

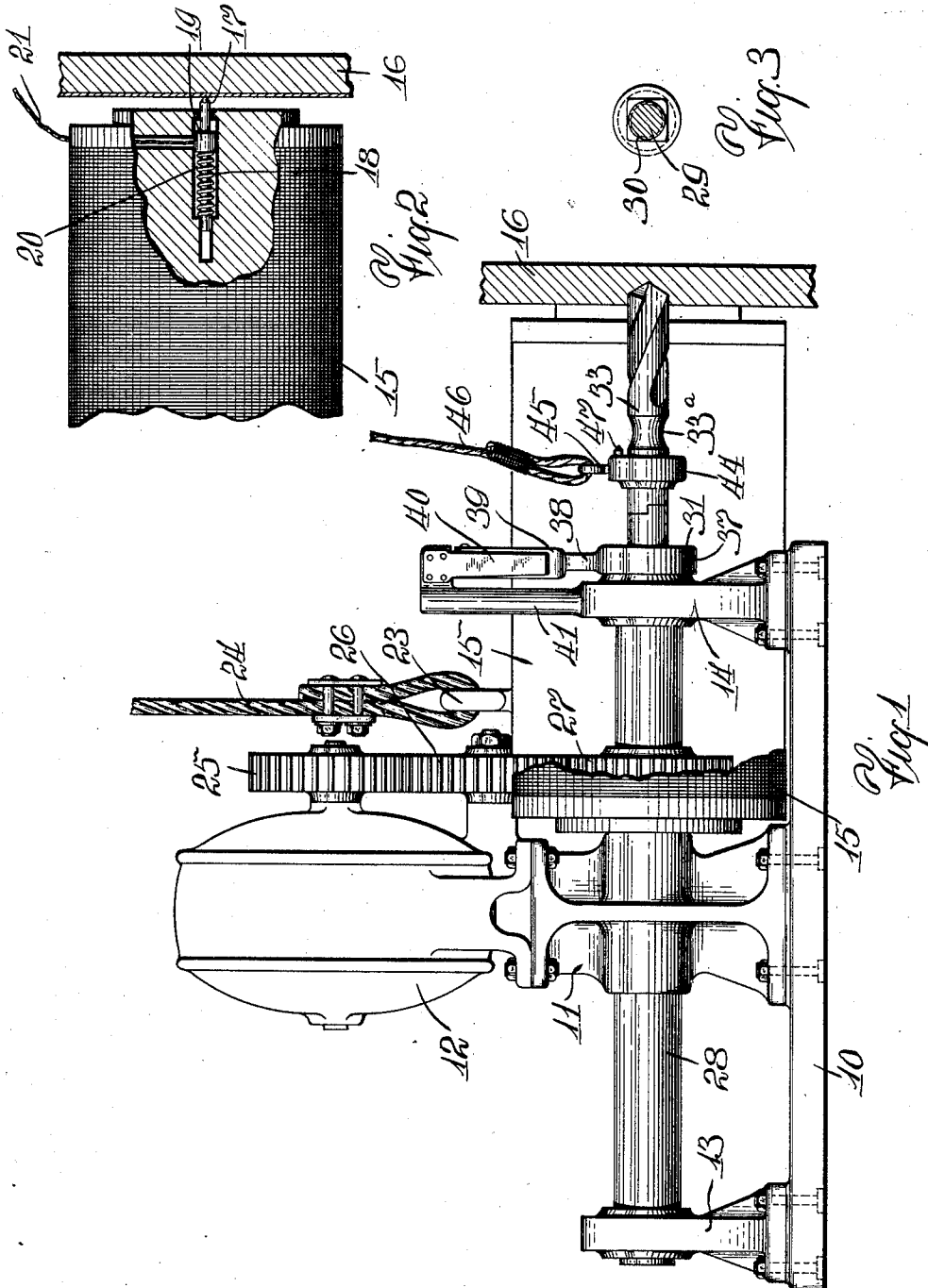
A. CASAZZA.
PORTABLE MAGNETIC DRILL.

APPLICATION FILED MAR. 16, 1909. RENEWED MAR. 24, 1911.

1,006,532.

Patented Oct. 24, 1911.

