No. 745,281. PATENTED NOV. 24, 1903.

J. T. HUME.

WRENCH FOR THRESHING MACHINE CYLINDERS.

NO MODEL. APPLICATION FILED SEPT. 29, 1902.

3 SHEETS—SHEET 1.

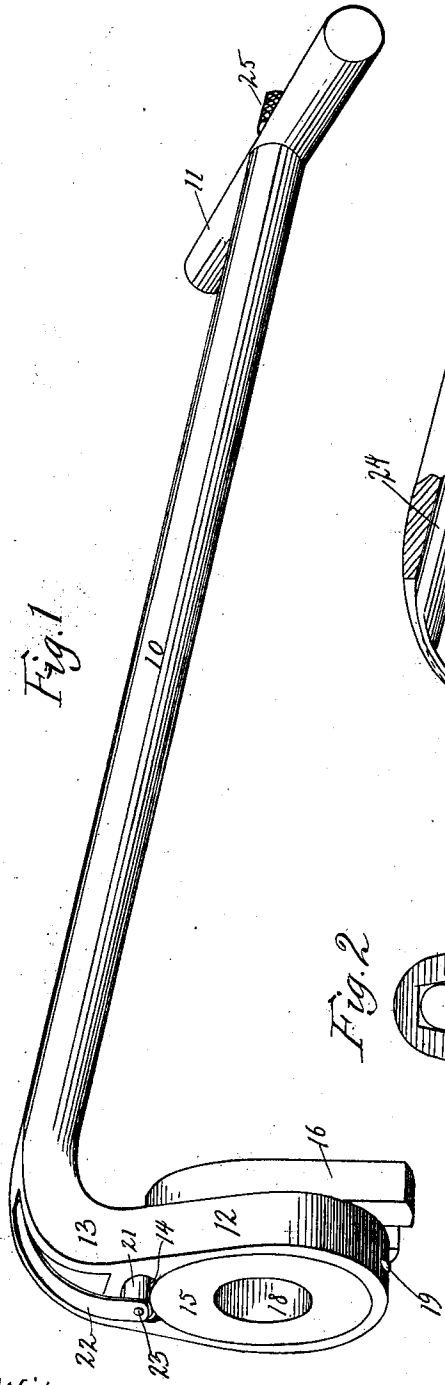


Fig. 1

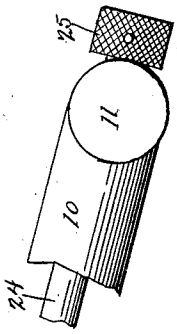
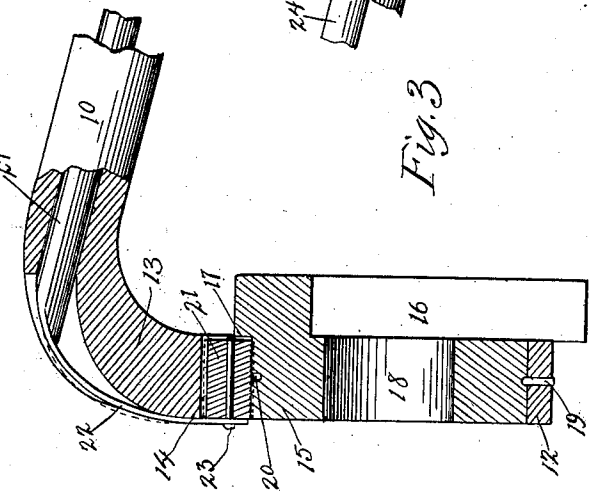


