



(No Model.)

2 Sheets—Sheet 2.

A. H. FORD.  
STEAM ENGINE VALVE.

No. 546,316.

Patented Sept. 17, 1895.

FIG. 3-

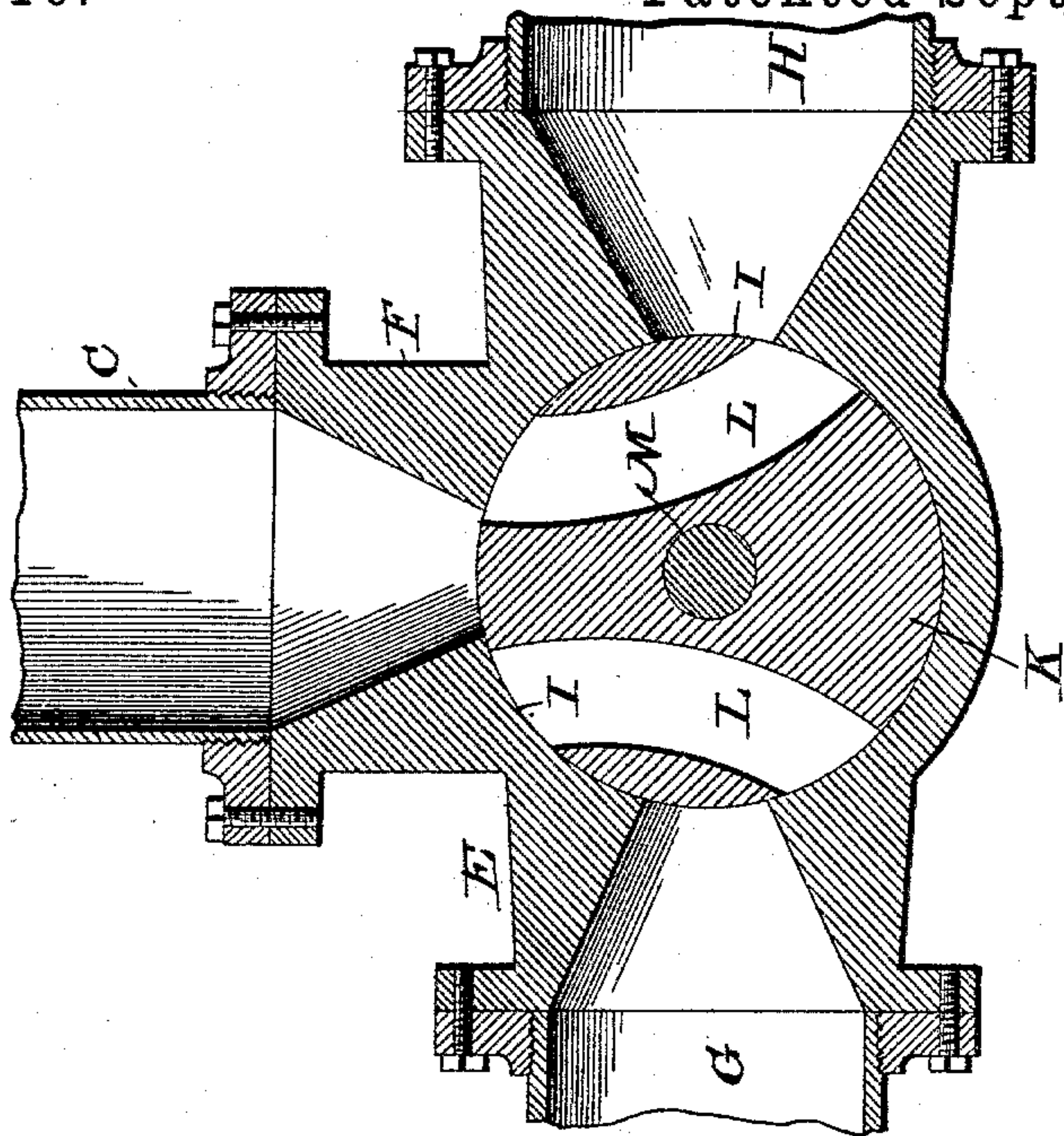
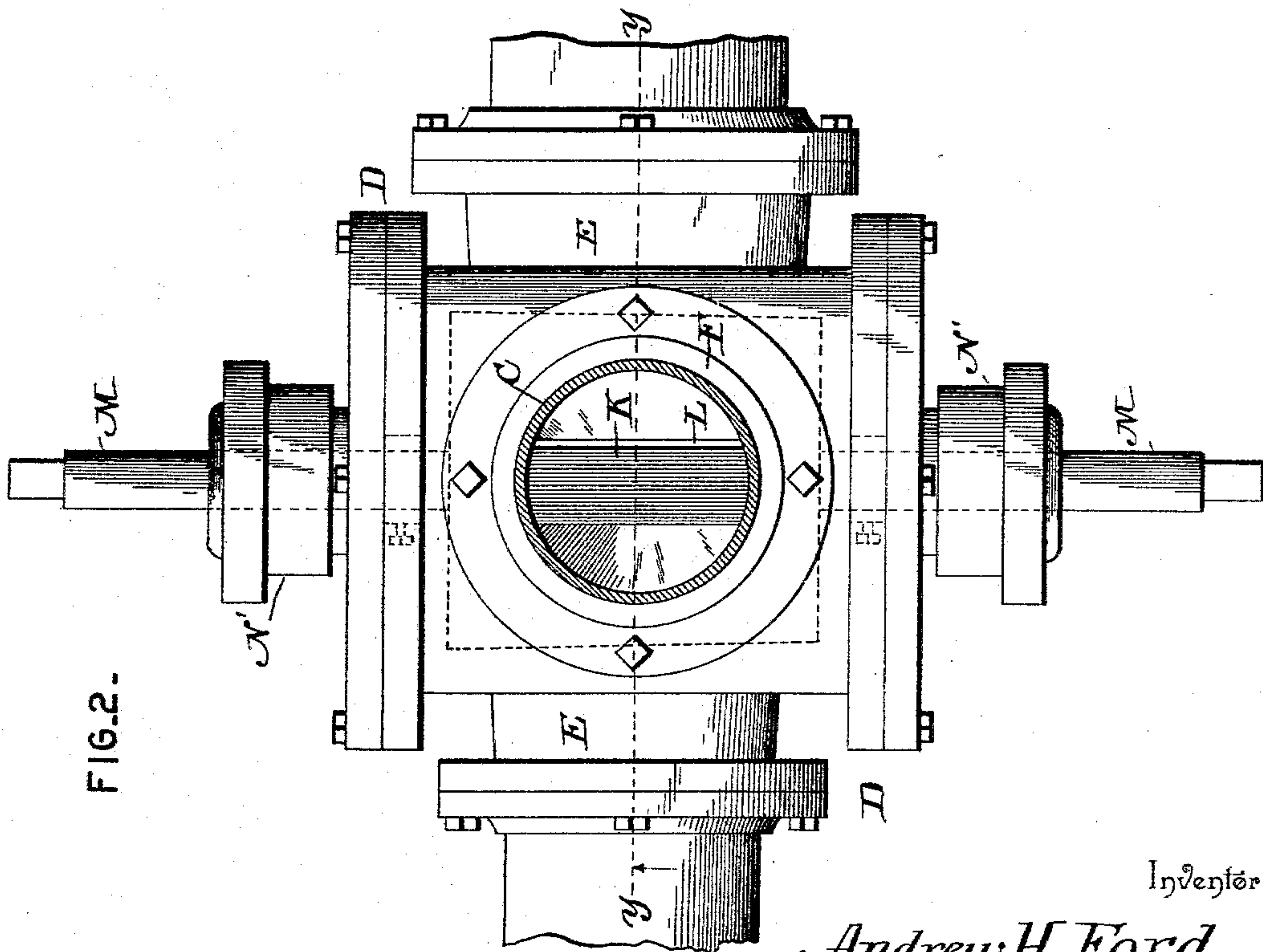


