

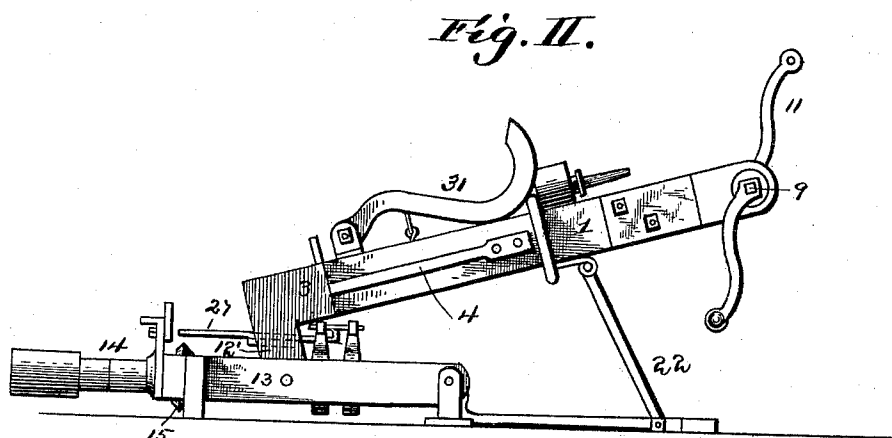
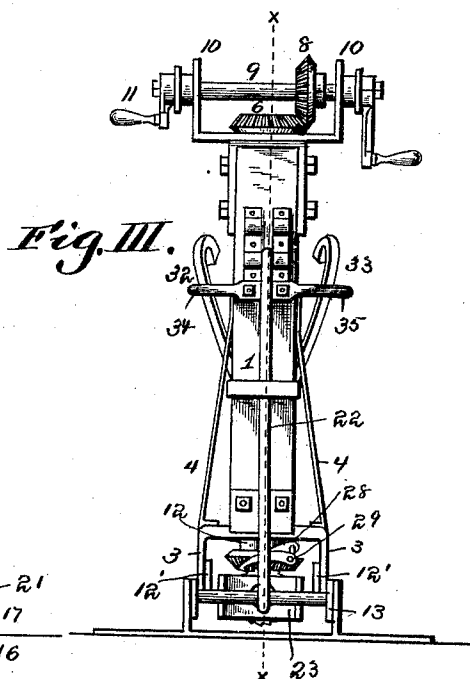
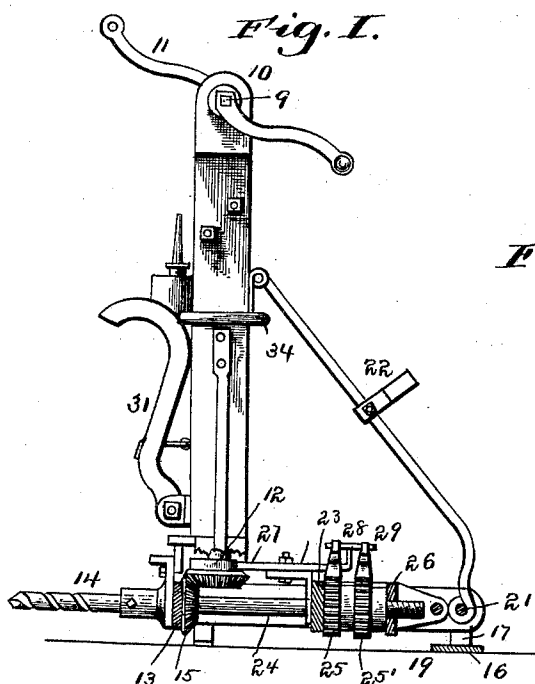
(No Model.)

2 Sheets—Sheet 1.

J. WATERMAN.
CONVERTIBLE DRILL AND WRENCH.

No. 465,626.

Patented Dec. 22, 1891.



Witnesses:

J. B. McGirr.
W. E. Berukar.

Inventor:

John Waterman
By his Attorneys,
Edson Brod.

(No Model.)

