Sheet 1, 4 Sheets.

M. Fletcher.

Rotary Steam Engine.

No. 3,833. Patented Nov. 18, 1844.

Fig: 1.

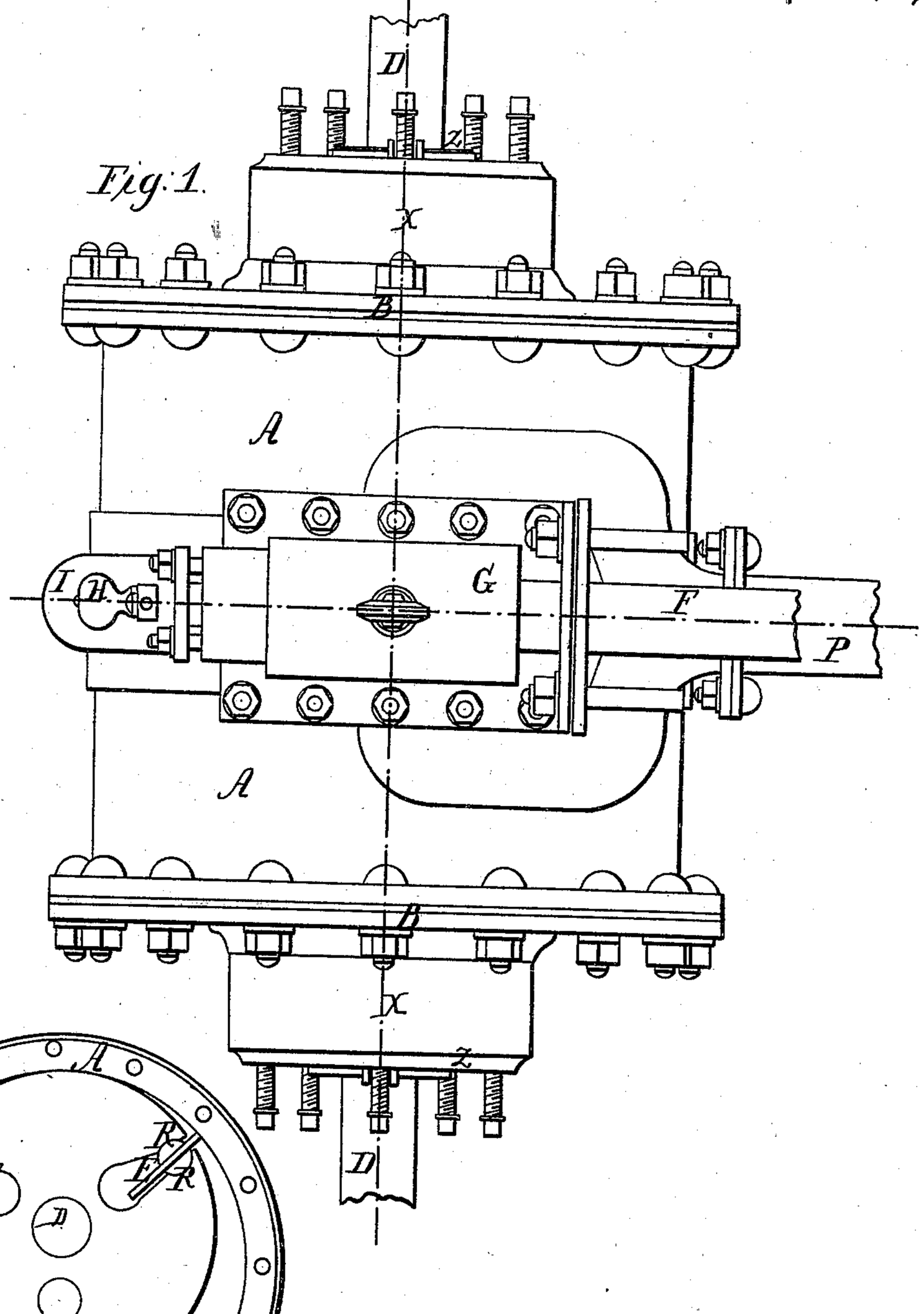
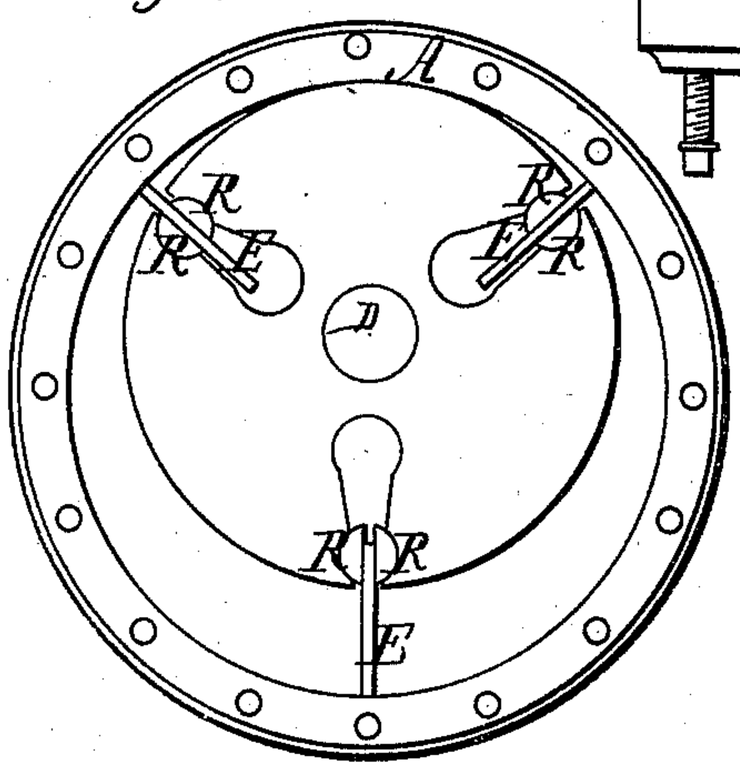


