

G. F. LOWRY.

2 Sheets--Sheet 1.

Improvement in Oscillating Steam Engines.

No. 124,754.

Patented March 19, 1872.

Fig. 1.

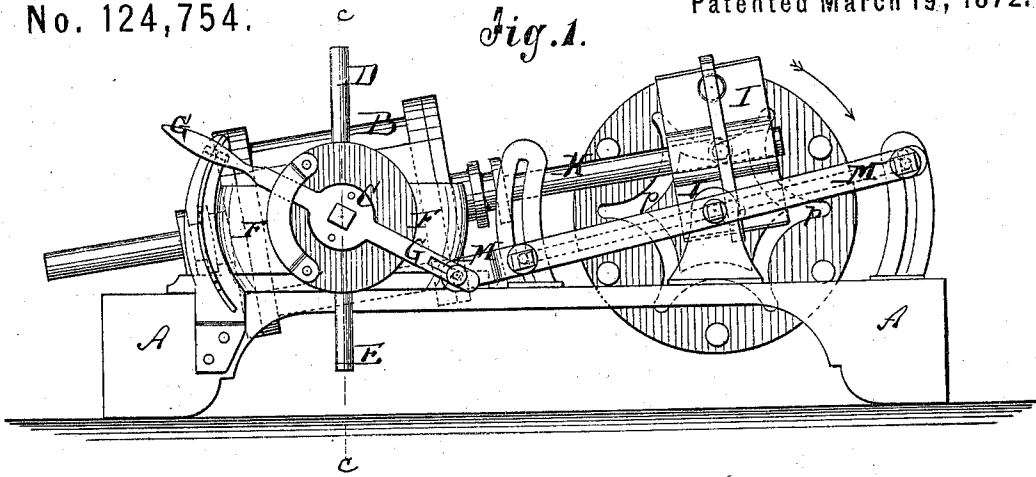


Fig. 2.

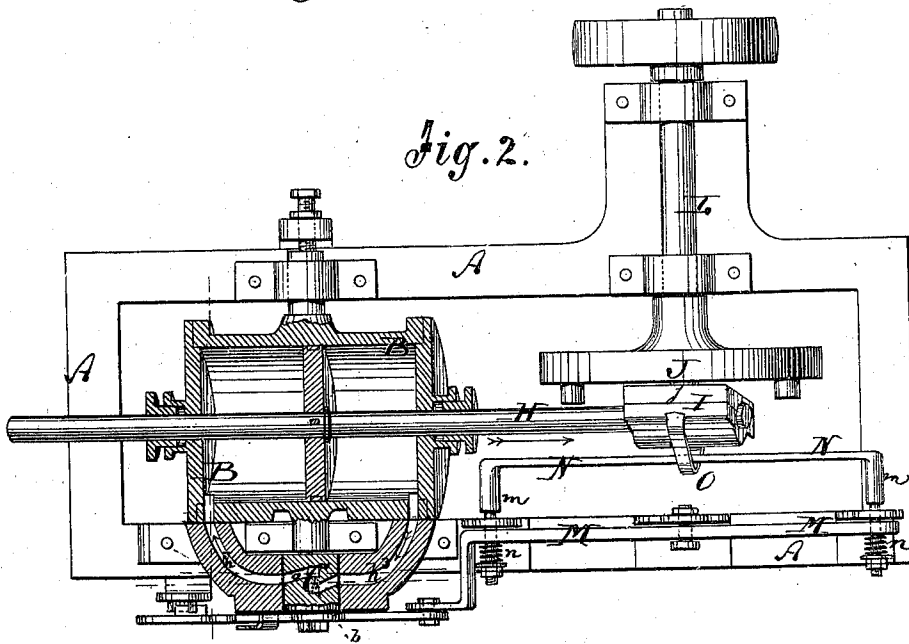
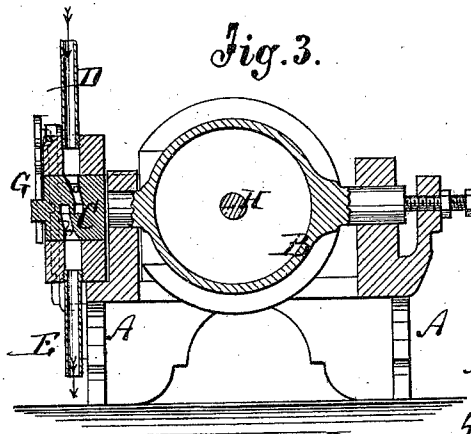


