

(No Model.)

W. S. BUXTON.
RATCHET AND PAWL DEVICE.

No. 395,737.

Patented Jan. 8, 1889.

Fig. 1.

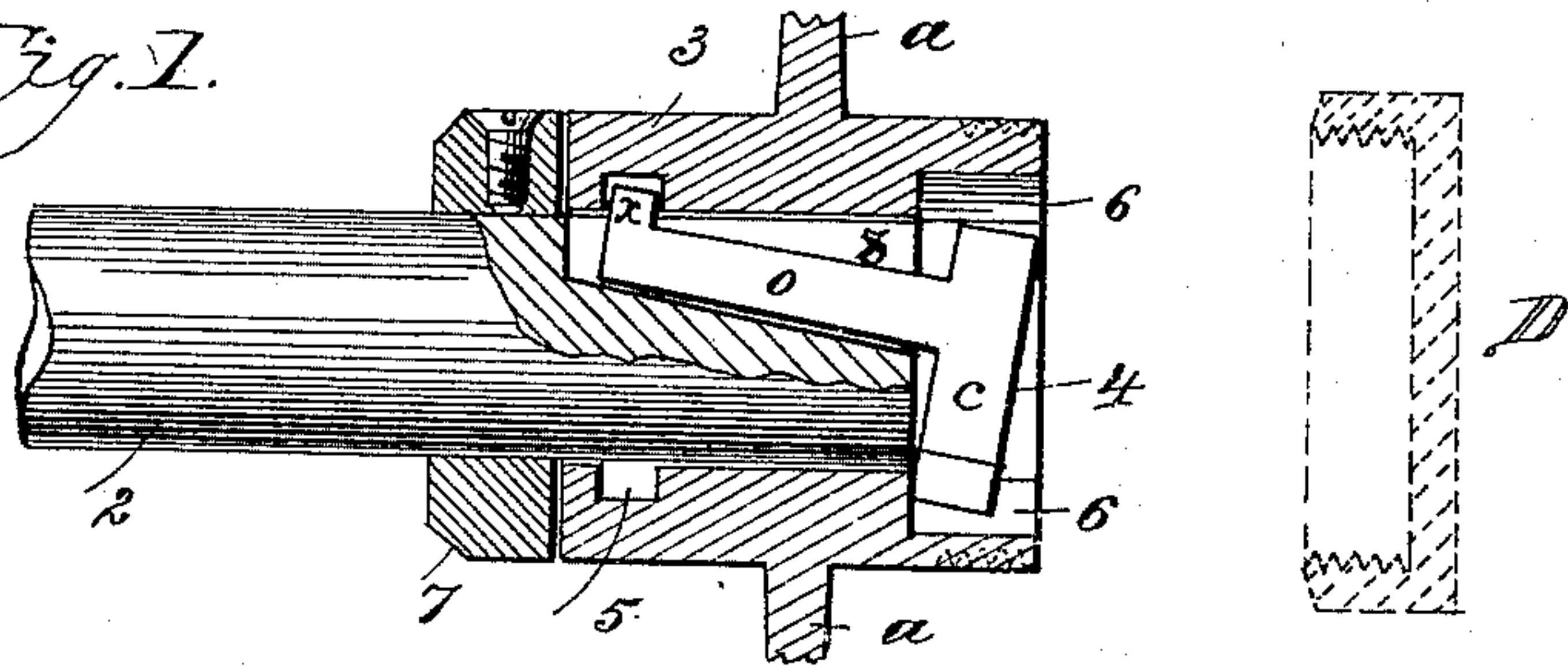


Fig. 2.

