

J. F. MUNN.

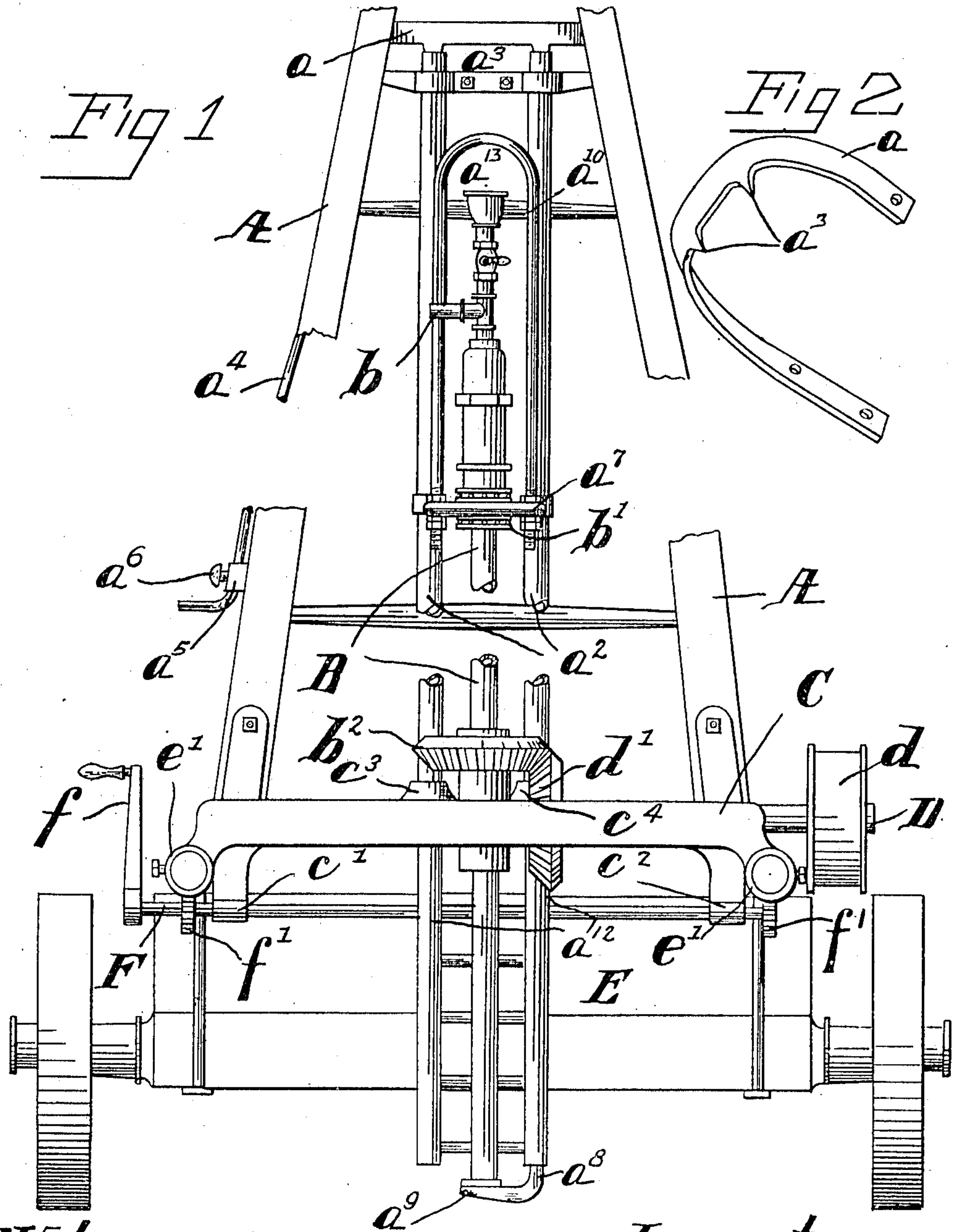
DRILL HEAD.

APPLICATION FILED JAN. 28, 1908.

947,394.

Patented Jan. 25, 1910.

