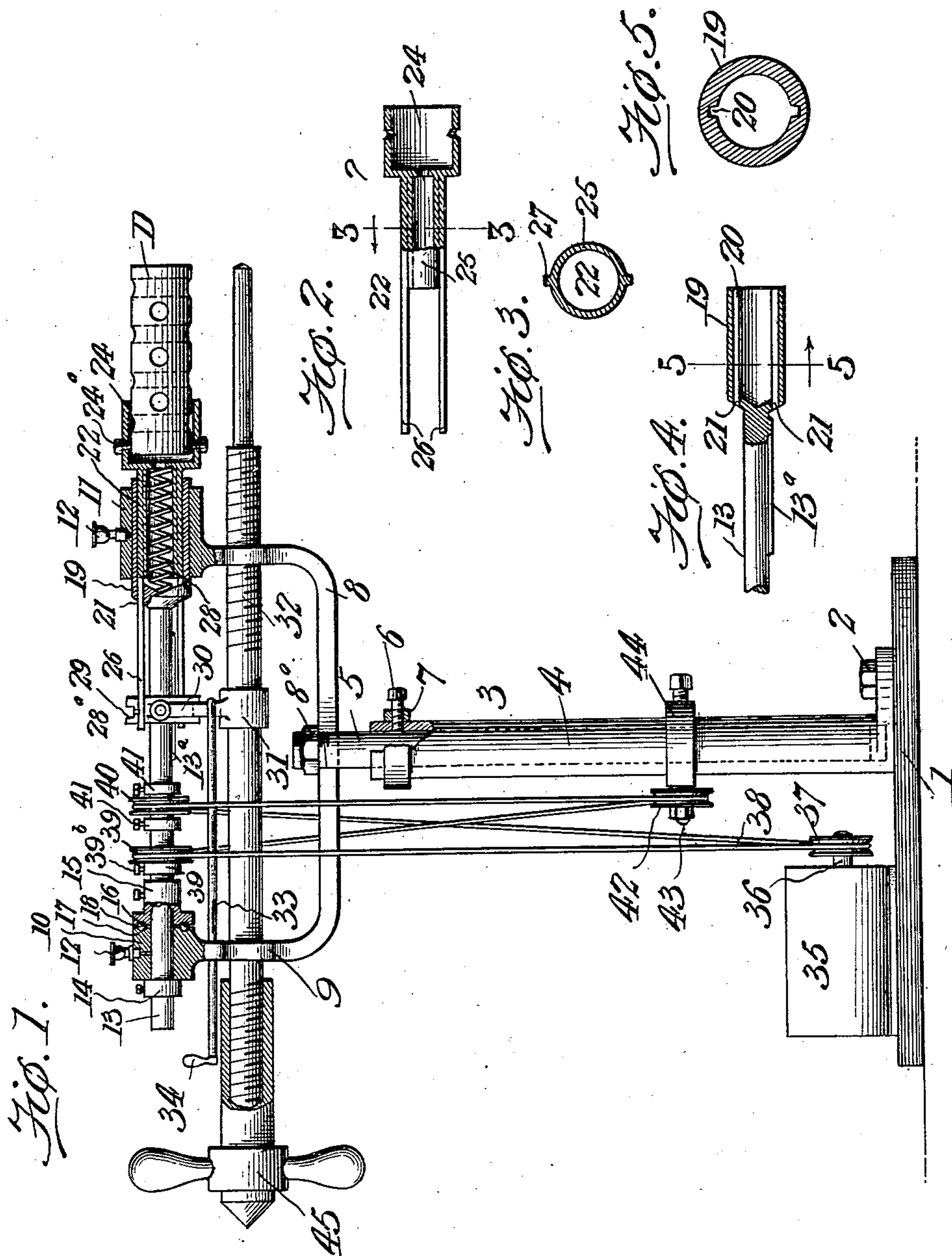


No. 751,062.

PATENTED FEB. 2, 1904.

C. ERICKSON.
DRILLING MACHINE.
APPLICATION FILED MAY 7, 1903.

NO MODEL.



Witnesses
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UNITED STATES PATENT OFFICE.

CHARLES ERICKSON, OF BREMERTON, WASHINGTON.

DRILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 751,062, dated February 2, 1904.

Application filed May 7, 1903. Serial No. 156,082. (No model.)

To all whom it may concern:

Be it known that I, CHARLES ERICKSON, a citizen of the United States, residing at Bremerton, in the county of Kitsap and State of Washington, have invented a new and useful Drilling-Machine, of which the following is a specification.

This invention relates to drilling-machines, and is especially designed for use with an improved drill which forms the subject of a co-pending application, filed May 11, 1903, Serial No. 156,665.

The object of the invention is to provide in drilling-machines a simple and effective mechanism for controlling the feed of the drill and holding it in contact with the work with a suitable degree of pressure.

A further object of the invention is to provide means for quickly withdrawing the drill from engagement with the work whenever it may be desirable to do so.

With the above and other objects in view, which will appear as the invention is better understood, the same consists in the construction and combination of parts hereinafter described and claimed and shown in the accompanying drawings, forming a part of this specification, in which corresponding parts are designated by the same characters of reference throughout, it being understood that changes may be made in the form, proportions, and exact mode of assemblage of the elements therein exhibited without departing from the spirit of the invention.

In the drawings, Figure 1 is a view, chiefly in side elevation and partly in section, of a drilling-machine with the drill gripped in the socket thereof. Fig. 2 is a detail view, partly in section and partly in elevation, of the drill-socket. Fig. 3 is a transverse section on the line 3 3 of Fig. 2. Fig. 4 is a detail view, partly in elevation and partly in section, of the drill-supporting end of the shaft. Fig. 5 is a view in transverse section along the line 5 5 of Fig. 4.

Referring to the drawings by reference characters, 1 designates a base-plate upon which is supported by means of screws 2 a standard, designated generally as 3 and consisting, preferably, of an outer tubular por-

tion 4, an inner tubular portion 5, and a clamping-screw 6, which is mounted in a collar 7, rigidly secured to section 4 of the standard near the upper end thereof.

8 is a shaft-supporting bracket slidably mounted in an opening in the upper end of standard 3 and adapted to be clamped by a nut 8^a, threaded on the standard above the bracket. The bracket 8 consists of the bent arm 9 and bearing-blocks 10 and 11, each bearing being provided with a suitable oil-cup 12. The shaft 13 is rotatably mounted in the bearings 10 and 11 and is held in proper association therewith by collars 14 and 15, placed on opposite sides of shaft-bearings 10, as shown. The collar 15 is provided on the face adjacent to shaft-bearing block 10 with an annular groove 16, and a similar groove 17 is provided in the adjacent face of the shaft-bearing block 10. Balls 18 lie in the two grooves 16 and 17 and form a thrust-bearing, which prevents frictional engagement of the collar 15 and bearing-block 10 when the drilling-machine is in operation. The shaft 13 at the end which is supported in bearing-block 11 is provided with a tubular extension 19, which has on either side thereof a longitudinally-disposed internal groove 20, and openings 21 are provided at the inner end of the tubular extension where it joints shaft 13. Mounted within the tubular extension 19 is a socket 22 for supporting a drill. The socket 22 comprises a drill-receiving portion 24, provided with radially-disposed clamping-screws 24^a, a tubular portion 25, and the longitudinally-projecting fingers 26 at the end of the tubular portion opposite the drill-receiving portion. Socket 22 has on the tubular portion 25 two external longitudinally-disposed ribs 27, which are continued on fingers 26 and engage grooves in tubular extension 19 of shaft 13.

When the sockets 22 and shaft 13 are assembled, as shown in Fig. 1, a spring 28 is mounted within the tubular portion 25 of the socket and has one end in engagement with the inner end of the tubular extension 19 of the shaft and is adapted to hold the drill (designated D) normally in engagement with the surface of the work.

At the inner ends of fingers 26 they are at-

tached to a collar 28^a, which is slidably mounted on the shaft 13 and held against rotation by feather 13^a. The collar is provided on its outer surface with a circumferential groove 5 29, with which engage the extremities of a forked arm 30, which projects from a collar 31, slidably mounted on a gage-bar 32, which is mounted in threaded engagement with an opening in the arm 9 of the shaft-supporting bracket. A rod 33 is attached at one end to 10 the arm 30 and extends through an opening in arm 9 of the shaft-supporting bracket, beyond which it terminates in a knob or head 34. The rod 33 affords means whereby the arm 30 15 may be moved rearward along the gage-bar 32, and so retract the drill-socket 22 against the tension of spring 27 when it is desired to withdraw the drill D from engagement with the work.

