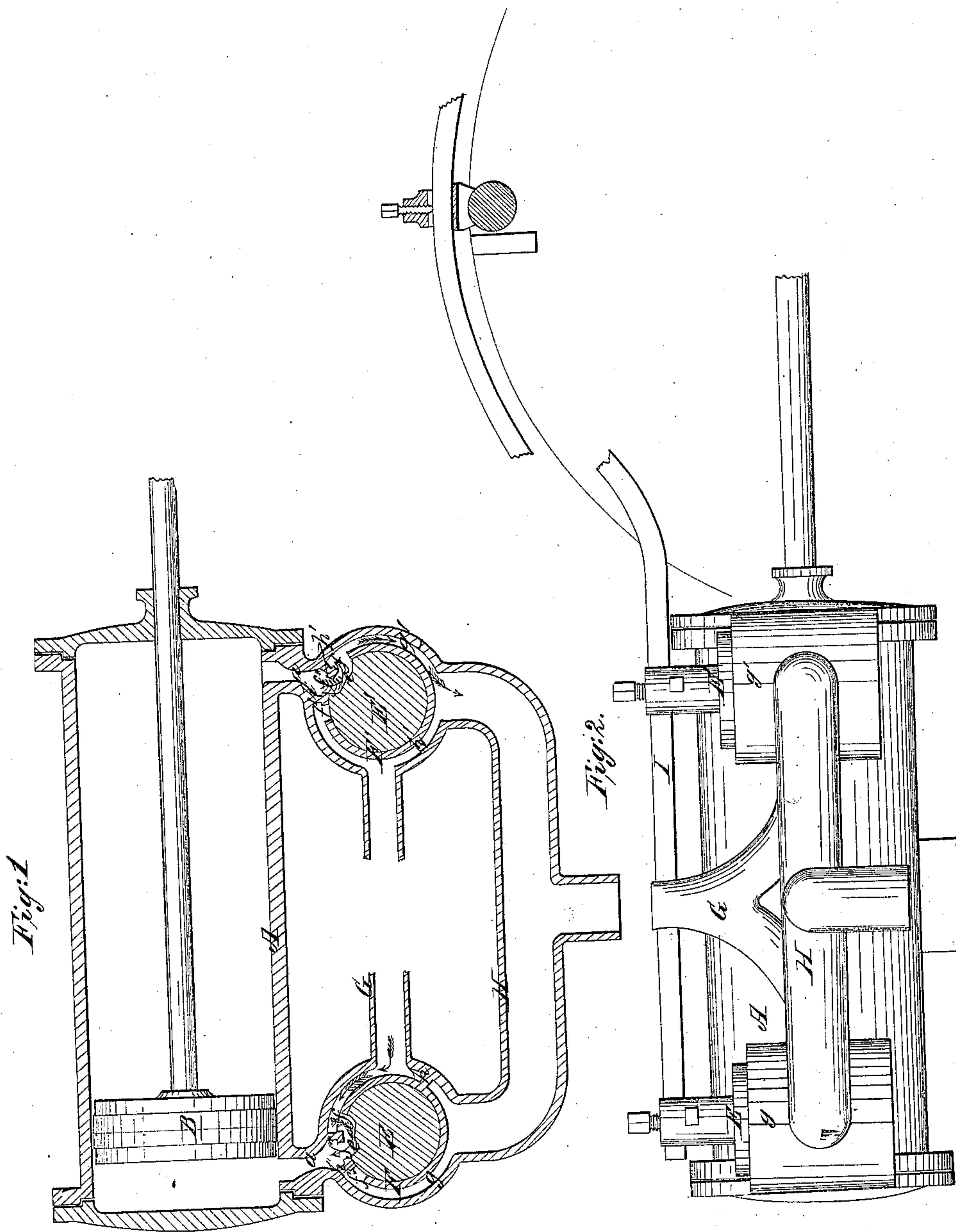


*W. H. Akins,*  
*Rotary Steam Valve.*

*No. 43,824.*

*Patented Aug. 16, 1864.*



*Witnesses:*

*J. P. Hall,*  
*J. F. McAmara.*

*Inventor:*

*William H. Akins*



# UNITED STATES PATENT OFFICE.

WILLIAM H. AKINS, OF DRYDEN, N. Y.