2 SHEETS—SHEET 1.



Witnesses

Carroll H Richards

Benjamin A. Edwards

Inventor

John Frederick Munn.

by

Walter A. Knight.

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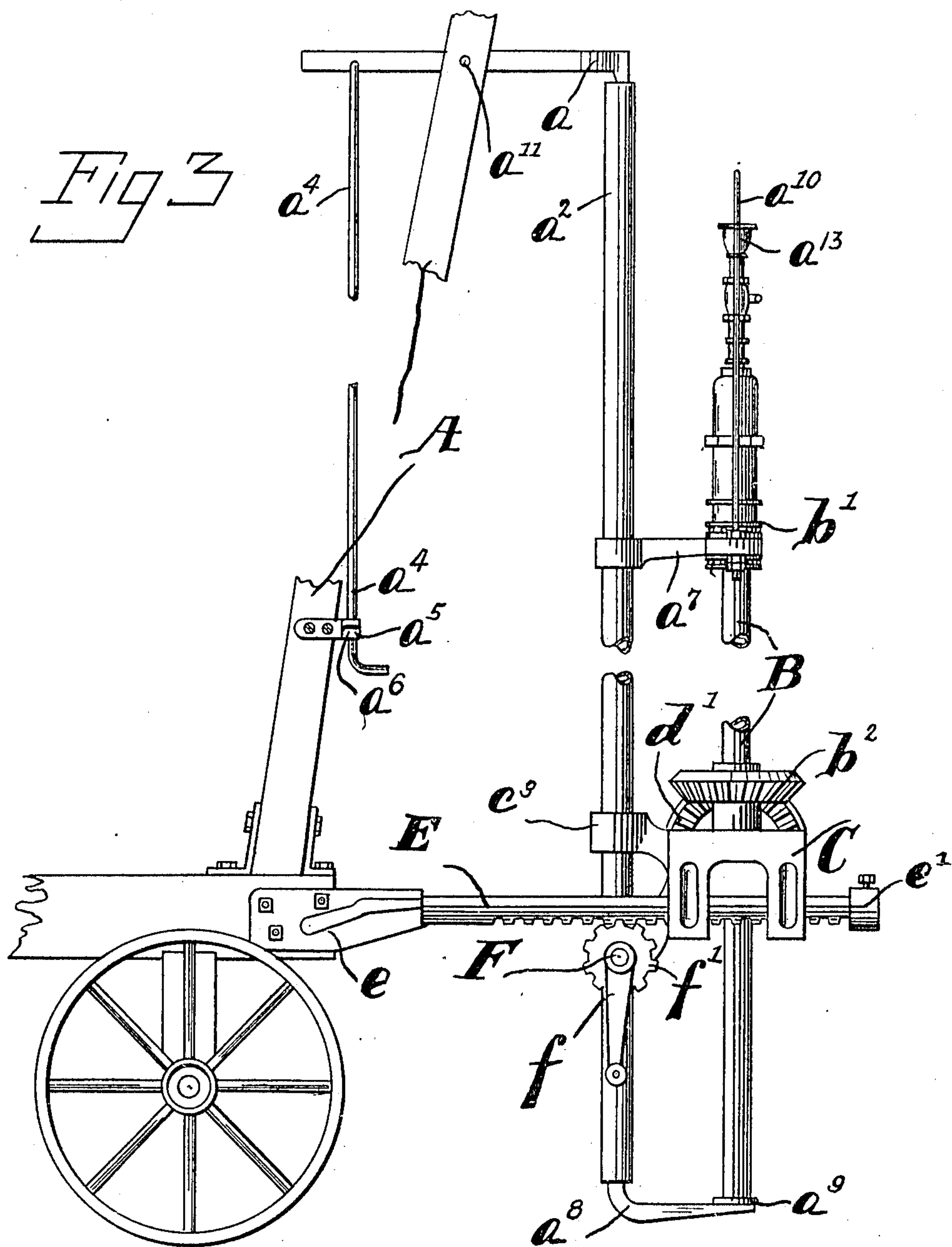
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UNITED STATES PATENT OFFICE.

