

W. C. FARNUM.  
Pawl and Ratchet Device.

No. 224,524.

Patented Feb. 17, 1880.

Fig. 1.

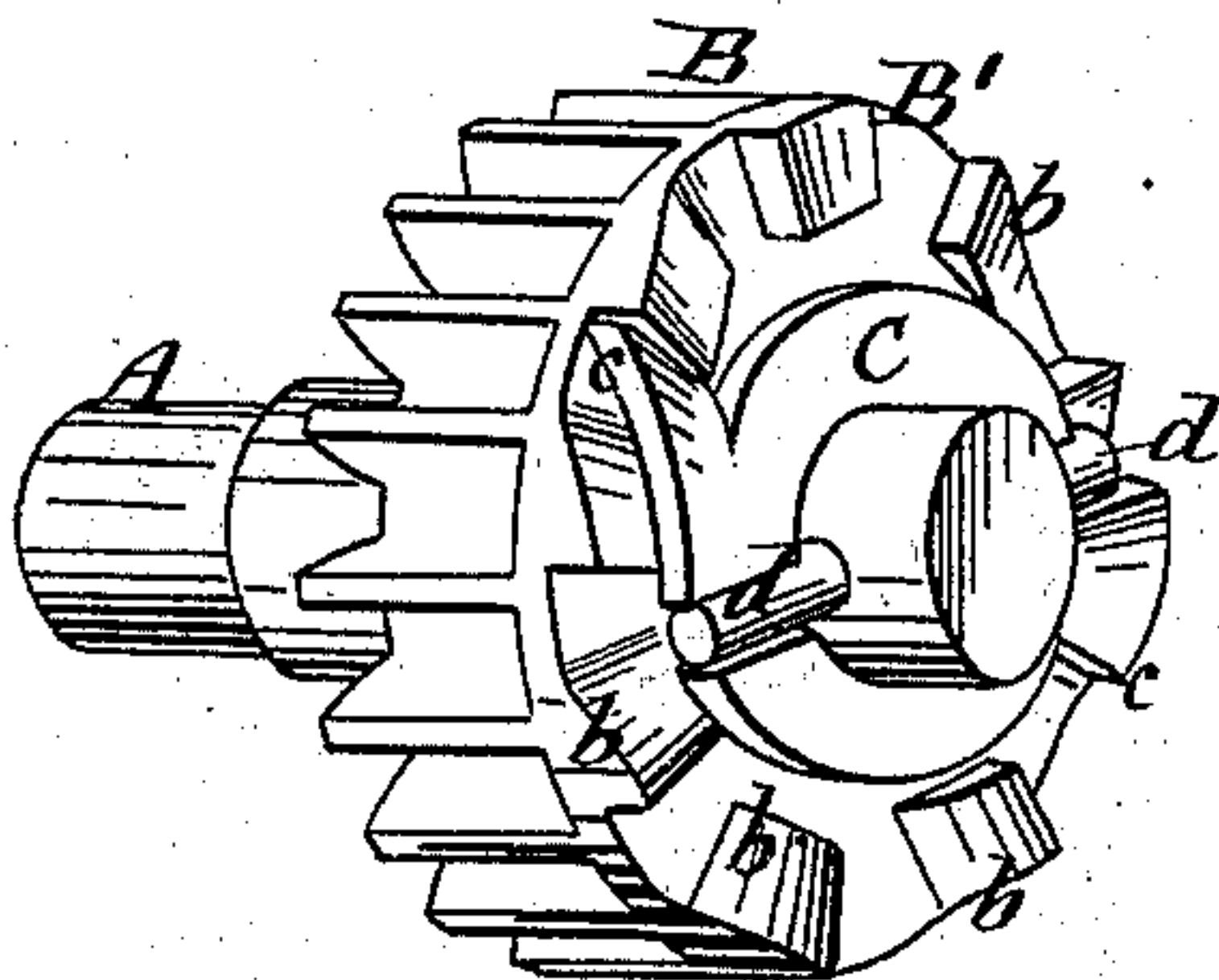


Fig. 2.

