

No. 656,415.

Patented Aug. 21, 1900.

D. G. MORGAN.

MACHINE FOR SPREADING, TRUING, AND GAGING DRILLS.

(Application filed Apr. 18, 1900.)

(No Model.)

Fig. 1.

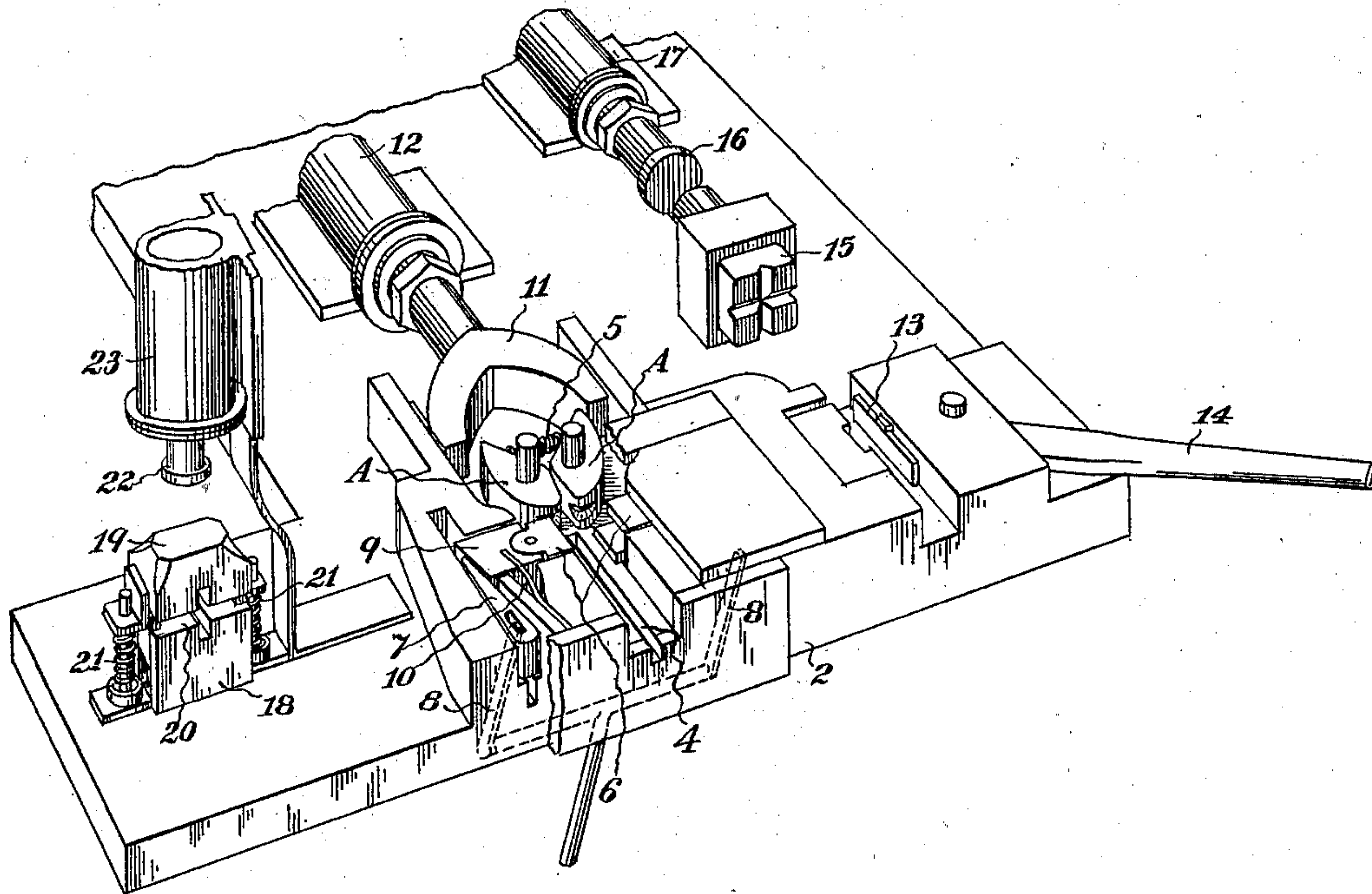


Fig. 2.