Fig. 3.



Witnesses:

A. Bennekenhoff.
Geo. W. Mabee

Inventor:

G. F. Lowry

PER

Munn & Co.
Attorneys.

Fig. 4.

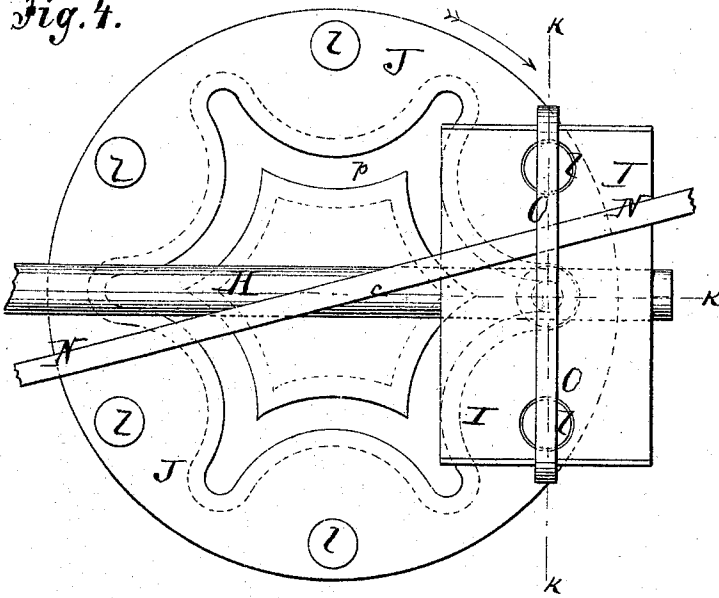


Fig. 5.

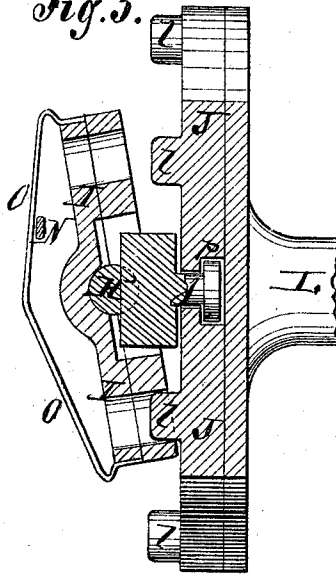


Fig. 6.

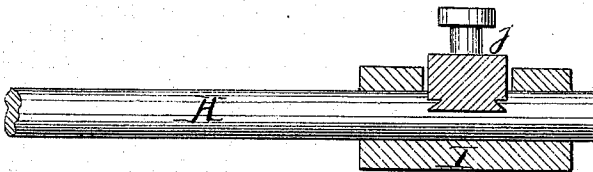


Fig. 7.

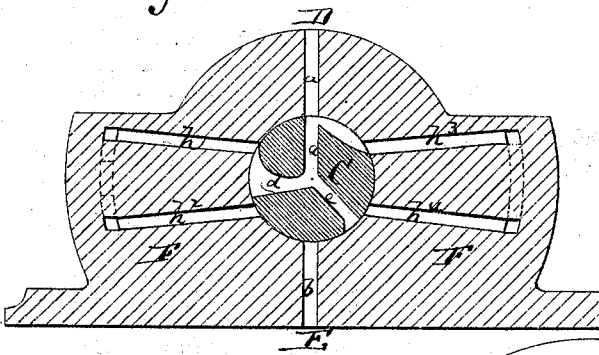


Fig. 8.