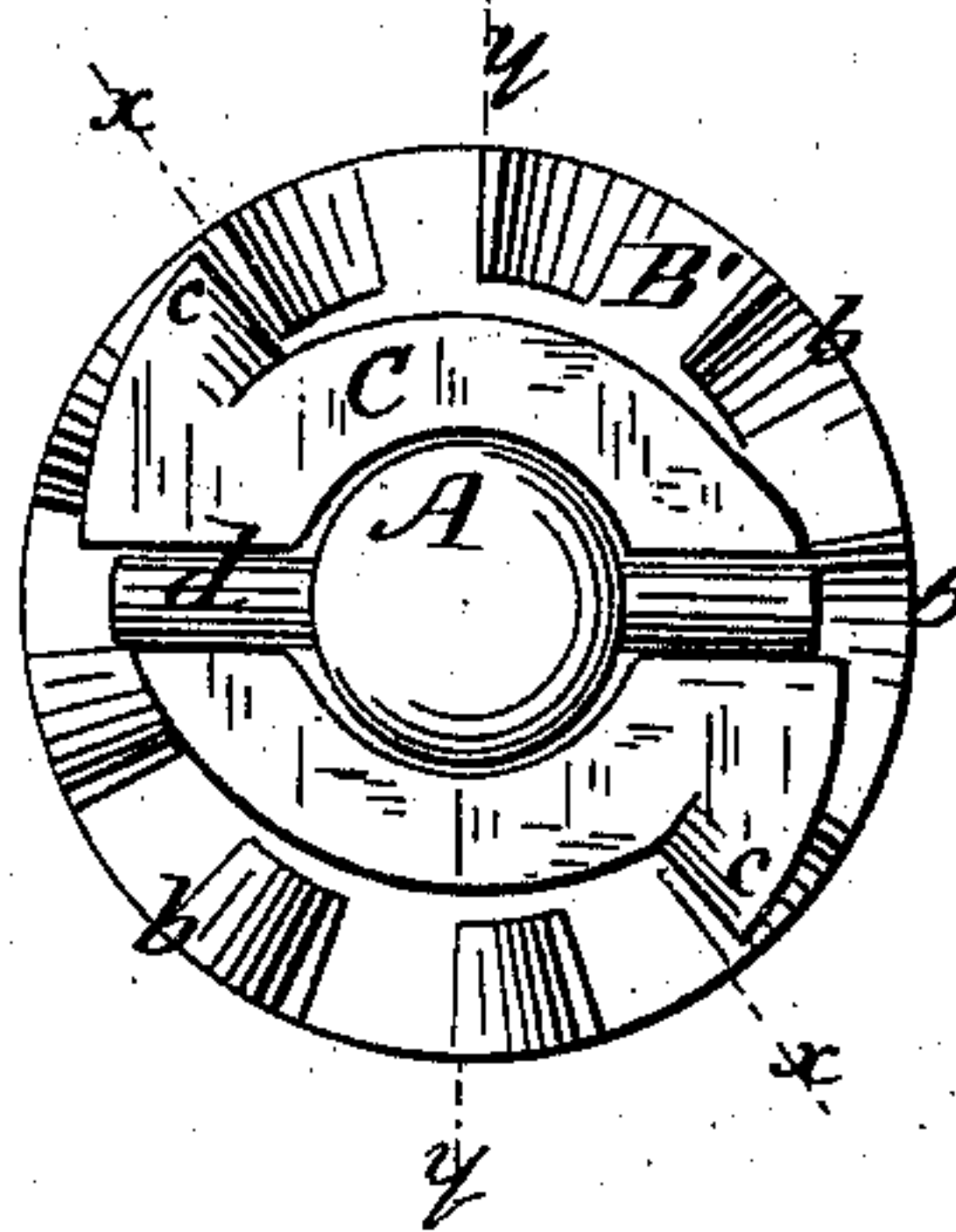


Fig. 3.

