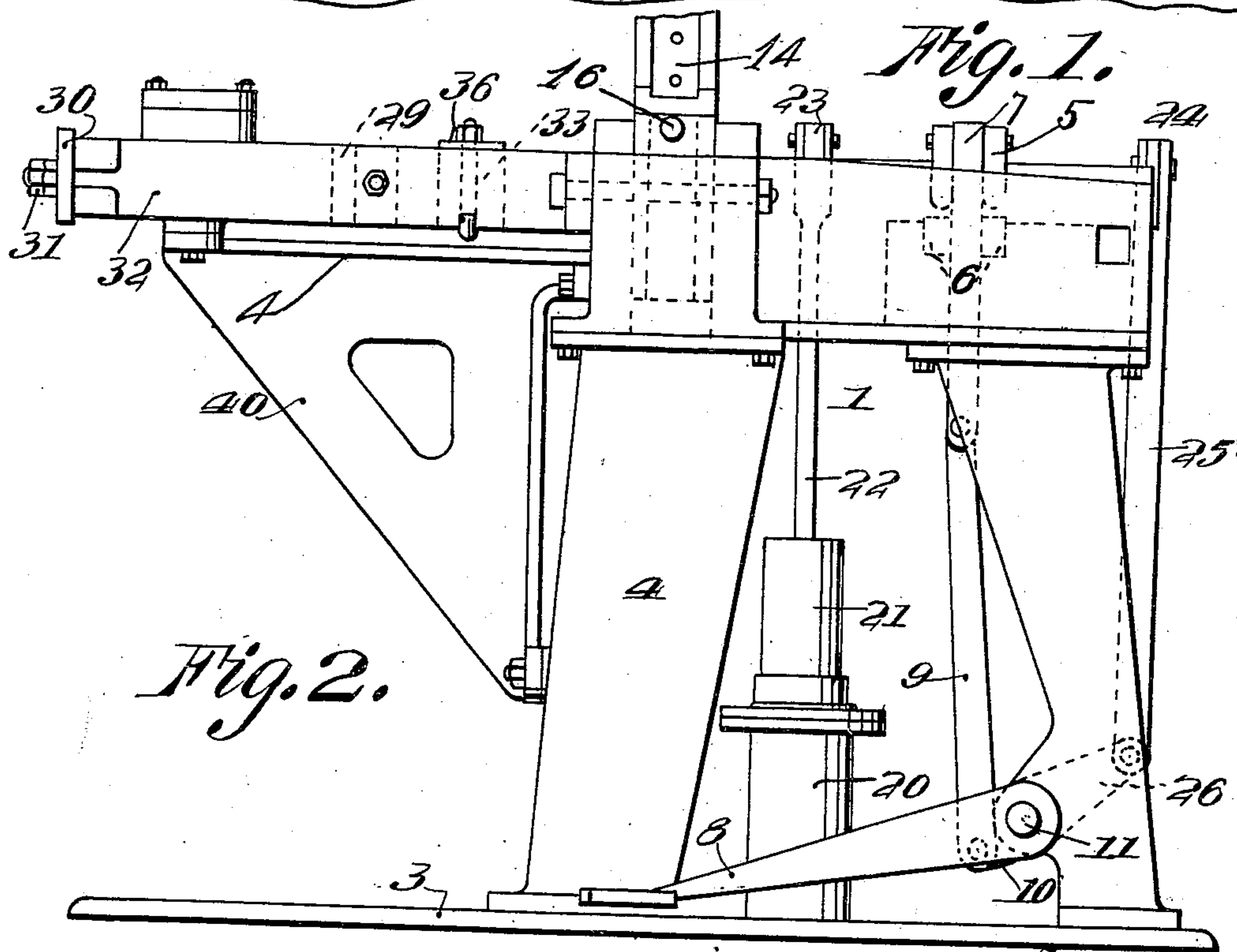
