

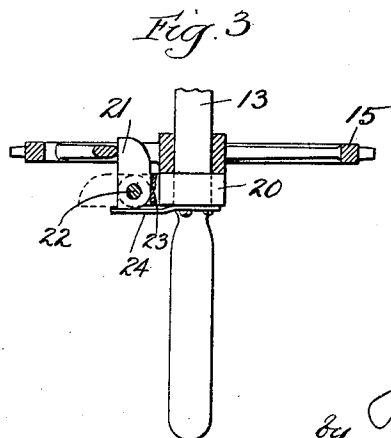
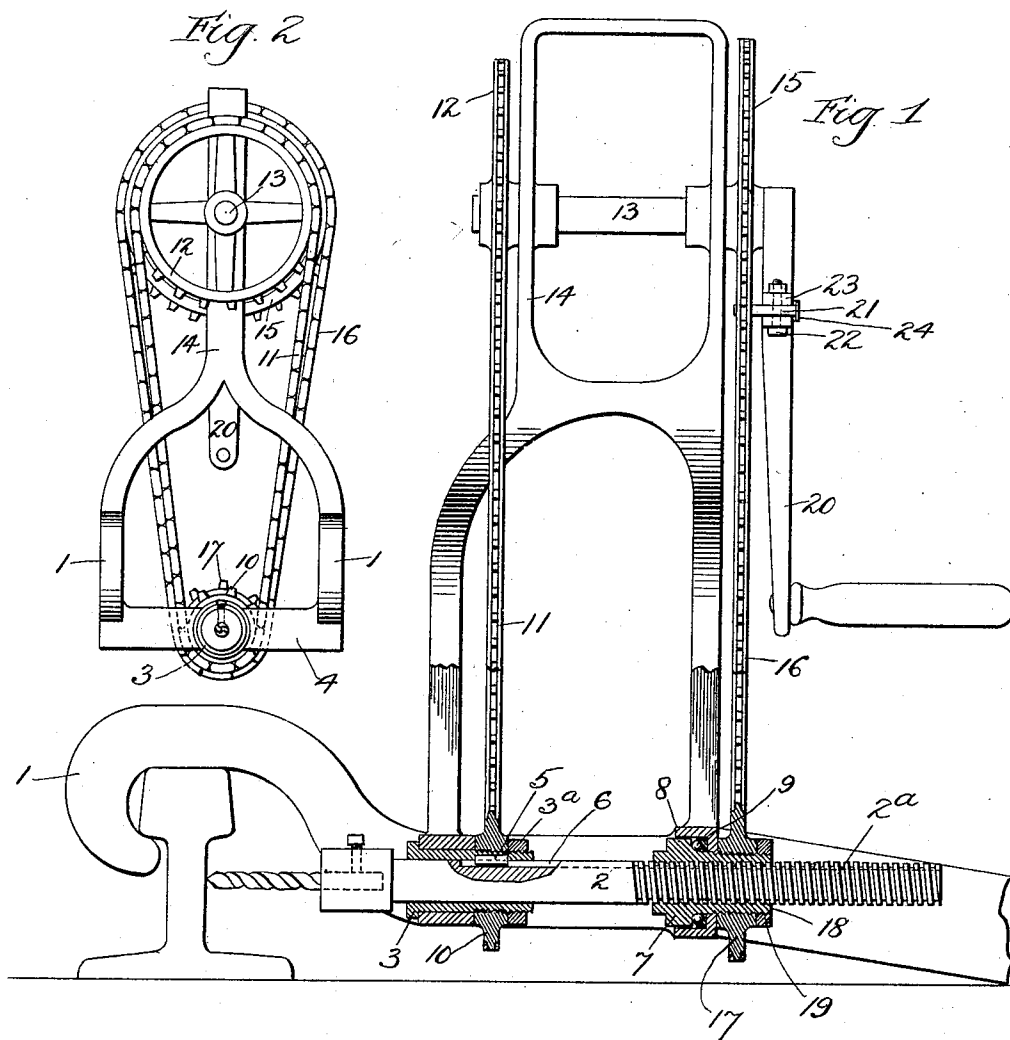
No. 613,748.

Patented Nov. 8, 1898.