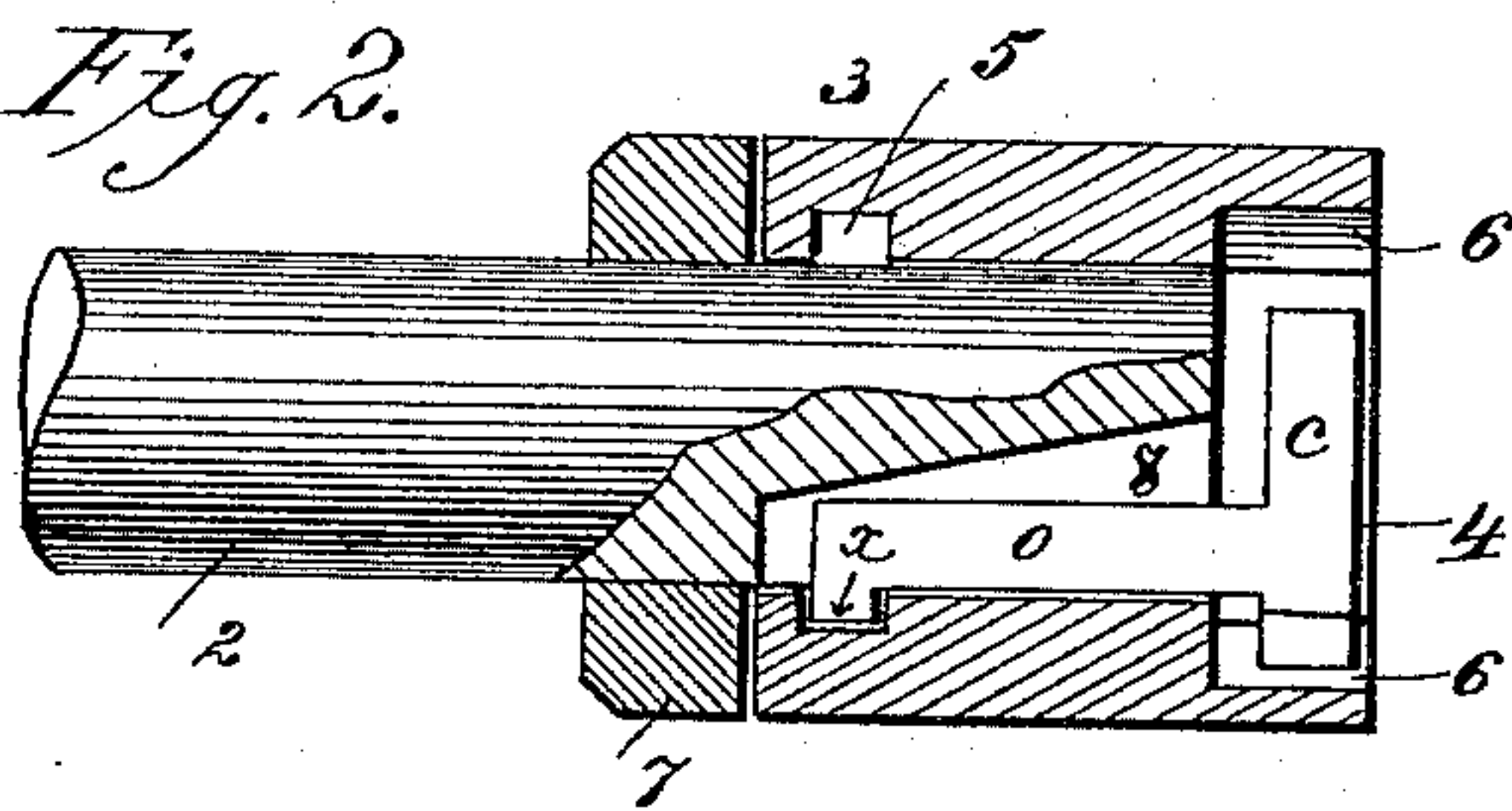


Fig. 5.