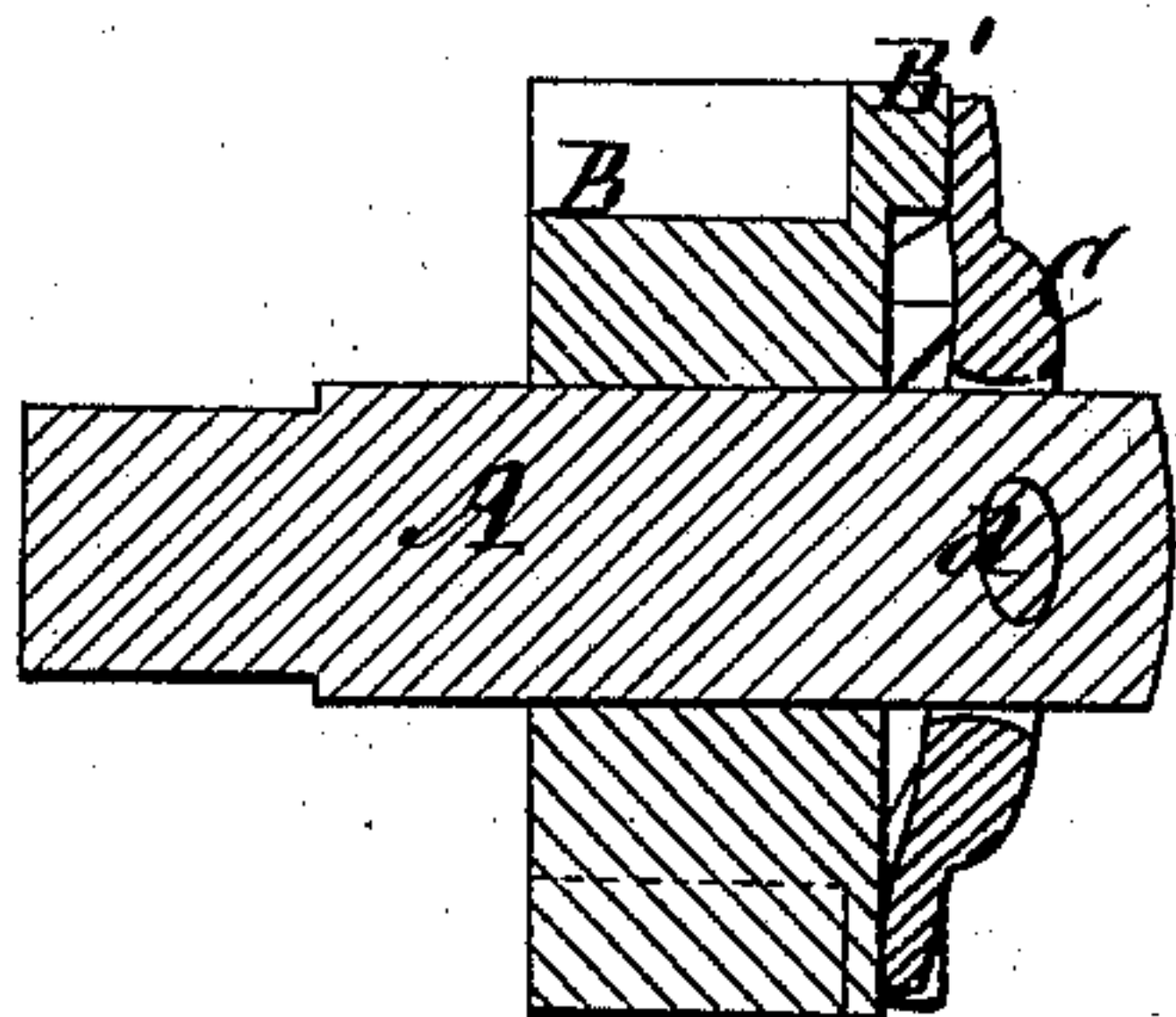


Fig. 4.

