W. HOOD.

PAWL AND RATCHET MECHANISM.

APPLICATION FILED JAN. 12, 1914.

1,125,325.

Patented Jan. 19, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

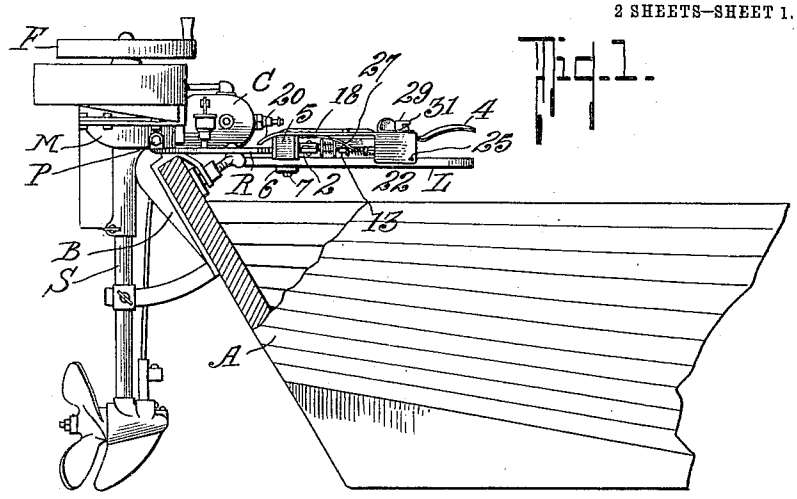


Fig. 2.

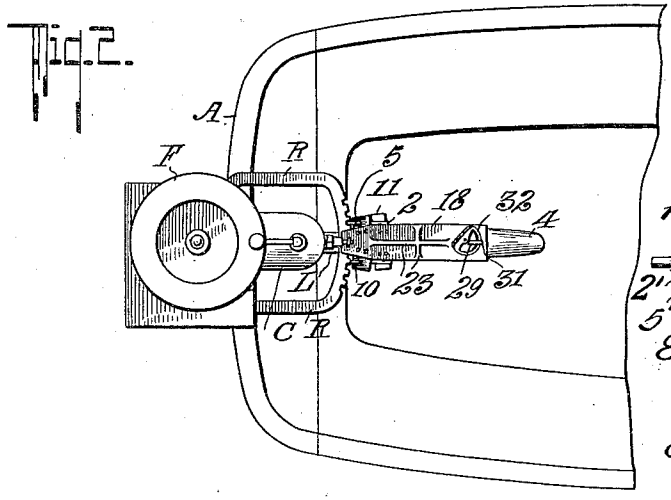


Fig. 9.

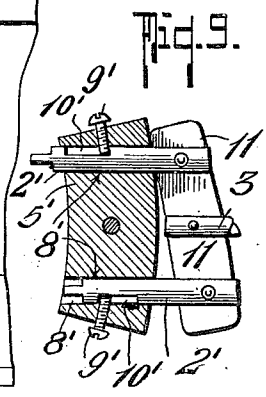
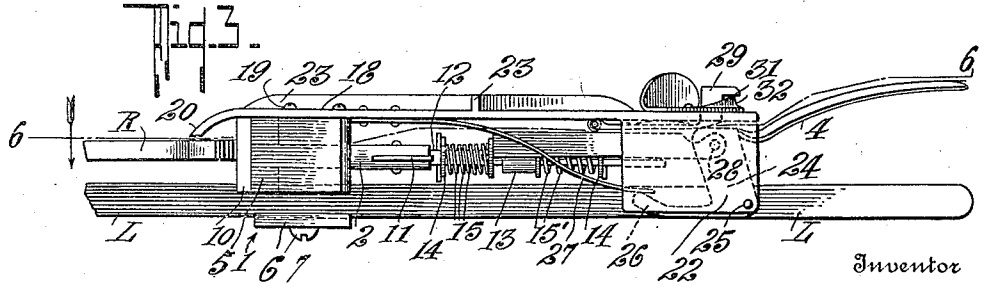


Fig. 3.



Witnesses

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2 SHEETS—SHEET 2.

Fig. 4.