## IMPROVEMENT IN CYLINDRICAL STEAM-VALVES.

Specification forming part of Letters Patent No. 43,824, dated August 16, 1864.

*To all whom it may concern:*

Be it known that I, WILLIAM H. AKINS, of Dryden, in the county of Tompkins and State of New York, have invented a new and Improved Steam-Valve; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 represents a horizontal section of a steam-cylinder provided with my improved valves. Fig. 2 is a side elevation of the same.

Similar letters of reference indicate like parts.

This invention consists in a solid plug provided with a cavity and fitted in a case surrounded by an annular steam-chamber furnished with three or more ports and divided off in three or more separate compartments, one to communicate with the interior of the cylinder, and one with the steam and the other with the exhaust pipe in such a manner that the plug is relieved from all, or nearly all, pressure of steam, and therefore can be moved instantaneously, and by turning said plug over a small arc the interior of the cylinder can be brought to communicate either with the steam or with exhaust pipe, as circumstances will require.

A represents a steam-cylinder, constructed, in the ordinary manner, of iron or any other suitable material, and provided with a piston, B, as clearly shown in Fig. 1 of the drawings. This cylinder receives steam and exhausts through the channels *a a'* at or near its ends, and these channels communicate through the valve-chambers and valves with the steam-pipe G, and with the exhaust-pipe H. The valves E E' consist of plugs provided with cavities *e e'*, and they are fitted nicely into cases F F', each of which is provided with three ports, *f f\* f\*\* f' f'\* f'\**, and which are surrounded by annular steam-chambers *g g'*. Each of these steam-chambers is divided off in three compartments by partitions *h h'*, two of which serve to separate the port *f\** from the ports *f* and *f\*\** and the port *f'\** from the ports *f'* and *f'\**, while the third partition in each steam-chamber is situated between the ports *f f\* f\*\* f' f'\* f'\**, respectively. The compartments thus formed in each of the annular

steam-chambers communicate, one with the interior of the cylinder, one with the steam-pipe, and one with the exhaust-pipe H.

If the valves are in the position shown in Fig. 1 of the drawings, the steam enters from the pipe G through the port *f*, cavity *e*, port *f\**, and channel *a* into the cylinder, imparting to the piston motion in the direction of the arrow marked thereon in the drawings, at the same time the steam from that portion of the cylinder in front of the piston exhausts through the channel *a'*, port *f'\**, cavity *e'*, port *f'\**, and exhaust-pipe H.

Instead of using two valves, one at each end of the cylinder, one valve might be used in the middle, and in that case the plug would have to be made with two cavities, one opposite the other, and the case surrounding the plug would have to be made with six ports instead of three. But if two valves are used, as shown in the drawings, they will be connected by a rod, T, so that they will be changed simultaneously by the action of suitable lugs projecting from a disk and acting on a tappet secured in the rod, or by any other suitable mechanism.

A valve constructed according to my invention is exposed to a very slight pressure, the only portion exposed to the same being the area of the cavities *e e'*, and for this reason my valves move with very little power, and can be changed instantaneously. By this arrangement I am enabled to overcome the dead-centers in a reciprocating engine, and to operate the same with great economy in steam compared with the power derived from the same.

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

The solid plug or plugs E E', provided with cavities *e e'*, and fitted in cases F F', with ports *f f\* f\*\* f' f'\* f'\**, to operate in combination with the annular steam-chambers *g g'*, each divided off in three compartments, to communicate with the interior of the cylinder, with the steam pipe, and with the exhaust-pipe, in the manner and for the purpose substantially as herein shown and described.

W. H. AKINS.

Witnesses:

WM. F. McNAMARA,  
J. P. HALL.