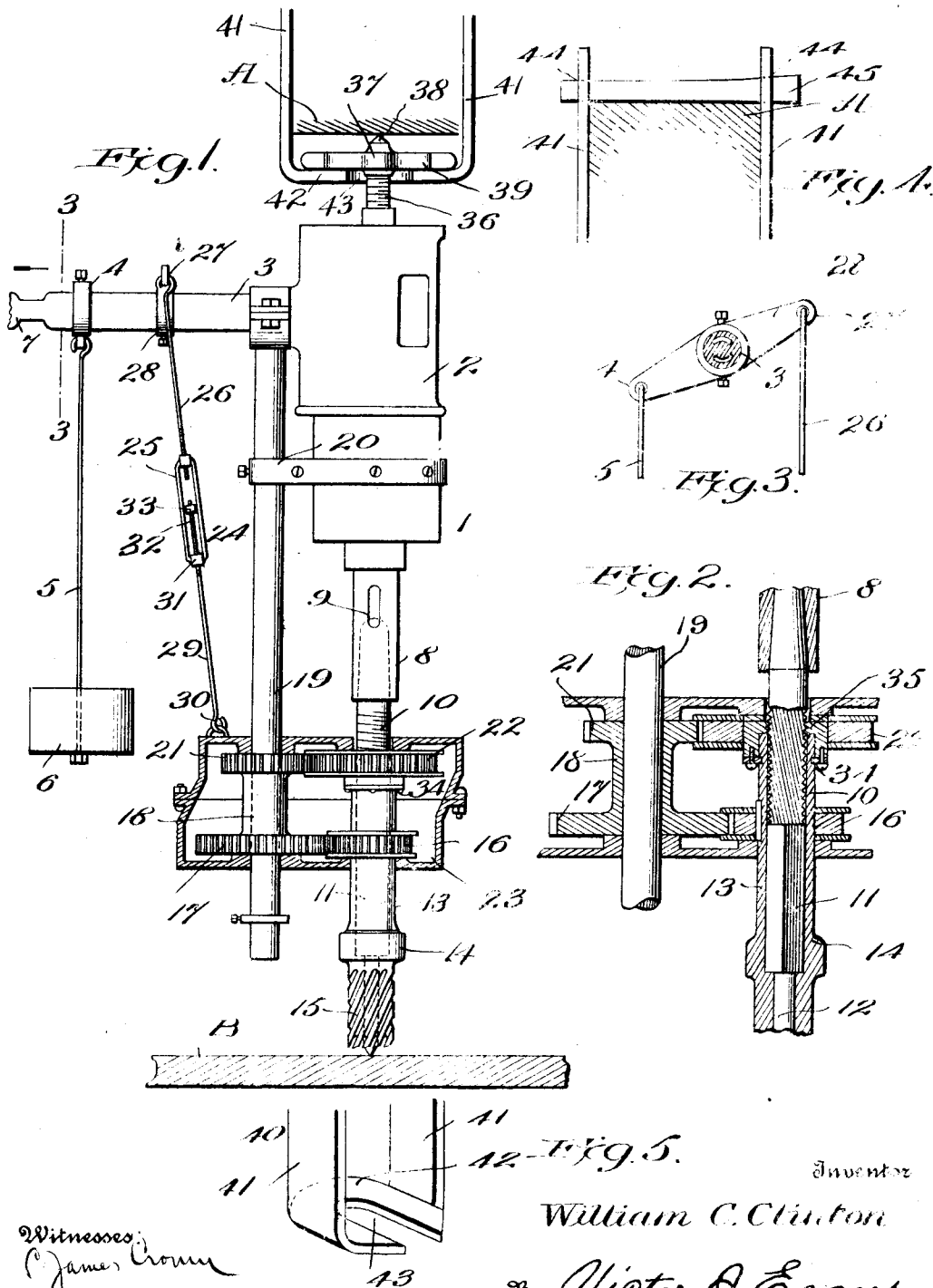


W. C. CLINTON.
 DRILL.
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1,065,778.

Patented June 24, 1913.



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UNITED STATES PATENT OFFICE

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DRILL.

1,065,778.

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To all whom it may concern:

Be it known that I, WILLIAM C. CLINTON, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Drills, of which the following is a specification.

This invention relates to drills and particularly to metal-working drills and has for an object to provide a drill of this character wherein will be included means for regulating the feed of the bit or cutting tool according to the thickness of the work which is operated upon.

Another object of the invention is to provide a drill which will include a fluid controlled engine and means for automatically controlling the engine, whereby to cut off the power from the drill tool on a predetermined adjustment thereof.

A still further object of the invention is to provide means which will be positively driven through the drill tool for advancing the tool against the work.

Another object of the invention is to provide means whereby the tool will be effectually sustained with relation to the work after the cutting operation of the bit.