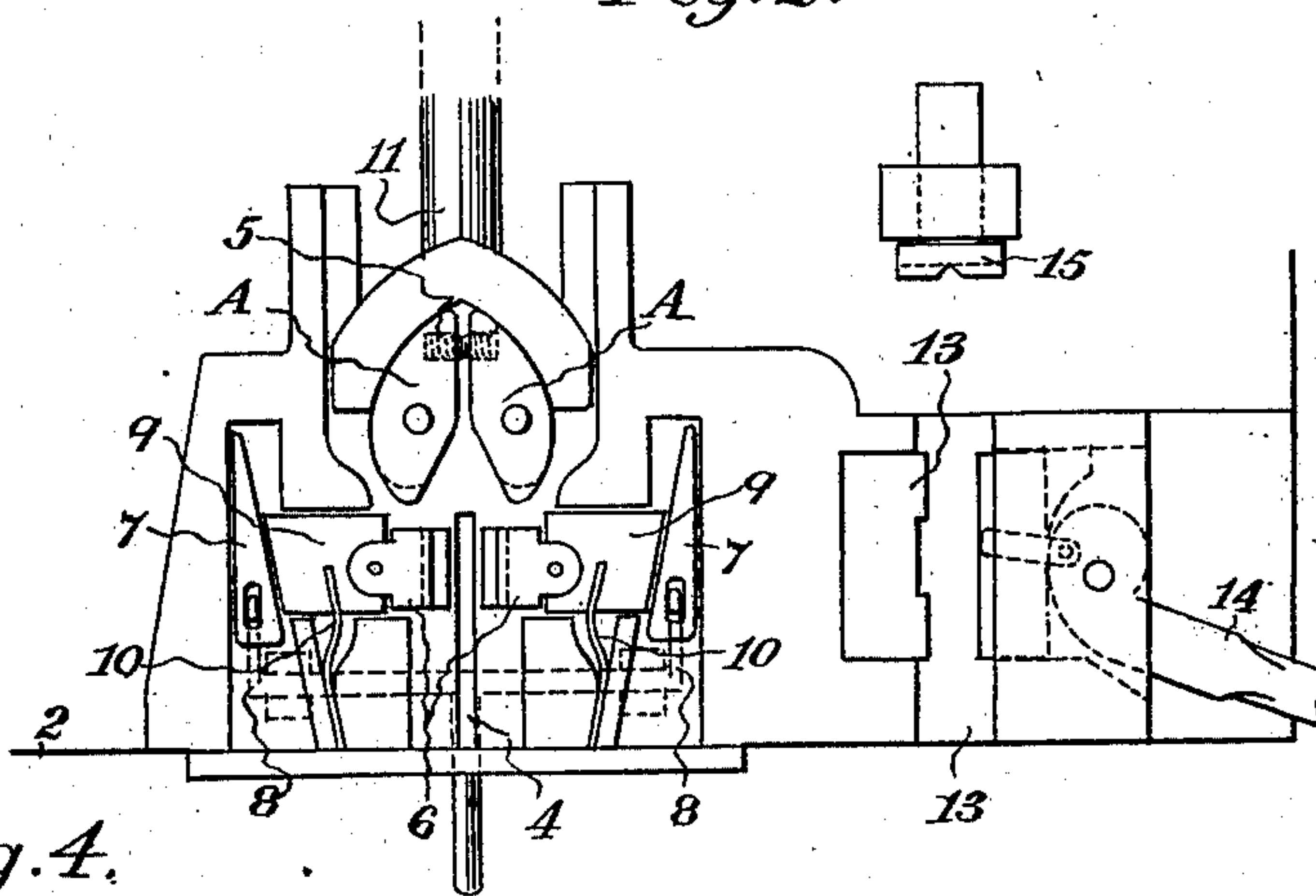


Fig. 3.