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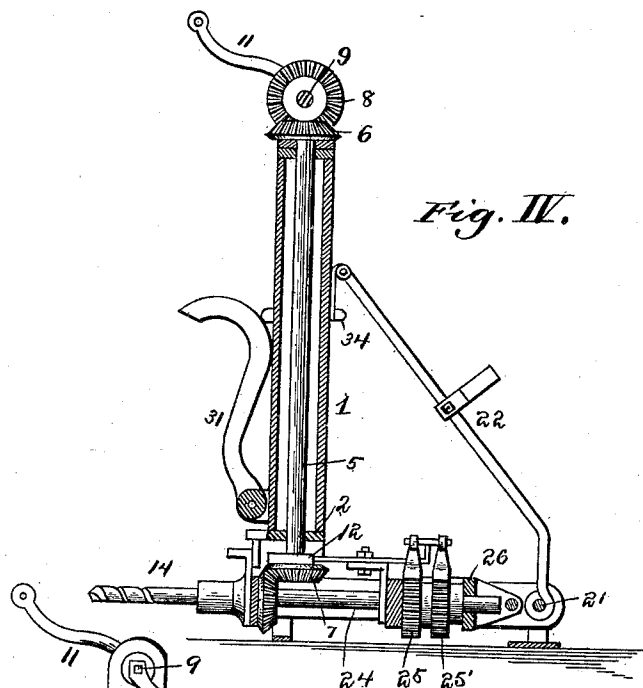


Fig. IV.

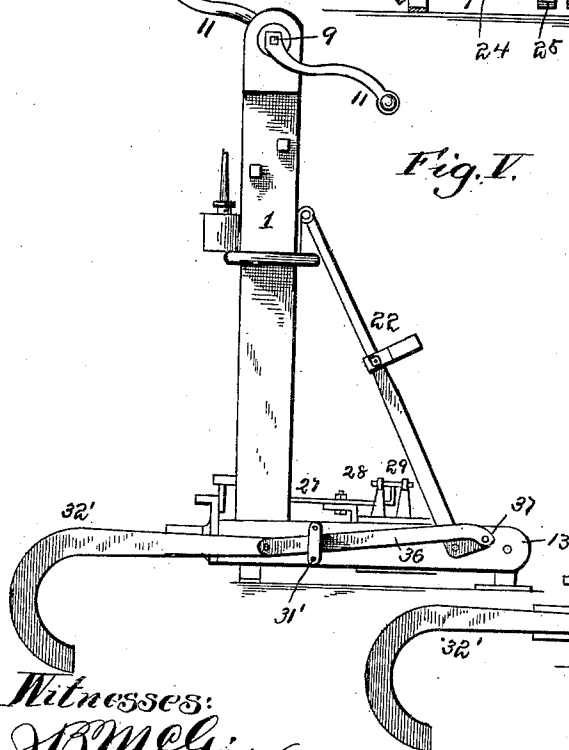


Fig. V.

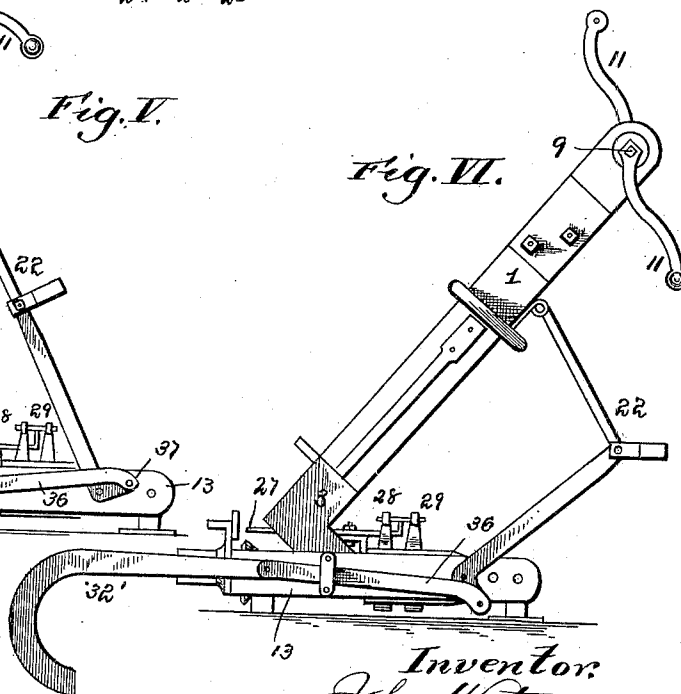


Fig. VI.