FIG. 2-



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# UNITED STATES PATENT OFFICE.

ANDREW H. FORD, OF ORANGE, TEXAS.

## STEAM-ENGINE VALVE.

SPECIFICATION forming part of Letters Patent No. 546,316, dated September 17, 1895.

Application filed April 7, 1894. Serial No. 506,741. (No model.)

*To all whom it may concern:*

Be it known that I, ANDREW H. FORD, a citizen of the United States, residing at Orange, in the county of Orange and State of Texas, have invented a new and useful Steam-Engine Valve, of which the following is a specification.

This invention relates to steam-engine valves, and it has for its object to effect certain improvements in valves of the rotary type, and to arrange the same in connection with an ordinary engine-cylinder whereby the engine is placed easily under control of the operator for such purposes, particularly as controlling the movements of the log-carriage of a sawing-machine.

To this end the main and primary object of the present invention is to construct an improved rotary valve capable of feeding and exhausting one end of a steam-cylinder, and easily controlled and operated.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the accompanying drawings, Figure 1 is a side elevation of an engine-cylinder, showing my improved valve devices connected therewith. Fig. 2 is a detail transverse sectional view on the line *xx* of Fig. 1 above one of the valve-casings. Fig. 3 is a vertical sectional view on the line *yy* of Fig. 2. Fig. 4 is a detail horizontal sectional view of one of the valves.

Referring to the accompanying drawings, A represents an ordinary engine-cylinder, inside of which is arranged to travel the ordinary piston which may be used to communicate motion to any suitable machines; but in the present invention the valve devices connected with such cylinder are particularly useful in controlling feed-carriages for sawing and other mills.

