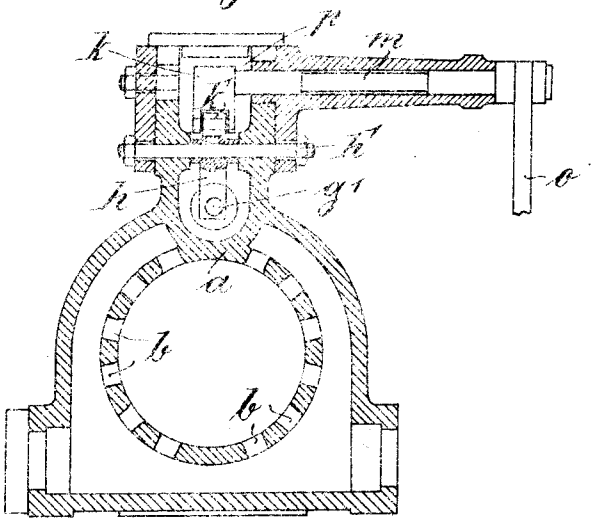


Fig. 2.



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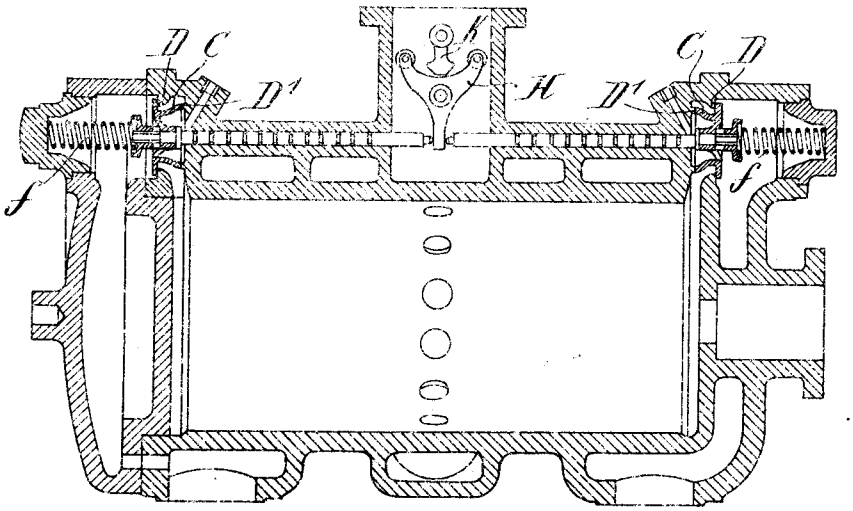
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2 SHEETS—SHEET 2.

Fig. 3.



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UNITED STATES PATENT OFFICE.

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DISTRIBUTING-VALVE FOR STEAM-ENGINES.

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Application filed March 30, 1912. Serial No. 687,423.

To all whom it may concern:

Be it known that I, JOHANN STUMPF, a subject of the King of Prussia, resident of 33 Kurfürstendamm, Berlin, German Empire, professor, have invented certain new and useful Improvements in Distributing-Valves for Steam-Engines, of which the following is a specification.

This invention relates to improvements in mechanism for operating the distribution valves of steam engines, and has for its object to provide a simple form of actuating mechanism in which a rapid and intermittent actuation of the valves may be effected without heavy impacts, while reducing the number and mass of the parts subjected to this motion to a minimum.

According to the present invention, the valve spindles, which are arranged parallel with the axis of the cylinder and extend toward one another, are actuated by one arm of a pivoted lever which fits between the abutting ends of the valve spindles. This lever is actuated by a rocking member to which a comparatively slow and uniform rocking motion is imparted from a moving part of the engine, such as an eccentric on the crank shaft or a connection from the connecting rod. Motion is transmitted from the rocking member to the pivoted lever through what will be hereafter termed a curve-transmission-motion; the coacting surfaces of said lever or rocking member being curved in such a manner that the uniform rocking movement of the rocking member is transformed into a rapid and intermittent or jerking motion on the part of the pivoted lever, which in turn actuates the valve spindles in like manner. It will thus be seen that the only parts subjected to the rapid and intermittent or jerking motion are the valve spindles and pivoted lever, whereas the greater mass of the mechanism, namely, the rocking lever and the parts operating the same move uniformly and comparatively slowly.