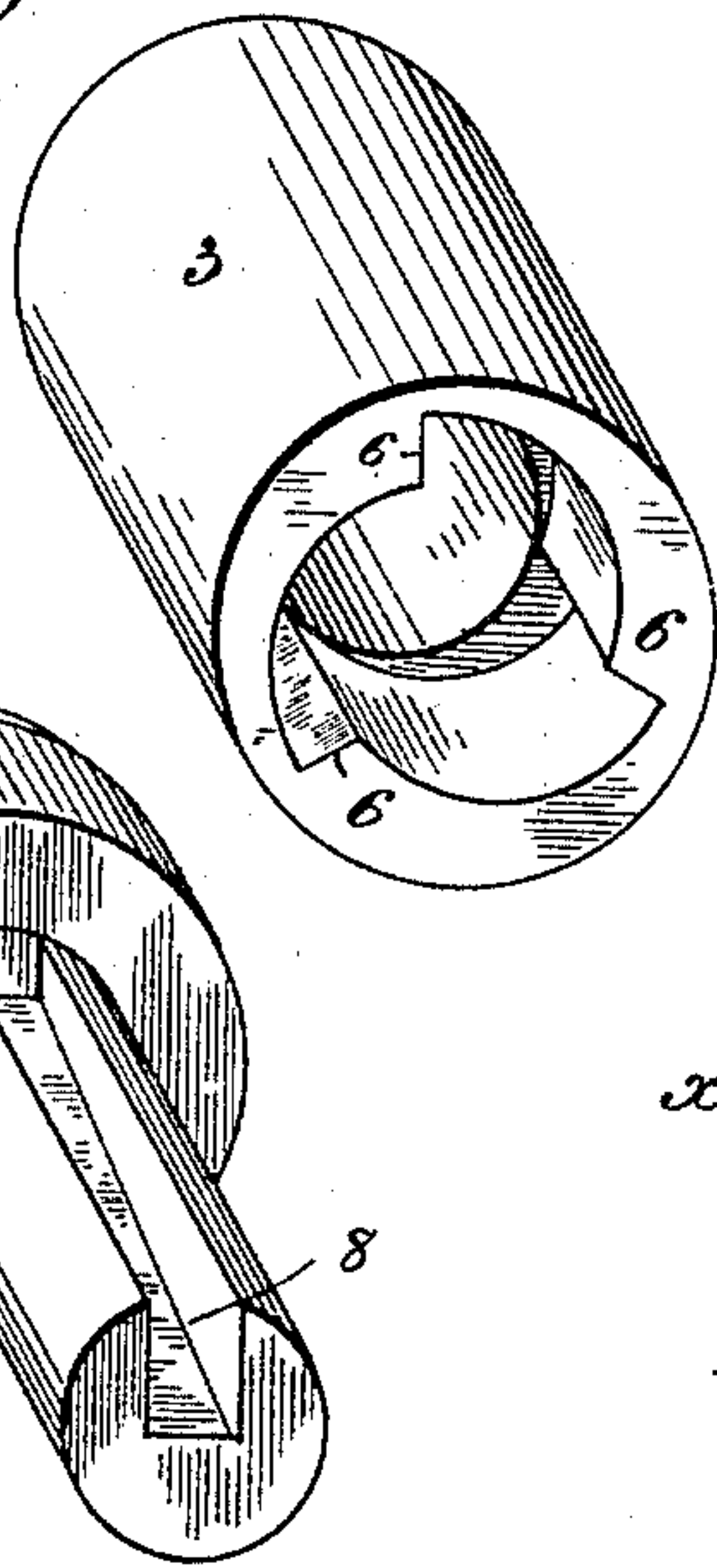


Fig. 3.

