

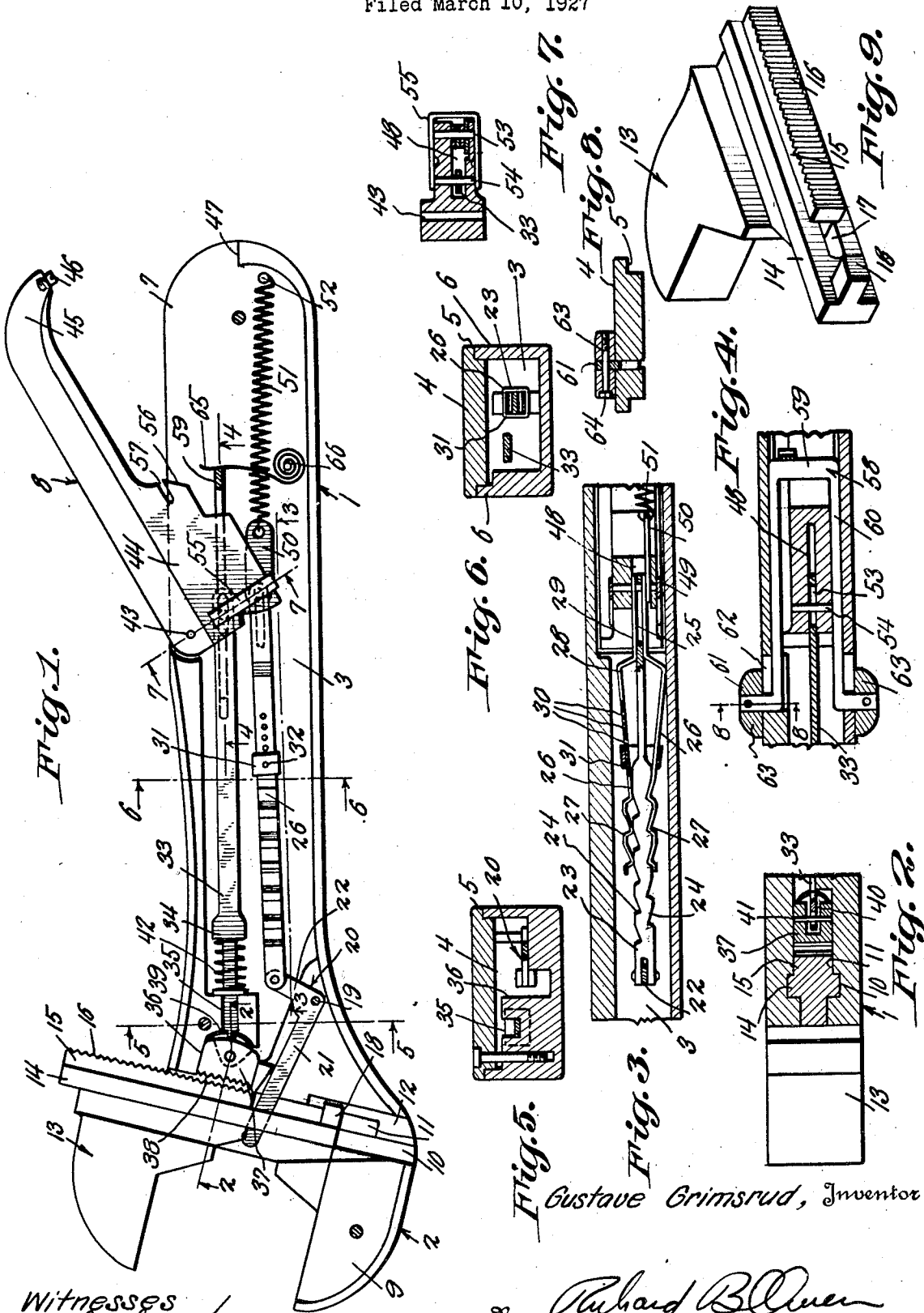
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WRENCH

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WRENCH.