J. A. WILSON.
DRILLING MACHINE.

(Application filed Feb. 7, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

JOSEPH A. WILSON, OF CHICAGO, ILLINOIS.

DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 613,748, dated November 8, 1898.

Application filed February 7, 1898. Serial No. 669,317. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH A. WILSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Drilling-Machines, of which the following is a full, clear, and exact specification.

My invention relates to drilling-machines of that class in which the drill is revolved and advanced or fed by one and the same movement of the operating-shaft; and my invention has for its primary object to provide improved and simple means whereby the drill may be rapidly advanced or retracted when desired for withdrawing it from the hole or placing it in position to drill a new hole.

Another object of my invention is to cause the nut which engages with the feeding-thread of the drill to revolve therewith, but at a different rate of speed, whereby the drill will be fed forward for drilling at the same time it is rotated and to cause such rotation of said nut to automatically cease when the direction of rotation of the drill is reversed, so that when the drilling is finished and the drill reversed the latter will be automatically and rapidly retracted from the hole.

With these ends in view my invention consists in certain features of novelty in the construction, combination, and arrangement of parts by which the said object and certain other objects hereinafter appearing are attained, all as fully described with reference to the accompanying drawings and more particularly pointed out in the claims.

In the said drawings, Figure 1 is a side elevation, partly in vertical section, of my improved drill, showing the same applied to a railway-rail in position for drilling the web thereof. Fig. 2 is a front elevation on a small scale, and Fig. 3 is an enlarged detail plan section of one of the sprocket-wheels and the operating crank or handle.

In adapting my improved drilling-machine for drilling the webs of railway-rails or other like objects the base-frame or some other suitable part of the frame is provided with the usual hooks or claws 1, which fit over the head of the rail, as will be understood, and while the drilling of railway-rails constitutes

the greatest field of usefulness of my invention the fact will nevertheless be appreciated that the improved features of my drilling-machine are equally applicable to other uses. 55
The drill-stock 2 is journaled at or near one end in a bushing 3, which is mounted in a cross-bar 4 of the main frame with capability of revolving therein. This bushing is connected with the stock 2, so as to impart rotation to the latter while permitting the latter to move longitudinally therein, by means of a key or spline 5, secured in the bushing and engaging in a longitudinal groove 6, extending, preferably, to the rear end of the stock 2. The other end of the stock 2 is screw-threaded, as shown at 2^a, and such screw-threaded end is mounted in a nut 7, which latter in turn is journaled in another cross-bar 8 of the main frame. The bar 8 and a 70
shoulder formed on the nut 7 preferably constitute means for housing a set of balls 9, which form an antifriction-bearing for the nut 7. Thus it will be seen that when the stock 2 is rotated and the nut 7 held at rest the drill 75
will be advanced or retracted at its maximum rate of speed; but if the nut 7 be rotated in the same direction of rotation as the stock 2, but at a different rate of speed, the advancing or feeding movement of the stock and drill 80
will be in proportion to such difference in the rate of speed. In order to utilize one of these movements for rapidly advancing or retracting the drill to get it in position and the other for feeding the drill forward or keeping it up 85
to its work, I employ the means which I will now describe. Secured upon the bushing or sleeve 3 is a sprocket-wheel 10, which is connected therewith in any suitable manner, as by jam-nut 3^a, so as to compel the bushing 90
to receive the rotary movement of the sprocket, and this sprocket 10 is connected by chain or belt 11 with a sprocket-wheel 12, secured upon a shaft 13, journaled in an upward extension 14 of the frame. Also 95
mounted upon this shaft 13, but loosely, so as to revolve independently thereof, is another sprocket 15, which is connected by chain or belt 16 with a sprocket 17, secured in any suitable way to a tubular extension or sleeve 100
18, formed on or secured to the nut 7, the sprocket 17 being shown as screw-threaded