20 Motion is imparted to the drill-shaft 13 by means of a motor 35, preferably electric, which is mounted on the base 1. The motor 35 has on the driving-shaft 36 thereof a pulley 37, over which runs a belt 38. The belt 38 passes 25 over two pulleys 39 and 40, mounted on the shaft 13. The pulley 39 has a laterally-projecting hub 39^a, provided with clamping-screws 39^b for holding the pulley in rigid association with the shaft. The pulley 40 is loosely jour- 30 naled on the shaft and is held against sliding by set-collars 41, provided on either side thereof, as shown. The belt 38 also passes over a pulley 42, rotatably mounted on a stud 43, which projects from a collar 44, fastened to 35 or formed integral with the lower section 4 of standard 3.

The feed of the drill is determined by means of the gage-bar 32, which is provided at its rear end with a handle 45, which has a long in- 40 ternally-threaded hub which is screwed upon the gage-bar.

In operation the gage-bar is set so that the spring 28 will hold the drill D in suitable contact with the work, with which the gage-bar 45 engages at the end adjacent to the drill. Motion is then imparted to shaft 13 by means of the motor 35 and the connections already described, and the drilling operation is accomplished by the cutting action of the end of the 50 drill upon the work. As the opening in the work deepens the gage-bar 32 must be retracted to permit the spring 28 to maintain the necessary pressure of the drill upon the work.

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

1. The combination in a drilling-machine of 60 a shaft having at one end a tubular extension provided on its inner surface with a longitudinal groove, a drill-supporting socket slidably mounted in said tubular extension and having a projection engaging said groove, a 65 spring interposed between said shaft and said

socket, means for retracting said socket against the tension of said spring, and means for rotating said shaft.

2. The combination in a drilling-machine of a shaft having a tubular extension at one end 70 thereof, said extension being provided with an internal longitudinal groove and with openings at the inner end of said extension, a drill-supporting socket slidably mounted within said tubular extension and having a projec- 75 tion engaging said groove and longitudinally-disposed fingers projecting rearward through the openings in said tubular extension, a collar slidably mounted on said shaft to which said fingers are secured, means for retracting said 80 collar, and means for rotating said shaft.

3. The combination in a drilling-machine of a supporting-standard having a transverse opening, a shaft-supporting bracket slidably 85 mounted in said opening, means for clamping said bracket in position on said standard, a shaft rotatably mounted in said bracket, a drill-socket slidably associated with said shaft, and a spring interposed between said shaft and 90 said socket.

4. The combination in a drilling-machine of a supporting-standard, a shaft-supporting bracket carried by said standard, a shaft ro- 95 tatably mounted in said bracket, a drill-socket yieldably mounted on said shaft, and a gage-bar adjustably mounted in said bracket parallel to said shaft.

5. The combination in a drilling-machine of a suitable supporting structure, a shaft rota- 100 tably mounted in said supporting structure, a gage-bar adjustably mounted in said supporting structure adjacent and parallel to said shaft, a drill-socket slidably mounted on said shaft, a spring interposed between said shaft and said socket, a collar also slidably mounted 105 on said shaft to which said socket is connected, a collar slidably mounted on said gage-bar and having an arm projecting laterally therefrom and engaging the collar on said shaft, and a rod slidably mounted in said supporting struc- 110 ture and having one end attached to said arm.

6. The combination in a drilling-machine of a base, a vertically-extensible standard secured on said base, a drill-shaft rotatably carried by said standard, a plurality of pulleys 115 carried by said shaft, one of said pulleys being rigidly attached thereto, a motor having a driving-shaft and a pulley provided on said base, a pulley adjustably mounted on said standard, and a belt arranged to travel over 120 all of said pulleys and impart rotation to said drill-shaft.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

CHARLES ERICKSON.

Witnesses:

GEO. F. MALLETT,
ASA H. CODER.