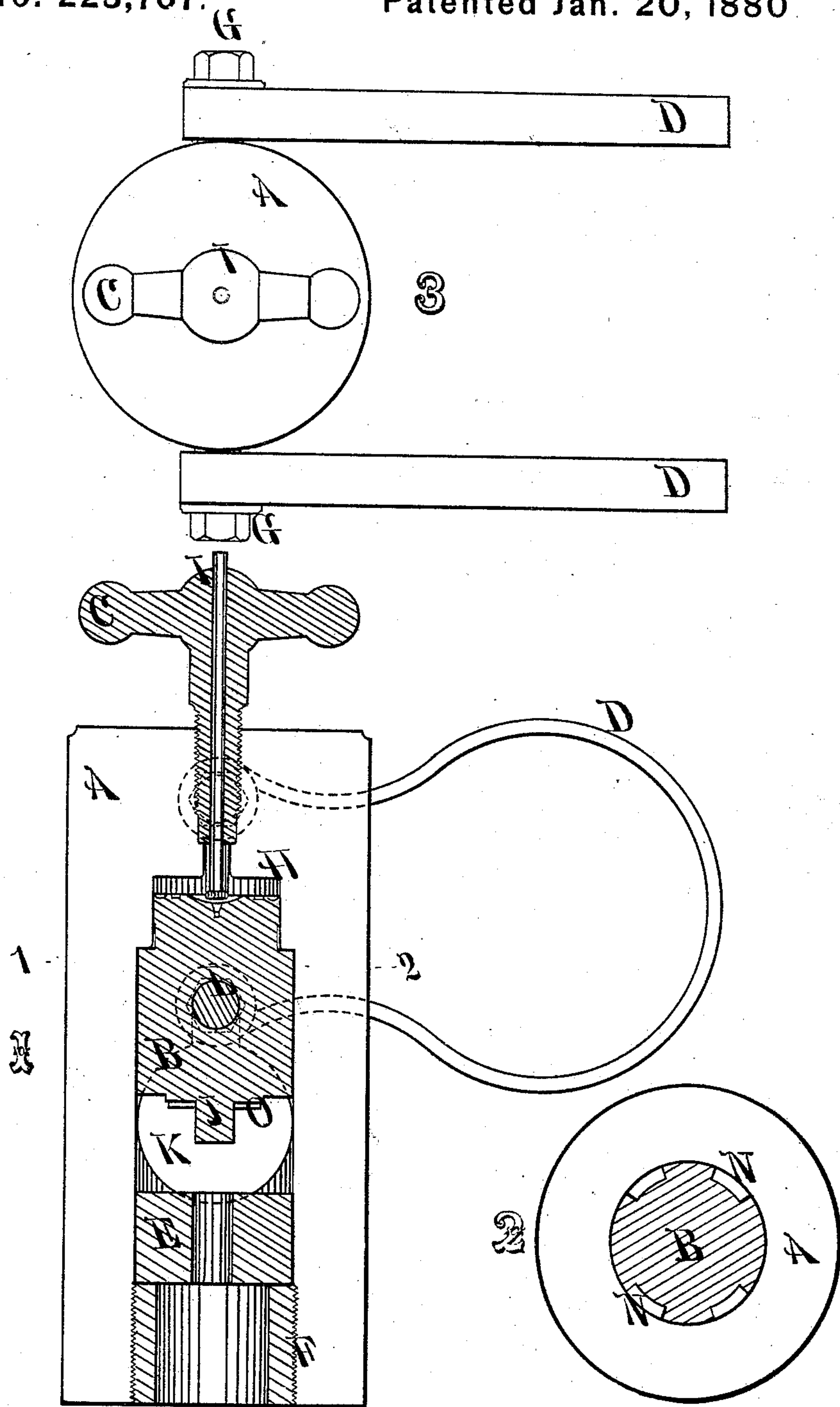


T. SHAW.
Gun-Powder Punching-Machine.

No. 223,767.

Patented Jan. 20, 1880.



WITNESSES:

Elias J. Shaw
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THOMAS SHAW, OF PHILADELPHIA, PENNSYLVANIA.

GUNPOWDER PUNCHING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 223,767, dated January 20, 1880.

Application filed November 23, 1878.

