M. Fletcher,

Rotary Steam Engine.

No. 58,086. Patented Sept. 18, 1866.

Fig. 1.

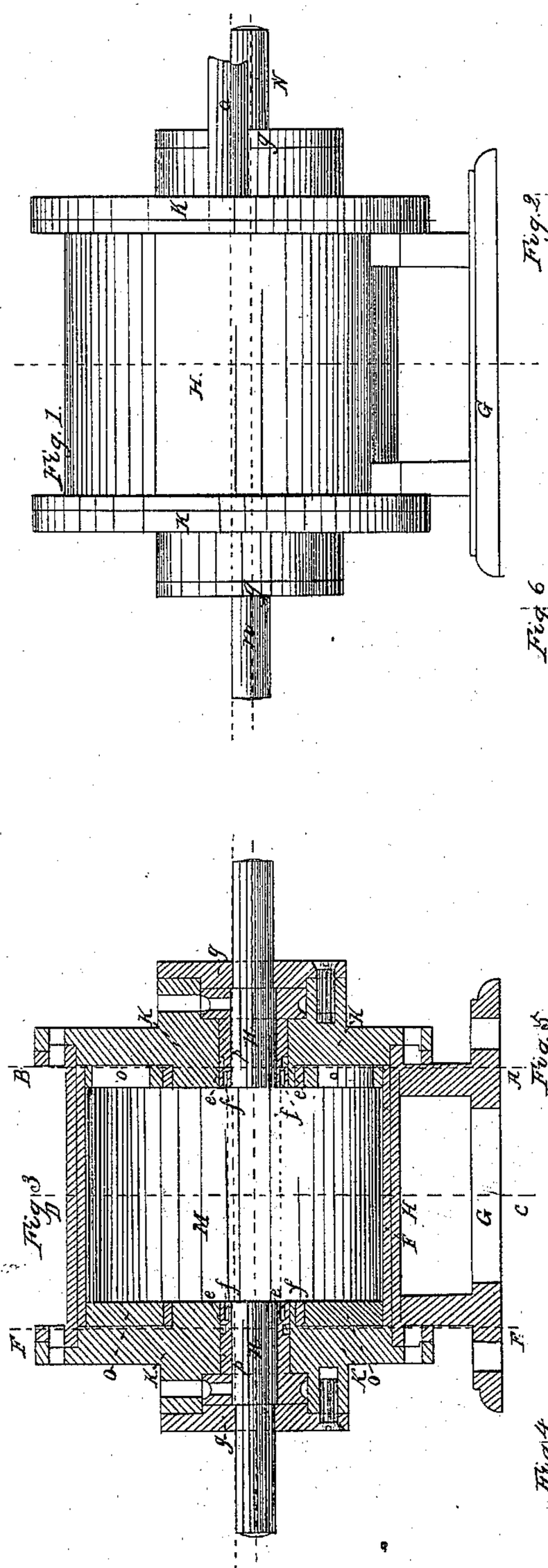


Fig. 2.

