C. H. OSLUND.

DRILL.

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981,791. Patented Jan. 17, 1911.

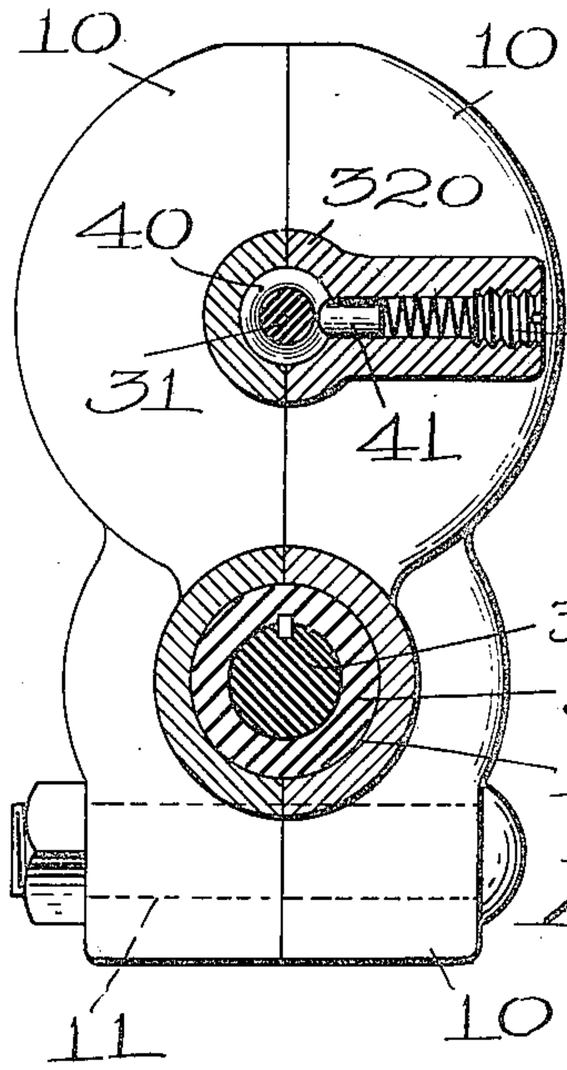

Fig. 2.