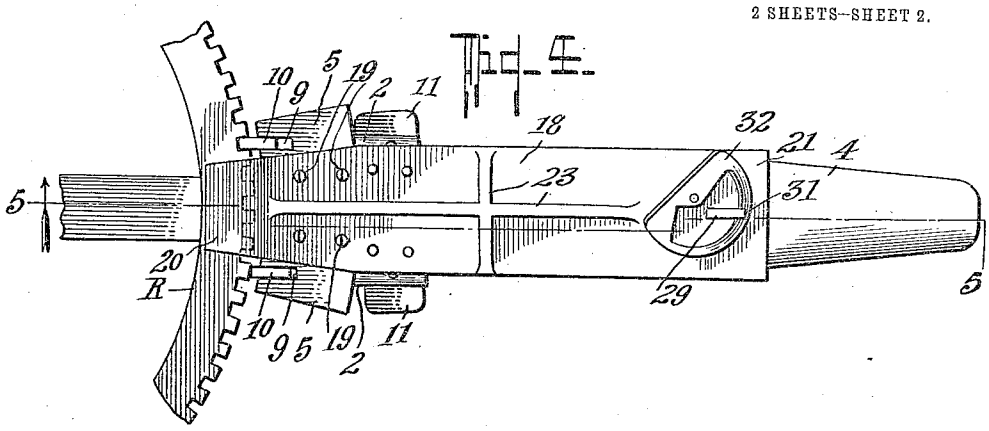


Fig. 5.

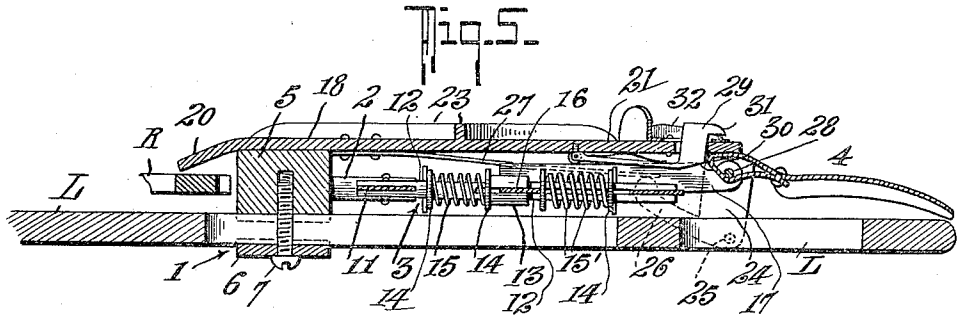


Fig. 6.

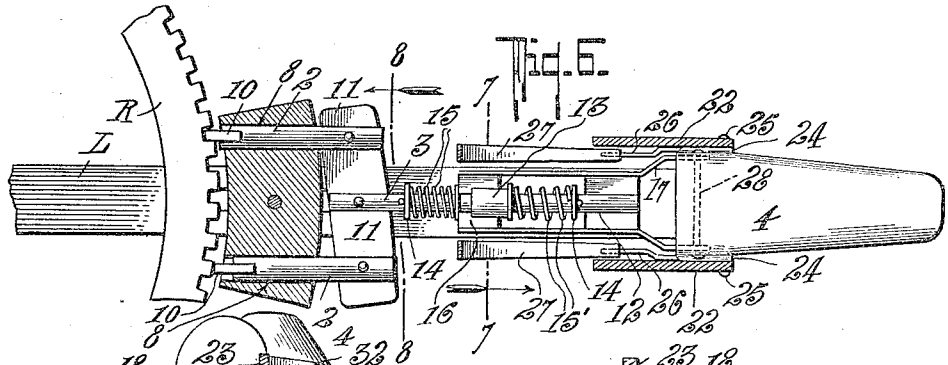


Fig. 7.

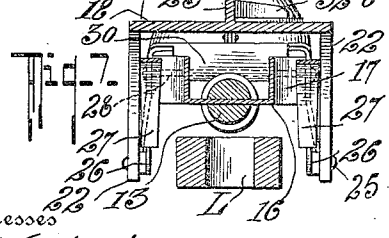
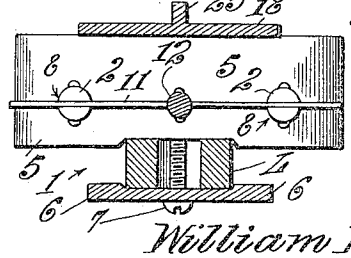


Fig. 8.



