

F. H. SCHWERIN.  
 RATCHET MECHANISM.  
 APPLICATION FILED OCT. 22, 1919.

1,402,898.

Patented Jan. 10, 1922.

2 SHEETS—SHEET 1.

Fig.1.

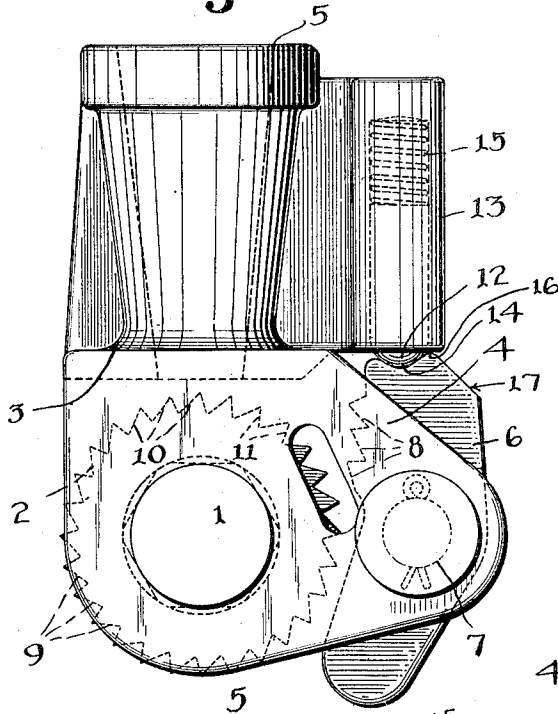


Fig.2.

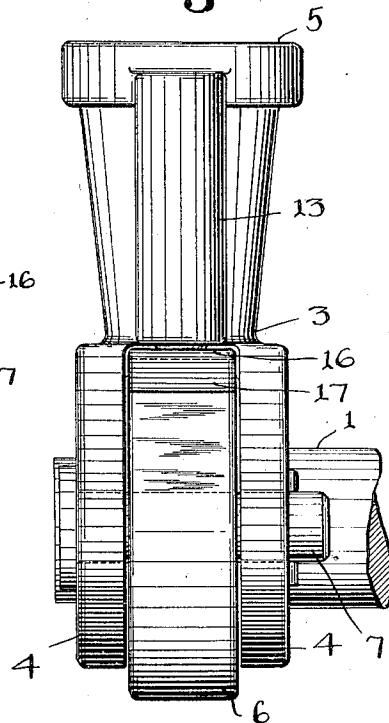


Fig.3.

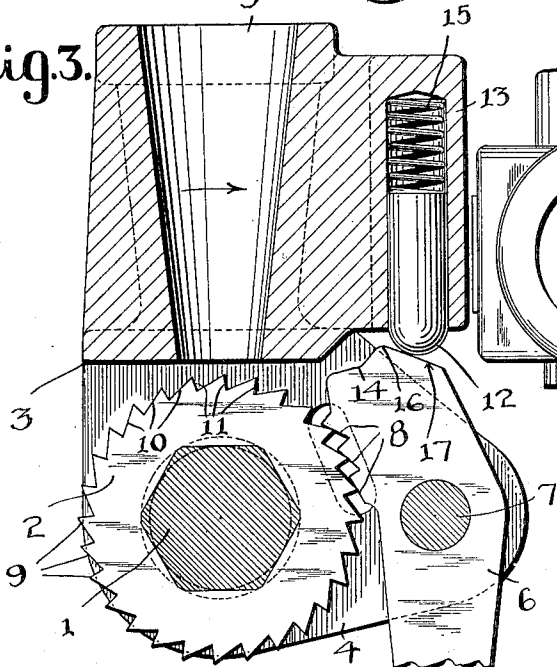
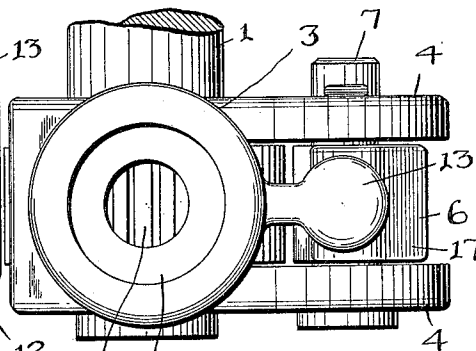


Fig.4.



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2 SHEETS—SHEET 2.



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# UNITED STATES PATENT OFFICE.