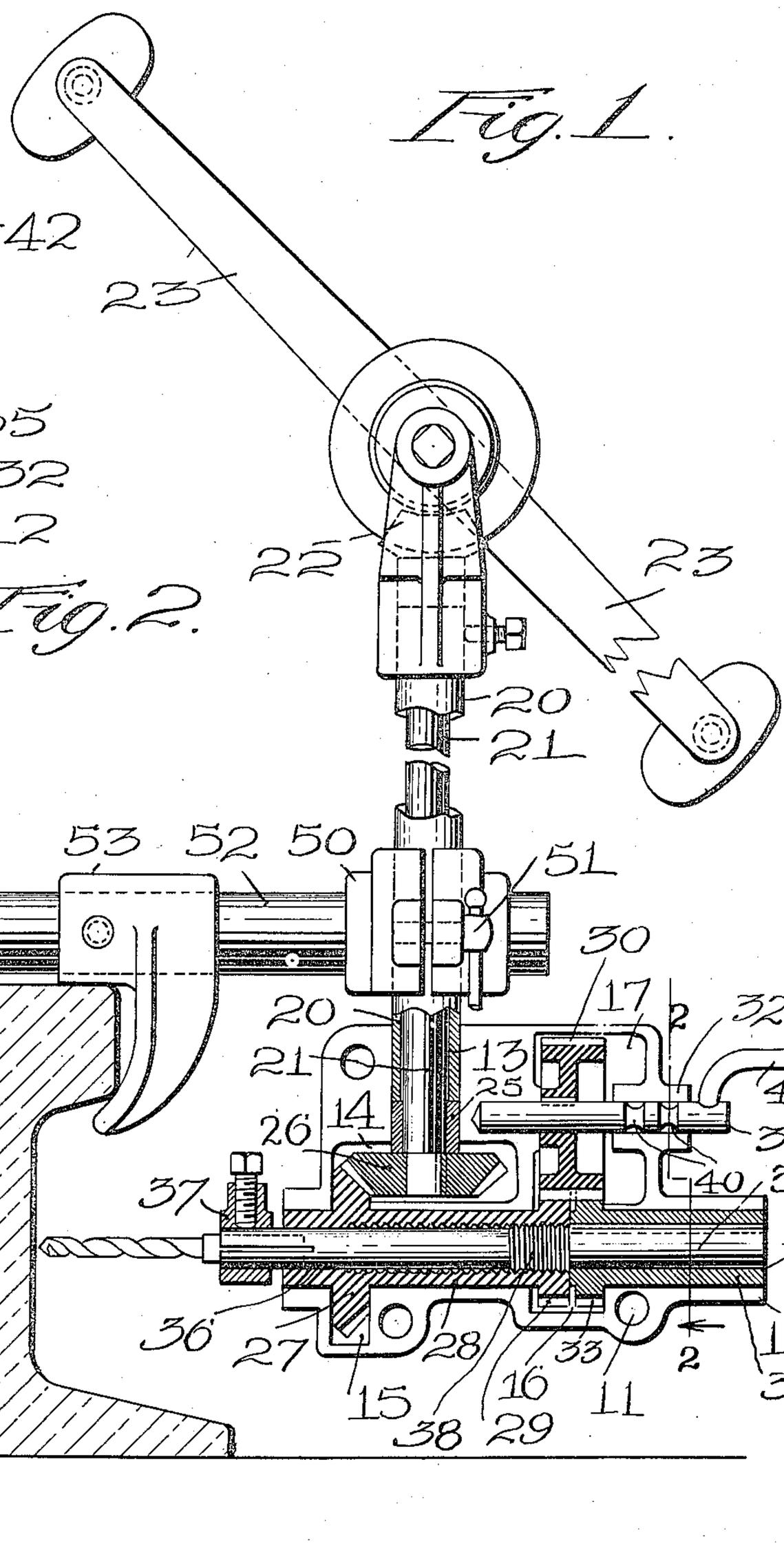

Fig. 1.

Witnesses:

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DRILL.

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To all whom it may concern:

Be it known that I, CHARLES H. OSLUND, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Drill, of which the following is a specification.

This invention relates to a drill.

The principal objects of the invention are to provide a compact and simple construction for a small drill adapted for many purposes but particularly designed for drilling rails for electric signal connections, in which the driving and feeding mechanism will be very conveniently and compactly located in the casing; to provide simple and convenient means within the casing whereby the drill can be operated either by powerful handle connections or by a crank adapted to be operated by one hand; to provide an accurate and simplified means whereby the drill will be automatically fed forward while it is being rotated and whereby simply by disconnecting the feeding connection and continuing to rotate the driving means in the same direction, the drill will be drawn back at a much higher speed; and to provide an improved form of clamp adapted to support the drill casing or to be supported thereby.

Further objects and advantages of the invention will appear hereinafter.

Reference is to be had to the accompanying drawings, in which—

Figure 1 is a longitudinal central sectional view of a drill constructed in accordance with this invention showing one-half the casing in elevation and showing the clamp on the casing also in elevation, and Fig. 2 is a section on line 2—2 Fig. 1 on an enlarged scale.

The drill is shown as comprising a closed casing 10 consisting of two halves adapted to be bolted together through the holes 11 therein. This casing is provided with a main longitudinal passage 12 which communicates with a vertical or transverse passage 13 through a chamber 14 having an axis coincident with that of the passage 13. The passage 12 is provided with a cylindrical enlargement 15 communicating also with the passage 14. It also has a cylindrical enlargement 16 nearer the other end of the casing which communicates with the cylindrical passage 17 having an axis parallel with the axis of the main passage. All these passages and enlargements are preferably of a cylindrical form, half of each cylinder being in each half of the casing. They are so located that the casing does not have to be greatly enlarged over the size that would be required for the passages 12 and 13 alone and so that the several enlargements do not materially weaken the casing.

In the passage 13 is a sleeve 20 which is fixed in the casing and extends therefrom. This sleeve constitutes a bearing for the main power shaft 21 which is provided with a gear 22 and one or more operating handles 23 located up above the casing in a convenient position to be operated by hand. It will be understood, however, that this shaft can be operated by power without departing from the scope of this invention.

Below the sleeve 20 is a bushing 25 and on the power shaft is a beveled gear 26 located in the enlargement 14. This gear meshes with a gear 27 which is integral with the rotary sleeve 28 mounted in the longitudinal passage 12. This sleeve is provided with an integral spur gear 29 thereon which meshes with a spur gear 30 fixed to a shaft 31 which projects out through a bearing 320 of the casing.

Abutting against the end of the sleeve 28 is an independently rotary sleeve 32 provided with an integral spur gear 33 meshing with the teeth of the gear 30 and having a smaller number of teeth than the gear 29, preferably one less. On account of this construction, it will be seen that the sleeve 32 rotates faster than the sleeve 28 and that the ratio will depend upon the number of teeth in the gears 29 and 33.

Keyed to the sleeve 32 is a drill spindle 35. This spindle extends through the sleeve 28 which has a bearing therefor. The end outside of the bearing is provided with a clamp 37 for clamping the drill thereto. This spindle is provided with an enlarged right-handed screw-threaded portion 38 and the interior of the sleeve 28 is provided with a screw-thread from end to end fitting the threads 38.

The shaft 31 is longitudinally movable with its gear 30 from the position shown in Fig. 1 in full lines to a position at the right in which said gear meshes only with the gear 33. In order to hold the shaft in either one of these positions, it is provided with a pair of annular grooves 40 and the casing is provided with a spring-pressed pin

41 adapted to engage in either one of said grooves in accordance with the position of the shaft. A screw 42 adjusts the tension of the spring behind the pin 41. The end of the shaft 31 is provided with a handle 43 by which it can be turned in an obvious manner.