Fig: 9.



Inventor;

Matthew Fletcher

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Rotary Steam Engine.

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Fig: 2.

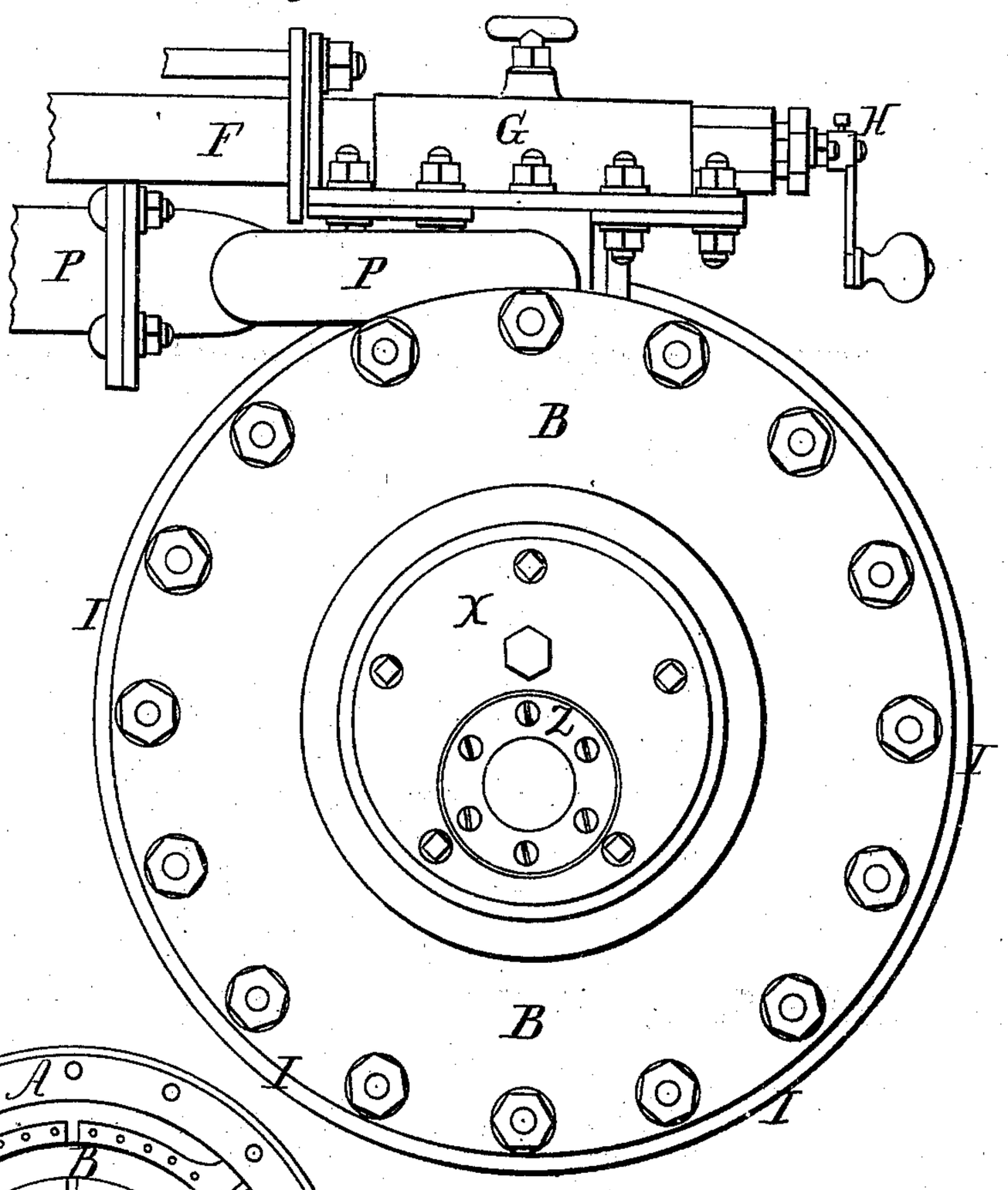