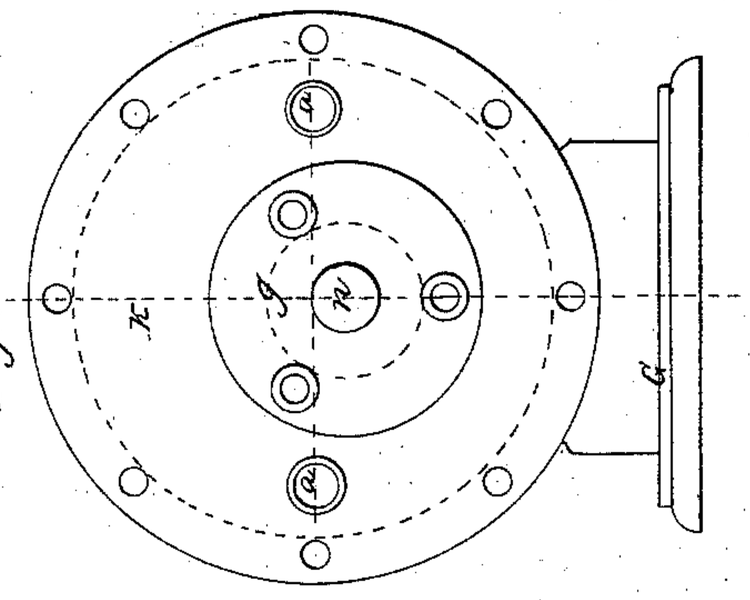


Fig. 6

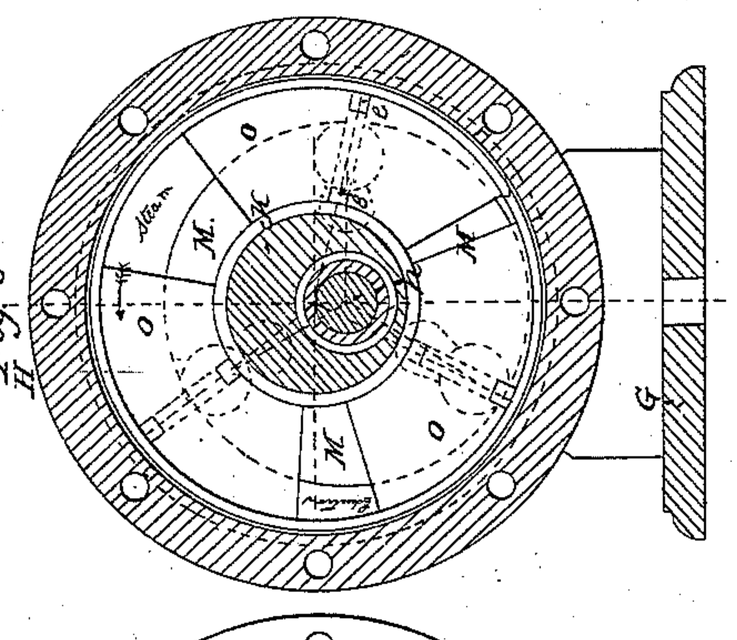


Fig. 3

Fig. 5

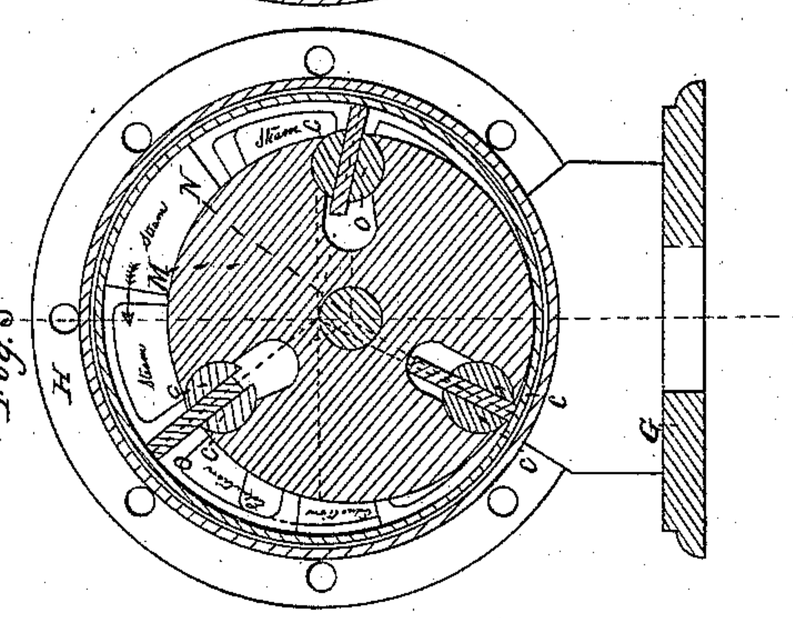
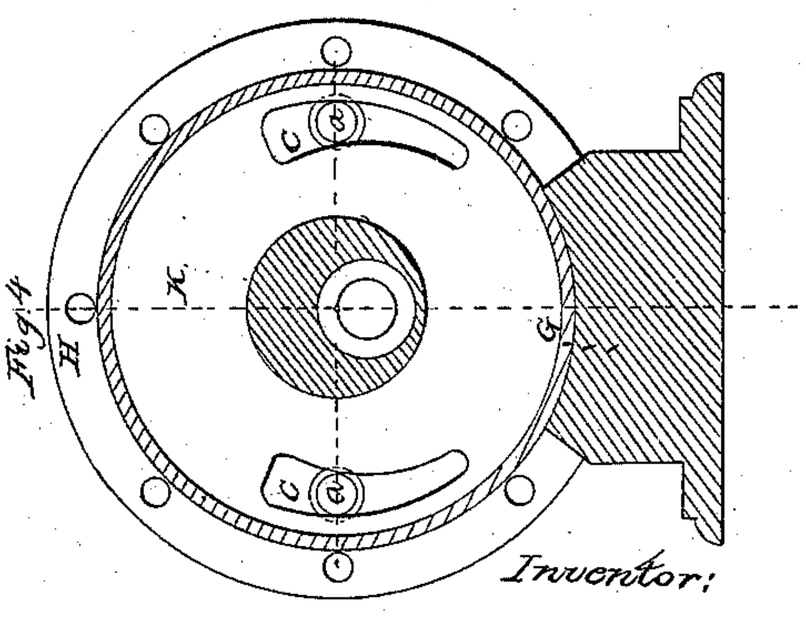