The cylinder A is provided near its opposite ends with the steam-ports B, which receive the upper ends of the short cylinder-pipes C, the lower ends of which are fitted into the top of the valve-casings D. The valve-casings D are arranged near each end of the steam-cylinder so as to control the feed

and exhaust of steam for each end of the cylinder, and said valve-casings D are provided with the opposite flanged side necks E, and a flanged top neck F, to the latter of which is suitably secured the lower ends of the short cylinder-pipes C, while to the side necks E, arranged in a line opposite to each other, are coupled the ends of the common live-steam pipe G, arranged intermediate of and connecting the opposite valve-casings and receiving a supply of live steam from the boiler-pipe *g*, connected centrally thereto. The outer side necks E, of the valve-casings receive one end of the exhaust-pipes H, which provide means for carrying off the steam which may be exhausted through the valves in said valve-casings.

Each valve-casing D is provided with a circular slightly-tapered valve-bearing I, which is pierced at the opposite sides and top by the steam-ports J, communicating with the pipes connected to the several necks of the casing, as is clearly shown in the drawings, and the circular-tapered valve-bearing I of each valve-casing is adapted to accommodate therein a cylindrical slightly-tapered rotary valve-plug K. The cylindrical rotary valve-plugs K are provided with the separate oppositely-curved steam-passages L, located at one side of the centers thereof and adapted to either connect the live steam-ports of the valve-casing with the port leading into the cylinder-pipe or the latter port with the exhaust-port of the casing in order to provide for the feeding and exhausting of each end of the cylinder A.

Each of the valve-plugs K, which are mounted in their respective casings, as described, are mounted fixedly on the transverse valve-stems M, the extremities of which turn in the opposite sides of the valve-casings and project beyond the stuffing-boxes N, located at such opposite sides of said casings, and said valve-plugs are somewhat shorter than the bearings in which they turn in order to be properly adjusted to take up wear, by means of the longitudinally-adjustable take-up-collars N', arranged for adjustment on opposite portions of the valve-stems inside of the opposite heads or sides of the valve-casings.

To one extremity of each of the valve-stems



M, projecting beyond the valve-casings D, is attached the upper end of a depending valve-arm O, provided in its lower end with a series of perforations o, adapted to adjustably receive the bolt P, connecting the single operating-rod Q thereto. The operating-rod Q leads to any suitable lever under the control of the engineer or operator, and forms a single connection between the valve-arms for the oppositely-arranged valves, thereby insuring the simultaneous movement thereof. By moving the operating-rod Q in one direction one of the rotary valves is turned to a position so as to exhaust the steam from one end of the cylinder, while the opposite valve is turned so as to admit live steam into the other end of the cylinder, and by having the operating-rod Q connected with the ordinary eccentric or other valve-operating devices the herein described rotary valves can be operated automatically in the ordinary manner.

To the lower extremities of the valve-arms O are loosely connected the upper ends of the weight-ropes R, which carry at their lower extremities the valve-adjusting weights S, and are arranged between the retaining-pulleys T, mounted side by side on a suitably-arranged bracket U. By reason of the weighted ropes R it will be apparent that in the event of the operator or engineer releasing his control of the operating-rod Q, or the other operating connections therewith becoming displaced, the weight at the lower end of the weighted rope will cause the valve-arms O to assume a vertical position in alignment with such weighted ropes, and thereby cause the rotary valves to assume a position with their steam-passages out of alignment with any ports in the casings, thus causing the engine to stop at once. By reason of connecting a weighted rope with each of the valve-arms O, it will be obvious that the combined weight of both weighted connections is exerted upon both valve-arms O, on account of the connection Q between said valve-arms, thereby positively insuring the automatic closing of both valves simultaneously. The arrangement of the weighted connections directly below each valve is therefore important, inasmuch as the weight of said connections can be combined to insure the result referred to, whereas a single-weighted connection of the character described would ordinarily be insufficient to insure the quick

and positive closing of two valves simultaneously.

Changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. The combination with an engine cylinder having end steam ports; of oppositely arranged valve casings connected with said cylinder ports and provided with circular tapered bearings and side and top ports piercing the bearings, tapered rotary valve plugs mounted in said bearings and shorter in length than the length of the bearings, said plugs having separate steam passages to connect the side and top ports, the valve stems, and take-up collars mounted for longitudinal adjustment on the valve stems inside of the opposite heads of the casing at both ends of the plugs to provide for adjusting the latter within their bearings, substantially as set forth.

2. The combination with a steam engine cylinder having opposite end ports; of opposite connected valve casings connected with the end ports of the cylinder, rotary valves mounted in said valve casings and having projected valve stems, swinging depending valve arms connected at their upper ends to said projected valve stems, a single operating rod arranged intermediate of and pivotally connecting the opposite valve stems to insure a simultaneous turning of the valves, stationary pairs of pulleys arranged below each valve casing, and weighted ropes guided between said pulleys and connected at their upper ends respectively to the lower end of each swinging valve arm, the combined weight of both weighted ropes providing means for normally holding the valve arms vertical and for automatically returning the same to such position, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ANDREW H. FORD.

Witnesses:

W. J. KOLTER,  
G. M. SELLS.