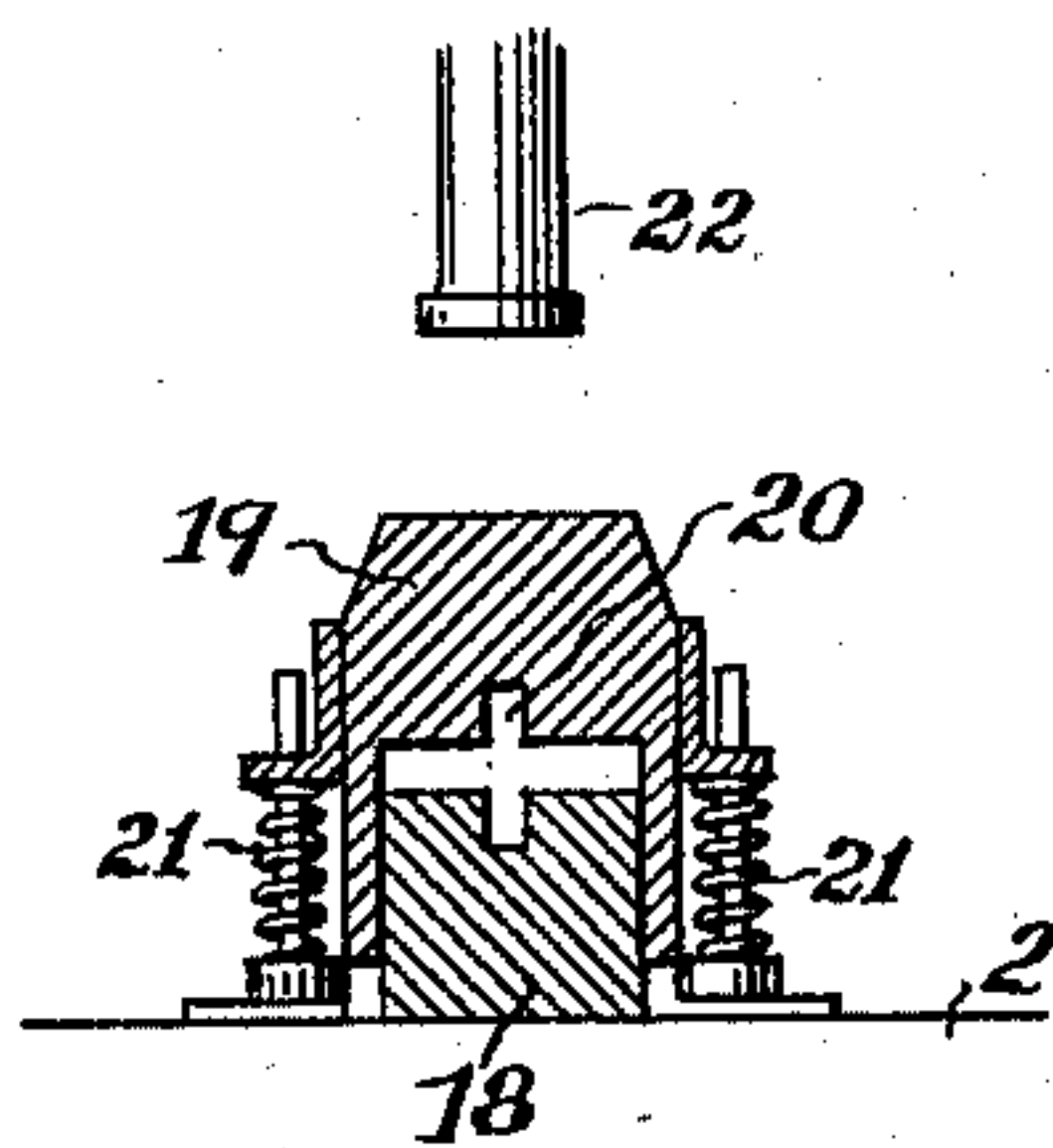
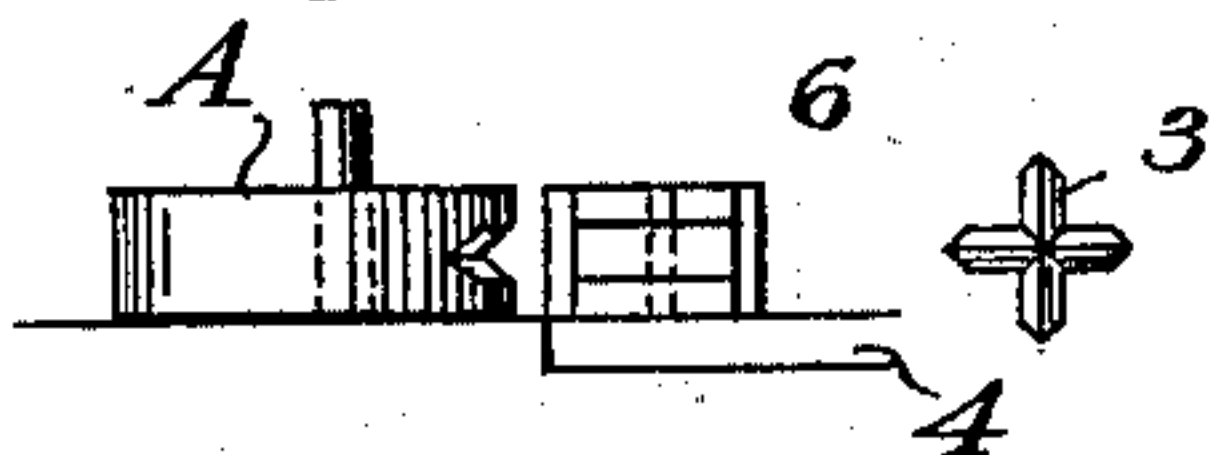


