(No Model.) 2 Sheets—Sheet 1.

A. B. CASE.

RATCHET AND PAWL DEVICE.

No. 383,624. Patented May 29, 1888.

Fig 1

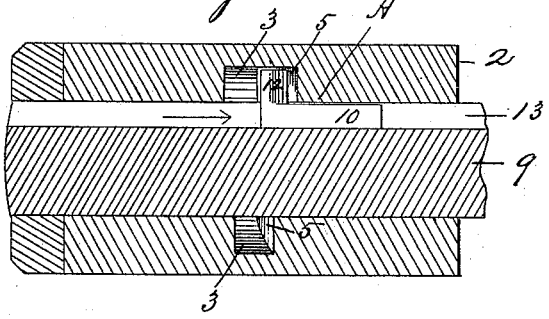
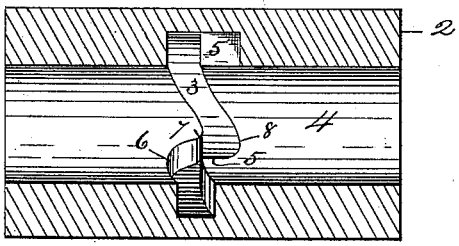


Fig 2



Witnesses.
G. M. Chamberlain.
Wm. H. Chapin

Inventor.
Adelbert B. Case.
By his Attorneys Chapin & Co
4

(No Model.)

2 Sheets—Sheet 2.

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Fig 3

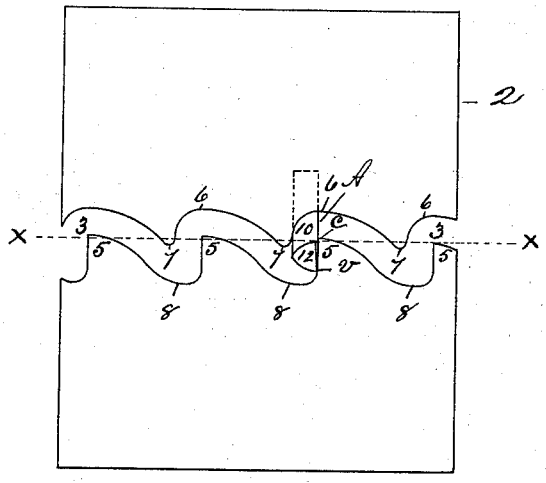
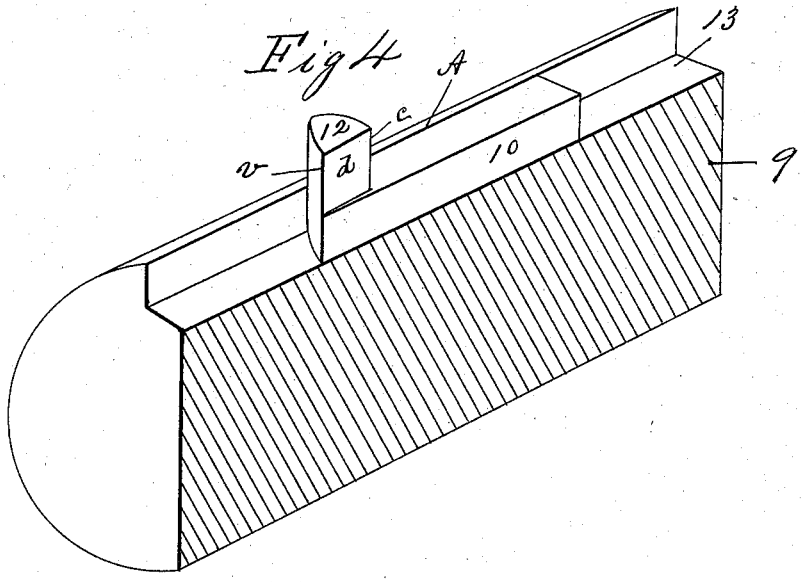


Fig 4



Witnesses
G. M. Chamberlain
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Inventor
Adelbert B Case
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UNITED STATES PATENT OFFICE.

ADELBERT B. CASE, OF SPRINGFIELD, MASSACHUSETTS.

RATCHET-AND-PAWL DEVICE.

SPECIFICATION forming part of Letters Patent No. 383,624, dated May 29, 1888.

Application filed November 7, 1887. Serial No. 254,536. (No model.)

To all whom it may concern:

Be it known that I, ADELBERT B. CASE, 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 construction of said devices adapted particularly to be used in that portion of a shaft which rotates within the hub of a wheel or gear; and the invention consists in the peculiar construction and adaptation of the pawl to the shaft, in connection with one of said hubs, having an annular groove or enlargement therein, provided with ratchet-teeth only on one side thereof, all as hereinafter fully described, and pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a longitudinal section of the hub of a wheel or gear and the end of a shaft therein embodying my improvements in ratchet-and-pawl devices. Fig. 2 is a longitudinal section of said hub. Fig. 3 is a diagram illustrating the internal construction of said hub, all as hereinafter fully described. Fig. 4 is a perspective enlarged view of said shaft in longitudinal section and of the pawl in operative position on said shaft.