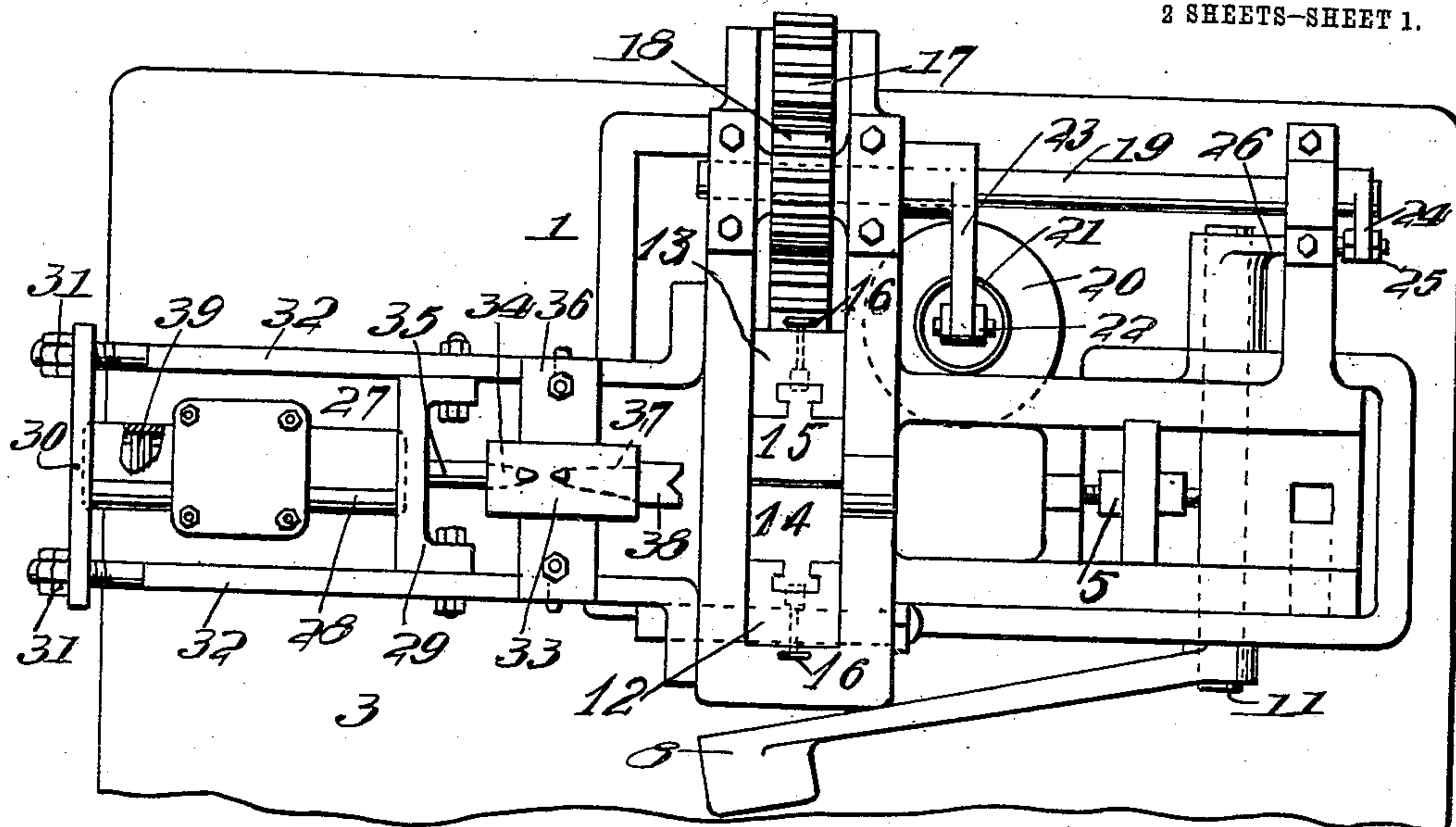