Mounted on the sleeve 20 is a split collar 50 adapted to be fixed in position by a screw 51. This collar has a horizontal passage therein for receiving a bar 52 which is firmly clamped in the same. On this bar is a fixed jaw 53 for gripping one side of the top of a rail or the like. The bar is screw-threaded at the end and provided with a nut 54 having a handle 55 by which the companion jaw 56 can be moved back and forth. This nut has a projecting collar 57 and the jaw 56 has a hook 58 engaging it so that this jaw moves back and forth with the nut.

The operation of the device is as follows:— The jaw being clamped on a rail as indicated in the drawing and the drill being in place on the spindle, the handle 23 is turned which rotates the sleeve 28 in one direction. This rotates the gear 30 and the sleeve 32. The latter rotates in the same direction as the sleeve 28 and a little faster and obviously the drill spindle does the same. On account of this fact the drill spindle is moved forward provided the rotation of the two sleeves is in the usual right-handed direction. At the same time, of course, the drill is rotated in the proper direction for cutting. Now when it is desired to withdraw the drill the shaft 31 is moved back so as to bring the gear 30 out of mesh with the gear 29 keeping it, however, in mesh with the gear 33. The handle 23 is rotated continuously in the same direction and now as there is no power to rotate the spindle 35, the continual rotation of the sleeve 28 to the right will bring the spindle back rapidly in accordance with the pitch of the screw-threads. It is to be observed also that while the gear 30 is in mesh with the gear 33 and out of mesh with the gear 29, the handle 43 can be operated to turn the spindle 35 and that at this time it will be fed forward very rapidly because the sleeve 28 which acts as a nut is then stationary. At this time if it is desired to reduce the feed of the drill, the handle 23 can be rotated to turn the sleeve 28 in the same direction as the spindle.

In view of what has been said it will be seen that the feed of the drill is accomplished in a very simple way and that the mechanism therefor is extremely compact and does not take up any more room than would the rotating mechanism by itself, except that occupied by the gear 30 and shaft 31.

While I have illustrated and described a preferred embodiment of the invention, I am aware that many changes may be made therein by any person skilled in the art without departing from the scope of the invention as expressed in the claims. Therefore, I do not wish to be limited to all the details of constructions herein shown and described, but

What I do claim is:—

1. In a drill, the combination of a hollow sleeve having internal screw-threads, a feed screw therein rotatable independently thereof, gearing for transmitting power from the sleeve to the feed screw at an increased rate of speed, and means for rotating the sleeve.

2. In a drill, the combination of a hollow sleeve having internal screw-threads, a second hollow sleeve in alinement therewith, a drill spindle extending into both sleeves and fixed to the second sleeve having screw-threads thereon fitting the screw-threads on the first named sleeve and free to turn therein, means for transmitting power to rotate the first named sleeve, and gearing for transmitting power from the first named sleeve to the second sleeve at a higher rate of speed.

3. In a drill, the combination of a power shaft, an internally threaded sleeve at right angles thereto, means for transmitting power from the shaft to the sleeve to rotate the latter, a shaft parallel with the axis of the sleeve, a gear fixed thereon, a second sleeve in axial alinement with the first named sleeve, gears on the two sleeves both in mesh with the gear on said shaft, the number of teeth on the gear on the second sleeve being one less than the number on the gear on the first sleeve, a drill spindle fixed to the second sleeve and threaded to fit the threads on the first named sleeve, and a handle on said shaft for rotating it independently of the first named sleeve, said shaft being movable to bring its gear out of mesh with the gear on the first named sleeve.

4. In a drill, the combination of a power shaft, a casing into which it extends, a hollow sleeve rotatably mounted in the casing and adapted to be rotated by the power shaft, a drill spindle extending from said sleeve and rotatable therein and so connected with said sleeve that the spindle will be longitudinally moved by relative rotation of the spindle and sleeve, means in the casing connected with said sleeve for rotating the drill spindle and feeding it forward when the power shaft is rotated in one direction, and means whereby when said connections are disconnected from said sleeve the continued rotation of the power shaft in the same direction will cause the drill spindle to be withdrawn backwardly at a greater speed.

5. In a drill, the combination of a casing, a sleeve mounted therein, a driving shaft extending through the sleeve into the casing, a rotatable sleeve having connections for ro-

tating it from the driving shaft mounted in the casing, a drill spindle extending from the end of said sleeve and so connected with said sleeve that the spindle will be longitudinally moved by relative rotation of the spindle and sleeve, means in the casing connected with said sleeve, whereby the rotation of said power shaft will rotate said drill spindle and feed it forward, and means whereby the connections can be changed to cause the drill spindle to be withdrawn without changing the direction of rotation of the power shaft.

6. In a drill, the combination of a casing, a sleeve supported at one end therein and extending therefrom, a driving shaft extending through the sleeve into the casing, a drill spindle projecting from the casing and adapted to be driven by the power shaft, and means for supporting said casing comprising a rod secured on said sleeve and projecting therefrom parallel with the spindle, a jaw fixed on said rod, said rod being provided with screw-threads, a second jaw slidably mounted on the rod and provided with a hook, and a nut having a handle mounted on said screw-threads and provided with a collar for engaging in said hook, whereby the rotation of the nut moves said movable jaw in either direction.

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

CHARLES H. OSLUND.

Witnesses:
ALBERT E. FAY,
C. FORREST WESSON.