JOHN FREDERICK MUNN, OF ORRVILLE, OHIO, ASSIGNOR TO THE CYCLONE DRILL COMPANY, OF ORRVILLE, OHIO, A CORPORATION OF OHIO.

DRILL-HEAD.

947,394.

Specification of Letters Patent. Patented Jan. 25, 1910.

Application filed January 28, 1908. Serial No. 413,057.

To all whom it may concern:

Be it known that I, JOHN FREDERICK MUNN, a citizen of the United States, residing at Orrville, in the county of Wayne and State of Ohio, have invented new and useful Improvements in Drill-Heads, of which the following is a specification.

This invention relates to new and useful improvements in mechanisms designed to drill into the earth's crust, by means of rods or spindles, usually vertical, operating the drill bit, whether the rods reciprocate or rotate, but more especially to that type of machinery having a rotating spindle.

Heretofore the chattering of the drill spindle has shortened the life of the operating machinery, reduced the efficiency of the operation, and caused the drill bits to become fast, and break. Also, as often times it is necessary to have immediate access to the drill hole, a great amount of trouble has been experienced in securing such access, due to the fact that it has necessitated the moving of the entire drill machinery, which consumes time and labor; and it is difficult to re-set the drill, so that the spindle is in line with the hole.

The object of this invention is to provide such a drill head, that the chattering will be so reduced that smooth, efficient and incessant operation can be had. Also to provide such apparatus, that the drill spindle and the mechanism immediately attached to it, can be removed from the drill hole easily and quickly, and at the same time keep the drilling machine in a fixed position.

When it is borne in mind that this type of drilling machine is usually mounted on trucks provided with wheels, and that ease and rapidity of changing from one operation to another is vital in operating at a minimum cost, the importance of the invention is apparent.

My invention is illustrated in the accompanying drawings, in which:

Figure 1 is an end view of the drill head as applied to a core drill, not showing the auxiliary mechanism. Fig. 2 is a view in perspective of a brace for the guide rods. Fig. 3 is a side view of a drill head as applied to a core drill, the auxiliary mechanism being omitted.

Referring to the drawings, A is a brace made in the form of a ladder comprising a part of a derrick and firmly held in position

by other parts of the derrick and its fastenings connecting it with the bed.

Pivoted to brace A by means of a horizontal rod a^{11} is an auxiliary brace a , which is intended to assist in holding the guide rods a^2 rigid. Said brace a has two prongs a^3 , which fit down in the tops of guide rods a^2 . By means of rod a^4 attached to brace a and held by guide a^5 supported by the frame A, prongs a^3 may be caused to disengage from the tops of the guide rods a^2 . A thumb screw a^6 or its equivalent is threaded in part a^5 and is capable of being forced down on rod a^4 and prevent said rod from sliding.

Guide rods a^2 pierce a guide bracket a^7 , which slides over said rods. The rods are rigidly fastened in brackets c^3 and c^4 which are attached to the beam C and may or may not be integral with same; and which are pierced by the rods a^2 . The guide rods may or may not continue below the beam C, but if they do, they may terminate in a ladder a^{12} as shown in the drawings. Rotatively fastened to the bottom of one of the upright portions of said ladder or any other convenient part of the drill head is a bent arm a^8 carrying a disk a^9 , capable of being revolved into position under the spindle B, so as to support it, when in position and out of the bore hole. Bail a^{10} is attached to guide bracket a^7 by means of bolts.

The drill spindle B has at its top a shot feed mechanism a^{13} for feeding shot or other cutting element to the drill bit, and just below this and near the top of said spindle is a nozzle b to which a hose may be attached for the discharging of water through the hollow spindle B to the bit. Just below the said nozzle b is a water swivel b^1 which is connected to the guide rods a^2 by means of guide bracket a^7 , which incloses part of the swivel and in which the swivel is capable of rotating in its bearing, the said bearing comprising a ball bearing or any other one that will provide smoothness and ease of rotation. The water swivel b^1 permits of the rotation of the drill spindle below the bracket, while the portion above remains practically at rest. Bevel gear b^2 is splined to drill spindle B and its lower face rests on any suitably designed portion of the beam C.