C. O. BORKMAN.
 DRILL FORGING AND SHARPENING MACHINE.
 APPLICATION FILED APR. 22, 1910.

991,689.

Patented May 9, 1911.

2 SHEETS—SHEET 1.



Witnesses
 E. O. Brown
 C. H. Grubner.

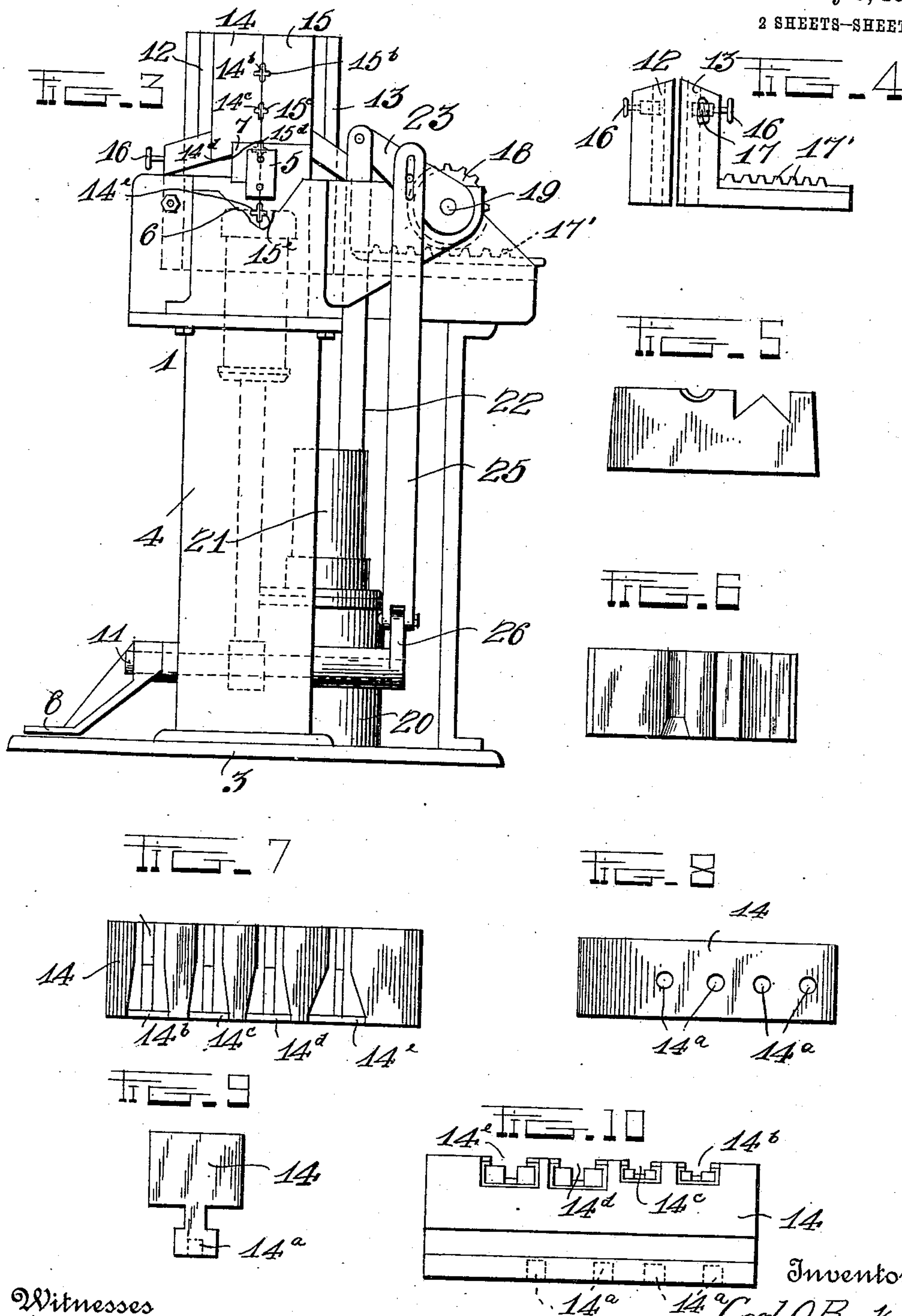
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2 SHEETS—SHEET 2.