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## RATCHET MECHANISM.

1,402,898.

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*To all whom it may concern:*

Be it known that I, FRANK H. SCHWERIN, a citizen of the United States, and resident of the borough of West View, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Ratchet Mechanism, of which the following is a specification.

The invention relates to pawl and ratchet mechanisms, and particularly to power-applying pawl-and-ratchets such as are used in jacks where heavy resistance is to be overcome. For adequate strength and in order to guard against accident in event of the breaking of a tooth, these mechanisms are so designed that a plurality of teeth on the pawl, usually three, at different distances from the center, act simultaneously on a corresponding number of teeth on the ratchet wheel, but as such mechanisms have been heretofore constructed, serious difficulty has been experienced with the pawl tending to slip out of engagement, necessitating the use of a heavy holding spring, which is liable to fail. The purpose of the present invention is to overcome this difficulty, at the same time increasing the strength of the mechanism by reason of the form and cooperation of the parts, and while providing a form of the ratchet which can be economically cut.

In the accompanying drawings, forming a part hereof:

Fig. 1 is a side elevation of a pawl-and-ratchet mechanism embodying the invention, showing the pawl held out of action;

Fig. 2 is a front elevation;

Fig. 3 is a section in the central plane normal to the centers, illustrating the action on the reverse or idle movement of the rocker and pawl;

Fig. 4 is an end view, looking at the mouth of the socket; and

Fig. 5 is an enlarged view corresponding to the lower part of Fig. 3 showing the relation on the working stroke, certain radii and perpendiculars being represented by broken lines.

The numeral 1 designates the shaft to which power is intermittingly applied in the direction of the arrow of Fig. 5; 2 is the ratchet wheel keyed on an angular portion of this shaft, and 3 is an ordinary rocker oscillatable upon the shaft, having cheek portions 4 embracing the ratchet and a han-

dle-receiving socket 5. The pawl 6 is pivoted between the cheeks of the rocker on a transverse pin 7. This pawl is provided with a series of teeth 8, at one side of the line of centers, formed and arranged to engage simultaneously with a corresponding number of teeth 9 on the ratchet.

12 is an ordinary plunger in a spring-barrel 13 on the rocker, cooperative with a notch 14 in the end of the pawl to hold the same in an outward-tilted, inoperative position when desired; and 15 is a comparatively light spring in the barrel for pressing the plunger outward. When the pawl is moved inward until the crest 16 passes the center of the plunger tip, the plunger and spring by acting upon a slope 17 automatically throw the pawl into complete engagement. Heretofore a much heavier spring in a similar location has been relied upon to hold the pawl in, during the working stroke, but as will presently appear this is not necessary under the present invention, and a positive holding is substituted, which becomes the more forcible the greater the power that is applied to turn the mechanism.

The teeth 9 of the ratchet are of buttress formation, being deeply triangular in the circumferential direction, with low sloping backs 10 and abrupt working faces 11. As shown more clearly in Fig. 5, said working faces are inclined slightly forward of the radii drawn to the ends of the teeth. The plural teeth 8 of the ratchet are of similar nature, reversed to the teeth of the pawl, and the form and arrangement are such that in the working condition the teeth of the two parts fit back to back and face to face. A vital feature of the invention resides in the fact that all or substantially all perpendiculars to the working faces in action pass between the centers, that is to say the center of rotation of the ratchet and rocker on the one hand and the pivotal center of the pawl on the other. This is represented in Fig. 5.

With this construction, when power is applied, there is a component of pressure between the teeth which acts to draw or wedge the several teeth of the pawl inwardly of the ratchet, thereby preventing all possibility of flying out. Moreover, the form of the teeth and the mutual support resulting from the fitting abutment of their sloping backs, and the wedged engagement as aforesaid,

renders the teeth practically proof against breakage. When the rocker is swung backward on the idle stroke, all of the teeth in engagement pass freely, as seen in Fig. 3.  
5 A ratchet wheel formed as described, is susceptible of manufacture by a cheap hobbing process, and need not be milled.

What I claim as new is:

10 In a pawl-and-ratchet mechanism, the combination of a ratchet having buttress

teeth the working faces of which incline slightly forward of the radii of their tips, and a pivoted pawl having a series of reversely arranged buttress teeth formed to engage simultaneously a corresponding number of teeth on the ratchet, the relation being such that substantially all perpendiculars to the working faces in action pass between the centers. 15

FRANK H. SCHWERIN.