In the drawings, 2 indicates the hub of a gear or of any other wheel to which it may be desirable to attach ratchet-and-pawl connections. The said hub is cast on a suitable core, whereby the longitudinal shaft-passage 4 is formed therein, and an annular groove or enlargement, 3, is formed in the walls of the hub surrounding said passage. Said annular enlargement has formed on one side thereof by casting, as aforesaid, a series of ratchet teeth, 5, and in said side adjoining the engaging portion of the face of each of said teeth is formed a recess, 8, the base of which recess is beyond the engaging-point of the pawl with said tooth, as below described. On the side of said groove or enlargement 3 opposite to that on which are said ratchet-teeth 5 is formed a series of recesses, 6, and projections 7, the latter occupying positions substantially opposite the said recesses 8, and the recesses 6 occupying positions substantially opposite the extremities of the ratchet-teeth 5.

The above-described construction of the hub 2, and more particularly of the conformation of the toothed side of said enlargement 3 and of the side opposite thereto, is particularly dwelt upon, for the reason that in the peculiarity of the construction of said enlargement, combined with a pawl adapted to co-operate therewith, consists the essential feature of the improvement which is the subject-matter of this application.

In order to make the above-referred-to peculiar construction clear, the aforesaid diagram, Fig. 3, is provided, and said diagram presents the said enlargement 3 to the eye as it would appear if the hub 2 were cut longitudinally through one side thereof and its interior brought to a horizontal plane. In said diagram the dotted line *x x* indicates substantially the position of the points of the ratchet-teeth 5 and the position of the projections 7 on the opposite side of the enlargement 3 relative to the points of said teeth and to the base of the recesses 8 opposite the highest part of said projections 7. It will be observed by reference to said diagram that the extremities of the projections 7 extend past said line *x x*, and consequently past the extremities of said ratchet-teeth. In said diagram, Fig. 3, is shown the pawl A, which is constructed, as shown in Figs. 1 and 4, as well as in Fig. 3, with a tooth, 12, at one end of and at right angles to the body 10 of said pawl, and the purpose of the said peculiar construction of said enlargement 3 is to impart certain movements to said pawl, as below described. In ratchet-and-pawl devices heretofore constructed, in which the pawl has a longitudinal reciprocating motion in a groove in a shaft within a hub, said pawl having a tooth thereon for engagement with ratchet-teeth on one or both sides of said groove or enlargement, it has been found that the quick longitudinal movement imparted to the pawl by the backward movement of the hub, whereby the tooth of said pawl is driven alternately against one side and then the other of said groove, almost invariably causes the pawl to rebound to such an extent that the engagement of the tooth of the pawl with the ratchet-teeth is near the extremity of the latter, a conse-

quence of which is, that the side of the ratchet-tooth at its point of engagement with the pawl becomes so hammered or battered that its engagement with the pawl is uncertain.

To remedy the above-described defect, the above-named recesses 8 at the base of the ratchet-teeth, extending beyond the point of engagement of the pawl with the latter, and the projections 7 opposite said recesses, are provided on the sides of the groove or enlargement 3, to the end that the engagement of said projections 7 with the tooth 12 of the pawl in said backward movement of the hub shall impart a more pronounced longitudinal movement to the pawl in the direction of the base of the recess 8, and the latter is made to extend beyond the base of the ratchet-teeth, so that when the pawl strikes the base of said recess and rebounds, as aforesaid, it shall come to a stop at a proper point opposite the ratchet-tooth, whereby the pawl-tooth shall become engaged with the side of the ratchet-tooth substantially at the base of the latter, as shown in Figs. 1 and 3, and not near the extremity of the ratchet-tooth, as has heretofore been the case.

The shaft 9 is grooved longitudinally to receive the pawl A, said groove being indicated by 13. The pawl A, of suitable metallic construction, consists of a body, 10, adapted to fit and slide in said groove 13, having the tooth 12 at one end thereof and standing at right angles to said body 10, said tooth being adapted to enter the annular enlargement 3 in the hub and to have its face *d* engage with the ratchet-teeth 5. In order, however, to insure the engagement of that part of the face *d* of the pawl-tooth nearest the end of the pawl on which said tooth is, said face *d* is formed on an incline from the edge *v* of the face *d* to the edge *c* of said face, or in a direction toward a longitudinal center line drawn through the pawl, as clearly shown in Fig. 4. By so forming the engaging side of the tooth of the pawl, the edge *v* of the latter is made to engage with the ratchet-teeth 5 near the base of the latter, as shown in Fig. 3, and in practice the said edge *v* gradually embeds itself into the side of the ratchet-tooth, thereby forming such an engagement with said tooth as conduces to the utmost certainty of a proper operation of the pawl and ratchet and to the longest durability of the parts.

What I claim as my invention is—

1. A ratchet and-pawl device consisting of a hub, 2, having the annular enlargement 3, having on one side thereof the ratchet-teeth 5, and between said teeth the recesses 8, extending beyond the base of said teeth, and on its opposite side a series of curved recesses and projections, as described, combined with a longitudinally-grooved shaft, 9, and a pawl, A, capable of a longitudinal movement in the groove in said shaft, having a tooth, 12, thereon entering said enlargement in the hub and engaging with said ratchet-teeth, substantially as set forth.

2. A ratchet-and-pawl device consisting of a hub, 2, having the annular enlargement 3, having on one side thereof the ratchet-teeth 5 and on its opposite side a series of curved recesses and projections, as described, combined with a longitudinally-grooved shaft, 9, and a pawl, A, capable of a longitudinal movement in the groove in said shaft, having a tooth, 12, thereon entering said enlargement in the hub, having its face *d* inclined, as described, whereby one edge of the tooth engages first with said ratchet-teeth, substantially as set forth.

ADELBERT B. CASE.

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