Witnesses
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UNITED STATES PATENT OFFICE.

CARL O. BORKMAN, OF VICTOR, COLORADO.

DRILL FORGING AND SHARPENING MACHINE.

991,689.

Specification of Letters Patent.

Patented May 9, 1911.

Application filed April 22, 1910. Serial No. 556,915.

To all whom it may concern:

Be it known that I, CARL O. BORKMAN, a citizen of the United States, residing at Victor, in the county of Teller and State of Colorado, have invented certain new and useful Improvements in Drill Forging and Sharpening Machines; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to an improved drill forging and sharpening machine.

The object of the invention is to provide a simply constructed and efficient machine of this class in which the shaping dies and the clamping jaws are operated simultaneously.

With this and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings; Figure 1 is a top plan view of this improved machine; Fig. 2 is a side elevation thereof; Fig. 3 is an end elevation thereof; Fig. 4 is a side elevation of the die holders detached; Figs. 5 and 6 represent a top and side view of the shank forming dies; Figs. 7, 8 and 9 show a top plan view, a rear elevation, and an end elevation respectively, of one of the shaping dies for forming a cruciform rock drill bit; Fig. 10 is a side elevation of the die shown in Figs. 7, 8 and 9.

In the embodiment illustrated, an upsetting machine 1 is shown mounted on a base plate 3. This upsetting machine 1 comprises a suitable supporting frame 4 in which are mounted a vertically movable jaw 5 and a stationary jaw or block 6 for securely clamping the shank of the tool to be operated on. The vertically movable jaw 5 is mounted in a jaw holding member 7 which is connected with a foot lever 8 by means of a rod 9, crank 10 and shaft 11 whereby an easily graduated pressure on the shank clamped between the jaws 5 and 6 may be obtained. Two die holders 12 and 13 are mounted on the frame 4, the holder 12 being stationary and the holder 13 movable laterally relatively to the holder 12 by means hereinafter to be described. Dies 14 and 15 are mounted for vertical adjustment in said holders 12 and 13 and are secured in adjusted position in said holders by pins as 16,

which are designed to engage longitudinally spaced sockets as 14^a formed in the outer or rear faces of the dies, (see Fig. 8). These pins 16 are preferably held in position by helical springs as 17, (see Fig. 4). The die holder 13 is provided preferably at its lower end with a laterally extending rack 17' designed to mesh with a pinion 18 mounted on a horizontally disposed shaft 19 and operable thereby as hereinafter described.

These dies 14 and 15, one of which is shown in detail in Figs. 7, 8, 9 and 10 are each provided with a plurality of longitudinally spaced matrices of the same shape but of different sizes, four being here shown, those in the die 14 being numbered 14^b, 14^c, 14^d and 14^e, which are arranged to register with correspondingly shaped matrices 15^b, 15^c, 15^d and 15^e in the die 15 which when brought together correspond in form to the flaring cruciform drill end to be shaped.

In rock drilling four sizes of drill are used for holes of considerable depth, the first drill being the largest and the last the smallest, hence four sizes of dies or matrices are necessary. To render the change from one size to another rapid and easy the dies 14 and 15 are made vertically adjustable by providing the longitudinally spaced apertures 14^a in their rear faces which are so positioned that when engaged by the pins as 16 one of the matrices will be opposite the dolly 38 hereinafter described.