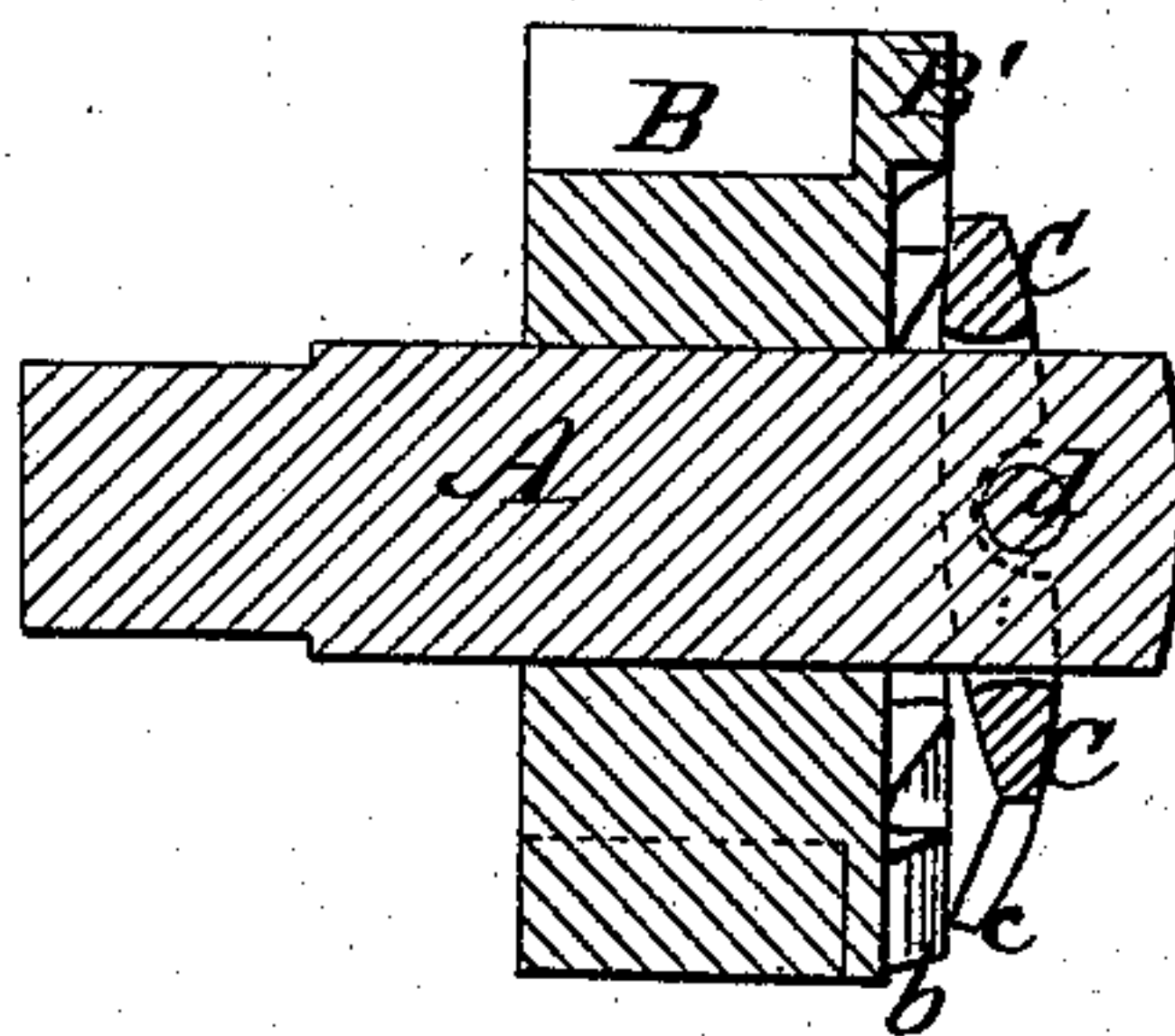


Fig. 5.