4 SHEETS—SHEET 1.



Witnesses:
H. J. Fleischer
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By his Attorney,
W. B. Hutchinson,

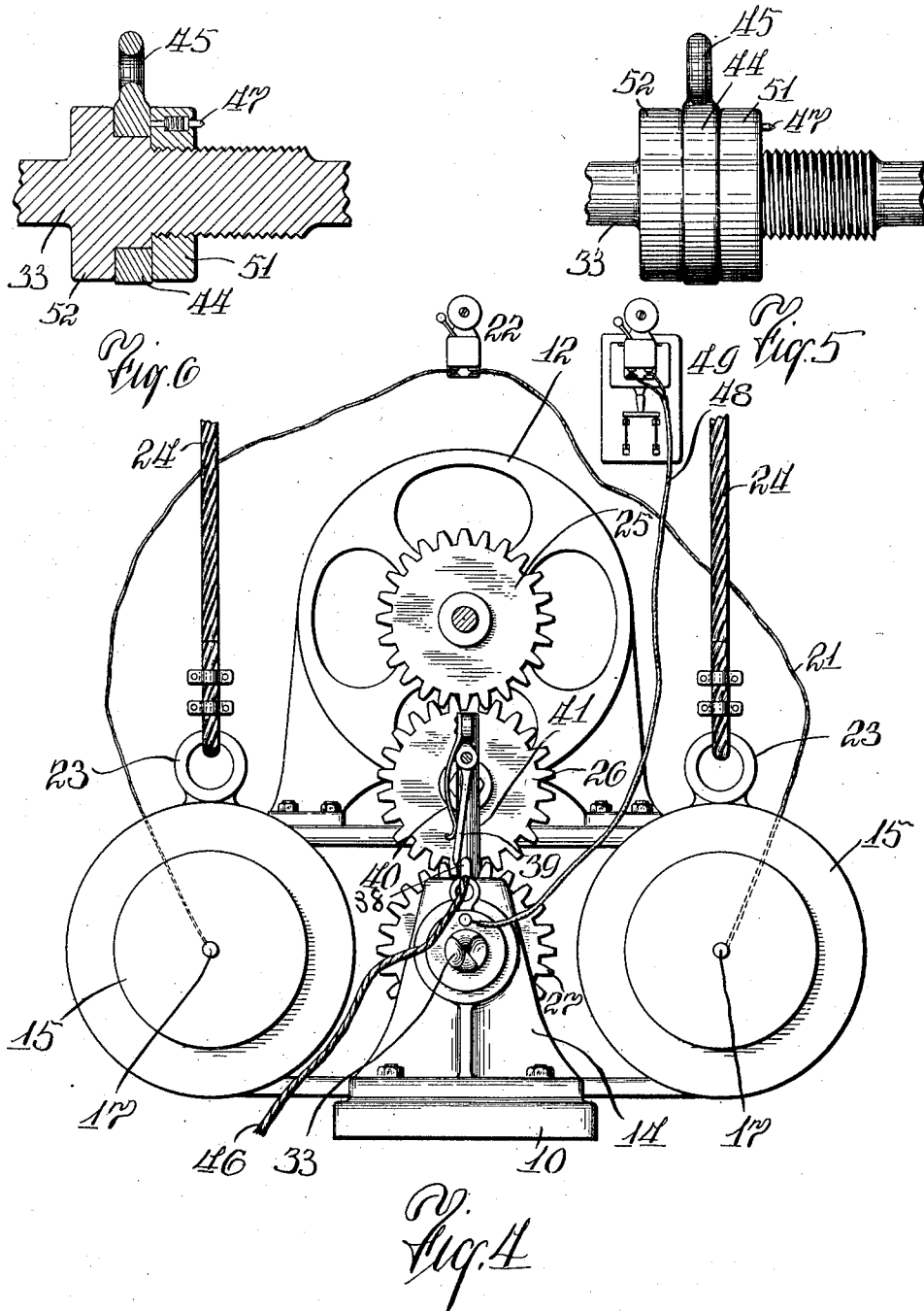
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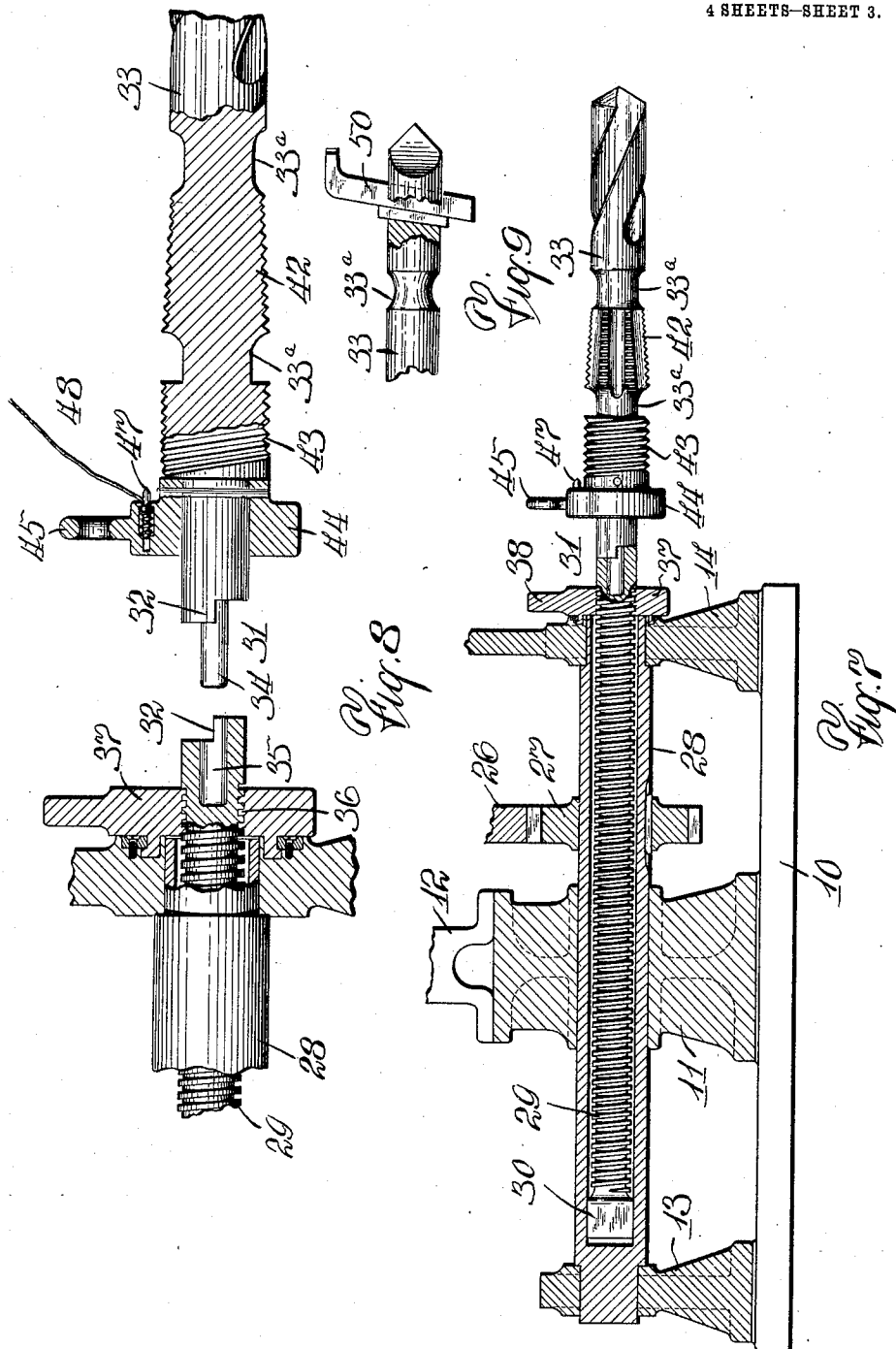
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4 SHEETS—SHEET 3.