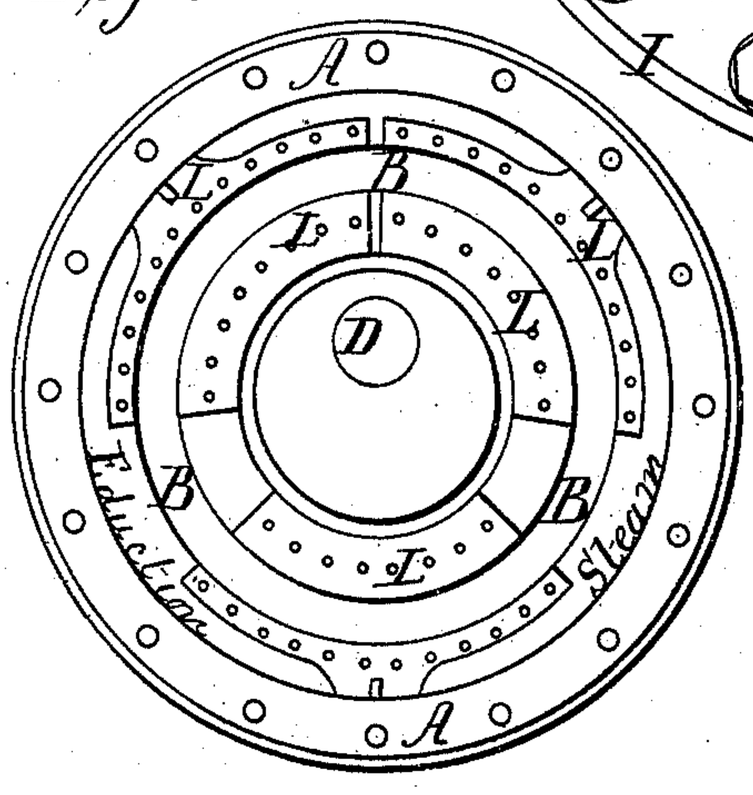


Fig: 8.



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M. Fletcher.

Rotary Steam Engine.

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Fig: 5.

