

No. 735,215.

PATENTED AUG. 4, 1903.

T. A. CROSSGROVE.
MOTOR.

APPLICATION FILED AUG. 11, 1902.

NO MODEL.

Fig. 1.

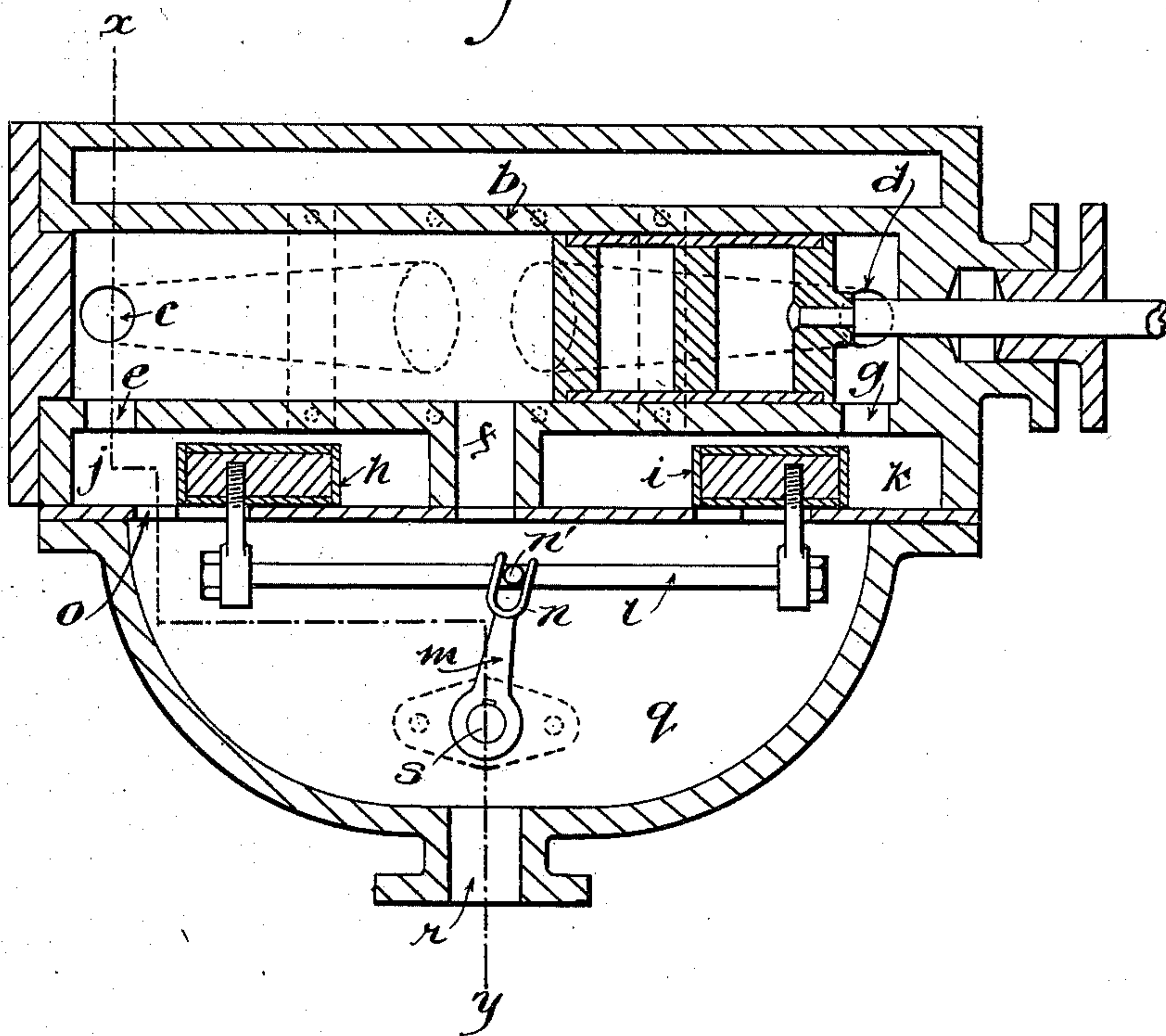
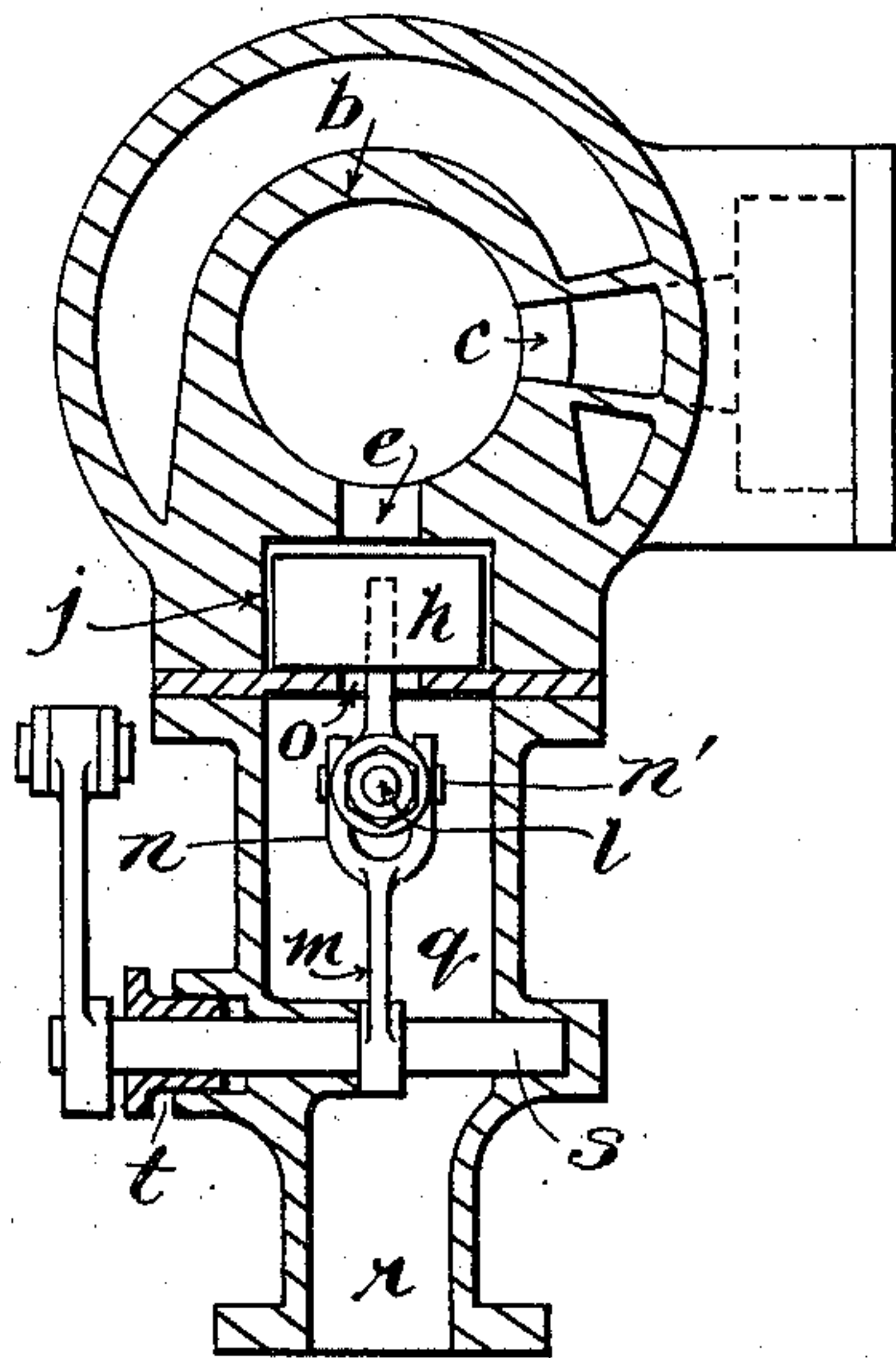


Fig. 2.



