(No Model.)

J. B. BRAY.

MECHANICAL MOVEMENT.

No. 256,633. Patented Apr. 18, 1882.

Fig. 1

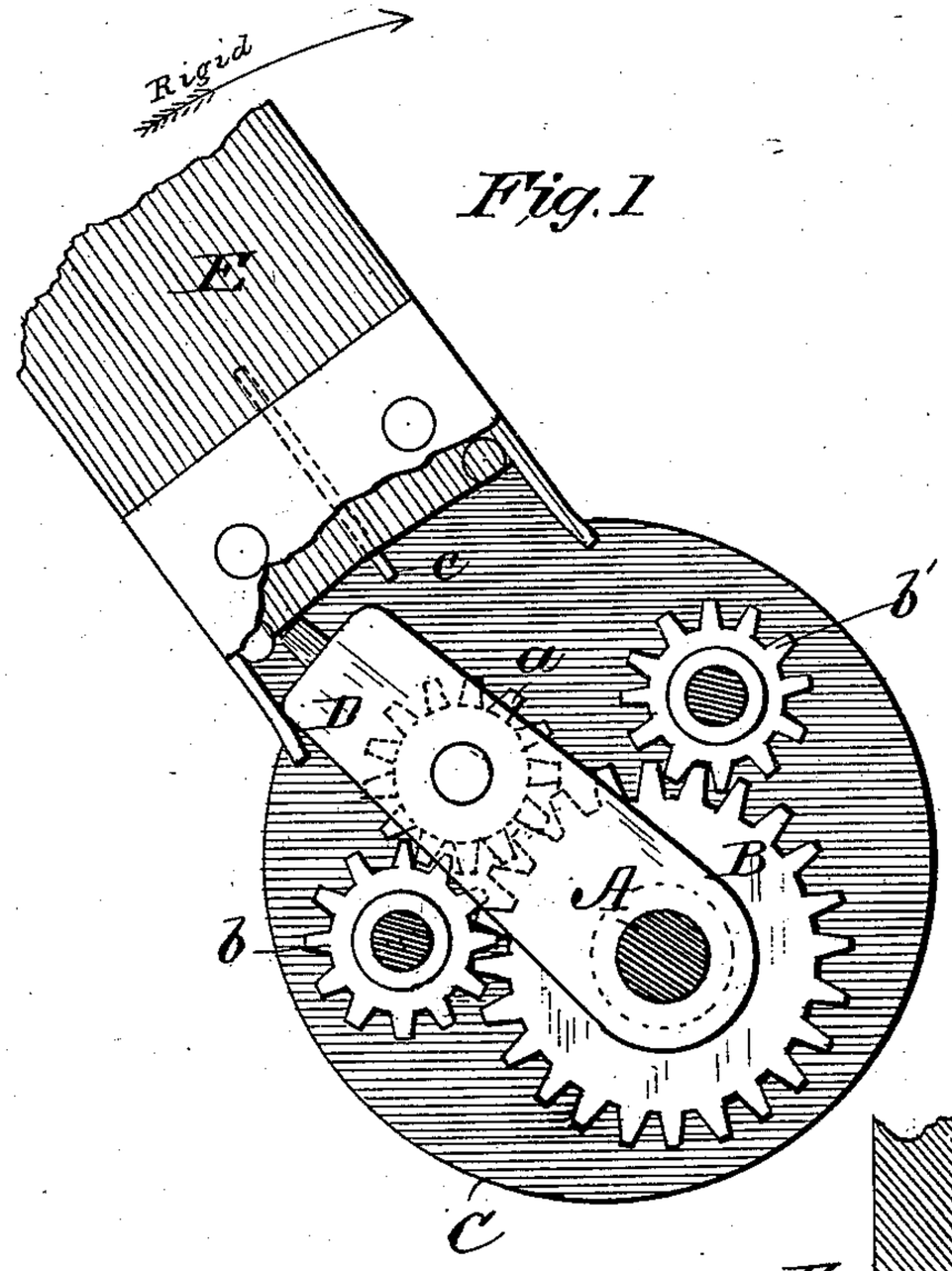


Fig. 2.