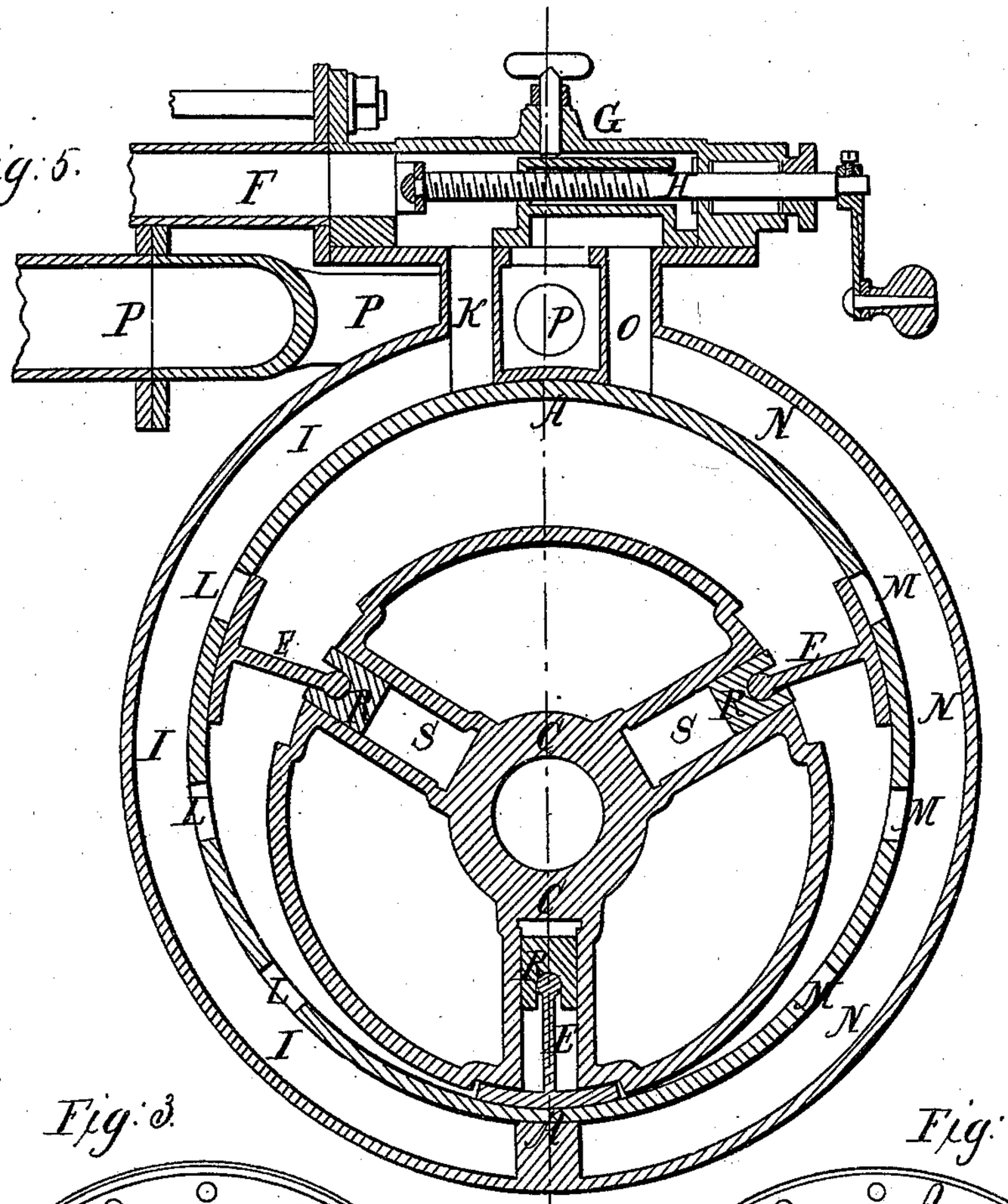


Fig: 3.

