(No Model.) 3 Sheets—Sheet 1.

T. BEACH.

MECHANICAL MOVEMENT.

No. 524,371. Patented Aug. 14, 1894.

Fig. 2.

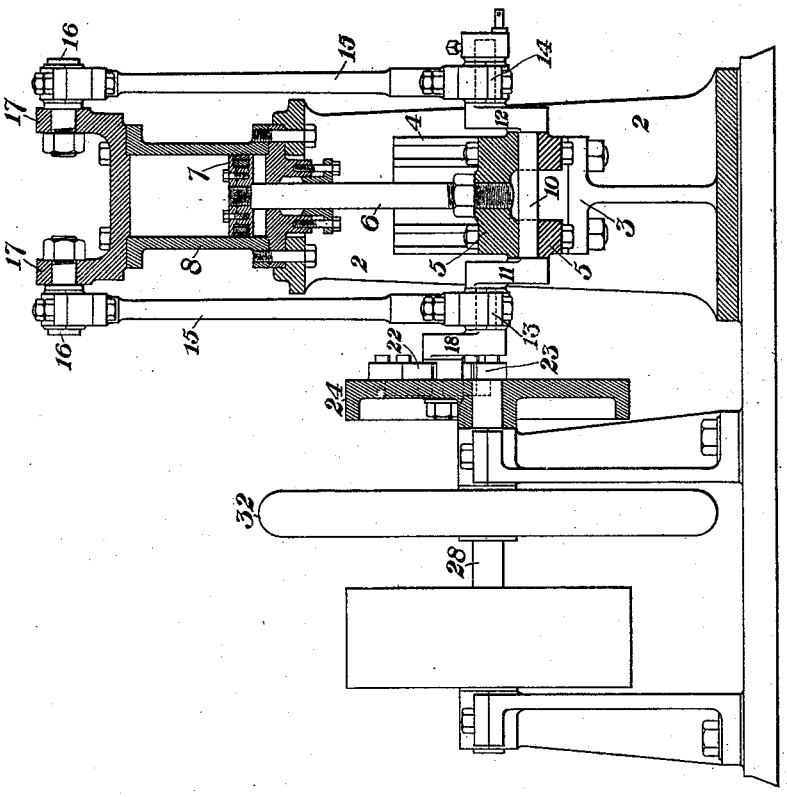
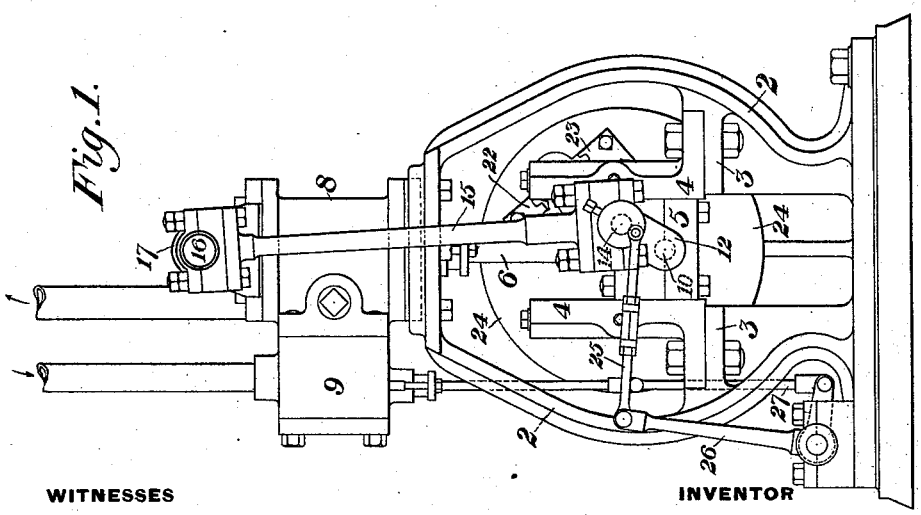


Fig. 1.



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his attorneys

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

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T. BEACH.

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Fig. 3.