Fig. 3



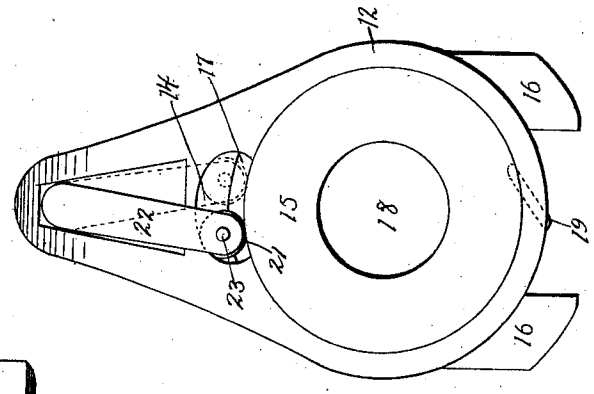


Fig. 2

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Fig. 4

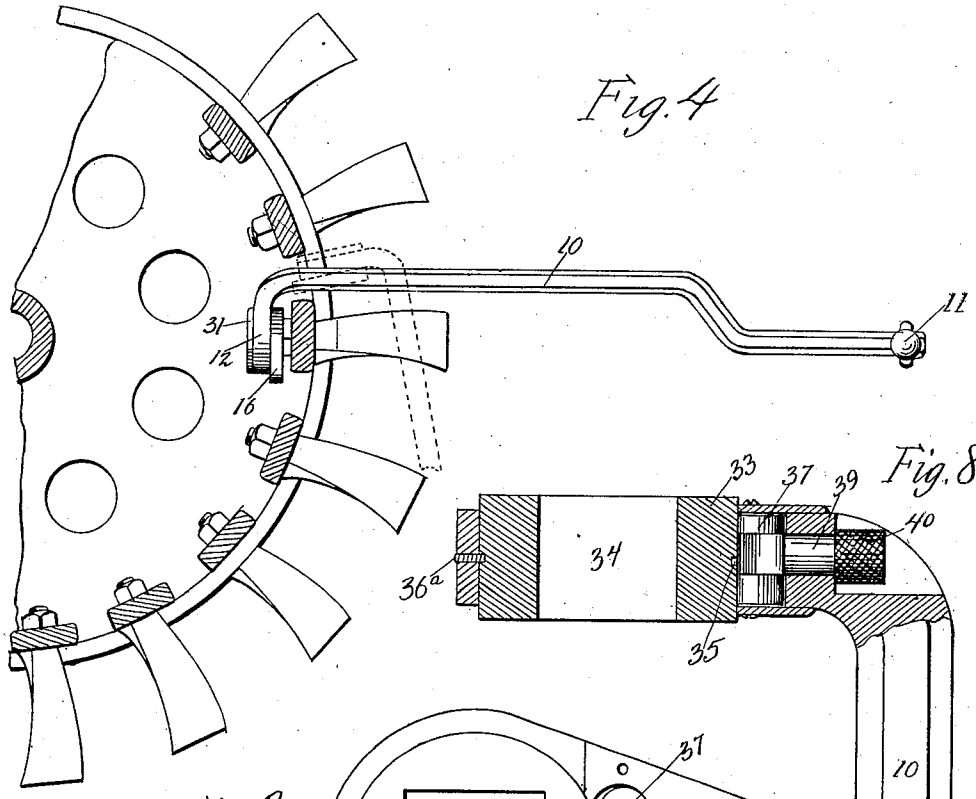


Fig. 8

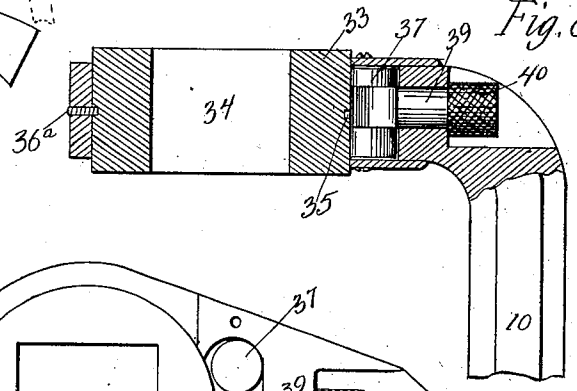


Fig. 9

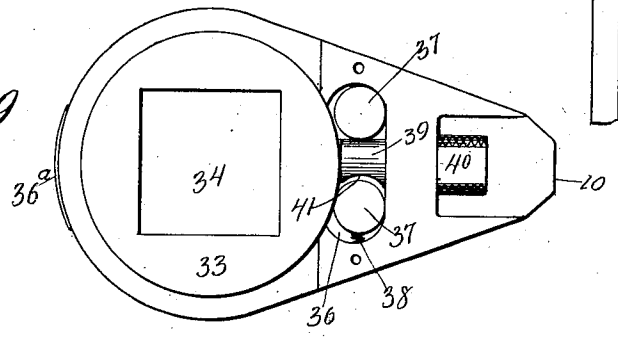
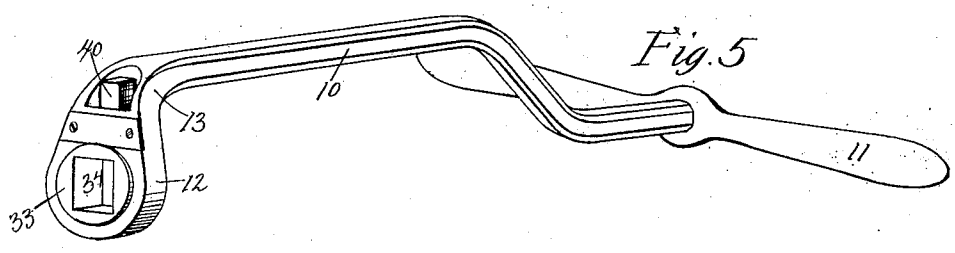


Fig. 5



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 745,281. PATENTED NOV. 24, 1903.

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NO MODEL. APPLICATION FILED SEPT. 29, 1902. 3 SHEETS—SHEET 3.