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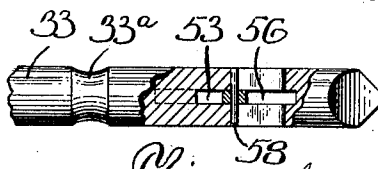
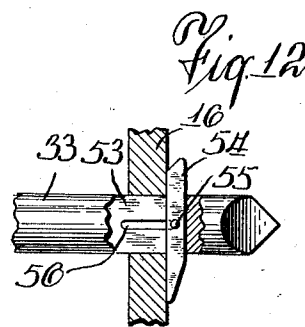
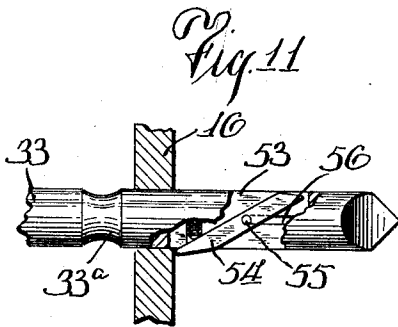
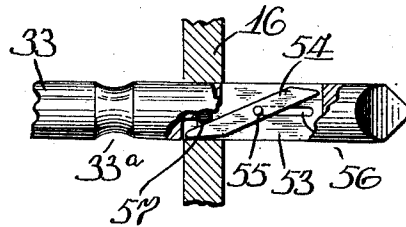
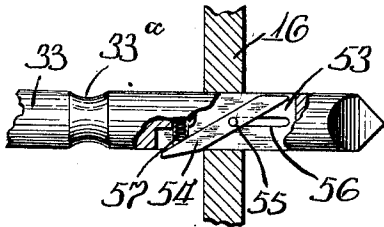
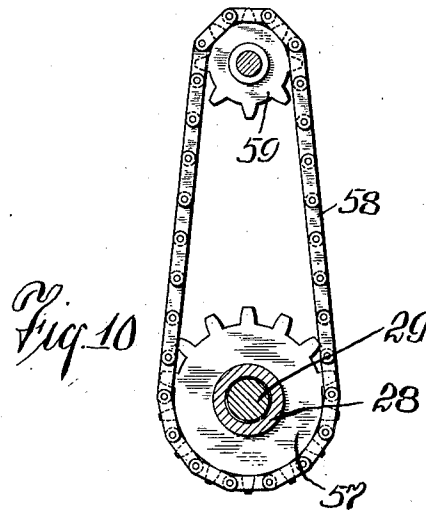
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