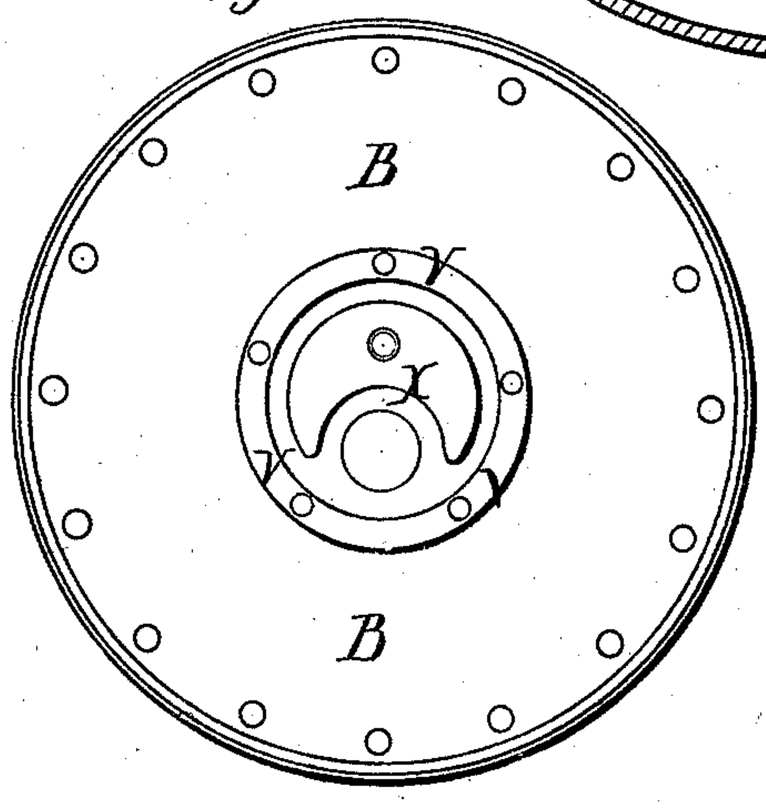
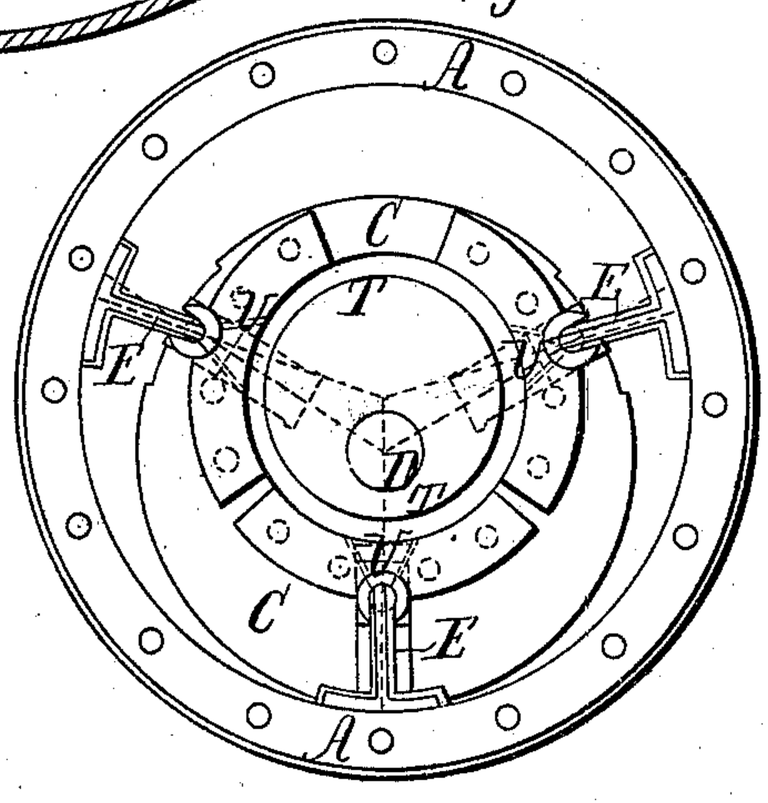


Fig: 6.



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Sheet 4, 4 Sheets

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Fig: 4.