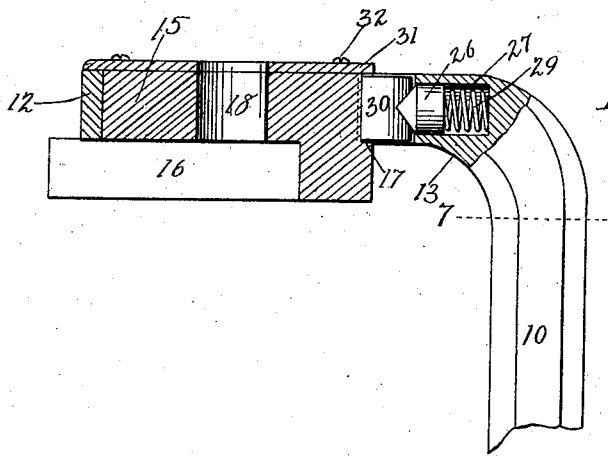


Fig. 6

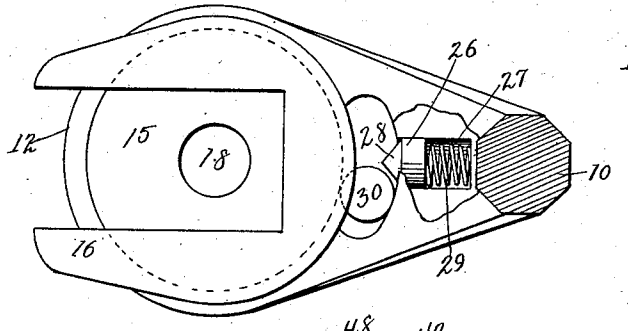


Fig. 7

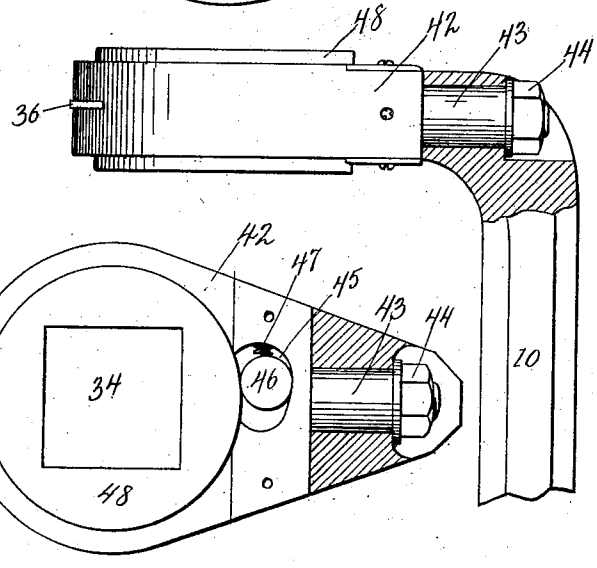
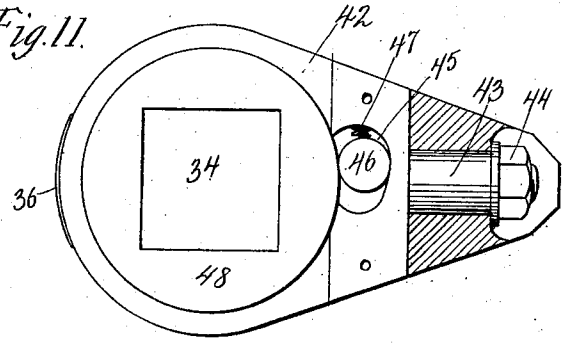


Fig. 10

Fig. 11.



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No. 745,281. Patented November 24, 1903.

UNITED STATES PATENT OFFICE.

JOHN T. HUME, OF NEWTON, IOWA.

WRENCH FOR THRESHING-MACHINE CYLINDERS.

SPECIFICATION forming part of Letters Patent No. 745,281, dated November 24, 1903.

Application filed September 29, 1902. Serial No. 125,340. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. HUME, a citizen of the United States, residing at Newton, in the county of Jasper and State of Iowa, have invented certain new and useful Improvements in Wrenches for Threshing-Machine Cylinders, of which the following is a specification.

The invention relates to that class of wrenches designed to be inserted between the bars of a threshing-cylinder and its nut-holder brought into engagement with the nuts on the inner ends of the threshing-machine teeth, so that the nuts may be turned either to screw or unscrew them by imparting an oscillating movement to the wrench-handle. In this connection it is to be noted that the bars of a threshing-cylinder are generally set so close together as to make it difficult to insert a wrench large enough to carry a nut-holder adapted to the size of nuts used.

The objects of my invention are, first, to provide a wrench of this class of simple, durable, and inexpensive construction, in which the handle and nut-holder are so shaped that they may be quickly and conveniently passed between the bars of a cylinder set so close together that a nut-holder of the size adapted to engage the nuts used could not pass between the bars if presented in position transversely