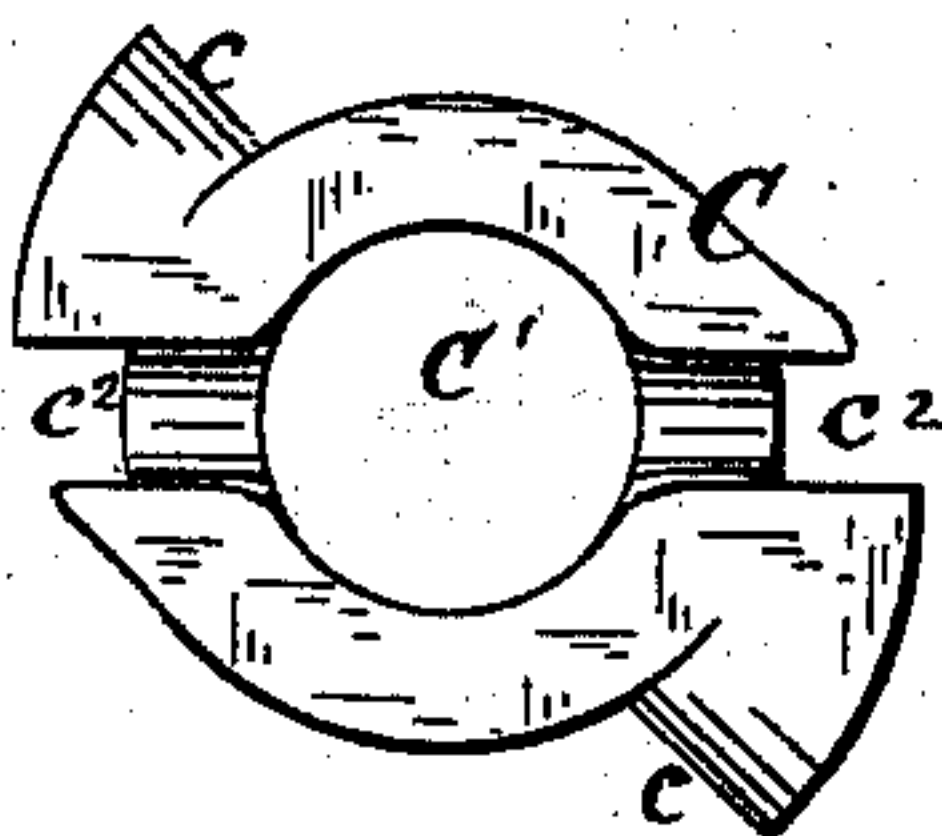
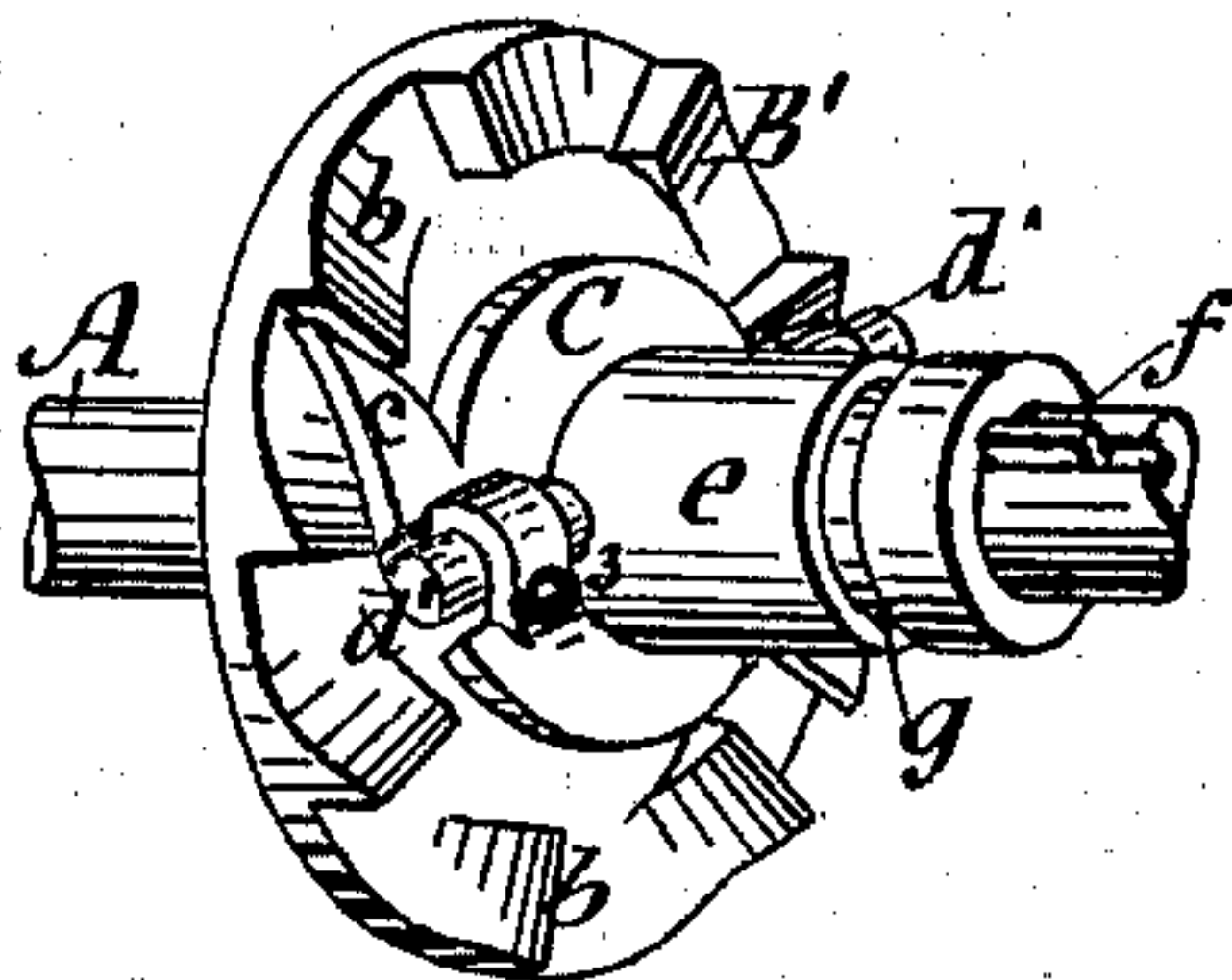