An air cylinder 20 is mounted on the base plate 3 and has a piston 21 operable therein. A piston rod 22 is connected at its upper end with a crank 23 fixed to the shaft 19 and this piston rod 22 serves to oscillate the crank 23 and rock the shaft 19 whereby the pinion 18 is operated to move the die holder 13 back and forth for opening and closing the dies 14 and 15. A crank 24 is also connected with the shaft 19 and a pitman rod 25 is connected with the free end of said crank 24 and with a crank arm 26, which is also mounted on the shaft 11, whereby the oscillation or rocking of shaft 19 caused by the movement of piston 22 in one direction serves to automatically raise the jaw 5 and move the die 15 outwardly and allows the ready insertion or removal of the tool to be operated on. The reverse motion of the piston 21 which is controlled by any suitable threeway valve conveniently placed, closes the dies 14 and 15 and lowers the jaw holding member 7 to close jaws 5 and 6. When

the foot lever 10 has been depressed to close the dies 14 and 15 and the jaws 5 and 6, they may be opened by any suitable means, the die 15 being preferably moved outwardly by hand and when so moved operates through the pinion 18 and the parts connected therewith to simultaneously open the jaws 5 and 6.

An upsetting hammer 27 is provided with a cylinder 28 mounted in tapered seats formed in a front cross bar 29 and in a rear cross bar 30, as shown in dotted lines in Fig. 1, and is securely held in said seats by nuts as 31 mounted on side bars 32 the ends of which are reduced and pass through said cross bar 30 and to which the cross bar 29 is bolted.

A head 33 is provided at one end with a socket 34 in which one end of a piston rod 35 fits tightly. This head 33 is mounted to slide freely in a guide 36 and is also provided in the end opposite the socket 34 with a similar tapered socket 37 to receive a dolly 38, said dolly fitting tightly within said socket 37 and arranged opposite one of the matrices in the dies 14 and 15. A piston 39 is connected with the piston rod 35 and operates in said cylinder 28 for reciprocating the said dolly 38. The cylinder 28 and the members connected therewith as above described are supported by a substantial iron brace 40 and a valve motion similar to that of any ordinary rock drill is used in connection therewith, its operation being governed by any convenient throttle suitably located.

The gripping mechanism for holding the shank to be operated on by the dies 14 and 15 securely holds the shank and protects the said dies from considerable wear and also accomplishes more uniform work and relieves the operator from the violent jarring which is inevitable when the drill is held by hand using the ordinary anvil block.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention as defined in the appended claims.

I claim as my invention:

1. In a drill forging and sharpening machine, the combination of a supporting structure, laterally movable die holding

means mounted on said structure, gripping jaws mounted on said structure, and means for closing said gripping jaws and said die holding means simultaneously, comprising a rock shaft, means connecting said rock shaft with said movable die holding means, a crank connected with said rock shaft, a pitman connected at one end with said crank, a revoluble shaft mounted in said structure, a crank arm mounted on said revoluble shaft and connected with the free end of said pitman, means connecting said shaft with said gripping jaws, and operating means for said rock shaft.

2. The combination of a supporting structure, vertically adjustable dies mounted in said structure and having a plurality of vertically spaced matrices of similar shape and different sizes, means for holding said dies in adjusted position, means for opening and closing said dies and a dolly mounted for operation with the respective matrices when they are brought into position in alignment with said dolly.

3. In an upsetting machine, the combination of a supporting structure, die holders mounted thereon, means for moving one of said holders laterally relative to the other, dies vertically adjustable in said holders and having a plurality of vertically spaced matrices formed in their adjacent faces, means for holding said dies in adjusted position, gripping jaws for engaging the shank of the tool to be operated on, and means for opening and closing said gripping jaws and said movable die holder simultaneously.

4. In an upsetting machine, the combination of a supporting structure, die holders mounted thereon, means for moving one of said holders laterally relative to the other, dies vertically adjustable in said holders, gripping jaws for engaging the shank of the tool to be operated on, and means for opening and closing said gripping jaws and said movable die holder simultaneously, said movable die holder having a laterally extending rack, a rock shaft having a pinion mounted for engagement with said rack, means carried by said rock shaft for operating said tool gripping jaws, and means for operating said rock shaft.

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

CARL O. BORKMAN.

Witnesses:

A. S. JOHNSON,
F. R. DELANEY.