of the nut-opening—that is to say, the handle and nut-holder are so shaped that the nut-holder may be passed between the cylinder-bars when presented in a direction longitudinally of the nut-opening. Hence a nut-holder may be used of comparatively slight thickness longitudinally of the nut-opening.

A further object is to provide a wrench of this class having a roller-ratchet device so arranged that the nut-holder may move freely and easily and with a minimum of friction relative to the handle in one direction, so that the nut-holder will be quickly and firmly clamped to the handle when the handle is turned in the other direction, so that the nut is turned the full length of the handle-stroke.

A further object is to provide a roller-ratchet device of this class of simple, durable, and inexpensive construction in which only one roller is used, and this single roller may be quickly and easily adjusted to clamp on either direction by the manipulation of a thumb-nut at the end of the handle cross-head, thus providing a reversible ratchet that may be set by the operator while the nut-holder is in engagement with a nut and without the operator reaching between the cylinder-bars.

A further object is to provide improved means for applying yielding pressure to the ratchet-roller when set to grip in either direction for the purpose of holding the roller in position where it will instantly grip when the handle is turned in the proper direction.

A further object is to provide a wrench of this class in which the nut-holder is open at one side, so that a nut may be engaged thereby and turned in either direction even though one side of the nut stands quite close to a surface projecting beyond the nut, such as would prevent a round nut-holder from being placed in engagement with the nut.