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This invention relates to the class of tools, and pertains particularly to a wrench of the hand grip type.

The primary object of this invention is to provide, in a manner as hereinafter set forth, a wrench of the sliding jaw type capable of instantaneous adjustment of the jaws to take substantially any sized nut, by simple compression of the control lever, which becomes a part of the handle structure when the wrench is in use.

Another object of the invention is to provide, in a manner as hereinafter set forth, a wrench having the above described capabilities and wherein means is provided for engaging and blocking one of the jaw members in adjusted position as soon as the jaws have gripped the nut and simultaneously with the movement of the control lever to its completely closed position.

Still another object of the invention is to provide, in a manner as hereinafter set forth, an improved means for automatically locking the jaw controlling mechanism, and lever member as soon as the same has been moved to operative position.

Another feature of the present invention resides in the improved means for shifting one of the wrench jaw members to its engaging position and holding the same so fixed until the jaw locking mechanism comes into play.

A final object of the present invention is to provide a wrench having the foregoing advantageous features, in which all of the operating mechanism is completely housed in the handle shank thus leaving the exterior of the tool smooth on all faces and free of projecting parts which would interfere with the easy operation of the tool.

Numerous other objects and advantages of the present invention will become apparent as the description of the same proceeds, and the invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawing forming a part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing of the drawing but may be changed or modified so long as such changes or modifications mark no material departure from

the salient features of the invention as expressed in the appended claims.

In the drawings:

Figure 1 is a plan view of one side of the wrench structure from which the cover plate has been removed showing the interior construction and arrangement of the operating elements.

Figure 2 is a section through the head of the wrench and one of the jaw members, taken upon the line 2—2 of Figure 1.

Figure 3 is a section taken longitudinally of the center portion of the handle, substantially upon the line 3—3 of Figure 1.

Figure 4 is a longitudinal section through a portion of the handle structure taken upon the line 4—4 of Figure 1.

Figure 5 is a transverse section rearwardly of the wrench head taken upon the line 5—5 of Figure 1.

Figure 6 is a transverse section through the central portion of the handle taken upon the line 6—6 of Figure 1.

Figure 7 is a section taken upon the line 7—7 of Figure 1.

Figure 8 is a section taken upon the line 8—8 of Figure 4.

Figure 9 is a detailed perspective view of the shiftable jaw and sliding base portion formed integral therewith.

Referring now to the drawing in detail wherein like numerals of reference indicate corresponding parts throughout the several views, the numeral 1 designates generally the handle portion of the wrench while the head of the same which comprises the jaw members, is indicated generally by the numeral 2. The handle 1 is relatively long as shown and flat, and one side face is provided with the longitudinally extending recess 3, the inner face of which recess is provided with various recesses and grooves which will be more particularly pointed out hereinafter, for the reception of the various working parts of the wrench structure. A side wall plate 4 having the inner face thereof provided about the edge with the groove 5, closes the recess, the edges of the handle edge walls 6 seating in the groove 5 to form a firm connection with the plate. One edge wall of the handle at the rear end of the same is cut away as indicated at 7 to form an opening for receiving a control lever

member 8 during the operation of the wrench. This control lever will be more fully described hereinafter.

The forward or head end of the wrench 5 has a laterally offset forwardly directed fixed jaw 9 formed integral therewith, the base of which jaw has cut transversely of that face lying beneath the plate 4, the shiftable jaw base receiving and guide groove 10, the inner wall of the groove 10 being further recessed throughout the major portion of its length as indicated at 11 to receive a rack body forming a part of the shiftable jaw base and a third and deeper groove 12 is formed in this inner wall of the main groove 10 for the reception of another portion of the shiftable jaw as will hereinafter be more fully described. This third groove 12 is relatively short as shown 20 in Figure 1 lying mostly beneath the inner end of the fixed jaw 9.