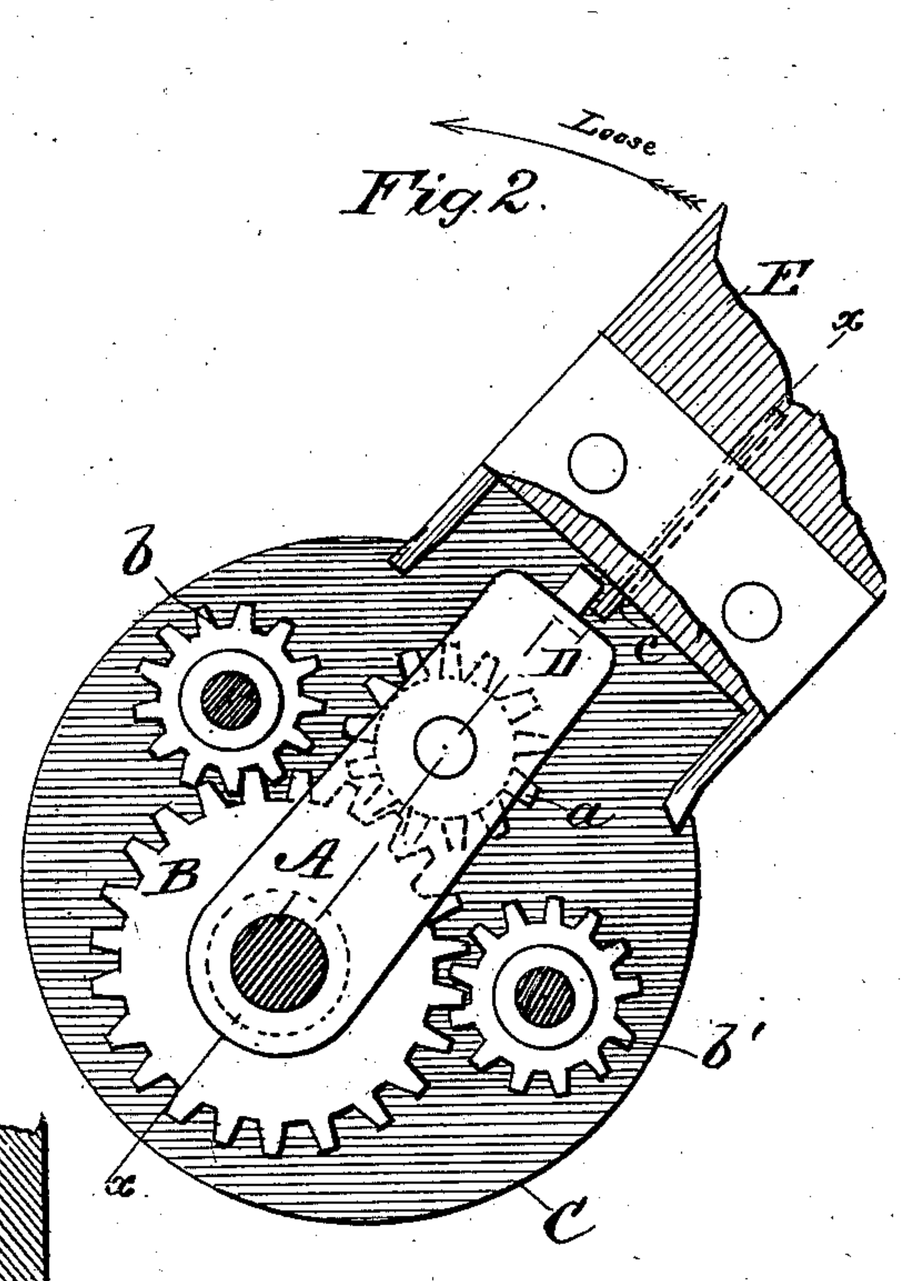


Fig. 3.