Fig. 6.



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# UNITED STATES PATENT OFFICE.

WILLIAM C. FARNUM, OF HOOSICK FALLS, NEW YORK, ASSIGNOR TO LYMAN WILDER, OF SAME PLACE.

## PAWL-AND-RATCHET DEVICE.

SPECIFICATION forming part of Letters Patent No. 224,524, dated February 17, 1880.

Application filed June 12, 1879.

*To all whom it may concern:*

Be it known that I, WILLIAM C. FARNUM, of Hoosick Falls, in the county of Rensselaer and State of New York, have invented certain new and useful Improvements in Pawl-and-Ratchet Devices; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 represents a perspective view of the pawl-and-ratchet device connected to a gear-wheel and its shaft. Fig. 2 represents a front view of the same. Fig. 3 represents a longitudinal section of the same, taken on line *x x* of Fig. 2. Fig. 4 represents a similar section, taken on line *y y* of Fig. 2. Fig. 5 represents a front view of the pawl detached. Fig. 6 represents a perspective view of the pawl and ratchet with the pawl connected to a sleeve placed upon a shaft or axle.

My invention relates to pawls used on various kinds of mechanisms in connection with a ratchet to transmit motion to said mechanism in one direction only, while the shaft carrying the pawl or ratchet may turn either forward or backward.