upon such sleeve 18 and locked by a jam-nut 19, so as to compel the nut 7 to revolve with the sprocket 17. The shaft 13 is provided with an operating crank or handle 20, which
 5 when revolved imparts rotation to the sprocket 10, and consequently to the drill-stock, while the sprocket 15 and nut 7 remain at rest, thus advancing or retracting the drill at the maximum rate of speed. In order,
 10 however, that the rotation of the crank 20 may be likewise imparted to the nut 7 and in the same direction, I provide a suitable attachment between the crank and sprocket 15, which may be disconnected when this rapid
 15 movement is desired. This attachment may consist of a dog or pivoted lug 21, pivoted on a bolt 22, carried by a suitable support 23 on the crank 20 and being so arranged that when the tooth or dog 21 is thrown inwardly toward
 20 the sprocket 15 it will engage between the spokes of the latter and cause it to revolve, and when thrown outwardly to the position indicated in dotted lines in Fig. 3 the crank may be revolved in either direction without
 25 moving the sprocket 15. The tooth or dog 21 may be held in either of these positions by means of a flat spring 24, pressing against the heel thereof and being secured to the support 23. One side of the dog 21, however,
 30 is rounded, as clearly shown in Fig. 3, so that after the drilling is finished a reverse movement of the handle 20 will automatically throw the dog out of engagement with the sprocket, and in thus permitting the nut 7 to
 35 remain at rest while the sprocket 10 revolves the stock 2 the latter will be retracted at its maximum rate of speed. The drill may then be moved along to the next point of drilling and the drill rapidly advanced at its maxi-
 40 mum rate of speed against the surface to be drilled by simply reversing the direction of rotation of the crank, the tooth 21 in the meanwhile remaining out of engagement. When it is desired to begin the drilling, it is simply
 45 necessary to press the dog or tooth 21 inwardly, so as to again engage with the sprocket 15 and cause the nut 7 to revolve with the stock 2 at a slightly increased or decreased rate of speed. This difference in speed may of
 50 course be effected by a difference in size of the sprockets 10 12 and 15 17, as shown in the drawings.

It is of course very evident that the bushing 3 might be omitted and the sprocket 10
 55 secured directly to the stock 2 by the spline-and-groove connection; but the bushing 3 is preferable, because it is much easier to replace when the bearing is worn than would be the cross-bar 4 or other part of the main
 60 frame. It is also quite evident that a common train of gears in lieu of the chains and sprockets would be within the scope of my invention; but the sprockets and chains are preferable for obvious reasons.

65 Having thus described my invention, what

I claim as new therein, and desire to secure by Letters Patent, is—

1. A drilling-machine having in combination a drill-stock provided with a thread, a nut engaging with said thread, means for rotating said stock, means for rotating said nut and a detachable connection between the means for rotating said stock and the means for rotating said nut, adapted to be released by the reverse movement of said first means, substantially as set forth.

2. A drilling-machine having in combination a drill-stock, a crank-shaft having operative connection with for rotating said stock, a nut having threaded connection with said stock, a gear-wheel loose on said shaft and being geared to for rotating said nut and a pawl carried around with said shaft for imparting rotation to said gear-wheel in one direction, said pawl being deflectable in the opposite direction so as to disengage with said wheel, substantially as set forth.

3. A drilling-machine having in combination a drill-stock, a crank-shaft having operative connection with for rotating said stock, a sprocket-wheel loose on said shaft, a nut having threaded connection with said stock, a sprocket-wheel geared to said nut, a chain connecting said sprocket-wheels and a deflectable pawl carried around with said shaft and adapted to engage with and revolve said sprocket-wheel, substantially as set forth.

4. A drilling-machine having in combination a drill-stock, a frame, a bushing rotatably mounted in said frame and embracing said stock, a gear or sprocket wheel screwed on said bushing, the jam-nut 3, spline-and-groove connection between said bushing and stock, and means for rotating said gear or sprocket, substantially as set forth.

5. A drilling-machine having in combination a drill-stock, means for rotating said stock, a nut threaded on said stock and having the extension 18, the gear or sprocket 17 threaded on said extension, the nut 19 binding said gear or sprocket, and means for rotating said first nut, substantially as set forth.

6. A drilling-machine having in combination a drill-stock, a sprocket-wheel having spline-and-groove connection thereto, a nut threaded on said stock, a sprocket secured to said nut, a crank-shaft, a sprocket-wheel fixed to said crank-shaft and being geared to said first sprocket, a second sprocket-wheel loose on said shaft and being geared to said second sprocket, a crank secured to said crank-shaft, and the pivoted pawl or dog secured to said crank and adapted to engage with and revolve said loose sprocket-wheel, substantially as set forth.

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