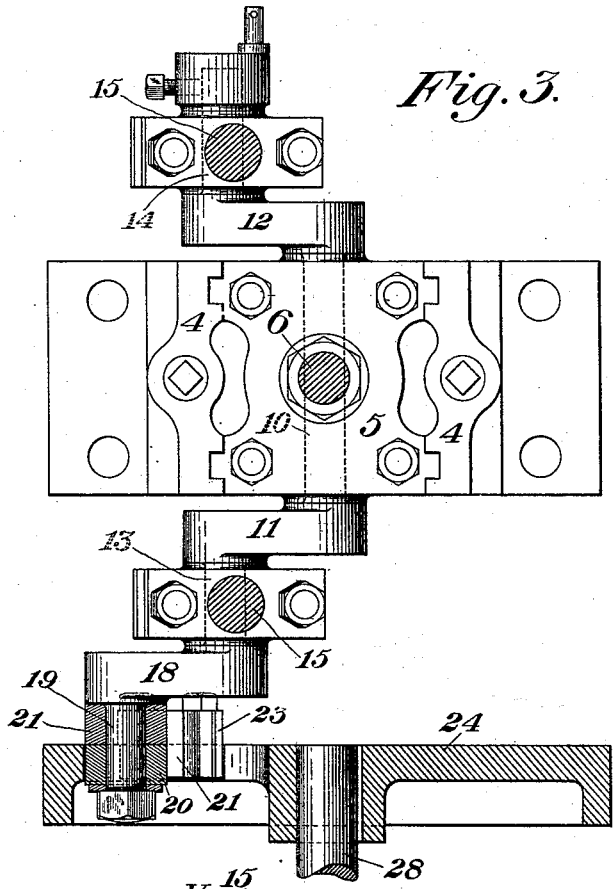


Fig. 5.

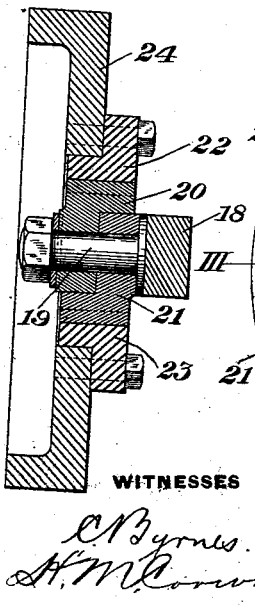
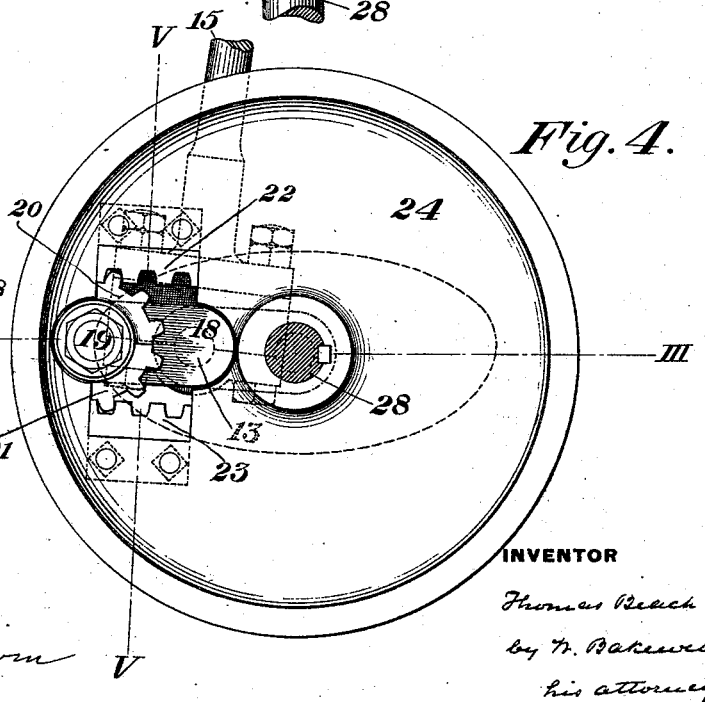


Fig. 4.



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(No Model.) 3 Sheets—Sheet 3.

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MECHANICAL MOVEMENT.

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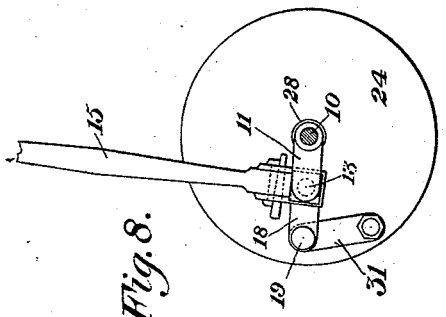

Fig. 8.

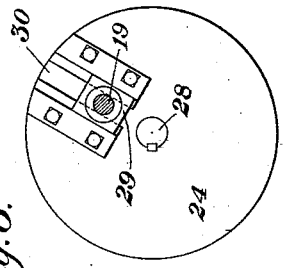

Fig. 6.

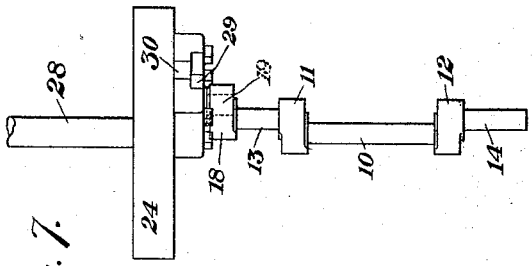

Fig. 7.

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UNITED STATES PATENT OFFICE.

THOMAS BEACH, OF FREEPORT, PENNSYLVANIA.

MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 524,371, dated August 14, 1894.

Application filed May 19, 1893. Serial No. 474,810. (No model.)