Other objects will appear and be better understood from that embodiment of my invention of which the following is a specification, reference being had to the accompanying drawings forming part hereof, in which:

Figure 1 is a side view of the drill showing the parts in section. Fig. 2 is a vertical longitudinal section through a portion of the drill illustrating the bit feeding mechanism. Fig. 3 is a section on line 3-3 of Fig. 1. Fig. 4 is a section through a portion of the drill support showing the manner of connecting the same with a drill frame. Fig. 5 is a perspective view of a portion of the support.

The drill 1 comprises an engine or driving motor which is conventionally illustrated at 2 and which may be connected in any suitable well-known fluid source such as a compressed air reservoir, (not shown.) The engine includes a controlling valve whose stem 3 has connected therewith an arm 4 to which is connected an arm 5 having a weight 6 thereon which is adapted to influence the stem of said valve and to hold the latter normally in an opened position. The said engine may be connected in the

described fluid source through the medium of the hose 7 herein shown.

A chuck 8 of the driving engine receives the tang 9 of a feed screw 10, and as shown said screw is provided with an intermediate rectangular portion 11 and a lower centering portion 12. The squared portion 11 extends into a correspondingly formed socket 13 in the sleeve 14 of the drill bit or tool element 15. The sleeve 14 has fixedly mounted thereon a gear wheel 16 which is arranged in intermeshing relation with an idle gear wheel 17 on a revoluble mounted member 18. The member 18 is mounted to slide longitudinally on a vertical guide rod 19 which is supported at 20 upon the engine 2. The member 18 is fixedly secured to a second gear wheel 21 which is relatively small as compared with the size of the companion gear wheel 17 and which is shown to mesh with a gear wheel 22. The just described gear wheels are preferably mounted in a carriage 23 and as illustrated, the said carriage is connected through the medium of a valve controlling means 24 with the valve stem 3. The means 24 comprises a nut 25 which threadedly receives the lower end of a rod 26, the upper end of said rod having connection at 27 with an arm 28 which extends from the valve stem 3 as particularly illustrated in Fig. 3. Another rod 29 has connection at 30 with the carriage 23 while the opposite end of the rod is slidable in a guide portion 31 of the nut 25. Immediately at one side of the guide portion 31, the rod 29 is shown as to be threaded as at 32 to adjustably accommodate a nut 33. The guide portion 31 is disposed directly in the path of the nut 33, whereby to engage positively therewith to regulate the descent of the carriage 23.

The gear wheel 22 is swiveled at 34 to the sleeve 13 and as shown, the said gear is provided with a nut 35 through which the intermediate threaded portion 10 extends. This construction is such that when the motor tool is operated the power will be imparted to the idle gear wheel 17 through the gear wheel 16 and the power then applied through the medium of the gear wheel 21 to the gear wheel 22 so that the latter and the carriage 23 will be fed in the direction of the work. The bit 15 is preferably hollow and as shown, the centering portion 12 is associated therewith so as to insure the proper association of the bit with the work.

A stub screw 36 extends from the upper end of the engine cylinder 2 and as shown said screw adjustably receives a clamping element 37 which is shown to include an upwardly extending point 38 and radial arms 39. When the drill is associated with suitable supporting apparatus, the point 38 is adjusted against the supporting or overhanging arm A of the apparatus, while the centering point 12 is disposed above the table of the apparatus and arranged in proper relation with the work B, as shown in Fig. 1.

A support 40 is employed with a view to preventing the dropping of the drill after the bit 15 has been extended entirely through the work B. Said support includes spaced side portions 41 which are disposed against the opposite sides of the arm A. A head 42 of said support connects the companion side portions 41 and as shown said head is bifurcated at 43 to accommodate the screw 36. In other words, the screw is adapted to extend into the bifurcation so that the radial arms 39 lie in mutual contact with adjacent portions of the head 42. The side portions 41 are provided with alining slots 44 which are disposed preferably above the plane of the arm A, being adapted to accommodate a key 45 so that the support and the arm may be operatively connected with each other. This construction is also such that the drill may be readily connected with or disconnected from the arm A as the occasion may demand.

Now that the details of the construction of the apparatus are clearly described, it is

said that the nut 33 is adjusted on the rod 29 as may depend upon the thickness of the material to be operated upon. The distance between the nut 33 and the guide portion 31 slightly exceeds the thickness of the material or work B. Now, it is seen that as the carriage 23 approaches the work the nut 33 will be forced into engagement with the portion 31, exerting pull upon the arm 28 with a resultant closing of the valve of the engine and thereby immediately stopping movement of the drill tool or bit.

What is claimed as new is:

1. In apparatus of the character described, a driving motor, a hollow cutting tool, a vertically movable carriage, a feed screw driven by the motor and extending through the tool, and gearing between the motor and the feed screw for moving the carriage to advance the cutting tool.

2. Apparatus of the character described comprising, a fluid operated motor having a valve for regulating the admission of fluid thereto, means for normally holding the valve closed, a traveling carriage, means operated by the motor for moving the carriage, a tool carried by the carriage, and means operated on a predetermined adjustment of the carriage for closing the valve of the motor.

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

WILLIAM C. CLINTON.

Witnesses:

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