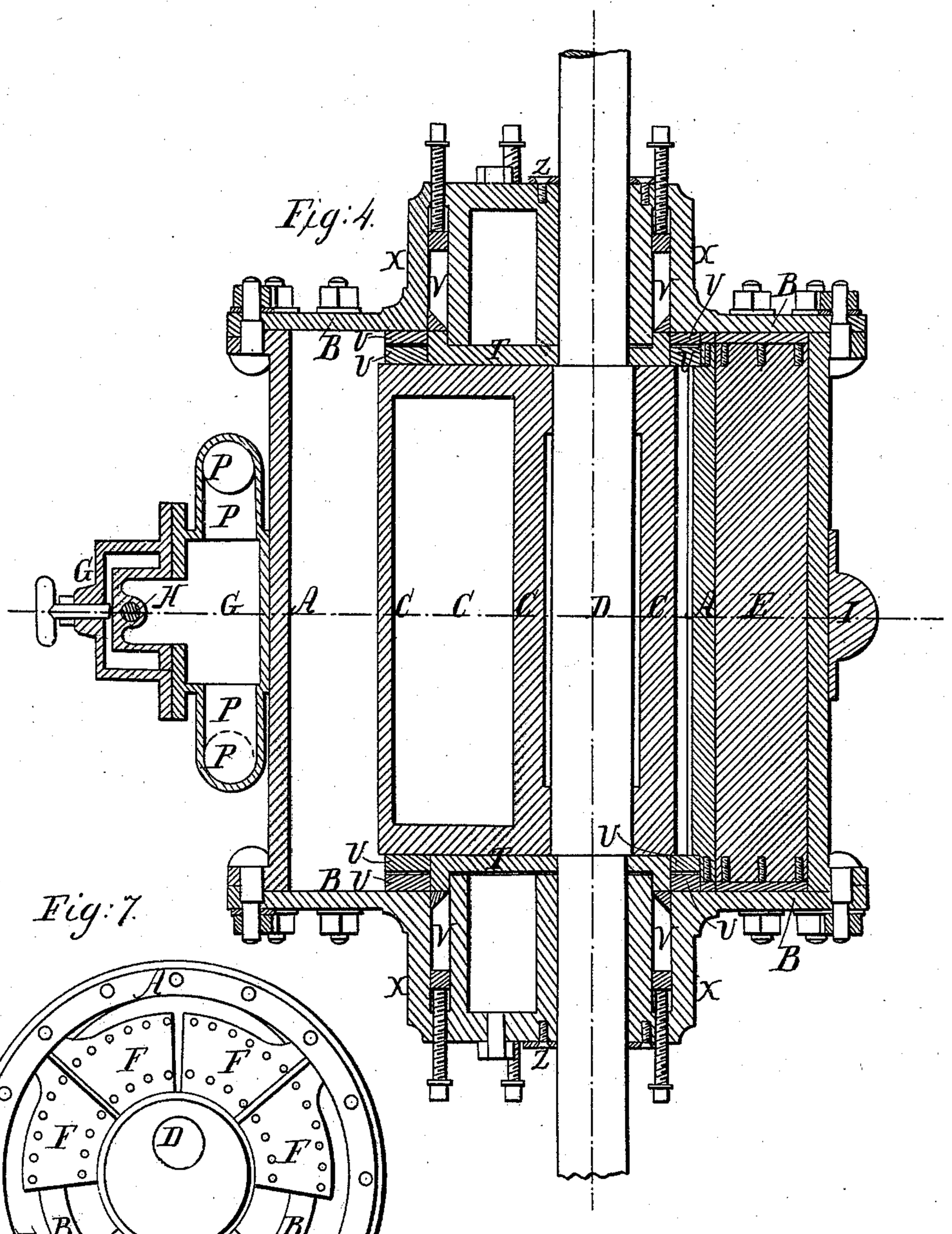

Fig: 7.

Inventor,
Matthew Fletcher

UNITED STATES PATENT OFFICE.

MATTHEW FLETCHER, OF LONDON, ENGLAND.

ROTARY STEAM-ENGINE.

Specification of Letters Patent No. 3,833, dated November 18, 1844.

To all whom it may concern:

Be it known that I, MATTHEW FLETCHER, a subject of the Queen of Great Britain, late of London, England, civil engineer, have invented or discovered new and useful Improvements in Steam-Engines; and I, the said MATTHEW FLETCHER, do hereby declare that the nature of the said improvements and the manner in which they are to be performed are fully described and ascertained in and by the following statement thereof, reference being had to the figures and letters marked thereon—that is to say, these improvements relate to an improvement and improvements in rotary steam engines.

Reference being had to Figures 1, 2, 3, 4, 5, and 6, A, A, (shown in Figs. 1, 4, 5, 6) is a bored cylinder with the lids B, B, at each end (shown in Figs. 1, 2, 3, 4); these lids are bolted fast to the cylinder.