To all whom it may concern:

Be it known that I, THOMAS BEACH, of Freeport, in the county of Armstrong and State of Pennsylvania, have invented a new and useful Improvement in Mechanical Movements, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an end elevation of my improvement as applied to a steam engine. Fig. 2 is a side elevation of the same, partly in vertical central section. Fig. 3 is an enlarged top plan view of the triple crank and attachments. Fig. 4 is a front view of the rotatory disk; and Fig. 5 is a sectional view on the line V—V of Fig. 4. Fig. 6 is a front view of a modified form of face plate; and Fig. 7 is a top plan view of the same with the triple crank. Fig. 8 illustrates a third form of face-plate.

Like symbols of reference indicate like parts in each.

My invention relates to the class of mechanical movements employed for converting reciprocal into rotary motion, and is designed to provide a more effective means therefor.

To that end it consists in a triple crank suspended upon pivoted fulcrum rods, one of said cranks being operatively connected with the disk or shaft to be rotated.

It also consists in the construction and arrangement of parts as hereinafter more fully described and set forth in the claims.

In the drawings, 2 indicates the frame of a vertical direct-acting engine, having seats 3, 3, to which are bolted vertical guides 4, 4. Within these guides is mounted the cross-head 5 of a piston-rod 6 connected to the piston 7 of a steam-cylinder 8 having the usual steam-chest 9. Secured to the ends of a wrist-pin 10 passing through the cross-head are two cranks 11 and 12 having wrist-pins 13 and 14 respectively, which are pivoted in the lower ends of the fulcrum-rods 15, these fulcrum-rods being pivoted at their upper ends upon short shafts 16 projecting from lugs 17 secured to the steam cylinder 8. To the outer end of the wrist-pin 13 is secured a third or actuating crank 18, upon a projecting portion in the form of a short shaft 19 projecting from which crank are pivoted two segmental pinions 20 and 21 intermeshing with two short racks 22 and 23 secured upon opposite sides of the radial slot in the disk 24; (Figs. 4 and 5). The slide-valve is operated through the lever-system 25, 26 and 27, and when steam is admitted to the cylinder, the reciprocatory motion of the cross-head causes a rotation of the cranks and an oscillatory motion of the rods 15. The rotation of the crank 18 causes the shaft 19 to move in an elliptical path about the shaft 28, to which the disk 24 is secured, thus rotating the disk and shaft. As the disk rotates, the segmental pinions move through a semi-circular path and thus a rolling friction is obtained between the crank and the disk, though I may use a block and slideway, as shown in Figs. 6 and 7, wherein a sliding block 29, pivoted to the crank-shaft 19, reciprocates within the grooved slideway 30 of the disk.

In the modification of Fig. 8, the third crank 18 is pivoted to a link 31, which is pivotally connected to the disk, thus doing away with the slot or groove in the disk. I show in Fig. 1 a fly-wheel 32 secured to the driven shaft, but this may be dispensed with if desired.

The advantages of my invention result from the greater leverage obtained upon the disk, since the point of application of power thereto is removed a greater distance from its center, thus lengthening the lever-arm at the time that the admission valve is opened, and the greatest pressure is applied. The construction is comparatively simple and compact, and a much more efficient device is attained than heretofore.

It will be understood that although I have shown my invention as applied to a steam engine, it is equally useful in any location where reciprocatory motion is to be converted into rotary motion, and I desire to cover its use in all such connections.

By the word "guideway" in the claims, I intend to cover a recess whether it takes the form of a groove or extends through the plate.

Many variations other than those shown may be made in the form and arrangement of the parts without departure from my invention as defined in the claims.

I claim—

1. In a device for converting reciprocatory into rotary motion, the combination with the oscillatory fulcrum rods, of the substantially

parallel cranks pivoted therein, the actuating crank projecting from the wrist-pin of one of the parallel cranks, and a projection upon said crank arranged to move in an elliptical path, an independently pivoted disk, and an operative connection between the projection and disk; substantially as described.

2. The combination with the oscillatory fulcrum-rods, of the substantially parallel cranks pivoted therein, the actuating crank projecting from the wrist-pin of one of the parallel cranks, a disk having a guide-way, and a block connected to the actuating crank and movable within said guideway; substantially as described.

3. The combination with the oscillatory fulcrum rods, of the substantially parallel cranks pivoted therein, the actuating crank projecting from the wrist-pin of one of these parallel cranks, a shaft upon the actuating crank provided with segmental pinions, and a disk having racks intermeshing with said pinions; substantially as described.

4. In a device for converting reciprocatory into rotary motion, the combination with a rotatory disk having a guideway, a block movable within the guideway, oscillatory fulcrum rods, a crank pivoted therein, and an actuating crank connecting the same with the movable block; substantially as described.

In testimony whereof I have hereunto set my hand.

THOMAS BEACH.

Witnesses:
W. B. CORWIN,
H. M. CORWIN.