Heretofore pawls have generally been rendered operative either by means of springs pressing upon and forcing them in engagement with the teeth of ratchet-wheels, or so located that their own gravity will perform the same function as springs.

The object of my invention is to dispense with springs common to ratchet devices, simplify said device, and still render it operative, in whatever position or inclination it may be placed, by making it positive and independent in its action.

My invention consists in a rocking pawl provided with a central opening and diametrically-located engaging-points.

It consists, also, in the means provided for connecting said pawl to a shaft, and in its combination with a ratchet-wheel, as will be first described in connection with the drawings, and then pointed out in the claims.

In the drawings, A represents a shaft or axle. Upon said shaft is placed a gear-wheel, B, capa-

ble of rotating thereon independently of the latter. This wheel B has, in the form of a circle, an odd number of ratchet-teeth, *b*, projecting from its face, with which the radial edges *c* of the peculiarly-constructed pawl C can engage to rotate the ratchet and cog-wheel in one direction, but over the face of which it will slip and pass if the shaft A is rotated in the opposite direction. For this purpose the pawl C has a central opening, *c'*, slightly larger than the diameter of the shaft upon which it is placed, and retained at a very short distance from the ratchet-wheel B' by a pin, *d*, passing tightly through said shaft. This pin enters and fits loosely in a diametrical groove, *c''*, in the pawl, and allows the latter to rock upon it as an axis.

The ratchet-wheel B' having an odd number of teeth, and the engaging edges or ends *c* of the pawl being in line upon the same diameter, it follows that while one of the edges *c* of the pawl rides upon the highest part of one of the ratchet-teeth the other will be upon the lowest, directly in the rear of one of the teeth, and in position to engage with the latter if the shaft A is rotating in the right direction to move the ratchet and gear-wheel. The action of this pawl is always positive in engaging with every cog, tooth, or projection of a ratchet-wheel upon the face of which it passes, and does not require any spring to press upon it to secure this effect.

If the ratchet-wheel had an even number of teeth the pawl should be constructed with its engaging edges *c* out of a diametrical line, at such a distance from said line that one end of the pawl would be elevated while the other rests in the hollow between two teeth.

If it should be required to disconnect at times the pawl from the ratchet, various modes may be employed.

In Fig. 6 the shaft A is shown as provided with a sleeve, *e*, connected thereto by a longitudinal feather, *f*, so that the shaft and its sleeve will continuously rotate together, although the sleeve can slide freely upon this shaft in the direction of its length. This longitudinal motion can be controlled by a forked lever, the branches of which may enter the groove *g* in its periphery. This sleeve carries pins or



trunnions  $d'$ , upon which the pawl can rock, as previously stated in relation to the single pin  $d$ . The pawl, in this case, is provided with lugs  $c^3$ , that are bent over the pins  $d'$ , to thus loosely  
5 secure the pawl to the sleeve and be controlled thereby. Other means may be used to connect the pawl and its sleeve to the shaft, and yet allow said pawl to be disconnected from the ratchet-wheel when desired—as, for example,  
10 by having the pin  $d$  secured to the sleeve and passing through a diametrical slot in the shaft.

The sleeve and its pawl may remain stationary upon the shaft, and the ratchet-wheel be moved by suitable means toward or away from  
15 the sleeve and its pawl.

Having now fully described my invention, I claim—

1. In combination with a ratchet-wheel, the double pawl C, provided with two ends,  $c$ , bent

toward said ratchet-wheel, and a central opening, substantially as and for the purpose described. 20

2. The pawl C, provided with two engaging edges,  $c$ , a central opening,  $c'$ , and two radial grooves,  $c^2$ , substantially as and for the purpose  
25 described.

3. The combination of a ratchet-wheel mounted upon a shaft and a double pawl having a central opening to receive said shaft, and also a diametrical groove, with a pin, by which it  
30 is connected to the shaft, and upon which it is adapted to rock and engage its ends alternately with the teeth of the ratchet-wheel, substantially as and for the purpose described.

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Witnesses:

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