Fig. 4



Witnesses:

Herman Stetcher
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UNITED STATES PATENT OFFICE.

MATTHEW FLETCHER, OF LOUISVILLE, KENTUCKY.

IMPROVEMENT IN ROTARY STEAM-ENGINES.

Specification forming part of Letters Patent No. **58,086,** dated September 18, 1866.

To all whom it may concern:

Be it known that I, MATTHEW FLETCHER, of Louisville, in the county of Jefferson and State of Kentucky, have invented new and useful Improvements in the Rotary Steam-Engine; 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, making part of this specification, in which—

Figure I is a side view. Fig. II is an end view. Fig. III is a longitudinal section. Fig. IV is a cross-section at A B. Fig. V is a cross-section at C D. Fig. VI is a cross-section at E F.

The nature of this invention consists in the means herein set forth for taking the side strain from the rotative shaft and avoiding soft or elastic packing from coming in contact with the shaft. To effect this, and enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

H, Figs. I, III, IV, V, VI, is an external cylinder or casing, connected by rivets or bolts to the base-plate G.

I, Figs. III, IV, VI, is an internal cylinder, turned to fit the external one very easily, so as not to rub on it as it revolves, and is kept in its station independent of the external cylinder.

K K, Figs. I, II, III, IV, are the two lids, bolted fast to external cylinder H, bored eccentrically, and forms internally an eccentric for guides of piston. Those lids support the bushes or bearings P P for rotative shaft to work in, as well as the steam and eduction-pipes *a a* and the steam-passages *b b*, Fig. IV.

L L L, Figs. V, VI, are the fliers or pistons where the steam presses on to exert its power, which fliers, by pressing on the half-round pieces *c c c c c c*, propel and revolve the drum M, Figs. III, V, VI, and rotative shaft N, Figs. I, II, III, V, VI.

O O O, Figs. III, V, VI, are segments fitted to each end of the fliers to cause the same to point to center of cylinder. Those segments and fliers at their outer extremity lie against the internal part of the cylinder I and at the inside against the eccentric-rings *d d*, Figs. III, VI. If the steam enters in at one end of cylinder and out at the same end, then those segments at that end must be made in a skeleton form, as at Fig. V; but if the steam enters in at one end and out at the other, both ends must be made so.

P P, Figs. III, VI, are the oil or grease bushes where the rotative shaft works in, which bushes are packed at *e e*, Fig. III, to prevent the steam from passing over the outside of bush, and the small metal-packed rings *f f*, by pressing on the drum, prevent it from passing between the inside of bush and rotative shaft, by which means soft or elastic packing is avoided from pressing on the revolving shaft. The rings *g g*, Figs. I, II, III, are to keep the bushes P P in their places.