C, C, is a fan drum (shown in Figs. 4, 5, 6) with its shaft D, D, (shown in Figs. 1, 2, 4, 5, 6) which drum turns in the cylinder, but out of the cylinder's center, and propels the shaft D, D, by means of the fliers or pistons E, E, E, (shown in Figs. 4, 5, 6) and consequently is the prime mover.

F, F, F, is the steam pipe (shown in Figs. 1, 2, 5,) where the steam comes through from the boilers to propel this machine.

G, G, is a casing box or nozzle (shown in Figs. 1, 2, 4, 5,) to reverse the steam.

H, H, is a slide cork (shown in Figs. 1, 2, 4, 5) to reverse the engine by reversing the steam and eduction. This rotary steam engine is worked by admitting the steam into the half round steam pipe I, I, I, at K, (shown in Fig. 5,) and into the cylinder through the three holes L, L, L, where it acts upon the fliers or pistons E, E, E, and propels them and consequently also the drum C, C, C, and the rotative shaft D, D. After propelling the fliers or pistons E, E, E, the steam gets out of the cylinder through the three holes M, M, M, and the belt N, N, N, into the eduction pipe P.

The machine is reversed by admitting the steam at Q (shown in Fig. 5) into the half round belt steam pipe N, N, N, and through the three holes M, M, M, into the cylinder where it acts upon the fliers or pistons E, E, E, and propels them and consequently the drum C, C, C, and the rotative shaft D, in the contrary direction to the above. After acting upon the fliers or pistons E, E, E, the steam gets out of the cylinder through the three holes L, L, L, into the half round belt steam pipe I, I, I, and the eduction pipe P.

The action of the steam on the fliers or pistons E, E, E, (shown in Figs. 4, 5, 6) which propels the drum C, C, C, and consequently the rotative shaft D and the suction of the condenser on the opposite side as described above can be readily seen by the drawings. The rotative shaft being out of the middle the fliers are carried out by the slides R, R, R, (shown in Figs. 4, 5,) which slides work in the drum grooves S, S, S, and are kept always on the sides of the cylinder by the rings T, T, which rings are concentric with the cylinders but eccentric with the drum.

The three pieces of brass U, U, U, to which the slides are fixed at each end (shown in Figs. 4, 6) are for the purpose of forming a better bearing for them, than if they rested merely on the rings P, P. The pieces of brass U, U, U, the slides R, R, R, and the fliers or pistons E, E, E, (shown in Figs. 4, 5, 6) have small bits of brass with springs in their ends to make them steam tight, which can be done either in this way or by packing and it will be seen by the drawing that the rings T, T, do not act alone for the purpose of carrying out the fliers E, E, E, but as they are packed behind in the groove V, V, (shown in Figs. 3, 4,) they become steam tight on the outside and by this packing they press against the ends of the drum and make them steam tight there. The fliers or pistons E, E, E, become steam tight on the cylinder by the pressure of steam. The internal part of the box X, X, (shown in Figs. 1, 2, 3, 4) which is cast on the cylinder lids acts as a grease cup besides having the grooves V, V, for packing and the hole or bearing for the rotative shaft (shown in Figs. 3, 4,) and for this reason it is packed a little behind at Z, Z, (shown in Figs. 1, 2, 4,) to keep the grease from coming out.

In order to reduce the friction in the above machine and thereby cause a saving in the wear and tear as well as in the loss of power I construct the fliers or pistons on a rather different plan reference being had to Figs. 7, 8, 9, (they being three end views).

Although the principle of keeping the fliers or pistons E, E, E, in their proper position is the same as they are describing the

same circle the axis of which lies in the axis of the cylinder yet it must be seen that when they are running at great velocity the friction of the fliers against the sides of the cylinder must be very considerable. To avoid this I construct the fliers or pistons on the following plan. They having grooves in their end plates and the ring or hoop B, B, B, (shown in Figs. 7, 8,) turned or fitted into these grooves to unite the said fliers or pistons together. This hoop takes the friction from the sides of the cylinder which is caused by the centrifugal power of the fliers or pistons trying to fly away from the center, for, with the same power or velocity that one flier inclines to fly away from the center with the same power it inclines to draw the opposite fliers or piston with it and thereby causes them instead of pressing against the cylinder to press against the ring or hoop and as the ring or hoop runs around with the fliers or pistons the friction is considerably reduced.