Fig. 4.



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UNITED STATES PATENT OFFICE.

DAVID G. MORGAN, OF QUARTZ MOUNTAIN, CALIFORNIA, ASSIGNOR OF
ONE-HALF TO RICHARD H. McNAMARA, OF SAME PLACE.

MACHINE FOR SPREADING, TRUING, AND GAGING DRILLS.

SPECIFICATION forming part of Letters Patent No. 656,415, dated August 21, 1900.

Application filed April 16, 1900. Serial No. 13,031. (No model.)

To all whom it may concern:

Be it known that I, DAVID G. MORGAN, a citizen of the United States, residing at Quartz Mountain, county of Tuolumne, State of California, have invented an Improvement in Machines for Spreading, Truing, and Gaging Drills; and I hereby declare the following to be a full, clear, and exact description of the same.

10 My invention relates to a machine which is designed for spreading, truing, and gaging rock-drills of that class in which the cutting-bits are formed at right angles with each other.

15 It consists of tools or formers into which the cutting-bits of the drills are placed, clamps for holding them in position, and hammers acting upon the formers to give the proper shape and size to the bit.

20 My invention also comprises details of construction which will be more fully explained by reference to the accompanying drawings, in which—

25 Figure 1 is a perspective view of the machine. Fig. 2 is a plan. Fig. 3 is a section of the slidable movable guide. Fig. 4 is a side view of the dies.

30 Drills which are used for perforating rock are made with the cutting-bits in the form of a cross, and these drills may be used with various forms of operating mechanism. When the drills wear, the outer angles become worn off. The drill will then cut a hole of a less diameter and it is necessary to again extend the cutting-bits to the proper length and to sharpen and straighten the edges.

35 It is the object of my invention to thus repair and sharpen the drills.

40 The first operation to which the drill is subjected is what is known as the "fuller," which is designed to spread the metal outward and extend the corners or angles which have been worn off. For this purpose the dies or formers A are pivoted in a suitable framework or horizontal bed-plate 2. The points of the formers are made with V-shaped grooves or notches in them, and the drill is presented so that one of the lines of bits 3 will lie within these V-shaped grooves, while the transverse line will stand vertically with relation thereto. A channel 4 is made in the

bed-plate to admit the lower end of the vertically-disposed bits and allow the horizontal ones to fit within the grooves or channels of the formers. The points of these formers 55 are normally pressed together by means of a spring 5, located between the opposite ends of the formers and acting to separate them and force the grooved ends toward each other. Upon each side of the drill-shank are jaws 6, 60 which are movable to and from each other by wedge or cam shaped blocks 7. Various devices may be used for this portion of the apparatus. As here shown they consist of wedges slidable in grooves or channels and 65 moved backward or forward by a forked lever 8, which is fulcrumed to the bed-plate, and the arms project up through slots in the bed-plate and engage with corresponding slots in the wedges or cams 7, so that by moving the 70 lever back and forward these wedges or cams will be correspondingly moved. The jaws 6 are pivoted in carriers 9, which are slidable in guides, and the rear ends are beveled, so as to be acted upon by the wedges 7. Springs 75 10 serve to retract these carriers when the wedges are withdrawn, and thus separate the jaws 6. By pivoting the jaws to the carriers the jaws are allowed to turn about their pivots, so that their clamping-faces will fit 80 against the drill-shank and adjust themselves to whatever taper or divergence there may be to the drill near its end, the drill being spread at the cutting end, so as to have considerably greater diameter than the drill-shank. 85 The drill having been placed between the jaws 6 and one line of the bits 3 lying in the channels of the fullers A, the drill-shank can be firmly clamped between the jaws 6. 11 is a guided slidable head having convergent inner 90 faces which are adapted to fit over the outer ends of the fulcrumed fuller-jaws A. This slide is connected with a piston movable in a cylinder 12 and actuated by compressed air or other suitable fluid under pressure, 95 the movement being controlled by valves of any description. (Not here shown.) When the drill is in position, the head 11 is caused to reciprocate, and its convergent inner faces striking upon the outer ends of the jaws A 100 will cause the grooved ends to slide outwardly with each stroke, and as the drill is firmly