Witnesses:
J. B. McGirr.
N. J. Bessard.

Inventor:
John Waterman
By his Attorneys,
Edson Bros.

UNITED STATES PATENT OFFICE.

JOHN WATERMAN, OF VILLISCA, IOWA, ASSIGNOR OF ONE-HALF TO F. B. WEST AND G. O. LEMLEY, OF SAME PLACE.

CONVERTIBLE DRILL AND WRENCH.

SPECIFICATION forming part of Letters Patent No. 465,626, dated December 22, 1891.

Application filed March 31, 1891. Serial No. 387,145. (No model.)

To all whom it may concern:

Be it known that I, JOHN WATERMAN, a citizen of the United States, residing at Villisca, in the county of Montgomery and State of Iowa, have invented certain new and useful Improvements in Convertible Drills and Wrenches; and I do hereby 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.

My invention relates to improvements in convertible drills and wrenches especially adapted for use in drilling railway-rails and loosening or tightening bolt-nuts or taps on the rails.

The object of my invention is to provide a simple and compact machine for drilling railway-rails, which machine can be readily changed to adapt it for loosening or tightening nuts on the rails.

With these ends in view my invention consists of a single upright or standard suitably pivoted in one end of a horizontal main frame, a shaft extending vertically through the center of said standard, which shaft is provided with a crank and handles on its upper end and a gear-wheel on its lower end. Secured in the main frame and projecting therefrom is a drill-stock, which is provided with a gear-wheel which meshes with the gear-wheel on the upright-shaft, and in the other end of the main frame is a supplemental frame, in which is secured a feed-screw which operates to feed the drill forward and keep it in position for operating properly. On the lower end of the upright shaft, above the gear-wheel thereon, is an eccentric disk which engages with a lever, and this lever has two pawls on its end to engage with ratchet-wheels on the feed-screw, by means of which the said feed-screw is revolved and the drill advanced or returned. Pivoted on the forward part of the upright is a bifurcated holding-arm which insures a good contact with the rail and holds the machine steady. To further hold the upright in a firm position, I provide a foldable brace, one end of which is fastened to the upright and the other end to the rear end of the main frame. Pivottally secured on the rear end of the main frame is a rest which has its base-

piece projecting at either end to form handles for carrying the machine or steps to hold it steadily in position with the feet, as described.

My invention further consists in providing two arms or hooks on the front of the frame instead of the single bifurcated arm and pivoting the same to bars secured in guides or keepers on either side of the main frame. The foldable brace is also provided with a bifurcated lower portion, and these bifurcated arms are pivottally secured in the rear end of the frame. The extreme ends of these arms are bent upwardly and loosely secured to the rods, so that when the brace is bent and the standard lowered the ends of the bifurcated arms will move the side rods lengthwise and thus loosen the holding-arms on the rail.

My invention further consists of the peculiar construction and arrangement of parts, as will more fully appear hereinafter.

To enable others to understand my invention, I have illustrated the same in the accompanying drawings, in which—

Figure I is a side elevation of my improved machine, partly broken away, to show the working mechanism. Fig. II is a view showing the upright in a folded position and the drill-stock provided with a wrench for use in tightening or loosening bolts. Fig. III is a rear view of my machine. Fig. IV is a sectional elevation taken on the line *x x* of Fig. III. Figs. V and VI are elevations showing modified constructions of my invention.

Referring to the drawings, in which like numerals of reference denote corresponding parts in all the figures, 1 designates the upright or standard, which is preferably made of wood, and is mounted on a plate 2, having the downwardly-extending ends 3 3, and this upright is braced by rods 4 4, secured to the plate 2 and the upright on either side of the latter. Extending through the center of the upright is a shaft 5, which has gear-wheels 6 7 on either end thereof. The upper gear 6 meshes with another gear-wheel 8 on a shaft 9, which is journaled in bearings in the upwardly-projecting ends of the plate 10, secured on the top of the upright 1. The shaft 9 is provided with suitable cranks 11, and when these are turned the shaft 5 is revolved. Fitted on this shaft 5, just above the gear 7,