The different parts of the machine are as follows:

Figs. I, II, III, IV, V, VI, G is the base or foundation plate.

Figs. I, III, IV, V, VI, H is the external cylinder or casing.

Figs. III, V, VI, I is the internal cylinder.

Figs. I, II, III, IV, K K are the cylinder-lids.

Figs. V, VI, L L L are the fliers or pistons.

Figs. III, V, VI, M is the drum.

Figs. I, II, III, V, VI, N is the rotative shaft.

Figs. III, V, VI, O O O are the flier-end segments.

Figs. III, VI, P P are the oil or grease bushes; *a a*, steam, and eduction pipes; *b b*, steam-passages in cylinder-lids; *c c c c c c*, half-round pieces in drum; *d d*, revolving eccentric-rings; *e e*, packing or bearing-bushes; *f f*, packing-rings in bearing-bushes; *g g*, rings to keep the bearing-bushes in their places.

This machine has concentric and eccentric motion as the drum or piston-shaft is out of the middle of cylinder, and consequently it causes the distance of the outside of fliers in one part of their revolution to be nearer the bearing than at the other. (See L L L, Figs. V, VI, in which it will be seen that the upright fliers are at a greater distance from the rotative shaft or action of power than the lower one. Therefore when the steam is let into one side of cylinder so as to fill one-half it causes the extended fliers to overpower the contracted one, and thereby causes the rotary

motion, and by reversing the steam to the opposite side of cylinder it causes the rotary motion in the contrary direction.

When the steam enters into a rotary-engine cylinder either on one side or the other, it naturally presses on the gudgeons and on the cylinder-side with a considerable force, and creates great friction. This bad effect on the cylinder I have satisfactorily overcome in my patent issued, Washington, the 28th day of November, 1865, No. 51,165, by the adoption of a revolving cylinder running round in unity with the drum and rotative shaft; and this same theory I adopt to reduce the friction on the rotative shaft by causing the cylinder, through its unity and revolving motion with the rotative shaft, to relieve the pressure from its bearings, for when the steam enters into the steam side of cylinder, as Figs. V, VI, it naturally inclines to press the cylinder and rotative shaft in opposite directions; but with the same power that it presses the cylinder out on steam side it pulls the cylinder in on exhaust side, and thereby acts on the opposite fliers and flier-end segments, and those end segments being kept in their position by the revolving eccentric-rings *d d* causes the power of motion to take its leverage on this revolving eccentric-ring and the half-rounds *c c c c c c*, and as the fliers are determined to their station by the definition of revolving cylinder, eccentric-rings, drum, half-rounds, fliers and flier ends, the side strain on shaft is relieved, and it becomes a simple turning motion, for, if the shaft was to be cut off or made very small, it would still have a very little inclination to get out of its stipulated place, and consequently the side pressure on the shaft is almost avoided, and the same case with the eccentric on lid inside of rings *d d*, as the main side strain of leverage has to be supported by the half-rounds in drum *c c c c c c*, and, as they have very little motion and revolve with the cylinder-drum and eccentric-ring, the leverage with regard to friction is of small consequence.

Having described the nature of those improvements and the manner of performing the same, I would have it understood that I do not confine myself to the precise details as described, provided the general character of either parts of these improvements are retained; nor either do I claim the concentric and eccentric motion, or the same in conjunction with the jointed fliers, having used the same in my previous invention of 1841; nor do I claim the double cylinder as described, nor the internal cylinder so arranged with reference to the fliers or pistons as to have a rotary motion nearly corresponding with those, and so as to rotate within the outer cylinder, having those claims in my patent dated Washington, 28th day of November, 1865, No. 51,165; but

What I claim is—

1. The method of reducing the side strain on the rotative shaft through the connection of cylinder with eccentric-ring fliers, flier ends, and half-rounds *c c c c c c* in drum M, substantially as described.

2. The arrangement and combination of the bushes P P and small metal-packed rings *f f*, by which means soft or elastic packing is avoided from pressing on the revolving shaft.

MATTHEW FLETCHER.

Witnesses:

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