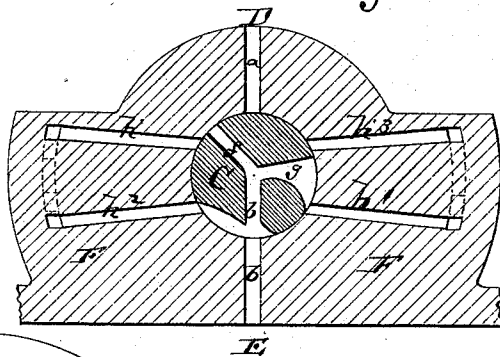
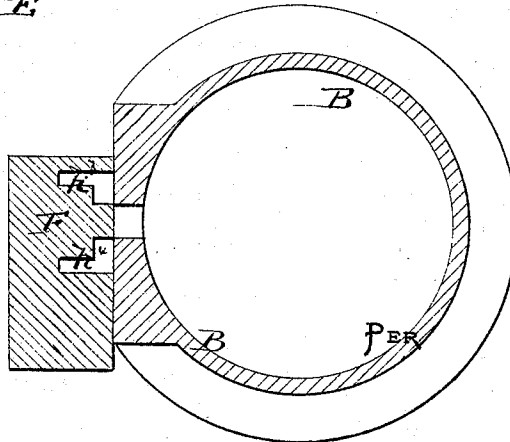


Fig. 9.



Witnesses:

A. Bennekenhof.
 Geo. W. Mabee

Inventor:

G. F. Lowry
 Munn & Co.
 Attorneys.

UNITED STATES PATENT OFFICE.

GEORGE F. LOWRY, OF LAKE MISSISSIPPI, MISSISSIPPI.

IMPROVEMENT IN OSCILLATING STEAM-ENGINES.

Specification forming part of Letters Patent No. 124,754, dated March 19, 1872.

Specification describing a new Improved Steam-Engine, invented by GEORGE F. LOWRY, of Lake Mississippi, in the county of Scott and State of Mississippi.

Figure 1 represents a side elevation of my improved steam-engine. Fig. 2 is a top view, partly in section, of the same. Fig. 3 is a vertical transverse section of the same on the line *c c*, Fig. 1. Fig. 4 is a detail face view on an enlarged scale of the crank-disk. Fig. 5 is a vertical section of the same on the line *k k*, Fig. 4. Fig. 6, a horizontal section on the line *c k*, Fig. 4. Figs. 7 and 8 are detail transverse sections, on an enlarged scale, of the improved valve; and Fig. 9 is a vertical transverse section of the steam-cylinder.

Similar letters of reference indicate corresponding parts.

This invention relates to a new arrangement of oscillating steam-engine, and more particularly to a new valve, new crank connection, and new link motion. The valve is made with two sets of apertures or steam-passages, each set having three arms to connect with the inlet and exhaust in the requisite manner. The crank motion is peculiar, consisting, principally, in the arrangement of a disk with a series of projecting crank-pins, which alternately connect with the oscillating slide that is attached to the end of the piston-rod. The link motion, finally, is an inclined rail, on which the above-mentioned slide travels, and which connects with the valve, so as by its changed inclination to reverse the valve and the motion of the engine. The mere change of position of said rail is, therefore, sufficient to reverse or arrest the motion of the engine, and the same is, therefore, under very convenient control. Its several advantages make the improved engine peculiarly adaptable for use on steamboats, locomotives, and other moving devices, though it can also be profitably employed on stationary machinery.