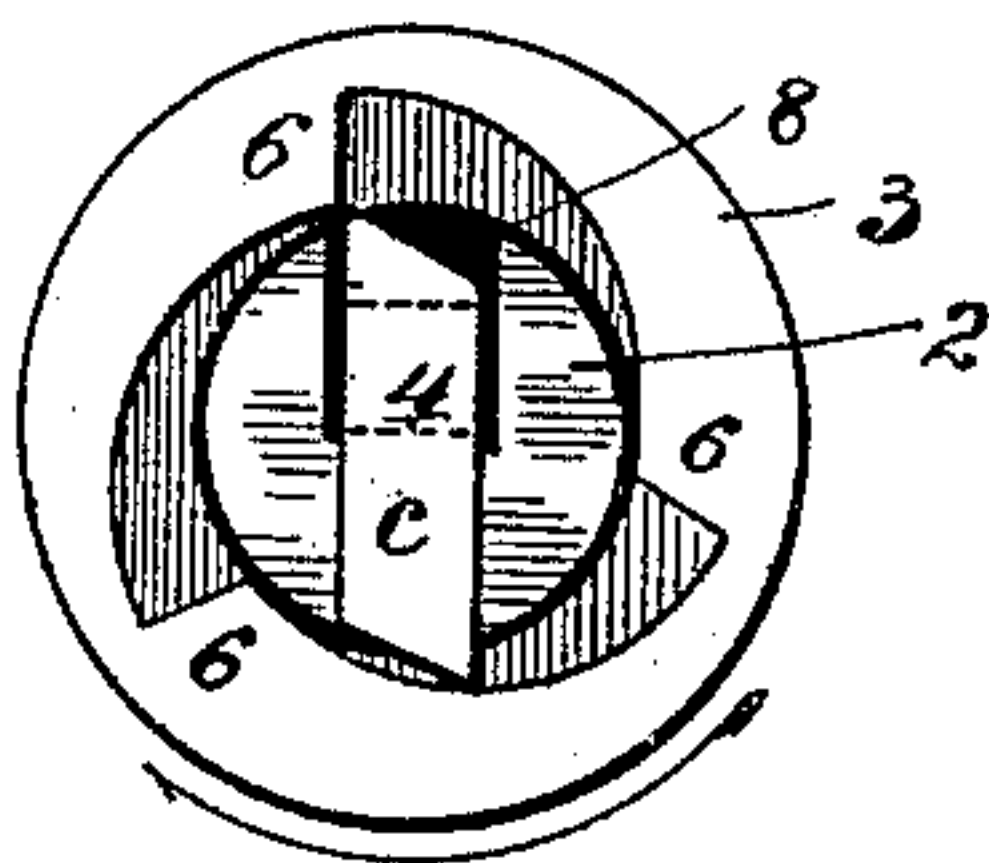
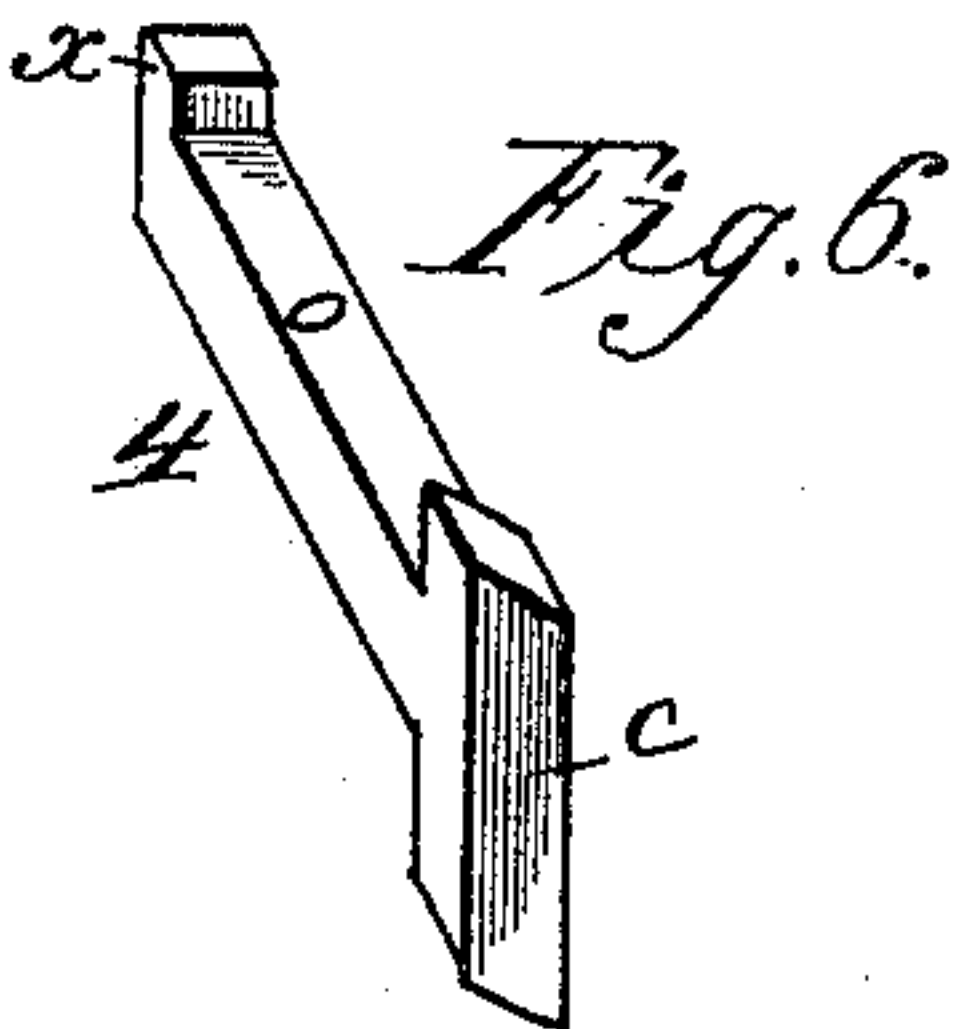