Witnesses

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UNITED STATES PATENT OFFICE.

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PAWL-AND-RATCHET MECHANISM.

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Application filed January 12, 1914. Serial No. 811,684.

To all whom it may concern:

Be it known that I, WILLIAM HOOD, citizen of the United States, residing at Kaukauna, in the county of Outagamie and State of Wisconsin, have invented certain new and useful Improvements in Pawl-and-Ratchet Mechanisms; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to improvements in machine elements and more particularly to pawl and ratchet mechanisms.

The primary object of the invention is to provide a device of this character so constructed as to employ two pawls which are spaced apart a proper distance to allow one pawl to engage the space between two of the teeth on the ratchet while the other pawl engages the outer face of one of said teeth.

A secondary object is to provide improved means for retracting the pawls and for retaining them in a retracted position.

A still further object is to provide a device of this character which is provided with a clamp by means of which the device may be applied to the steering lever of a detachable boat motor.

With these objects in view, the invention resides in certain novel features of construction and combination herein described and claimed and shown in the accompanying drawings wherein:

Figure 1 is a side elevation of the rear end of a boat showing a detachable motor applied thereto and showing my pawl and ratchet mechanism applied to the steering lever of said motor; Fig. 2 is a plan view of the parts shown in Fig. 1. Fig. 3 is an enlarged side elevation of a portion of the steering lever, and a portion of the arcuate rack, showing my invention in an operative position. Fig. 4 is a plan view of the parts shown in Fig. 3. Fig. 5 is a central vertical longitudinal section taken on the line 5—5 of Fig. 4 and showing the pawls locked out of engagement with the teeth on the rack. Fig. 6 is a horizontal section on the line 6—6 of Fig. 3. Figs. 7 and 8 are vertical cross sections taken on the lines 7—7 and 8—8 of Fig. 6; and Fig. 9 is a fragmentary view similar to Fig. 6 showing a different form of pawls and stops than those illustrated in the above described views.

In the embodiment illustrated in the drawings, I have shown a detachable boat motor comprising the usual bracket B for securing the motor on the stern of the boat A, this bracket being provided with the usual pivot studs P passing through said bracket into the casing of the motor M, said motor being provided with the ordinary cylinder C, drive shaft S, fly wheel F, and steering lever L for swinging the propeller in a well-known manner forming no part of the present invention.

Coming now more particularly to the details of the present invention, my device comprises in general a clamp 1 for attachment to the lever L, pawls 2 slidably mounted within one member of said clamp, a longitudinally expansible link 3 for retracting said pawls, a thumb lever 4 for actuating said expansible link, and an arcuate rack R secured to the bracket B by means of the studs P and adapted for coaction with said pawls.

In Figs. 1 to 8 inclusive, the clamp is formed in an upper section 5 and a lower section 6 secured together by a screw 7 or other suitable fastening means. The upper section 5 is provided with horizontal bores 8 and with vertical notches 9 communicating with the outer ends of said bores. Slidably mounted within the bores 8 of the upper section 5 are the pawls 2 which are preferably provided with vertical teeth engaging heads 10. The pawls 2 are spaced apart a suitable distance to allow one of the heads 10 to engage the space between two teeth of the rack R while the other head 10 rests upon the outer face of one of said teeth, for a purpose to appear. Pivotally connected to the inner ends of the pawls 2 is a lateral connecting element or cross head 11 to the center of which the forward end of the link 3 is pivoted. The expansible link

above referred to comprises a slotted rod 12 provided with an intermediate stop 13 and independent stops 14 spaced therefrom, a cross head 16 sliding through the slot of said member, connecting links 17 secured at their forward ends to the cross head 16 and having their rear ends bent outwardly and pivoted to the thumb lever 4 in a manner to appear, and coil springs 15 and 15′ disposed between the stop 13 and the spaced stops 14. The upper section 5 of the clamp 1 is provided with a rigid back plate 18 secured thereto by screws 19 or other suitable fastening devices. This plate has a forwardly projecting nose 20 and a rearwardly projecting supporting plate 21 which is provided with depending ears 22 and with suitable bracing ribs 23. Extending through these ears 22 and into depending arms 24 of the thumb lever 4 are pivot studs 25. The depending arms 24 of the thumb lever 4, are provided with forwardly extending fingers 26 which are pressed normally downward by flat leaf springs 27.