Witnesses:—

Benjamin Clark
Charles H. Briggs.

Inventor:—

Thomas Anderson Crossgrove.
per:— *E. E. Eaton*
His Attorney.

UNITED STATES PATENT OFFICE.

THOMAS ANDERSON CROSSGROVE, OF DARLINGTON, ENGLAND.

MOTOR.

SPECIFICATION forming part of Letters Patent No. 735,215, dated August 4, 1903.

Application filed August 11, 1902. Serial No. 119,275. (No model.)

To all whom it may concern:

Be it known that I, THOMAS ANDERSON CROSSGROVE, a subject of the King of Great Britain, and a resident of Darlington, in the county of Durham, England, have invented certain new and useful Improvements in Motors, (for which I have applied for a patent in Great Britain, No. 17,526, dated September 2, 1901,) of which the following is a full, clear, and exact specification.

This invention relates to improvements in fluid-pressure engines, more particularly to the construction and arrangement of the exhaust-valves, the object of which is to insure a rapid emptying of the cylinder on the return stroke, thereby preventing back pressure, also the prevention of leakage through the exhaust on the pressure side of the piston.

In order that my invention may be clearly understood, I now refer to the annexed drawings, in which—

Figure 1 is a sectional side elevation; Fig. 2, section through line X Y, Fig. 1.

The piston *a* travels in the cylinder *b*, the fluid-pressure being admitted through ports *c* and *d*, the exhaust from the cylinder being effected through ports *e*, *f*, and *g* and regulated by means of the valves *h* and *i*, which are contained and operate in separate chambers *j* and *k*, respectively, the valves *h* and *i* being connected by the rod *l*, as shown, and operated by the crank *m*, which has a forked end *n*, with which engages a pin or pins *n'*, carried by the rod *l*. The crank is rigidly attached to a spindle *s*, passing through a stuffing-box *t* in the side of the exhaust-chamber *q*. The spindle has the required rocking motion given to it through the medium of any well-known and suitable mechanism—such as an eccentric mounted upon the engine-shaft, an eccentric-rod, and a second crank *v*, attached to the spindle *a* aforesaid.

The action is as follows: Upon the fluid-pressure entering the port *d* the valve-chamber *k* will be filled before any pressure is directed on the piston *a*. The fluid, however, as it surrounds the valve *i* will have no tendency to remove same from covering the port

p. Upon the piston completing the stroke the valve *i* will uncover the port *p* and allow the fluid to empty by gravitation (the port *f* also assisting) into the chamber *q*, which in turn empties through port *r*.

It will be seen that by this arrangement of valves the leakage on the pressure side of the cylinder which takes place when the exhaust-valves fit their chambers, owing to the wear on the upper surface of the valve, is prevented, the only wear which takes place being on the wider side of the valves *h* and *i*, which regulate the ports *o* and *p*, which would cause a more perfect engagement of the under surface of the valves *h* and *i* on the bottom of their respective chambers *j* and *k*, and thus prevent leakage.

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

In fluid-pressure engines, the combination with the cylinder and piston thereof, of duplicate exhaust-valve chambers opening into the cylinders and exhaust-chamber, exhaust-valves contained therein of smaller sectional area and engaging on the bottom only of said valve-chambers, a direct opening from the center of the cylinder into the exhaust-chamber, a rod connecting said valves together, a stuffing-box within the side of said exhaust-chamber, a spindle passing through said stuffing-box and actuated by suitable mechanism, a crank rigidly attached to said spindle and having a forked end, a pin carried by the rod connecting the valves aforesaid and engaging with the forked end of said crank, all substantially as described and illustrated herein.

In testimony that I claim the foregoing I have hereunto set my hand this 9th day of April, 1902.

THOMAS ANDERSON CROSSGROVE.

Witnesses:

BENJAMIN CLARK,
CHARLES H. BRIGGS.