Associated with the fixed jaw member 9 is the shiftable jaw member 13, the base portion of which has formed integral therewith the relatively long and broad supporting and slide bar portion 14, which bar is clearly shown in Figure 9, is of materially greater length than the base of the jaw of which it forms a part, and one side edge is 30 designed to fit into the groove 10 for slidable movement therein. The inner end of the base or bar portion 14 has formed integral with the under face thereof a rack bar 15, which rack bar is of less width than 35 the bar 14 and also of materially less length than the same and has the under face thereof provided with transversely formed teeth 16. The bar 14 at the inner end of the rack bar 15 has an aperture 17 formed there-through, and the free forward end of this bar 14 further has formed upon the under face thereof the stud 18 which projects beyond the toothed face of the rack bar. The rack bar 16 is positioned for sliding movement in the recess 11 while the stud 18 operates in the groove or recess 12, as shown in Figure 1, and as will be readily understood from the showing of this figure, this stud 18 limits the outward movement of the jaw 13, preventing the same from being completely removed from the head by abutment against the wall formed at the inner end of this groove.

Within the forward end of the recess 3 55 there is pivotally mounted upon the pivot pin 19 fixed in and transversely of the handle, the bell crank member 20, which member is provided with a relatively long arm 21 and a short arm 22. This member 60 is pivotally mounted at the point of jointure between the arms which are substantially right-angularly related and the free end of the long arm 21 extends through the aperture 17 in the base bar 14 of the shiftable jaw, as shown.

Pivotally connected to the free end of the short arm 22 is one end of a jaw shifting bar 23, which bar extends longitudinally within the recess 3 toward the rear of the handle. Each side face of this bar 23 is 70 provided with a plurality of transverse notches 24, the notches upon the two faces being arranged in staggered relation as shown in Figure 3. The rear end of this bar 23 is provided with the short longitudinally extending slot 25. Upon each side of the bar 23 there is positioned an elongated resilient arm 26, the forward end of which is transversely corrugated as indicated at 27 while a portion 28 adjacent the rear end 80 is directed inwardly toward the bar 23 bringing the rear terminal portion 29 to position against the adjacent side of the bar, covering the slot 25 as shown in Figure 3.

The spring arms 26, together with the bar 23 having the teeth 24, with which the corrugations 27 of the arms 26 engage, provide a slipping clutch which only holds when the movement of the bar 23 is not strongly resisted. Due to the off-set portion 28 of each 90 of the resilient arms the intermediate portions thereof are held away from the jaw shifting bar. One of the arms 26 is provided with a longitudinally extending series of apertures 30 and surrounding the bar and the arms is an arm tension controlling ring 31 having an instruck portion 32 designed to engage in one of the apertures 30. From this it will be readily understood that upon shifting the ring 31 longitudinally of the 100 arms 26 the frictional engagement of the corrugated ends of the arms with the adjacent notched faces of the bar 23, will be increased or decreased.

Lying within the recess 3 substantially 105 parallel with the jaw shifting bar is a jaw lock control bar 33 having an enlarged portion 34 formed inwardly of the forward end, and the forward end of this bar lies in a guide recess 35 formed in the thickened portion 36 at the forward end of the recess 3, this recess opening at its forward end in a recess 36 in which a jaw locking head member 37 is positioned. The forward face of this member 37 is toothed as indicated at 38 115 and lies contiguous to the toothed surface of the bar 15. A spring member 39 is arranged rearwardly of this member 37, the rear face of which member is convexed as shown, and bears against this face to resiliently urge the member forwardly under proper conditions. The member 37 has the rear face thereof provided with the slot 40 into which the forward end of the bar 33 extends, the bar being secured to the member by means of the pivot pin 41, this end 125 of the bar 33 which is secured to the jaw locking member 37 is reduced as shown in Figure 1 and the shoulder thus formed bears against the base of the spring member 39 130

which spring is urged against the member 37 when the bar 33 is moved forwardly.

Between the rear face of the enlargement 36 and the enlargement 34 of the bar 33, there is positioned a spring 42, which spring serves to retract the latching member 37 under certain conditions, to release the jaw 13.