It will be seen by reference to Fig. 5 that a pivot pin 28 passes through the upper ends of the depending arms 24, of the lever 4, and through the outwardly turned ends of the links 17 thus pivoting said links to said thumb lever. It will also be clearly seen by reference to Fig. 5, that a spring projected catch 29 carried by the under side of the back plate 18 engages a stop or shoulder 30 on the lever 4 when said lever is depressed as seen in this figure. In order to release the catch 29 from the shoulder 30, I provide said catch with a lateral nose 31 adapted to overlie a cam ring 32 pivoted on top of the back plate 18. By the use of this cam ring the catch 29 may be retained in an inoperative position when it is desired to have the pawls 2 come into play or by proper manipulation of said ring, said catch may be released to drop within the path of the shoulder 30 and hold the pawls 2 in a retracted position.

In the operation of the device, one tooth engaging head 10 will rest between two of the teeth while the other head 10 rests against the outer face of one of said teeth and the inner end of the retracted head 10 will rest against the inner wall of one of the vertical notches 9 in the upper section 5 of the clamp. If now, the thumb lever 4 is depressed, the cross head or connecting element 11 will be rocked around the point where it is pivoted to the retracted pawl 2 by the action of the expansible link 3, and in so doing the projected pawl 2 will be retracted. The lever L may then be swung to any desired adjustment and the thumb lever 4 then released. After this action, the cross head 16 carried by the links 17 will be forced forwardly by the rear spring 15 until said spring engages one face of the stop 13, this spring 15 having been depressed by the depression of the thumb lever 4. When the cross head 16 is in this position, the leaf springs 27 will rock the thumb lever 4 still farther upwardly and in so doing its pivot pin 28 will travel forwardly and consequently through the action of the links 17 connected to said pivot pin 28 and said cross head 16, said cross head will be forced forwardly, engaged with the forward spring 15′ which spring will force against the stop 14, and will thus rock the connecting element 11 in the proper direction to project one of the pawls 2.

If at any time it is desired to throw the pawls 2 out of play, the thumb lever 4 may be depressed and the catch 29 released to hold said lever in a depressed position and secure said pawls in a retracted position as above described.

In Fig. 9 I have shown the upper section 5′ of the clamp 1 as provided with bores 8′ and screws 9′ passing through the ends of the section 5′ and into notches 10′ formed in the pawls 2′. This is merely illustrative of one of numerous ways in which I may mount the pawls in the clamp section.

Although I have shown my invention as applied to the steering lever of a detachable boat motor, I do not wish to be limited to this application of the device, it being clear that I may employ it in any case where it may be adaptable.

By the relation of the pawls 2 and 2′ with the notches between the teeth of the rack R, I am enabled to secure a very fine adjustment without the necessity of making the teeth of said rack so fine as to weaken them. This I consider a very advantageous feature of my invention.

Although I have described my invention with considerable minuteness, I do not wish to be limited to details other than those amplified in the appended claims.

From the above described structure, it will be clearly seen should the lever L be moved laterally to steer the boat A and released, that the pawls will immediately engage the teeth of the rack and hold the same in its adjusted position.

What I claim as my invention is:

1. The combination with a rack and an element movable in respect thereto, of a pair of spaced pawls carried by said element and adapted to alternately engage the spaces between the teeth of said rack and the outer faces of said teeth, a spring projected element loosely connected to said pawls for projecting the same, a hand piece operatively connected to said element for retracting the pawls, and a locking device for holding the hand piece in retracted position.

2. The combination with a rack and an element movable in respect thereto, of a pawl carried by said element and coacting

with the rack to retain said element in adjusted position, a spring projected lever for projecting and retracting said pawl, a spring projected locking device for retaining said lever in depressed position and releasable means whereby said spring projected locking device may be retained in inoperative position.