My invention consists in certain details in the construction, arrangement, and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which—

Figure 1 shows my complete wrench in perspective. Fig. 2 shows an enlarged end view of the nut-holder portion and by dotted lines illustrating the movement of the ratchet-roller. Fig. 3 shows a central sectional view of parts shown in Fig. 2. Fig. 4 shows a sectional view of a part of a threshing-machine cylinder with a modified form of my improved wrench applied to one of the cylinder-teeth nuts and also showing by dotted lines the position of the wrench when entering between the cylinder-bars. Fig. 5 shows in perspective a modified form of my complete wrench. Fig. 6 shows a central sectional view, through the nut-holder and adjacent parts, of another modification. Fig. 7 shows a transverse sectional view of the same modification on line 7 7 of Fig. 6. Fig. 8 shows a central sectional view of the nut-holder and a part of the handle and connected parts of another modified form of my improved wrench. Fig. 9 shows a face view of the nut-holder portion of my wrench, illustrating the same modification. Fig. 10 shows a side elevation of the nut-holder and part of the handle, illustrat-

ing another modification of my improved wrench, a part of the handle being broken away to show the connection of the nut-holder with the handle; and Fig. 11 shows an end view of the modification shown in Fig. 10.

Referring to the accompanying drawings, I have used the reference-numeral 10 to indicate the straight-handle body portion and 11 a cross-head at one end thereof.

The numeral 12 indicates the nut-holder portion, which is substantially cylindrical and is provided with a cylindrical central opening to receive the nut-holder. Between the nut-holder portion and the straight-handle body portion is a curved-handle portion 13, the said curved portion being arranged at such an angle that the longitudinal center of the nut-holder portion is directly in line with the center of the handle cross-head. The said nut-holder portion is made broad and flat—that is to say, its thickness longitudinally of the handle is comparatively slight and its width transversely is materially greater, so that the nut-holder may pass between cylinder-bars set so close together that a nut-holder large enough to engage the nuts used could not pass between them when presented transversely of the nut-holder.

The complete handle-body and its nut-holder portion are preferably made complete in one piece of steel with the nut-holder portion in line with the handle-body portion. Then the circular opening may be turned in the nut-holder portion and the roller-recess properly formed and smoothed up, after which the end of the handle may be bent at the angle shown to produce the finished handle and may be hardened, as required, to prevent wear.

Formed in the nut-holder portion is a roller-recess 14 at the side of the nut-holder opening, said recess being tapered from its central portion toward both ends.

The nut-holder proper comprises a cylindrical body portion 15, designed to fit into the opening in the nut-holder portion. On one face of the part 15 are the nut-holding jaws 16, forming a three-sided opening to receive a nut, the point of the jaws projecting a slight distance beyond the handle portion and the back of the jaw also projecting a slight distance beyond the handle portion at 17, so that it slightly overlaps the roller-recess, as clearly shown in Fig. 3. A concentric opening 18 is formed in the part 15 and extends through it. The said part 15 is held in position in the handle by means of a pin 19, passed through the part 12 into an annular groove 20 in the nut-holder.

The numeral 21 indicates a roller placed in the roller-recess 14, of such width as to engage both the periphery of the nut-holder and the side of the roller-recess 14 when the roller is a short distance past the center of said recess in either direction. This roller is supported upon a leaf-spring 22 by means of a journal 23, secured to the spring and passed through the roller. The opposite end of the spring is fixed to a rod 24, which passes through the handle 10 and projects beyond the cross-head 11, its end being provided with a thumb-nut 25, by which the rod may be easily turned.