Shaft D is journaled in beam C in any suitable manner and carries a pulley d , which is belted to the driving mechanism,

and has flanges d^2 so the belt will not run off when drill head is retracted. Bevel gear d^1 is keyed to shaft D and meshes with bevel gear b^2 .

5 Beam C is supported at its ends by cantalivers which project from the end of the bed supported by the trucks, and which are supported by the sockets e , bolted to said bed. Cantalivers E, into which racks are cut, pierce beam C, in which bearings are afforded for the same, and said beam C is slidable thereon. Collars e^1 are attached to the extreme ends of the cantalivers to form a stop for the drill head and prevent the same from being slid off of said cantalivers.

10 Shaft F is suitably journaled in bearings c^1 and c^2 formed in beam C in any convenient manner, and a crank and handle f is fastened to one end of shaft F for the purpose of rotating said shaft. Keyed to shaft F and meshing with said racks of the cantalivers E are spur gears f^1 .

The operation of the slidable drill head is as follows:—Thumb screw a^6 must be loosened and rod a^4 pulled downward, this disengages the prongs a^3 of the auxiliary brace a from the guide rods' tops. After this has been accomplished, the sliding head has nothing to prevent it from moving on cantalivers E. If now the crank f be rotated in the direction indicated by the arrow, spur gear f^1 meshes with the racks of the cantalivers and the whole drill head moves toward the trucks, and from over the drill hole. To bring the head back in position for drilling, a reverse of the foregoing would be necessary.

The rods a^2 form a guideway and they strengthen the whole mechanism and reduce the chattering to such a degree that the machine is not racked and the operation of the drill in the hole is smooth and even. The extension of these guide rods beneath the beam or cross head and parallel with the lower portion of the spindle, furnishes end supports for a series of cross bars similar to the "rungs" of a ladder and constitute conveniently related fulcrum for the application of a lever in raising or depressing the drills, upon occasion. The structure also furnishes, incidentally, a means of supporting the adjustable bracket for supporting the drill spindle when not in use.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. In a drilling machine in combination with the main supporting frame, a horizontal extension frame or cantaliver, a beam or cross-head adjustable to and fro thereon, the

drill-spindle rod carried vertically through said beam as a guide in a sliding fit, a guideway supported upon said beam and extended upward parallel with said spindle-rod, and a cross-head or bracket engaging said spindle rod, and having a sliding connection with said guideway.

2. In a drilling machine an extension or cantaliver frame, a beam or cross-head adjustably movable thereon, a drill-spindle rod sliding vertically through said crosshead as a guide, a guideway supported upon said crosshead and extended upward parallel with said spindle-rod a bracket crosshead movably seated on said guideway and engaging said spindle, a countershaft journaled on said beam transversely adjacent to said spindle-rod, a belt-pulley and toothed gear on said countershaft and a corresponding gear splined upon said drill-spindle rod engaging the gear of the countershaft.

3. A drill head comprising a main frame having a cantaliver extension, and having an upward extension or derrick brace, a beam or cross head adjustably mounted upon said cantaliver extension, a drill-spindle extended slidably and rotatively through said beam or cross-head, mechanism for transmitting power to said spindle, a fixed guideway parallel with said drill-spindle, a bracket cross-head carried slidably on said guideway and fixedly attached to said drill-spindle—all supported by said beam or crosshead, and a brace affixed to the upward extension or derrick-brace of the main frame and adapted to engage removably with the auxiliary guideway when in operation.

4. In a drilling machine, the combination of a main cross head, a drill spindle rod operating through the same, and a ladder-structure hung upon and below said cross head adjacent to the drill standard.

5. In a drilling machine of the character indicated, in combination with a supporting frame, cross-head adjustably mounted thereon, and drill-spindle passing through said cross-head in a sliding fit as a guide, an adjustable supporting bracket carried upon and beneath said cross-head adapted to be adjusted to a position beneath and as a support to the spindle.

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

JOHN FREDERICK MUNN.

Witnesses:

CARROLL H. RICHARDS,
CHAS. HERBERT JONES.