Pivotally mounted upon the transversely extending pin 43, in the rear portion of the recess 3, and within the opening 7 of the edge wall of the handle is a control lever member 8 the forward portion of which is enlarged as indicated at 44. The rear end of this lever is turned downwardly as indicated at 45 and the downturned end is provided with the screw member 46 which abuts the edge 47 of the handle body when the lever is swung inwardly. The enlargement 44 of the lever has its forward and inner faces provided with a slot 48 and into the lower portion of this slot the rear ends of the bar 23 and resilient arms 26, extend and are pivotally secured to the lever by means of the pin 49 which passes through the slot 25 of the bar 23 and the adjacent ends of the arms 26. Upon this pin 49 is also pivotally mounted the link 50 to the rear end of which is connected one end of a spring 51, the other end of this spring being connected at the point 52 in the rear of the handle recess.

Extending into the slot 48 through the forward end of the enlarged portion 44 of the lever is the rear end of a bar 33, which bar is provided with the short longitudinally extending slot 53 through which, and transversely of the lever, there extends the pin 54.

Engaged over the lower edge of the portion 44 of the handle is a substantially U-shaped member 55, the legs of which overlap the ends of the pins 53 and 54 and maintain the same in position.

The rear edge of the inwardly extending portion 44 of the lever is provided with a cam surface 56 and formed in this edge above the cam surface is the slot 57. Arranged in the recess 3 astraddle the extended portion 44 of the lever is a substantially U-shaped lever locking member, indicated as a whole by the numeral 58. The yoke portion 59 of this member extends across the rear edge of the portion 44 and is designed to engage in the slot 57 when the lever is pressed inwardly to lock the same in position. Each leg 60 of the member 58 is slidably positioned in the longitudinally extending slot formed in the adjacent wall of the recess or the cover plate 4 and has its forward end turned outwardly as indicated at 61 to project laterally through a slot 62 to the exterior of the handle body. Upon the outer face of each side wall of the handle there is positioned and secured to one of the downturned ends 61 the button 63, the connection being made by means of a screw or pin 64

which passes through the button and the portion 61 of the lever locking member. Extending across the yoke portion 59 of the member 58 is one end of the spring finger 65, the lower end of this finger being coiled as indicated at 66 and secured to one side wall of the recess in which it is positioned. From the foregoing description, it will be seen that upon pressing the lever 8 inwardly the cam surface 56 will ride over the inner edge of the yoke 59 forcing the same rearwardly against the tension of the spring finger 65 which spring will act upon further downward movement of the lever to force the yoke forward again into the slot 57 locking the lever in closed position. Release of the lever will of course be effective by drawing one of the buttons 63 rearwardly as will be readily understood.

In operation, the jaws 9 and 13, being normally held in wide open position under the action of the spring 51, as shown in Figure 1, are placed in position on either side of a nut. When the handle is gripped the lever 8 will be forced inwardly causing the resilient arms 26 to be forced forwardly and when thus moved, the corrugated portions 27 will engage the notches 24 of the bar 23 and cause the bar to be moved forwardly also. This action swings the lever 20 causing the same to draw the jaw 13 inwardly as will be readily understood until the nut is engaged between the jaws. Further depression of the lever 8 will cause the resilient arms to slip into and out of the notches 24 toward the forward end of the bar 23 and when the lever has almost reached a closed position, the pin 54 which has been until this time sliding freely in the slot 53 of the bar 33, will engage the bar at the forward end of the slot and force the same forwardly, thus shifting the latching head 37 to cause the teeth of the same to mesh with the teeth 16 of the rack bar forming a part of the shiftable jaw. When the latch head 37 has moved to locked position, the lever 8 will be flush with the edge of the handle of the wrench and while the jaw locking action has been taking place the member 58 will have been shifted for engagement in the slot 57 to hold the lever in closed position, in the manner previously described.

Release of the lever 8 can be readily accomplished by shifting rearwardly the button 63 thus permitting the spring 51 to come into play to retract the bar 23 and the bar 33, to unlock the jaw and allow the same to be moved outwardly by the bell crank lever 20.