From the foregoing description it is obvious that on account of the comparatively small longitudinal dimension of the nut-holder it may readily pass between the bars of a threshing-machine cylinder. Furthermore, by providing a handle portion 13, formed on the curve shown, the nut-holder may be inserted between the cylinder-bars and then turned to a position where it will engage the nut without having said curved portion strike against the cylinder-bars. After the wrench has passed through between the cylinder-bars it is made to engage a nut between the jaws 16, as illustrated in Fig. 4. Then, obviously, by oscillating the cross-head the nut may be turned on the bolt when the handle is moved in one direction, and then when the handle is moved in an opposite direction the nut-holder will turn relative to the handle, so that the nut will stand still during the backward or non-effective portion of the handle stroke. The ratchet-roller device operates to firmly grip the roller between the tapering surfaces of the nut-holder and the recess 14 when moving in one direction. This gripping movement is materially assisted by means of the spring 22, which normally exerts a yielding pressure tending to force the roller toward the ends of the roller-recess. Then when the handle is moved in an opposite direction the roller will compress the spring 22 and the roller will move toward the central portion of the recess, thus permitting the nut-holder to turn freely in the handle. When it is desired to have the ratchet device work in an opposite direction, the operator simply turns the thumb-nut 25, thereby forcing it against the pressure of the spring into the opposite side of the recess 14. This obviously provides a reversible ratchet-roller. Another material advantage attained by the use of the nut-holder jaws 16 is that a nut standing close to a projecting surface may be easily engaged by the jaws. In threshing-cylinders there is usually a tooth placed near each end of the bars, and the nuts on these teeth are quite close to the cylinder-heads, and when adjusting a nut of this class the operator simply engages the nut between the jaws 16, and when he has oscillated the handle to its limit between the bars two or three times the nut-holder jaws will make about half a revolution. Then they may be detached and readjusted to the nut, and this operation is continued until the nut is turned to the desired position.

In the modification illustrated in Figs. 6 and 7 I have provided a different means for yieldingly holding the roller toward either end of the recess, as follows: 26 indicates a sliding block mounted in an opening 27 in the nut-

holder portion, the said block being pointed at 28, and an extensile coil-spring 29 exerts its resiliency against the other end of the block. The roller 30 is engaged by the tapered end of the block and is pressed thereby toward either end of the recess. It may readily be shifted from one end to the other by the operator's finger, thus reversing the clutch. A plate 31 is secured to the top of the nut-holder by the screws 32 and overlaps a part of the roller-recess, thus holding the roller in position.

In the modification illustrated in Figs. 8 and 9 I have shown a nut-holder consisting of a cylindrical body portion 33, having an angular nut-opening 34 extended through it and having an annular groove 35 in its periphery. This nut-holder is placed in the cylindrical opening of the handle and is locked in position therein by means of the key 36^a entering the annular groove 35. In the handle I have formed a roller-recess 36, which is widest at its ends and narrowest at its central portion, and in each end of the roller-recess is a roller 37, normally pressed toward the narrow portion of the recess by means of the extensile coil-springs 38. Mounted in the handle is a shaft 39, having an enlarged head 40 at one end and having its other end projected into the narrow portion of the roller-recess. One face of the shaft 39 is cut away at 41, and the shaft is so shaped and proportioned that when the cut-away portion 41 thereof is placed adjacent to one of the rollers 37 the said roller may then move toward the center of the recess far enough to grip between the nut-holder and the side of the recess, the opposite side of the shaft 39 holding the remaining roller against the pressure of its spring in a position where it cannot engage the nut-holder. Obviously by simply turning the head 40 either of the rollers 37 will be held in an inoperative position, thus providing a simple, durable, and easily-reversible roller-clutch.

In the modification illustrated in Figs. 10 and 11 I have shown a nut-holder-handle portion 42 pivotally connected with the curved-handle portion 13 by means of an extension 43 passed through an opening in the handle portion 13 and held in position by a nut 44. In the nut-holder-handle portion is a roller recess 45, tapered from a maximum at one end to a minimum at its other end, and in said recess is a roller 46, held toward the smaller part of the recess by means of the extensile spring 47, and in the nut-holder portion 42 is a nut-holder 48, exactly corresponding to the nut-holder 33, before described. Obviously the roller-ratchet device operates in one direction only and is not reversible; but I provide for reversing the movement of the nut-holder, which may be done by simply turning the nut-holder-body portion 42 one-half a revolution relative to the handle-body portion, and then when it is placed upon a nut the movement of the roller-ratchet device relative to the holder will be just the reverse, so that substantially the same result is accomplished as in my other forms of the device.