To all whom it may concern:

Be it known that I, THOMAS SHAW, of the city and county of Philadelphia, Pennsylvania, have invented a new and Improved Gunpowder Punching-Machine; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists in the production of a machine actuated by explosive compounds in a confined chamber, that forcibly ejects a piston or plunger, to which is secured the desired punch or other tool that is to cut, impress, or shear metal or other material requiring great force to act upon the same, the principal features of which are constructed and operated in the manner and for the purpose as hereinafter described.

The object of the invention is to furnish a compact powerful machine to perform the maximum labor, limited in its giant strength only by the strength of the material of which it is composed.

In order to enable others to use and practice my invention, I will proceed to describe its construction and operation.

On reference to the accompanying drawings, which form part of the specification, Figure 1 is a vertical section through the center of the machine, and Fig. 2 is a cross-section on the line 1 and 2; and Fig. 3 is a top view of the same.

Similar letters refer to similar parts, of which A is the cylinder or body of the machine, bored in the center for the reception of plunger B, die E, and thrust-ring F, and has a cross-aperture, K, for the insertion of bars of metal to be acted upon. H is the explosion-chamber, provided with an aperture on the top for the insertion of explosive compounds, which aperture is closed by plug C, which plug has a central bore throughout its entire length for the insertion of the firing-pin I, which projects above the plug C at the top, and is provided with an enlarged head at the bottom, to prevent blowing the pin out of the plug. There is a slight concavity in the top of plunger B, in which the explosive powder falls, and on which the pin I rests preparatory to discharging the compound. The plunger B has a

through-bolt, L, that projects beyond both sides of cylinder A, which cylinder is slotted for its reception and operation. The outer ends of said bolt L are grasped by strong springs D, the upper ends of said springs being secured by bolts G to the outside of cylinder A, and the tension of the springs is to close plunger B back into the cylinder from which it is expelled by the explosive force.

The plunger B, Fig. 2, is provided with channel-ways N, to exhaust the pressure after the plunger B has traveled the length of the explosion-chamber H.

J shows a punch secured to plunger B in any of the ordinary methods of securing punches to punching-machines. The punch J is located over the die E, for the reception of the same, and any forcible downward movement of plunger B will punch from any bar or plate a hole of the configuration of said punch. The punch can be variously fashioned, and shear-blades or other metal-working devices can be secured to said plunger B, and other dies substituted in place of the one shown at E by any of the common methods of securing said dies or other metal-working devices, all of which can be forcibly operated by said plunger B, as hereinafter explained.

O is a cushion of elastic material, to overcome the final momentum of plunger B after the necessary stroke is terminated. The plug C is held in place by screw-thread on the entire or part of its length, or can be held by ordinary cam-grooves.

The machine is operated in this manner: The screw-plug C is removed, and a small portion of percussion material or powder is inserted or allowed to drop upon the top of plunger-head B in the explosion-chamber H. When the plug C is inserted or placed in a resisting position to prevent its being blown out, the material to be operated upon is inserted beneath the punch J of plunger B. The pin I is struck with a hammer or other object on the top at I, which causes the percussion material to ignite and create a great pressure in chamber H, which forcibly ejects plunger B and resists obstructions beneath the same, cutting or squeezing material according to the shape and fashion of the dies employed. This force continues until the gas exhausts itself from the

channels N, Fig. 2, on the completion of the stroke of chamber H, when a similar charge of percussion material is inserted and a like operation performed, as afore described, the
5 springs D insuring a return stroke.

The machine is intended for such laborious duty that each blow will have sufficient telling effect as to warrant its employment on several kinds of metal-work.

10 It will be evident that this machine can be variously modified and fashioned without any alterations in the result. I therefore do not wish to confine myself to the exact machine set forth.

15 What I claim, and desire to secure by Letters Patent, is—

1. The combination of the hollow cylinder

A and plunger B, with its explosion-chamber H and exhaust-grooves N, the plunger being forced by direct gas-pressure during the entire
20 stroke of punch, substantially as and for the purpose set forth.

2. The combination of the hollow cylinder A, the die E, plunger B, and the elastic cushion O, as and for the purpose specified. 25

3. The combination of the hollow cylinder A, the plunger B, with its explosion-chamber H, the plug C, and pin I, as and for the purpose set forth.

THOMAS SHAW.

Witnesses:

ELIAS J. SHAW,

WM. GARWOOD.