The present invention will be readily understood from the following description of one construction given by way of example in the accompanying drawings in which:—

Figure 1 is a side sectional elevation through the cylinder of an engine provided with valve operating mechanism for two inlet valves. Fig. 2 is a cross sectional elevation through the center of the cylinder shown in Fig. 1. Fig. 3 illustrates a modified form in side sectional elevation.

According to the form shown in Fig. 1 the exhaust from the steam cylinder a is effected through the ports b, which are controlled by the piston during its travel. The inlet of steam from the steam spaces e, on the ends of the double acting cylinder is controlled by lift valves c, which admit steam from the spaces e, to the cylinder a, through the ports d. The valves c are shown of the unbalanced type and are pressed to their seats by means of springs f. Such unbalanced valves may be employed in engines of the type described because high compression takes place with the result, that, at the moment when the valves are opened, no appreciable difference in pressure exists on the two sides of the valve. The stems g of the valves c are arranged parallel with the axis of the cylinder and extend toward one another, so that they are only separated by an arm h of an oscillating horned lever pivoted loosely at h'. The stems g are provided with grooves which assist in the lubrication of the parts and also serve as packing rings for the stems.

The pivoted lever h is operated from a rocking lever k through a curve-transmission-motion, the pivoted lever h being provided with two horns h^2, h^3, between which there is an arcuate part h^4 over which a roller k' on the rocking lever k may roll. The middle part of the arc h^4 is of such curvature that the roller k' when in contact therewith does not impart motion to the lever h, while the ends of the arc h^4 are curved somewhat inwardly so that when the rocking lever k is near the end of its rocking movement it imparts a sudden motion to the lever h, the curvature of the end parts of the arc h^4 being such that no impact occurs. The rocking lever k is mounted on a rock shaft m which carries an arm o rocked in any convenient manner, as from the crank shaft of the engine.

It will be seen that a uniform and comparatively slow motion may be imparted by the crank shaft to the arm o, shaft m and rocking lever k which constitute the greater mass of the moving parts, while the only parts which are subjected to a sudden and intermittent or jerking motion, are the pivoted lever h and the valve spindles g.

The horn lever h, rocking lever k and the

roller k' are contained in a casing p, which may be filled with oil so that the parts work in an oil bath.

It will be understood that during running of the engine, the lever k oscillates uniformly so that at the ends of its oscillatory movement it coacts with the end parts of the arc h^3 to suddenly oscillate the lever h, and thereby alternately and rapidly open the valves c against the action of their springs f.

It will be understood that the above described arrangement of operating gear may be applied to other forms of valves such as slide valves.

In the form illustrated in Fig. 3, the invention is shown applied to a partially balanced lift valve C, which closes on two faces D D'. In this case, the pivoted lever H is provided at the extremities of its horns with rollers which engage curved surfaces K' on the rocking lever K, the curvature of the surfaces K' and the contact thereof with the rollers on the lever H being such that the same effect is obtained as by the mechanism described with reference to Figs. 1 and 2.

It will be understood that if desired, the valves D may be completely balanced.

I claim:—

1. A power cylinder having an inlet port at each end, valves for said ports, valve actuating spindles having ends approaching each other, spindle-actuating means comprising two members co-acting through a cam face on one, one member actuated by a uniformly moved part of the engine, the other member transmitting to the spindles alternately intermittent quick movements.

2. A power cylinder having an inlet port at each end, valves for said ports, valve actuating spindles having ends approaching each other, spindle-actuating means comprising two pivotally movable members co-acting through a cam face on one, one member actuated by a uniformly moved part of the engine, the other member transmitting to the spindles alternately intermittent quick movements.

3. A power cylinder having an inlet port at each end, valves for said ports, valve actuating spindles having ends approaching each other, spindle-actuating means comprising two members co-acting through a cam face on one, one member actuated by a uniformly moved part of the engine, the other member transmitting to the spindles alternately intermittent quick movements, and an oil containing chamber inclosing said two members and the spindle ends.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

JOHANN STUMPF.

Witnesses:

SELMA WILKE,

JOAN JOHANNA STUMPF.