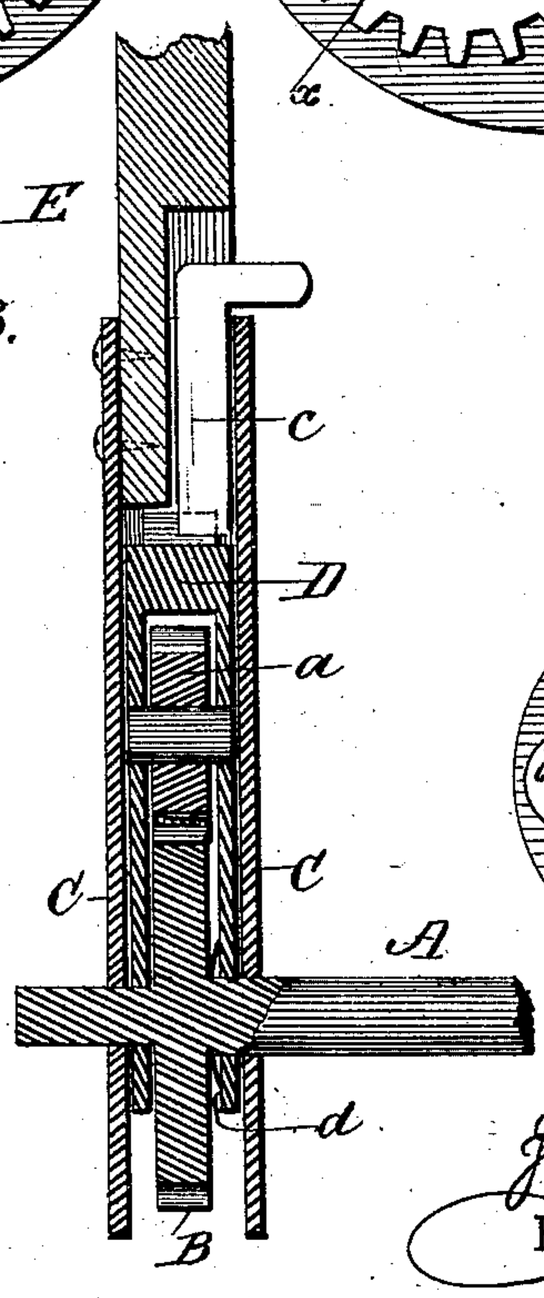
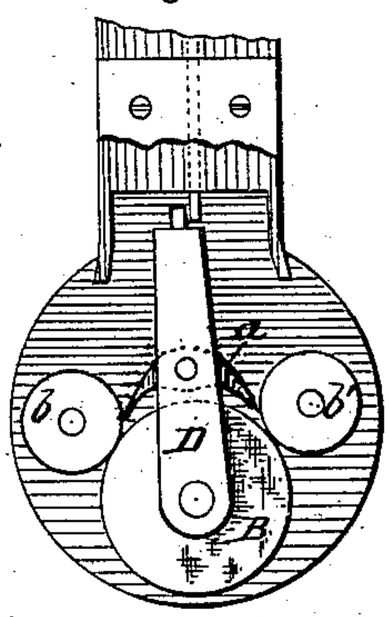


Fig. 4.



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MECHANICAL MOVEMENT.

SPECIFICATION forming part of Letters Patent No. 256,633, dated April 18, 1882.

Application filed January 24, 1882. (No model.)

To all whom it may concern:

Be it known that I, JAMES B. BRAY, of Waverly, in the county of Tioga and State of New York, have invented a new and Improved Mechanical Movement; 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 is a side view of the device with one of the frame-plates removed, and showing the swinging frame and its movable pinion in a position which for movement in the direction of the arrow makes the crank-arm rigid. Fig. 2 is a similar view of the same parts, showing the parts in position for loose movement of the crank about its shaft. Fig. 3 is a longitudinal section of Fig. 2 through the line *x x*. Fig. 4 shows a modification of my invention.

My invention relates to a new mechanical movement designed to convert an oscillating movement into a rotary movement in a single direction, and which mechanical movement is intended to take the place of a ratchet-and-pawl mechanism.

It consists in providing a rotary shaft with a rigid toothed wheel, then hanging a vibrating frame upon the said rotary shaft and arranging thereon a pinion, which meshes with the main toothed wheel, then pivoting upon a fixed center on one or both sides of this frame another pinion, that also meshes with the main gear-wheel, the parts being so arranged that when the vibrating frame moves in one direction the pinion carried by it meshes both with the main gear-wheel and the fixed pinion on that side connecting the frame (as a crank) rigidly to the main gear-wheel and the rotary shaft, to cause the latter to be turned by the former, and then when the frame is moved in the other direction it causes its movable pinion to pass out of mesh with that stationary pinion and leaves the rotary shaft and main wheel to rotate freely and independently of said frame.