AUGUST CASAZZA, OF HOBOKEN, NEW JERSEY.

PORTABLE MAGNETIC DRILL.

1,006,532.

Specification of Letters Patent.

Patented Oct. 24, 1911.

Application filed March 16, 1909, Serial No. 483,851. Renewed March 24, 1911. Serial No. 616,631.

To all whom it may concern:

Be it known that I, AUGUST CASAZZA, of Hoboken, Hudson county, New Jersey, have invented a new and useful Improvement in Portable Magnetic Drills, of which the following is a full, clear, and exact description.

My invention relates to improvements in drills, and the object of my invention is to produce a portable drill in which the drill is operated preferably by an electric motor, and which is provided with powerful magnets adapted to hold the drill up snug against its work in case metal is to be drilled, so that it may be certain that the machine will be steady and that the drill will always be in the right position with relation to the stock to be drilled.

The invention while being capable of use in various places, is especially and peculiarly adapted to submarine work, and in this connection I use detectors which will give a signal when the magnet has drawn the machine up snug against the stock, as for instance the hull of a vessel to be drilled, and will also give a signal when the stock has been drilled through.

My invention also provides means for separating the drill from its holder so that the machine can be lifted and the drill left in the stock if desired, and further, provides automatic means for regulating the drill so as to relieve the tension in case the drill becomes too tight.

A further object of my invention is to produce the drilling tool with means for separating it from the rest of the machine and for leaving it in the object drilled so as to form means for connecting with the said object either for lifting purposes or for purposes of locating it definitely after the work is partly done, all to the end that a practical, simple and efficient drill can be made which will be semi-automatic in its operation, and will be adapted to very many uses.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar reference characters indicate corresponding parts in all the views.

Figure 1 is a broken side elevation of the drill embodying my invention. Fig. 2 is a broken detail elevation partly in section of one of the magnets, and shows especially the detector or signal therein. Fig. 3 is a cross section through the drilling screw. Fig. 4 is an end elevation of the apparatus.