The nuts used in cylinder-teeth are about twice as wide as their thickness, and frequently the cylinder-bars in which the teeth are set are so close together that a nut could scarcely pass between them if presented in the direction of its greatest width. Obviously, then, it would not be possible to put a nut-holder on the nut and pass both through between such cylinder-bars unless the thickness of the nut-holder were materially less than its width. Furthermore, by providing a reversible roller-ratchet device contained wholly between the nut-holder and the extension of the handle the nut-holder-actuating means does not in any way interfere with the passage of the wrench between the cylinder-bars.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States therefor, is—

1. In a wrench, a handle, a fixed cross-head at one end of the handle, a fixed lateral extension at the other end of the handle, a nut-holder in the extension rotating in a plane at right angles to the handle, the combined thickness of the nut-holder and extension being less than their width for the purposes stated, and an automatic gripping device in the extension between the nut-holder and the handle gripping the nut-holder to the handle when the extension is oscillated in one direction and releasing when the movement is reversed.

2. An improved wrench, comprising a handle, a lateral extension rigid on the handle, a nut-holder rotatable in the extension substantially at right angles to the handle, the thickness of the combined extension and nut-holder being less than its width, said extension having a tapered roller-recess, a roller in the recess, and a spring forcing the roller toward either end of the recess.

3. An improved wrench, comprising a handle, a lateral extension rigid on the handle, a nut-holder rotatable in the extension substantially at right angles to the handle, the thickness of the combined extension and nut-holder being less than its width, said extension having a tapered roller-recess, a roller in the recess, and a spring supporting the roller and forcing it toward either end of the recess.

4. An improved wrench, comprising a handle, a lateral extension rigid on the handle, a nut-holder rotatable in the extension substantially at right angles to the handle, the thickness of the combined extension and nut-holder being less than its width, said extension having a tapered roller-recess, a roller in the recess, a spring, a journal attached to the spring supporting the roller, and means for adjusting the spring to yieldingly hold the roller toward either end of the recess.

5. In a wrench, a hollow handle, a lateral extension fixedly connected to one end of

the handle and having a tapered roller-recess therein, a nut-holder rotatable in the extension in a plane substantially at right angles to the handle, a rod passed through the hollow handle and having a yielding portion extending laterally and a roller supported at the end of the yielding portion in the said recess.

6. In a wrench, a handle, a nut-holder rotatably mounted in the handle, said handle having a roller-recess narrowest at its ends, a roller in the recess, and a spring supporting the roller and forcing it toward either end of the recess.

7. In a wrench, a handle, a nut-holder rotatably mounted in the handle, said handle having a roller-recess narrowest at its ends, a roller in the recess, a spring, a journal attached to the spring and supporting the roller, and means for operating the spring to yieldingly hold the roller toward either end of the recess.

8. In a wrench, a handle, a nut-holder rotatably mounted in one end of the handle, said handle having a tapered roller-recess, a roller in the recess, a spring supporting the roller and exerting its resiliency in a direction tending to force the roller toward the narrow ends of the recess, and a roller-reversing device operated from the other end of the handle.

9. In a wrench, a handle comprising a straight handle-body portion, a nut-holder portion having a tapered roller-recess, a nut-holder rotatably mounted in the nut-holder portion, a rod passed through the hollow handle, a spring on one end of the rod, and a roller supported by the spring in said recess.

10. In a wrench, a handle comprising a straight handle-body portion, a nut-holder portion having a tapered roller-recess, a nut-holder rotatably mounted in the nut-holder portion, a rod passed through the hollow handle, a spring on one end of the rod, and a roller supported by the spring in said recess, said spring exerting its resilience in a direction tending to force the roller toward the narrow ends of the recess.

11. An improved reversible roller-ratchet wrench, comprising a straight handle, a fixed extension on one end of the handle having a central opening in line with the handle and a roller-recess adjacent to the opening, a nut-holder in said central opening having nut-engaging jaws on one face thereof, means for rotatably supporting a rod in the straight handle, a thumb-nut on one end thereof, a curved leaf-spring on the other end of the rod, a roller supported by the said spring in the roller-recess and normally forced toward the ends of the recess by the resiliency of the spring.

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