clamped the action of these grooved jaws is to force the metal from the center outward and spread the bits which are being acted upon to the required length. It will be understood that the drill is heated before being placed in the jaws and that the rapid action of the sliding hammer upon the fuller-jaws will spread the bits of the drill to the required extent. The drill-shank is then released and is turned so as to bring the other bits into line with the fuller-jaws and these are acted upon. This operation makes the cutting-jaws of the bits irregular, and in order to straighten them as soon as the fulling or spreading has been completed the drill-shank is immediately released and placed between jaws 13, mounted in the same frame by the side of the first-named part of the apparatus. By means of a lever 14 the drill-shank is clamped with the bits extending into a die 15, which is in the form of V-shaped grooves or notches crossing each other in the same manner that the bits of the drill cross, these bits being fitted into the grooves of the die 15. A hammer 16, the shank of which is actuated by a piston in the cylinder 17, is caused to strike upon the die, and this straightens the edges of the cutting-bits of the drill. The latter is then immediately released and is transferred to the third part of the apparatus, which consists of a fixed die 18 and a guided movable die 19, situated in line above it. These two dies have vertical slots or channels formed in them, as shown at 20, and these receive the vertical cutting-bits of the drill, while the horizontal ones lie in the space between the two parts 18 and 19. The part 19 is normally raised by springs 21, and in line above it is a hammer 22, which is actuated by a plunger in the cylinder 23, with suitable valve connections, as previously described, so that after the bits of the drill have been inserted into these dies the strokes of the hammer will give the final sizing and gaging of the bits of the drill, so that it will be in proper form to be again used in the drill-hole. The drill is then tempered and is ready for use. By means of these successive devices mounted contiguous to each other a single heat is sufficient to spread or full the corners, to dolly or square the ends, and to size and gage the drill.

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

1. A machine of the character described consisting of separable channeled jaws, means for holding the drill in contact with said jaws and operating them to spread the bits, a die by which the ends of the bits are squared

or straightened after being spread, and a gage and sizer into which the bits are successively inserted, and hammers actuated by fluid-pressure to complete the operation at a single heat.

2. In a machine of the character described, a channeled base, levers fulcrumed to open and close horizontally having grooves formed in the ends adjacent to the channel, clamps by which the drill is held with the horizontal bits engaging the grooves, and a slidable hammer having converging openings to engage the outer ends of the levers whereby the grooved ends act to spread the bits of the drill which lie therein.

3. In a machine of the character described, hinged adjustable clamps and mechanism by which they are closed to grip the drill-shank between them, spring-pressed lever-arms having grooves in the ends within which grooves the horizontal bits of the drill are fitted, a hammer having a converging channel adapted to engage and close the outer ends of the levers and to correspondingly spread the grooved ends and extend the bits.

4. The combination in a machine of the character described, of grooved spreading-levers, jaws for adjustably holding the drill with its bits in contact therewith, carriers for the jaws, means for moving the carriers, and a hammer and actuating mechanism for the spreading-levers.

5. A machine of the character described comprising grooved spreading-levers, jaws for holding the drill with its bits in contact with the levers, carriers for the jaws and means for moving the carriers, a hammer and means for operating the spreading-levers, means for truing the bits of the drill, and means for sizing and gaging the bits.

6. The combination of grooved spreading-levers, movable jaw-carriers, jaws pivotally secured to the carriers whereby they adjust themselves to the drill-shank, means for adjusting and locking the carriers, a hammer for actuating the spreading-levers, and means for actuating the hammer.

7. A machine of the character described including mechanism for holding and spreading the drill-bits; mechanism for holding and truing said bits; mechanism for sizing and gaging the bits; and power devices for operating each of said mechanisms whereby the operation is completed at a single heat.

In witness whereof I have hereunto set my hand.

DAVID G. MORGAN.

Witnesses:

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