3. The combination with a rack and a member movable in respect thereto, of a pair of spaced pawls carried by said member and adapted to alternately engage the teeth of said rack, a back plate secured to said member and lying substantially parallel with the body portion of said member, a spring projected operating element loosely connected to said pawls, a lever connected to said element for retracting the same and the pawls, said lever having a shoulder located adjacent the back plate, the latter having an opening opposite said shoulder, an L-shaped locking device pivoted to the inner side of said back plate and having its angle located adjacent said shoulder one of its arms projecting through the opening in said back plate and having a nose, a cam ring pivoted upon said back plate and underlying said nose and a spring for normally projecting said angle of said locking device into the path of said shoulder.

4. The combination with spaced guides, pawls slidably mounted therein, a cross head pivoted to said pawls, and a spring pressed lever, of a longitudinally expansible link connecting said cross head and said lever, said expansible link comprising a slotted member, a stop intermediate the ends thereof, independent stops spaced from said intermediate stop, springs disposed between said intermediate and said spaced stops, a cross head projecting through the slot in said first mentioned member and disposed between said springs, and links connecting said cross head with said spring pressed lever.

5. The combination with a spring projected pawl, a link for retracting said pawl, a lever for actuating said link, and a stop carried by said lever, of a spring catch adapted to engage said stop when said pawl is retracted, and a cam for raising or lowering said spring catch.

6. The combination with a lever, of a clamp secured thereto, a back plate secured to the clamp and projecting longitudinally therefrom, said back plate being spaced from and lying substantially parallel to the lever, pawls slidably mounted in said clamp, a thumb lever pivoted to the free end of said back plate, connections between said thumb lever and said pawls for retracting the latter, said connections being disposed between the back plate and the lever, and a catch likewise carried by said back plate for retaining the thumb lever in depressed position, thereby retaining the pawls in retracted position.

7. The combination with a lever, of a sectional clamp secured thereto, a back plate secured to one section of said clamp and projecting longitudinally of said lever from the opposite sides of said clamp, ears carried by said back plate and straddling said lever, pawls slidably mounted within one section of said clamp, a spring projected bell crank thumb lever pivoted between said ears for retracting said pawls, a stop on said thumb lever, a spring catch carried by said back plate, and adapted to engage said stop when said pawls are retracted, and a cam for raising and holding said catch out of engagement with said stop.

8. A device of the character described, comprising a sectional clamp, one section thereof being provided with parallel bores, pawls slidable within said bores and having elongated notches in their outer sides, screws passing through said clamp and into said notches, means for projecting said pawls, and means for retracting the same.

9. The combination with a lever of a block secured to one side thereof, a back plate secured to said block and projecting therefrom, said plate being spaced from said lever and lying substantially parallel thereto, a pair of depending flanges on the opposite side edges of said plate at its free end, said flanges straddling said lever, a thumb lever having its forward end projecting beneath said free end of the back plate, its rear end lying adjacent to the free end of the lever, L-shaped members depending from and formed integrally with said forward end of the lever, said L-shaped members being pivoted to the inner sides of said flanges, flat leaf springs secured to the under side of the back plate and bearing against one arm of said L-shaped members whereby said lever is normally rocked to inoperative position, a pair of pawls slidably mounted in said block and lying parallel to said plate, their rear ends being located between the latter and the lever, a longitudinally slotted link loosely connected to said rear ends of the pawls, a cross head projecting transversely through the slot in said link, stops carried by said link and spaced from the opposite edges of said cross head, springs interposed between said stops and the cross head and a pair of links connecting said cross head with the L-shaped members carried by said lever.

10. A device of the character described comprising a guide adapted for attachment to a relatively movable member, a pawl slidably mounted in said guide, a longitudinal link loosely connected to said pawl and having a longitudinal slot, a cross head projecting transversely through said slot,

stops on said link spaced from the opposite edges of said cross head, coil springs encircling the link and interposed between said cross head and said stops, a pivoted operating lever and a link connecting said cross head with said operating lever for the purpose set forth.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

WILLIAM HOOD.

Witnesses:
FRANCIS S. BRADFORD,
G. MCDONOUGH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."