A in the drawing represents the bed of the engine. B is the steam-cylinder, hung on projecting trunnions in boxes that project from the bed A. There are two ports cut through the side of the cylinder, one near each end. During the oscillation of the cylinder these ports are alternately brought in indirect communication with corresponding apertures in the valve C. This valve is of cylindrical or

partly conical form, and communicates, by a passage, *a*, with the steam inlet-pipe D, and by a passage, *b*, with the steam outlet-pipe E. From the inlet-passage *a* extend two branches, *d e*, as in Fig. 7, and two branches, *f g*, extend from the exhaust-passage *b*, as in Fig. 8. The valve C hangs in a box, F, which rests on the bed A and carries hollow projecting arms, in which the channels that connect the ports in the cylinder with the valve-passages are arranged. There are four such channels, as appear from Figs. 7 and 8, for inlet and exhaust. When the branch *d* is in communication with the upper channel *h* the passage *a* connects with the upper channel *h*³, as shown, while the lower channels *h*² and *h*⁴ communicate with the exhaust-passages. The cylinder will then take in steam at whatever end is uppermost and exhaust it at the lower end. The reversing of motion is obtained by so turning the valve C as to connect the inlet-passages with the lower channels *h*² *h*⁴ and the outlet-passages with the upper channels *h* and *h*³. The motion is, of course, entirely arrested by turning the valve so as to shut off steam-inlet altogether. Thus the mere oscillation of the valve effects the requisite reversion or arrest of motion. Another advantage of this arrangement is the absence of an obstructing steam-cushion at the exhaust end of the steam-cylinder, the exhaust-port being entirely open as soon as the cylinder reaches the position for a change of stroke. G is a lever, applied to the end of the valve. By its means the valve can be set in the requisite manner. The piston-rod H, from the cylinder, connects at its outer end with a block or slide, I, which can rock on the rod H. A T-pin, *j*, projects from the rod H into a countersunk groove, *p*, which is formed on the face of a disk, J, that is mounted upon the shaft L, to which motion is to be imparted. From the disk J project also six, more or less, pins, *l l*, equidistant from each other and from the center. M is a bar, pivoted at the middle to the bed A, and connected at one end with the lever G, as shown in Fig. 1. This bar is held inclined in one direction or the other whenever the lever G is set to keep the engine in motion. A rod or rail, N, is, at the ends, connected with the bar M, and can slide laterally in the supports which said bar M furnishes for its bent ends *m m*. Springs *n n* tend to draw the rail

N toward the bar M. A V-shaped—i.e., double inclined—strap, O, projecting from the slide I, embraces the rail N. Whenever the upper part of said strap is in contact with the rail N the slide is swung so as to bring an aperture at its lower end over one of the pins *l*, as shown in Fig. 5. The slide is then so connected with the disk as to turn it and the shaft L one-third around by one stroke of the piston. At the end of the stroke the strap O arrives with its lower incline in contact with the rail N, and thereby vibrates the block I so as to throw its lower end off and its upper end in contact with another pin, *l*, of the disk, there being an aperture at each end of the block for fitting the pin. The T-pin *j* preserves the constant connection of the block I with the disk J, while the vibration of said block on the piston-rod causes the continuation of rotary motion of the shaft L.

Whenever the motion of the engine is to be reversed, the lever G is turned, as above set forth, and thereby also reverses the inclination of the bar M, with the desired effect upon the other operating parts.

Having thus described my invention, I claim

as new and desire to secure by Letters Patent—

1. The valve C, provided with the passages *a d e* and *h f g*, and arranged within the box F, which has four channels, substantially as herein shown and described.

2. The slide-block I, made to rock on the piston-rod of an oscillating steam-cylinder, and provided with the T-pin *j*, strap O, and with apertures for fitting the pins *l* of the disk J, as set forth.

3. The disk J, provided with the groove *p* and with the projecting pins *l l*, substantially as and for the purposes herein shown and described.

4. The inclined bar M, connected with the lever G and combined with the rail N, substantially as and for the purposes herein shown and described.

5. The combination, with the inclined rail N, of the slide I and strap O, as specified.

G. F. LOWRY.

Witnesses:

A. V. BRIESEN,

T. B. MOSHER.