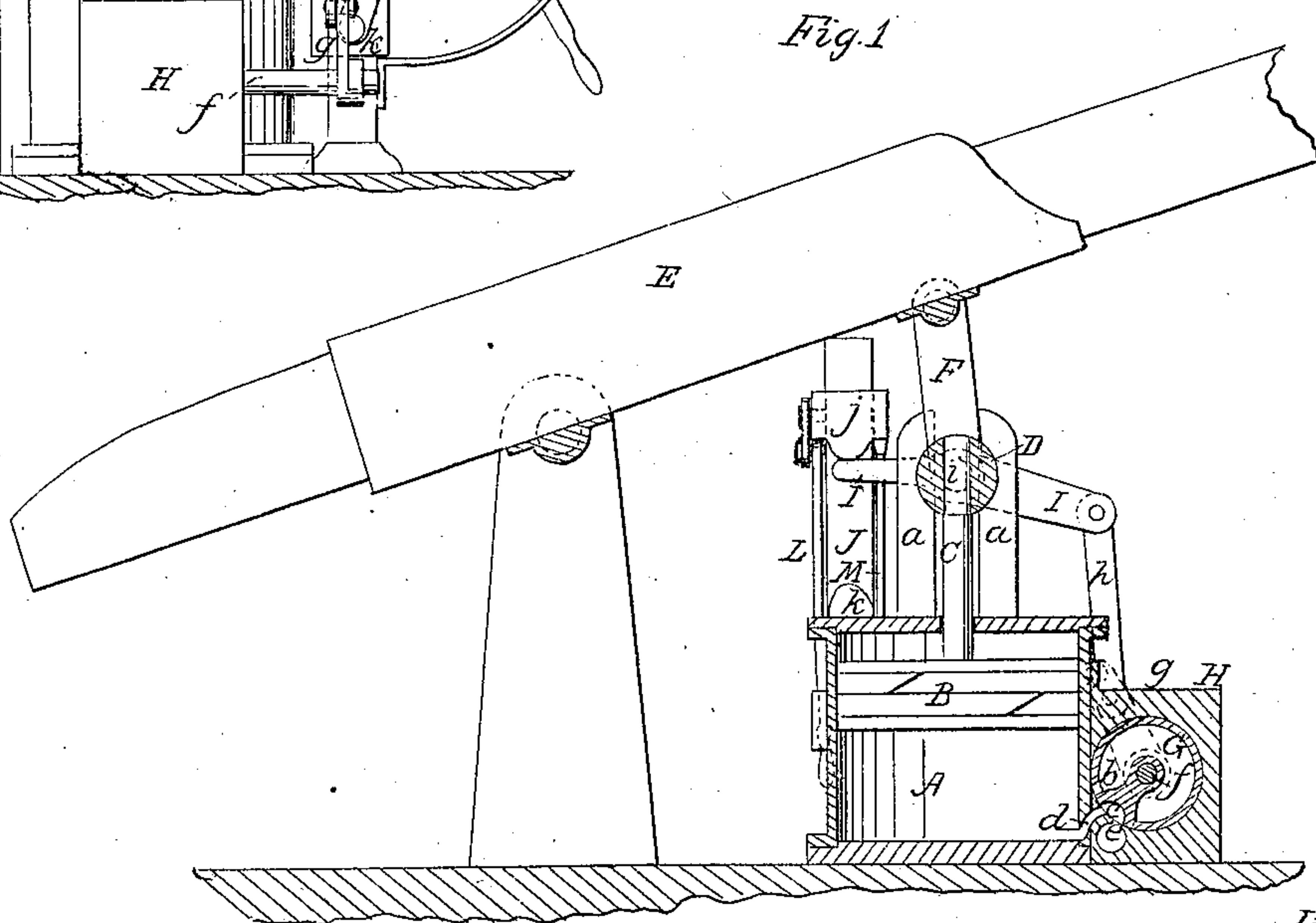