Fig. 8 shows the end plates of the fliers or pistons L, L, L, with the ring or hoop B, B, B, turned and fitted into their end plates to unite the said fliers or pistons together. Fig. 7, shows the ring or hoop B, B, B, with the plates F, F, F, which plates are fixed to the end plates of the fliers or pistons to keep the ring or hoop in its place.

Instead of making the joint X, (as shown in Fig. 5) to form part of the flier or piston E, and to make it move in and with the slides R, R, R, I cause this joint to be separate from the flier or piston and to remain at the same distance from the center of drum and let the flier, E, E, E, work through the middle of that joint instead of making that joint move with the flier.

Fig. 9, shows the fliers or pistons E, E, E, as they work through the slide joint R, R, R, which slide joint consists of two half round pieces of iron or metal and which are sunk a little into the drum C, C, C, so as to allow them to move, as the position of the fliers or pistons may require it.

The different principal parts of this improved machine are as follows: Figs. 1, 4, 5, 6, the cylinders A, A; Figs. 1, 2, 3, 4, the cylinders lids B, B; Figs. 4, 5, 6, the drum C, C; Figs. 1, 2, 4, 5, 6, the rotative shaft D; Figs. 4, 5, 6, the fliers or pistons E, E, E; Figs. 1, 2, 5, the pipe where the steam comes through from the boiler F, F; Figs. 1, 2, 4, 5, the casing box or nozzle G, G; Figs. 1, 2, 4, 5, the slide cork, H, H; Figs. 1, 2, 4, 5, the half round belt steam pipe I, I, and N, N; Fig. 5, the holes to admit the steam into the cylinder L, L, L, and to let it out again M, M, M, or on the contrary to admit the steam through the holes M, M, M, and let it out again through the holes L, L, L; Figs. 1, 2, 4, 5, the eduction pipe P, P; Figs. 4, 5, the slide R, R, R; Fig. 5 the drum grooves S, S, S; Figs. 4, 6 the rings T, T; Fig. 4, 6, the pieces of brass U U U; Figs. 3, 4, the groove V V; Figs. 1, 2, 3, 4, the box X, X; Figs. 1, 2, 4, the packing at Z, Z; and in Fig. 9 the fliers or pistons E, E, E; and in Fig. 9 the slide joint R, R, R; and in Figs. 7, 8, 9, the drum C, C; and in Figs. 7, 8, 9, the cylinder A, A; and in Figs. 7, 8, the ring or hoop B, B; and in Fig. 8, the end plates of the fliers or pistons L L, L; and in Fig. 7, the plates that go onto the end plates of fliers or pistons; Figs. 7, and 8, the ring around which the fliers or pistons work T, T.

The above described machine can be worked with either high or low pressure steam or expansively by shutting the steam passages more than those for the eduction but I think it would be most advantageous to work it first as a single high pressure engine then let the steam be transmitted through the waste steam pipe to another or more machines of the same construction. In this way I think it could be used with great advantage for steam boats as the rotary engine can be nearly as long as the boat is broad and the velocity can be increased to five times the speed of the cylinder or valve engines. Such an engine 20 feet long presenting a surface of only 6 inches in depth or 14.40 square inches to a vacuum and working with only low pressure steam would have a power of 313 horses. The principle of this machine can also be applied to pumps and propellers of vessels with great advantage, with little or no alterations.

Having described the nature of these 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 part of these improvements be retained, but

What I claim is—

1. The concentric and eccentric motion in conjunction with the jointed fliers or pistons, which cause the said fliers or pistons always to point to the center of cylinder and keep the same radius as the cylinder. The eccentric motion alone would not carry out the fliers or pistons to form a true circle if not in conjunction with the principle of jointed fliers.

2. I claim the method of taking the friction from the outside of the fliers or pistons against the sides of the cylinder occasioned by the centrifugal force by means of "the ring or hoop" which unites the fliers or pistons in manner substantially as described.

Vienna the 14 of May 1844.

MATTHEW FLETCHER.

Witness:

CHARLES LOWELL.