The invention also consists in duplicating the fixed pinions on opposite sides of the vibrating frame and providing a stop for shifting the range of vibration of the swinging frame for permitting the device to operate for rotating the shaft in either direction, all as hereinafter more fully described.

In the drawings, A represents the rotary shaft, which is to be turned, and which carries a gear-wheel, B, fixed rigidly on said shaft between two frame-plates, C C. D is the vibrating or swinging frame hung loosely upon the shaft A as a center, and carrying a pinion, *a*, which is arranged to mesh with the main wheel B.

Upon each side of the swinging frame D is a loose pinion, *b* and *b'*, arranged upon fixed bearings in plates C C, and in gear with the main gear-wheel. Now, when the swinging frame is moved toward the pinion *b* it will be seen that the swinging pinion *a* meshes both with the pinion *b* and the gear-wheel B and jams all these wheels rigidly together, so that for movement in the direction of the arrow in Fig. 1 this swinging frame acts like a rigid crank on the shaft to turn it, while for the reverse movement of said frame D its pinion leaves the pinion *b* and moves freely backward over the wheel B to take a new position on the same for turning it again. To define this backward movement of the swinging frame from the pinion *b* a stop, *c*, is arranged in a crank arm or handle, E, which arm is rigidly attached to the frame-plates C C, and which stop is made adjustable, so as to slide back and allow the swinging frame to be shifted to the other side of the same and in a position for engagement with the other pinion, *b'*. The object of this second pinion *b'* and the adjustability of this stop is simply for the purpose of reversing the direction of movement of the shaft. Thus when the swinging frame vibrates between the stop *c* and the pinion *b*, as in Figs. 1 and 2, it turns the shaft in one direction; and when it vibrates between the stop *c* and the pinion *b'*, it turns the shaft in the opposite direction. I may therefore, in many applications of the device, use only one pinion, *b*, and need not make the stop *c* adjustable.

Among the principal uses for which I design my movement is for the driving-cranks of a velocipede. In this application the plane of all of the wheels is vertical. The main shaft is the wheel-shaft and the arm E is the driving-arm, and when the arm E is moved in the di-

rection of the arrow, Fig. 1, the swinging frame is held to pinion *b* by the strain until the swinging frame passes over to the right of the center of the shaft A. Then when the strain on arm E is relieved the swinging frame is in a position where it is free to drop away from the pinion *b* to allow the swinging frame to move freely back over wheel B to take a fresh hold. Another application of the device is for ratchet-drills, and when used for this purpose the plane of the wheels is horizontal. When so used some positive mechanism is required for binding the swinging frame to the shaft or its wheel B with a frictional contact, so as to insure the throwing out of gear of the swinging pinion on the back movement, and for this purpose a friction-disk, *d*, is placed between the frame D and the wheel B.

As a modification of my invention I may use friction-gears instead of the toothed wheels B *b b' a*, or in the place of pinion *a*, I may use a wedge, *a'*, as shown in Fig. 4.

Among the advantages of this device may be mentioned the fact that it is very positive and quick in its action, and is entirely free from the clicking noise of ratchet-teeth when running.

Having thus described my invention, what I claim as new is—

1. The combination, with a rotary shaft having a rigid wheel thereon, a loose wheel meshing with the said rigid wheel and arranged on a fixed center, of a swinging frame hung upon the said shaft and having a loose wheel or its equivalent, as described, meshing against the said rigid wheel and adapted to jam between it and the said wheel on the fixed center, as and for the purpose described.

2. The combination, with a rotary shaft having a rigid toothed wheel thereon, a loose pinion fixed on a stationary bearing and gearing with said rigid wheel, and a swinging frame hung upon the rotary shaft and carrying a loose pinion also gearing with the rigid wheel and adapted, as described, to jam the same with the relatively fixed pinion, as described.

3. The combination, with the frame-plates C C and the arm E, rigidly attached thereto, of the rotary shaft A, carrying rigid wheel B, the pinions *b b'*, arranged on fixed centers on opposite sides of the swinging frame and in gear with the wheel B, and the swinging frame D, having a pinion, *a*, adapted to jam with either of the wheels *b b'* to rotate the main shaft in either direction, as described.

The above specification of my invention signed by me in the presence of two subscribing witnesses.

JAMES B. BRAY.

Witnesses:
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EDWD. W. BYRN.