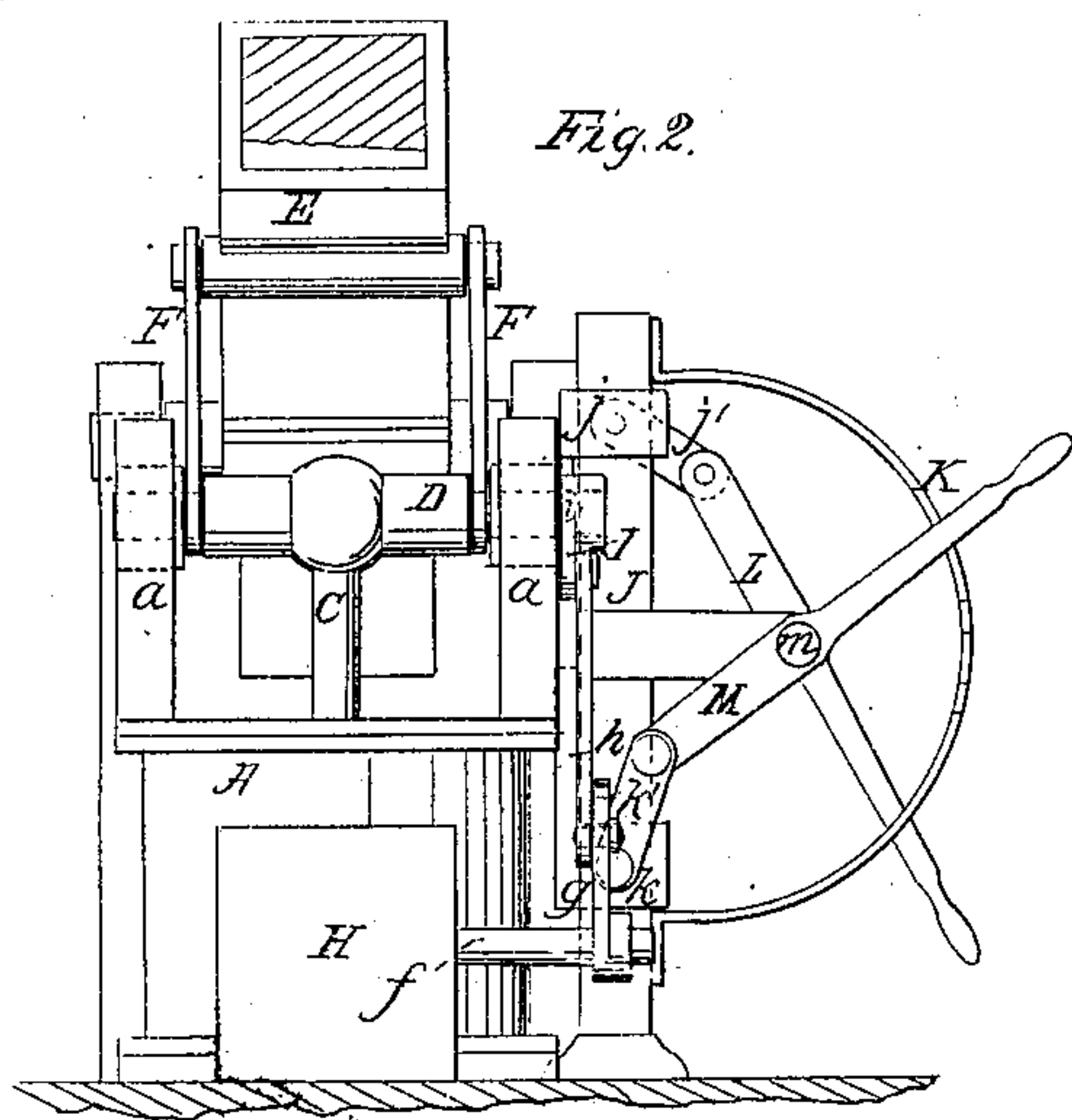