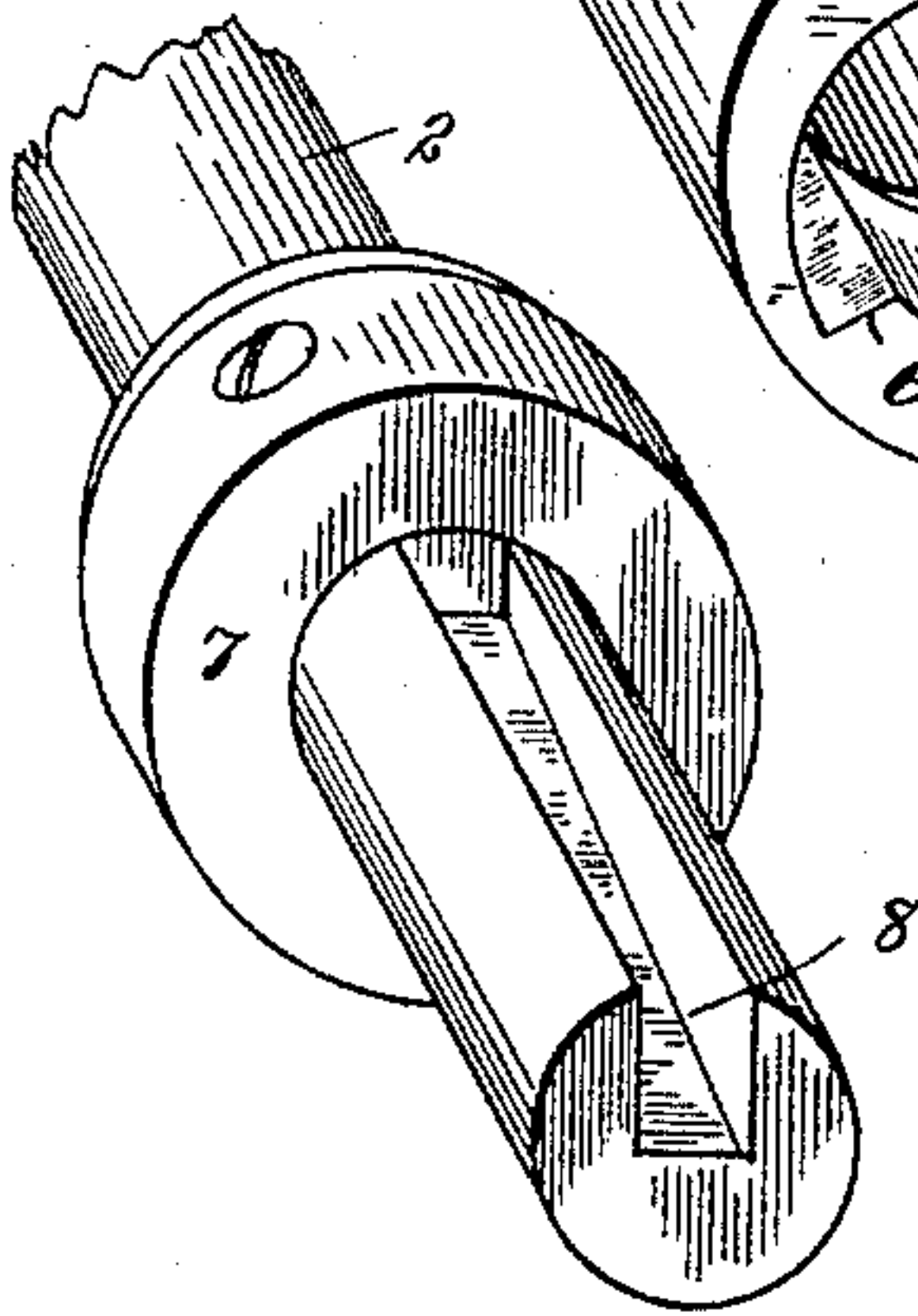