Fig. 5 is a detail of one of the drilling tools. Fig. 6 is a longitudinal section of the structure shown in Fig. 5. Fig. 7 is a longitudinal sectional elevation of the drilling tool and its driving mechanism. Fig. 8 is a broken sectional elevation of the drilling tool and its holder and driving mechanism, the tool being slightly separated from its holder. Fig. 9 shows a variant form of the drilling tool, Fig. 10 is a detail of a modified means of driving the drill. Fig. 11 is a detail sectional elevation of the drill as it enters the stock and showing the first position of the clenching dog. Fig. 12 shows a further progression of the tool and dog. Fig. 13 shows a still further progression of the tool and with the dog clear of the stock. Fig. 14 is a view of the tool after it is drawn back so as to bring the clenching dog snug up against the stock in position to fasten the tool, and Fig. 15 is a detail of the drilling tool showing the means for pivoting the dog in the tool.

Referring to Figs. 1, 4 and 7, it will be seen that the machine has a suitable bed plate or base 10 on which is arranged, preferably near the center, a substantial pedestal 11, which forms a part of the machine frame or body, and which carries a motor 12 which, while for many purposes it can be any form of motor, is for most purposes preferably, and for some necessarily, an electric motor. The bed plate is also provided with suitable brackets or pedestals 13 and 14 for carrying other parts of the mechanism, as will be presently described. Above the bed plate and projecting forward from the body portion 11 of the machine, are two powerful magnets 15, which are ordinary electro-magnets and which are adapted to hold the drill as a whole snug up against the stock as 16. These magnets are located on opposite sides of the drilling tool, as will be presently described, and if the machine is used in submarine work, it might often happen that the magnets would not be up against the stock and the drill would be started prematurely. To guard against this, I use signals in the form of push buttons, which are arranged on the ends of the magnet coils, each button 17 terminating in a sharp point so that it will project through any paint or other soft obstruction and connect with the stock 16 and sound the alarm when the magnets are thus positioned.

As shown in Fig. 2, the pointed button 17

is piercing the paint on the stock 16 which represents the hull of a vessel. The button 17 is backed by a spring 18 so that it may yield slightly, and the spring abuts with a collar 19 and is held in a chamber 20 in the core of the coil. The button connects in the ordinary way by means of wires 21 with a signal 22. I have not given the details of the push button because obviously this can be like any usual form of similar signals.

To provide for lifting the machine and carrying it to its position, the magnets 15 are preferably provided with staples 23 which connect with cables 24, and these may be secured to any ordinary derrick or similar rigging.

For driving the drill I preferably use a chain of gearing, and in Figs. 1 and 4 I have shown gears 25, 26 and 27 connecting the armature shaft of the motor with the hollow shaft 28 which turns in suitable bearings in the parts 11, 13 and 14. This is best shown in Figs. 1 and 7. Arranged longitudinally in the hollow shaft 28 is a screw 29 which has a squared portion 30 fitting in the hollow shaft so that the screw will turn with and also slide in the shaft. At its outer end the screw connects by a suitable coupling 31 with the drilling tool 33 which may be of any usual form except for the reduced portion 33^a which will be presently referred to. The coupling 31 must be such as will permit the easy separation of the drilling tool from the rest of the machine, and I have shown the end of the screw 29 and tool 33 having abutting shoulders 32, while the drilling tool has a center spindle 34 fitting in a socket 35 in the screw 39. Thus when the parts are united they will turn together positively, but they can be easily separated longitudinally. The reduced parts 33^a of the tool 33 are for the purpose of permitting the tool to wobble in the stock after the stock has been bored through, so that in certain cases the tool can be more easily tilted and pulled out if desired. The portion of the screw 29 which projects from the shaft 28, fits the threaded portion 36 of a nut 37 which is in the nature of a chuck and which turns with the screw, or which can be held stationary, so that it will give a longitudinal motion to the screw. To provide for this, the nut 37 has a lug 38 which engages an arm 39 pivoted opposite the lug and pressed by a spring 40 so as to hold the lug 38 stationary. The parts 39 and 40 are supported on a suitable post 41. Under ordinary circumstances the spring 40 is stiff enough to hold the nut 37 stationary, and so the turning of the shaft 28 and screw 29 will cause longitudinal movement to be imparted to the screw sufficient to feed forward the drilling tool connected therewith, but if the tool sticks and the tension becomes too great, pressure of the spring 40 will be overcome

and so the nut 37 and lug 38 will turn with the screw without advancing the drill until the tension is relieved and the lug 38 comes again in contact with the arm 39.