J. T. Turner,

Steam Hammer.

N^o 13,612.

Patented July 19, 1864.



Witnesses

*J. J. Whelan
G. J. Reed*

Inventor

*John T. Turner
per Brown & Coombs
attorneys*

UNITED STATES PATENT OFFICE.

JOHN T. TURNER, OF BRIDGEWATER, MASSACHUSETTS.

IMPROVEMENT IN THE VALVE-GEAR OF STEAM-HAMMERS.

Specification forming part of Letters Patent No. 43,612, dated July 19, 1864.

To all whom it may concern:

Be it known that I, JOHN T. TURNER, of Bridgewater, in the county of Plymouth and State of Massachusetts, have invented a new and useful Improvement in Steam-Hammers; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 exhibits a vertical section of the steam-cylinder, valve, and valve-chest, and a side view of the valve-gear, and a portion of the helve of a steam-hammer illustrating my invention. Fig. 2 is a front view of the same.

Similar letters of reference indicate corresponding parts in both figures.

This invention relates to the employment, in combination with the steam-cylinder of a steam-hammer, of an oscillating circular valve, whereby the valve-gear is enabled to be much simplified.

It consists in certain novel mechanism for combining such valve with the helve of a steam-hammer to make it produce the induction and exhaust of the steam to and from the steam-cylinder.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A is the steam-cylinder. B is the piston; C, the piston-rod; and D the cross-head. The cross-head works in stationary guides *a a* on the top of the cylinder, and is connected with the helve E of the hammer by links F F.

G is the oscillating valve, of cylindrical or slightly conical form, fitted to the valve-chest H. This valve is hollow, and the steam is admitted to its interior at one or both ends. It has an induction opening, *b*, in one side, and near this opening an exhaust-cavity, *c*, substantially like that in a slide-valve, and by making the opening *b* of proper size will be perfectly balanced. The valve-chest has two ports, *e* and *d*, the latter leading into the bottom of the cylinder A, and the former to the exhaust-pipe. The central spindle, *f*, of the valve is furnished at one end outside of the valve chest with an arm, *g*, which is connected by a rod, *h*, with one end of a lever, I, which

works upon a fulcrum, *i*, formed upon one end of the cross head D, and the other end of which is arranged between two stationary tappets, *j* and *k*, which are fitted to slide upon an upright fixed standard, J. These tappets are connected by links *j'* and *k'* with two hand levers, L and M, which work in a fixed fulcrum, *m*, by which they are adjusted higher or lower to regulate the rise and fall of the hammer, the said levers being respectively secured in their desired positions by being sprung laterally into notches in a fixed arc-piece, K. As the hammer is raised by the admission of steam below the piston, the portion of the lever I between the tappets, ascending with the cross-head D, is brought into contact with and pressed against the upper tappet, *j*, and its further ascent prevented, and the other end of the said lever, with which the valve-arm *h* is connected, is thus caused to ascend by the further ascent of the piston, and so caused to bring the valve to such position that its cavity *c* forms a communication between the ports *d* and *e*, as shown in Fig. 1, and so permit the to escape of steam from the lower part of the cylinder to the atmosphere, thereby permitting the hammer to drop. As the hammer drops, the piston and cross-head, descending with it, bring the portion of the lever which is between the tappets into contact with the lower tappet *k*, and their further descent causes the other end of the said lever, with which the valve-arm is connected, to descend, and so bring the valve to a position in which the port *b* communicates with *d*, and thereby admits steam below the piston and causes the piston and hammer to rise. This operation of the hammer is repeated so long as steam is admitted to the valve chest. By raising the upper tappet, *j*, the piston and hammer are caused to rise higher, and by lowering it the opposite effect is produced. By raising the lower tappet, *k*, the steam is admitted below the piston at a higher point, and the fall of the hammer checked in a higher position, and its blow lightened, and by lowering the said tappet the opposite effect is produced. The tappets are stationary at all times but when it is required to vary the rise and fall of the hammer.

I do not claim of itself the construction of the hollow valve, nor do I claim the system of adjustable tappets *j k*; but

What I claim as my invention, and desire to secure by Letters Patent, is—

Combining the oscillating valve with the hammer by means of a lever, *I*, one end of which is connected by a rod, *h*, with an arm

on the center spindle of the valve, and the other end of which is arranged between two tappets, *j* and *k*, all substantially as herein specified.

JOHN T. TURNER.

Witnesses:

J. Y. THATCHER,
ISAAC DAMON.