Fig. 4.



Witnesses

Wm. F. Bellamy,
G. W. Chamberlain.

Inventor,

Wm. S. Buxton,
By his Attorneys, *Chapman*

UNITED STATES PATENT OFFICE.

WILLIAM S. BUXTON, OF SPRINGFIELD, MASSACHUSETTS.

RATCHET-AND-PAWL DEVICE.

SPECIFICATION forming part of Letters Patent No. 395,737, dated January 8, 1889.

Application filed April 23, 1888. Serial No. 271,613. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM S. BUXTON, a citizen of the United States, residing at Springfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Ratchet-and-Pawl Devices, of which the following is a specification.

This invention relates to ratchet-and-pawl devices, the object being to provide an improved pawl construction adapted to operate with a longitudinally-slotted shaft, and in conjunction with a hollow cylinder or hub of a wheel having on its inner wall a series of ratchet-teeth to engage with the pawl.

The invention consists in the peculiar construction and arrangement of the pawl and the cylinder or hub with which it co-operates, all as hereinafter fully described, and pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a side elevation showing one end of a shaft partly in section, a collar and a hub thereon in section, and the pawl in operative relation to said hub and shaft, all showing a pawl-and-ratchet construction embodying my invention, said figure also showing in dotted lines the form of a cap adapted to be screwed onto the end of said hub. Fig. 2 is a similar view to Fig. 1, but showing the pawl therein in a different position from that shown in Fig. 1. Fig. 3 is an end elevation of the shaft, the hub, and the pawl. Fig. 4 is a perspective view of the shaft and the collar thereon. Fig. 5 is a perspective view of the hub or cylinder having the ratchet-teeth therein. Fig. 6 is a perspective view of the pawl.

In the drawings, 2 indicates the end of a shaft having a longitudinal groove, 8, therein, and 3 indicates a hub or a cylinder, with which it may be desirable to form a ratchet-and-pawl connection, whereby it may be given a rotary motion by said shaft, or whereby the shaft shall be given a like motion by said hub or cylinder *a*, indicating in Fig. 1 portions of the spokes of a wheel, of which 3 may constitute the hollow hub. The other figures of the drawings in which the hub is shown do not show the said portions of spokes that are shown in Fig. 1. The said hub 3 is fitted to rotate on the end of the shaft 2, and has one end projecting beyond the end of said shaft,

as shown in Figs. 1 and 2, and the hub is held in that position on the shaft by a collar, 7, or other suitable means, whereby the hub is maintained in such position on the shaft as will cause it to inclose the said grooved portion thereof. Said hub 3 is provided with an annular groove, 5, in its inner wall, near its rear end, as shown, and the inner wall of that portion thereof which projects beyond the end of the shaft 2 is provided with a series of ratchet-teeth, 6.

The pawl 4 is constructed, preferably, of steel, and consists of a head, *c*, having a bar, *o*, extending at right angles thereto, and on the end thereof opposite to that on which is said head is a short laterally-extending arm, *x*. The ends of the pawl-head *c* are preferably beveled off, as shown, to facilitate their engagement with said ratchet-teeth 6 in the hub 3, as below set forth.