is a cam 12, which revolves with the shaft, for a purpose hereinafter described. The downwardly-extending ends 3 3 of the plate 2 are secured to short metallic strips 12 12, which extend at right angles to the ends 3 3, and are secured to the sides of the main frame 13 about the center thereof. Suitably mounted in this frame is a drill-stock 14, which projects beyond the front of the frame, and is adapted to receive a drill or wrench, as desired. This drill-stock is provided with a gear-wheel 15 just inside the frame 13, which meshes with the gear 7, and by means of which the drill is operated. The strips 12 12 are of such length that when the upright is in a vertical position the gears 15 and 7 will be brought into a proper engagement, and in order to provide a firm base for the upright I arrange an upwardly-extending plate 16 on the front of the frame 13, upon which a small projecting plate 17 on the upright 1 is arranged to rest. This main frame 13 is provided with a resting-plate 18 on the forward end thereof and another base-plate 19 on the rear end of the frame which has the projecting standards 20 pivoted on a shaft 21. By means of this pivoted plate I provide a suitable base for the machine when it is in operation, and when it is desired to move the same this base can be turned up over the end of the frame and the projecting ends will then form handles by which the machine can be carried.

Secured to the shaft 21 is a foldable brace-rod 22, which is connected to the upper portion of the upright, and it is provided with a handle at the juncture of the two members thereof. When the upright 1 is thrown down, the rod 22 is drawn out and the handle thereon rests on the ground and supports the upright.

In the rear of the main frame is a supplemental frame 23, in which is secured a feed-screw 24, which bears against or engages with the drill-stock and feeds it forward to make the drill work properly. This feed-screw is provided with two ratchet-wheels 25 25', which have reversely-inclined teeth and arranged to operate between the piece 26 and the U-shaped supplemental frame 23.

Secured on one side of the main frame is a lever 27, which is operated by the cam-disk 12, and is provided with a pawl 28 on its upturned end and another pawl 29 on the other projecting end thereof. The pawl 28 is arranged to engage with the ratchet-wheel 25 and push the same around as the cam 12 presses the lever 27 out, thus feeding the drill-stock forward and causing the drill to contact properly with the work on which it is operating.

As heretofore mentioned, I have adapted my invention to be used for tightening or loosening nuts on railways or other structures, and it is therefore necessary to provide a machine which will work equally satisfactory in both directions. With this end in view I have provided the hook-shaped pawl

29 to engage with the reversely-inclined teeth on the ratchet-wheel 25', and which serves to rotate the feed-screw in the reverse direction when the handles 11 are turned backward. Thus the wrench 30 can be revolved forward or backward by simply reversing the movement of the handles 11, the gears 15 and 7 revolved in a reverse direction, and the pawl on the lever 27 engages with its ratchet-wheel, and by this means the wrench is revolved and fed backward, the other pawl simply sliding over the teeth on its ratchet-wheel and being adapted to engage with its ratchet-wheel to reverse the wrench when the handles are turned in an opposite direction. This construction and arrangement of a drill and wrench in one machine will be appreciated by those skilled in the art, as by using my machine much time will be saved and extra mechanism avoided. After the hole has been properly drilled the drilling-bit can be quickly removed and a wrench substituted therefor, and the nut may be then screwed on the bolt without loss of time.

To insure better connection between the machine and a railroad-rail, on which the machine is generally used, I provide a bifurcated holding-arm 31, which is pivotally secured to the front of the upright 1, said arm 31 having the hooks 32 33, adapted to engage with a rail and hold the machine firm and steady. The bifurcated arm 31, having two hooks, is preferred to a single arm and hook and to two separate arms and hooks, as by this device the two hooks prevent the machine from moving sidewise, and the single pivoted arm on the upright permits it to be folded on the upright for convenience in carrying the machine.

34 35 are suitable handles secured on the upright 1 for use in moving the machine.

The operation of my machine will be readily understood from the foregoing description, as it is only necessary to adjust the drill and bifurcated arm on the rail and operate the cranks 11. After drilling the hole, if it is desired to screw a nut on a bolt which has been inserted in the hole a wrench is substituted for the drill, as shown, and the machine is then operated as before. When it is desired to remove a nut from a bolt, the cranks are simply turned in a reverse direction and the wrench will unscrew the nut.