From the foregoing description it will be readily understood that the present wrench may be easily and quickly adjusted to take a nut of any size and when so adjusted automatically locks itself for further use upon

nuts of the same size. The lever 8 is always flush with the wrench handle while the same is in use, thus being out of the way and permitting a firm grip to be had upon the handle.

Although applicant has shown his invention as constructed to take articles of polygonal contour such as square, hexagonal, and octagonal nuts, it is of course to be understood that jaw members may be provided having recessed faces to permit the wrench to be used upon circular objects such as bars and pipes.

Having thus described my invention, what I claim is:

1. In a wrench structure of the character described including a handle body and a pair of jaw members associated therewith one movable relative to the other, a lever member pivotally associated with said handle and swingable inwardly upon gripping the same and a pair of shiftable elements loosely connected to and actuated by the lever, one thereof shifting the movable jaw to article engaging position and the other acting subsequent to the engaging of an article between the jaws to engage and lock the shiftable jaw in position.

2. In a wrench structure of the character described including a handle body and a pair of jaw members associated therewith one movable relative to the other, a lever member pivotally associated with said handle and swingable inwardly upon gripping the same, a pair of shiftable elements movable longitudinally of the body and connected to and actuated by the swinging of said lever, one thereof shifting the movable jaw to article engaging position and the other acting subsequent to the engaging of an article between the jaws to engage and lock the shiftable jaw in position, and means for locking said lever in closed position.

3. In a wrench structure of the character described including a handle body and a pair of jaw members associated therewith, one movable relative to the other and transversely to the longitudinal axis of the body, a lever member pivotally associated with said handle and swingable theretoward upon gripping the same, a longitudinally shiftable member actuated by said lever, and a bell crank like member actuated by said longitudinally shiftable member and connecting with the movable jaw to shift the same to operative or inoperative position.

4. In a wrench structure of the character described including a handle body and a pair of jaw members associated therewith, one movable relative to the other, and transversely to the longitudinal axis of the body, a lever member pivotally associated with said handle and swingable theretoward upon gripping the same, a longitudinally shiftable member actuated by said lever, and a

swingingly movable member adapted to be actuated by said shiftable member, said swingingly movable member having sliding engagement with the movable jaw to move the same to or from position.

5. In a wrench structure of the character described including a handle body and a pair of jaw members associated therewith, one movable relative to the other, a lever member pivotally associated with said handle and swingable theretoward upon gripping the same, a longitudinally shiftable member actuated by said lever, a swinging member actuated by the longitudinally shiftable member, and having sliding engagement with the movable jaw to move the same to or from position, and longitudinally shiftable means adapted to be actuated by said lever upon the completion of the movement of the shiftable jaw for engaging the jaw and locking it in set position.

6. In a wrench structure of the character described including a handle body and a pair of jaw members associated therewith, one movable relative to the other, a lever member pivotally associated with said handle and swingable theretoward upon gripping the same, a longitudinally shiftable member actuated by said lever, a swinging member actuated by the longitudinally shiftable member and having sliding engagement with the movable jaw to move the same to or from position, a bar member shiftable longitudinally of said handle body and adapted to be actuated by said lever, and means associated with said bar for engagement with said movable jaw to lock the same in position.

7. In a wrench structure of the character described including a handle body and a pair of jaw members associated therewith one movable relative to the other, a lever member pivotally connected to said handle, a pair of spaced elements arranged for movement longitudinally of the handle, means associated with one of said elements for engaging and shifting said movable jaw, and means whereby the other of said elements may be caused to shift after completion of the movement of the first mentioned element, to bring about the locking of the shiftable jaw member.

8. In a wrench of the character described, including an elongated handle body having a pair of jaws arranged at one end thereof, one movable relative to the other, a pair of longitudinally movable elements housed in said handle, a loose connection between one end of one of said elements and said movable jaw, a hand grip member carried by the handle body, means associated with the other of said elements for engaging said movable jaw and securing the same in adjusted position, and means connecting said elements with said hand grip whereby that one of the

elements having connection with said jaw will be shifted until an article is engaged between the jaws, the other of the elements then being engaged and shifted to bring about the locking of the movable jaw.