The operative position of the pawl 4 relative to the shaft 2 and the hub 3 is clearly shown in Figs. 1 and 2, and in said position the head *c* of the pawl stands substantially at right angles to the end of said shaft, the bar *o* thereof reaching from the end of the shaft longitudinally within the groove 8 therein, and the arm *x* on the side of said bar is engaged in the annular groove 5 in the inner wall of the hub, whereby the pawl is retained within the latter. The said groove 8 is so formed in the shaft 2 that it is deepest at the end of the latter to permit the head-bearing end of the pawl to have a vibratory motion opposite the end of the shaft and within the ratchet-toothed portion of the hub 3 substantially at right angles to the axis of the shaft. The inner end of the bar *o* of the pawl is, by the shallowness of the groove 8 at its inner end, retained in a position so near the inner wall of the hub that the arm *x* on the bar of the pawl is retained in engagement with the annular groove 5, as shown in Figs. 1 and 2.

If desired, the hub 3 may be made without the groove 5, and the said arm *x* may be omitted from the bar of the pawl, and the latter be held in place in the hub and in the groove of the shaft by screwing a cap, *D*, onto the end of the hub, said cap being indicated in dotted-line section in Fig. 1.

A cap as just described screwed onto the end of the hub 3 would serve to close the end

of the hub and prevent dust and dirt from accumulating therein, as well as to retain the pawl in place, as aforesaid.

The pawl herein shown and described, together with the grooved shaft in which the bar thereof engages, constitutes a construction embodying at once simplicity, ease, and certainty of operation, and strength of parts to resist the strain upon the pawl incident to the sudden reversal of the shaft or hub movement. The long bearing of the bar *o* of the pawl in the groove of the shaft imparts such strength to the pawl as contributes to said power of resistance to strain when the rotating parts are reversed, as aforesaid.

The operation of the within-described pawl-and-ratchet device, in connection with the cutter-shaft of a lawn-mower and the guiding-wheel thereof, or in other similar relations, will be easily understood by one familiar with such mechanism. When the hub 3 is rotated in the direction indicated by the arrow in Fig. 3, one of the ratchet-teeth 6 is brought into engagement with one end of the pawl-head *c*, and thereby the shaft 2 is caused to rotate with the hub. The reverse movement of the hub, whereby the ends of the head of the pawl are brought into engagement with the curved portions of the ratchet-teeth, causes the pawl to have an oscillating movement at the end of the shaft and within the groove 8 therein; but the pawl is capable, owing to the perfect freedom of movement which it has, of engaging instantaneously with the said ratchet-teeth in the hub when the latter is again rotated in the direction indicated by the arrow in Fig. 3.

What I claim as my invention is—

1. A pawl-and-ratchet device consisting of

a shaft having at one end thereof a longitudinal groove, a hub capable of rotating on said shaft, having ratchet-teeth on its inner wall and an annular groove in said wall, combined with a pawl having a bar thereon extending into the groove in said shaft, and an arm on said bar engaging with said annular groove, and a head on the end of said bar adapted to have a vibratory motion at the end of said shaft and engaging by either end with said ratchet-teeth, substantially as set forth.

2. In combination, the shaft 2, having at one end thereof a longitudinal groove deepest at the end of the shaft, a hub, 3, capable of rotating on said shaft, having one end extending beyond the end of the shaft, and having in the inner wall thereof ratchet-teeth 6, and the annular groove 5 and the pawl 4, having a bar thereon extending into said groove in the shaft, a head on the end of said bar engaging with said ratchet-teeth, and an arm on said bar engaging with the annular groove in said hub, substantially as set forth.

3. In combination, the grooved shaft 2, the pawl 4, having a head, *c*, a bar, *o*, extending into the groove in said shaft, and a laterally-projecting arm, *x*, on said bar, a hub capable of rotating on said shaft extending beyond the end thereof and surrounding said pawl-head, and having ratchet-teeth with which said pawl-head engages, and an annular groove in its inner wall with which said arm *x* engages, and a cap, *D*, screwing on the end of said hub, substantially as set forth.

WILLIAM S. BUXTON.

Witnesses:

G. M. CHAMBERLAIN,
H. A. CHAPIN.