In Figs. 7 and 8 I have shown the drilling tool 33 provided with a tap 42 integral with the drill and with the threaded part 43 which is also integral with the drill 33, so that after the hole is drilled by the tool, the part 43 can be screwed into the hole, thus fastening the drilling tool firmly to the part which has been drilled. The tool has a collar 44 near its base which is provided with a staple 45 or other means affording a connection with the cable 46 by which the drilling tool can be handled when separated from the rest of the machine, and by which the article to which the drill is screwed can be raised if desired. The threaded part 43 is provided as it is not of a highly tempered metal as the part 42, and therefore not liable to snap off when the article to which the drill is attached is raised. I also prefer to provide on the collar 44 or analogous part, a push button 47 connecting by means of suitable wires 48 with a signal 49 located above water, in case of submarine work, or at the station from which power is supplied in any event, so that when the drill goes through the work, the push button will be operated from contact with the stock and the signal is given, in which case of course the motor is stopped and the parts of the machine can be separated. It will be seen, especially by reference to Fig. 1, that when the drilling tool goes through the stock, the signal will be sounded and the part 33^a will be left in the stock so that the tool can then be operated upon and pulled out of the stock.

In Figs. 5 and 6 I have shown the collar 44 mounted loose on the tool 33 between the fixed collar 52 and a nut 51, so that the collar 44 will not turn with the tool but in this case the nut 51 is a collar so far as its function of carrying the push button 47 is concerned.

To illustrate the fact that any desired form of tool can be used, I have shown the tool 33 in Fig. 9 provided with an ordinary cutting tool 50 so that a larger hole can be made in the stock if desired. In some cases it is desirable to have the drilling tool which is, or may be of small value, left in the stock so as to afford a means of connection with the stock to raise it or to attach a buoy thereto so as to mark the location in case drilling operations are discontinued. To provide for this the tool 33 can be made to stay in the stock, and I have already described means for connection with the tool. In Figs. 11 to 15 I have shown the best means of making this connection with the stock, though I do not limit my invention to this precise means. As shown the tool is provided with a longitudinal slot 53 extend-

ing through it, and in this is pivoted a dog 54 which is held at an inclination as shown in Fig. 11 so that the front end of the dog will enter the stock with the drilling tool.

5 The dog is pivoted near the center as shown at 55, and the pivot slides in the slot 56 which is at right angles to the slot 53. The dog is normally pressed out by the spring 57 so that its rear end will abut with the stock 10 after the drilling tool is passed through it. The dog is forced inward and it passes through the stock as shown in Fig. 12, but when once through it is pressed out so that its rear end will engage the stock as shown 15 in Fig. 13. After this the tool can be pulled back by means of the cable 46, and the dog 54 will lie snug up against the stock and transversely of the tool as shown in Fig. 14, and thus the tool is held firmly to the 20 stock which, as stated may be the thing to be raised.

In Fig. 10 I have shown a modified means of driving the drill, which means can be substituted for the chain of gearing 25, 26 25 and 27. The modified means consists of a sprocket wheel 57 on the shaft 28, the chain 58 connecting with the sprocket wheel and a second driving sprocket wheel 59 on the armature shaft or driving shaft of the 30 motor.

From the foregoing description it will be seen that I have devised a compact and easily managed tool which is held up to the stock by magnetic attraction, and in which 35 the drilling tool and the driving mechanism can be easily separated and the tool left in

the stock if desired, also that the tool can be removed readily if desired and that the signals will be given to show when certain stages of the work are completed. 40

Having thus fully described my invention I claim as new and desire to secure by Letters Patent:—

1. The combination with a portable drill, of the drilling tool connected therewith, a 45 collar on the tool, and an electric signal on the collar adapted to operate when the drill has passed through the stock.

2. In an apparatus of the kind described, the combination with the drill, of the separable 50 drilling tool, a collar on the drilling tool, hoisting means connected with the collar.

3. In a portable drill, the combination of a body portion having electric magnets to 55 hold it in position for drilling, an electric signal having its push buttons arranged at the outer ends of the magnet coils, mechanism for driving the drilling tool, a collar on the drilling tool, and hoisting and signal- 60 ing means connected with the collar.

4. A machine of the kind described, comprising driving mechanism, a separable drilling tool connected with the driving mechanism, a collar on the tool, and hoist- 65 ing and signaling means connected with the collar.

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Witnesses:

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