9. A wrench structure of the character described, comprising an elongated handle body, there being a jaw formed integral with said body at one end thereof, said body at the base of the integral jaw being provided with a transverse guide groove, a shiftable jaw member having an elongated bar member at the base thereof and adapted to slide in said groove toward and away from said fixed jaw, there being a rack bar formed longitudinally of the under side of said bar member, hand grip operated means for shifting said slidable jaw, and means operable by said first mentioned means for engaging said rack member when the jaws are in proper relation, to lock the shiftable jaw in position.

10. A wrench structure of the character described, comprising an elongated handle body, there being a jaw formed integral with said body at one end thereof, said body at the base of the integral jaw being provided with a transverse guide groove, a shiftable jaw member having an elongated bar member at the base thereof and adapted to slide in said groove toward and away from said fixed jaw, there being a rack bar formed longitudinally of the under side of said bar member, a lever member, pivotally carried by said handle body, an oscillatory element housed within the body and engaging said shiftable jaw to move the same, a jaw shifting element connecting said lever with the oscillatory element and comprising a main bar having opposite side faces thereof provided with transverse notches and having one end provided with a longitudinally extending slot, means carried by the lever for sliding connection in said slot, and a pair of resilient arms arranged on opposite sides of the bar member having their rear ends connected to said lever carried means and their forward ends transversely corrugated for engaging said notches, substantially as and for the purpose described.

11. In a wrench structure of the character described, an elongated handle body, there being a jaw member formed integral with one end thereof, a shiftable jaw slidably associated with said fixed jaw there being a rack bar carried by said shiftable jaw, a lever member pivotally carried by said handle, a longitudinally shiftable slip clutch device having connection with said shiftable jaw to move the same to engaging position in association with the closing of said lever and designed to slip upon the engagement of

the jaws with an element to permit complete closure of the lever, a longitudinally shiftable bar having loose connection at one end with said lever and having its other end slidably held adjacent said rack bar, and a toothed locking head upon the forward end of said last mentioned shiftable bar, designed to engage said rack bar upon the complete closing of said lever.

12. In a wrench structure of the character described, an elongated handle body, there being a jaw member formed integral with one end thereof, a shiftable jaw slidably associated with said fixed jaw, there being a rack bar carried by said shiftable jaw, a lever member pivotally carried by said handle, a longitudinally shiftable slip clutch device having connection with said shiftable jaw to move the same to engaging position in association with the closing of said lever and designed to slip upon the engagement of the jaws with an element to permit complete closure of the lever, a longitudinally shiftable bar having loose connection at one end with said lever and having its other end slidably held adjacent said rack bar, and a toothed locking head upon the forward end of said last mentioned shiftable bar, designed to engage said rack bar upon the complete closing of said lever, and a finger operated element for automatically locking said lever in closed position.

13. In a wrench structure of the character described, an elongated handle body, there being a jaw member formed integral with one end thereof, a shiftable jaw slidably associated with said fixed jaw there being a rack bar carried by said shiftable jaw, a lever member pivotally carried by said handle, a longitudinally shiftable slip clutch device having connection with said shiftable jaw to move the same to engaging position in association with the closing of said lever and designed to slip upon the engagement of the jaws with an element to permit complete closure of the lever, a longitudinally shiftable bar having loose connection at one end with said lever and having its other end slidably held adjacent said rack bar, a toothed locking head upon the forward end of said last mentioned shiftable bar, designed to engage said rack bar upon the complete closing of said lever, a finger operated element for automatically locking said lever in closed position, and resilient means associated with said clutch device for reversing the engaging movement of the same upon release of said lever locking means to swing the lever outwardly and open said jaws.

In testimony whereof I affix my signature.

GUSTAVE GRIMSRUD.