In Figs. V and VI, I have shown a modified construction, which consists, principally, in providing two arms or hooks 32' 33' suitably joined together, and these arms extend on either side of the main frame and are loosely secured to bars or rods 36, which are secured in place by guides or keepers 31' midway of the frame. I also bifurcate the lower portion of the foldable brace-rod 22, and the lower ends 22' are bent outwardly and pivotally secured at said curved portions 37 to either side of the rear end of the main frame, and the projecting ends are also loosely connected with the rear ends of the side rods 36. This

latter construction is very simple and possesses practical advantages, as it will be readily seen that when the upright is turned down the brace will break back and the curved ends thereof will throw the side bars 36 forward, and thereby loosen the grip of the arms and hooks on the rail; and, again, when the arms and hooks have been placed in position on a rail, the upright remaining in a horizontal position, when the upright is turned to a vertical position it will cause the arms and hooks to grasp the rail firmly and assume a rigid and substantial position, thus facilitating the adjustment of the machine to the rail. I have also shown the upright 1 constructed partly of wood, and the lower portion thereof consisting of two pieces of iron 38, suitably fastened to the wooden upper end and the plate 2. This is a neater construction and affords a better opportunity for attending to the working mechanism of the machine.

I am aware that changes in the form and proportion of parts can be made without departing from the spirit or sacrificing the advantages of my invention, and I therefore reserve the right to make such changes as fall within the scope of my invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the stock, of the standard pivotally supported on the main frame, the shaft carried by said standard and having the gear-wheel which engages with the gear on the crank-shaft, the drill-stock geared to the shaft on the standard, the cam carried by the shaft, the lever actuated by said cam and provided with the feed-pawls, and the feed-screw having the ratchet-wheels, for the purpose described, substantially as set forth.

2. The combination, with the stock, of the standard carrying the driving-shaft for operating the drill, the main frame, the supplemental frame secured in said main frame, and the feed-screw supported in the supplemental frame and operating automatically with the stock, substantially as described.

3. The combination, with the stock, of the standard, the shaft carried by said standard and having the cam, the main frame, the supplemental frame secured therein, the drill-stock secured in the main frame, the feed-screw secured in the supplemental frame and carrying two ratchet-wheels, and the lever actuated by the cam and having two pawls which engage the ratchet-wheels, substantially as and for the purpose described.

4. The combination, in a convertible drill and wrench, of a foldable standard carrying

mechanism for operating the stock, the main frame carrying the stock, the supplemental frame carrying the feed-screw and the mechanism for operating said feed-screw, and the bifurcated holding-arm pivotally secured to the standard and adapted to engage with a railway-rail, substantially as and for the purpose described.

5. The combination, in a convertible drill and wrench, of a standard carrying the mechanism for operating the stock, the stock supported in the main frame, the supplemental frame carrying the feed-screw, the cam on the driving-shaft, the lever actuated by the cam, and the pawls arranged to engage with ratchet-wheels on the feed-screw for operating said feed-screw either forward or backward, substantially as and for the purpose described.

6. In a convertible drill and wrench, the combination of the standard, the main frame and the supplemental frame carried thereby, the bifurcated holding-arm pivoted to said standard, mechanism for operating the drill and feed-screw, and a single foldable brace-rod having a handle at its hinge and forming a support for the standard when folded on the main frame, substantially as described.

7. In a convertible drill and wrench, a foot-rest pivotally secured to the main frame and adapted to be adjusted over the end of the frame to form a handle, substantially as and for the purpose described.

8. In a convertible drill and wrench, the combination of the standard, the main frame and the supplemental frame carried thereby, the folding arms pivotally secured to rods on either side of the main frame, and the bifurcated foldable brace connected with said rods and adapted to move the same lengthwise when the brace is folded, substantially as described.

9. In a convertible drill and wrench, the combination of the standard, the main frame and the supplemental frame carried thereby, the folding arms having the depending curved hooks and pivotally secured to rods on either side of the main frame, the foldable brace-rod secured at its upper end to the standard and having its lower bifurcated ends pivoted to the main frame at the curved portion thereof and its inwardly-extending ends loosely secured to the rods on the frame, and the mechanism for operating the drill and feed-screw, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN WATERMAN.

Witnesses:

E. E. COFFIN,

W. M. CAMPBELL.