

No. 747,521.

PATENTED DEC. 22, 1903.

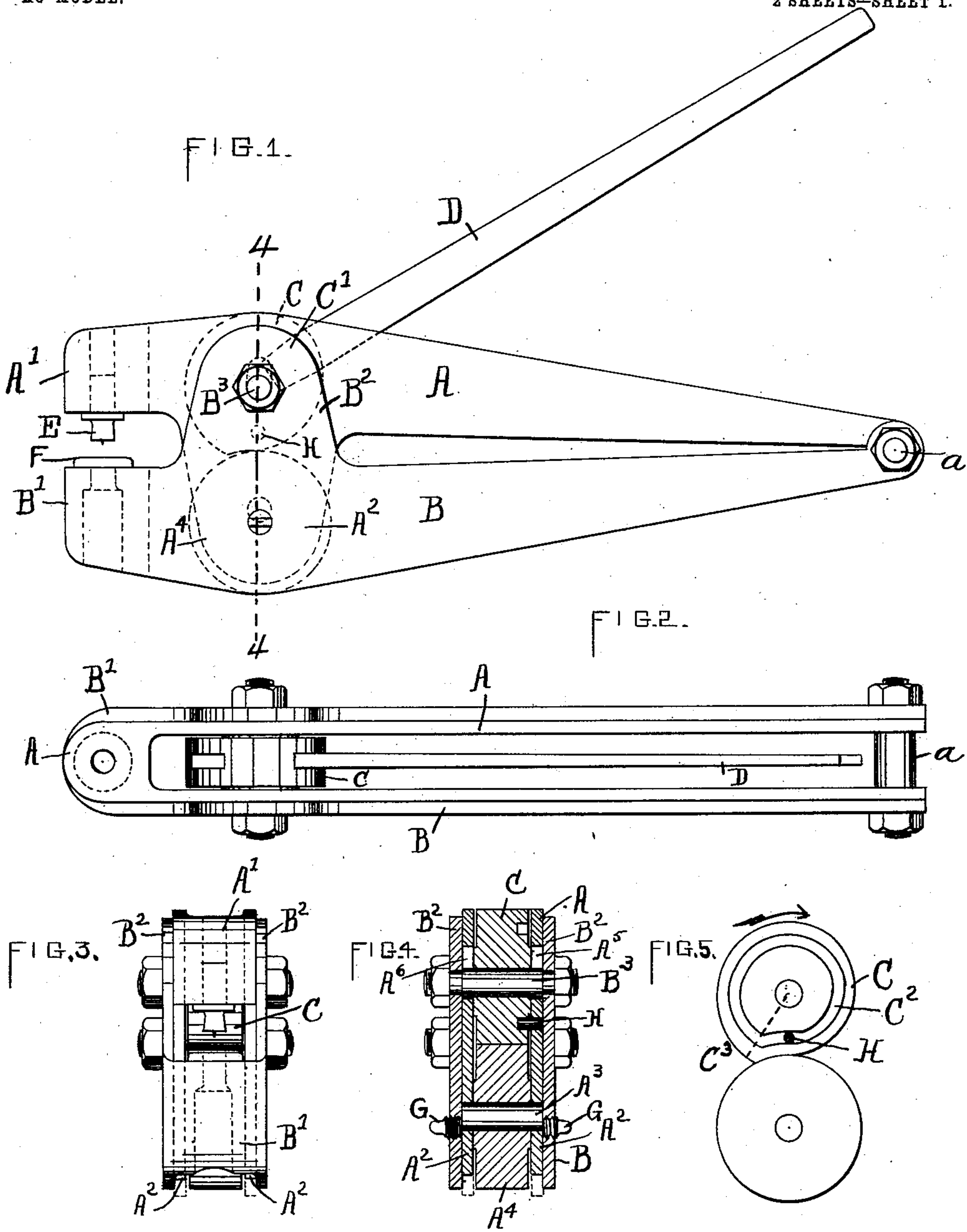
T. A. WESTON.

APPLIANCE FOR OPERATING PUNCHES OR THE LIKE.

APPLICATION FILED JUNE 17, 1898.

NO MODEL.

2 SHEETS—SHEET 1.



WITNESSES:

T. W. Wright
M. A. Miller

INVENTOR

THOMAS A. WESTON

BY *Howson & Howson*
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2 SHEETS—SHEET 2.

FIG. 6.

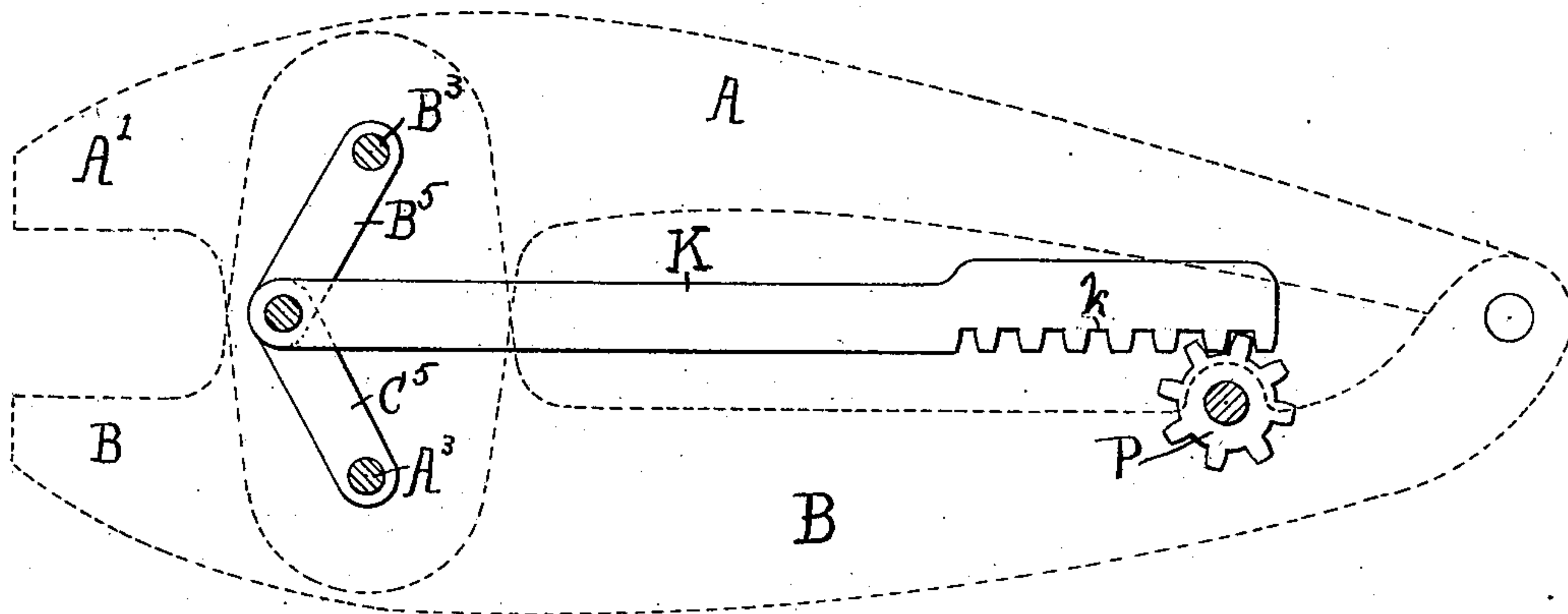
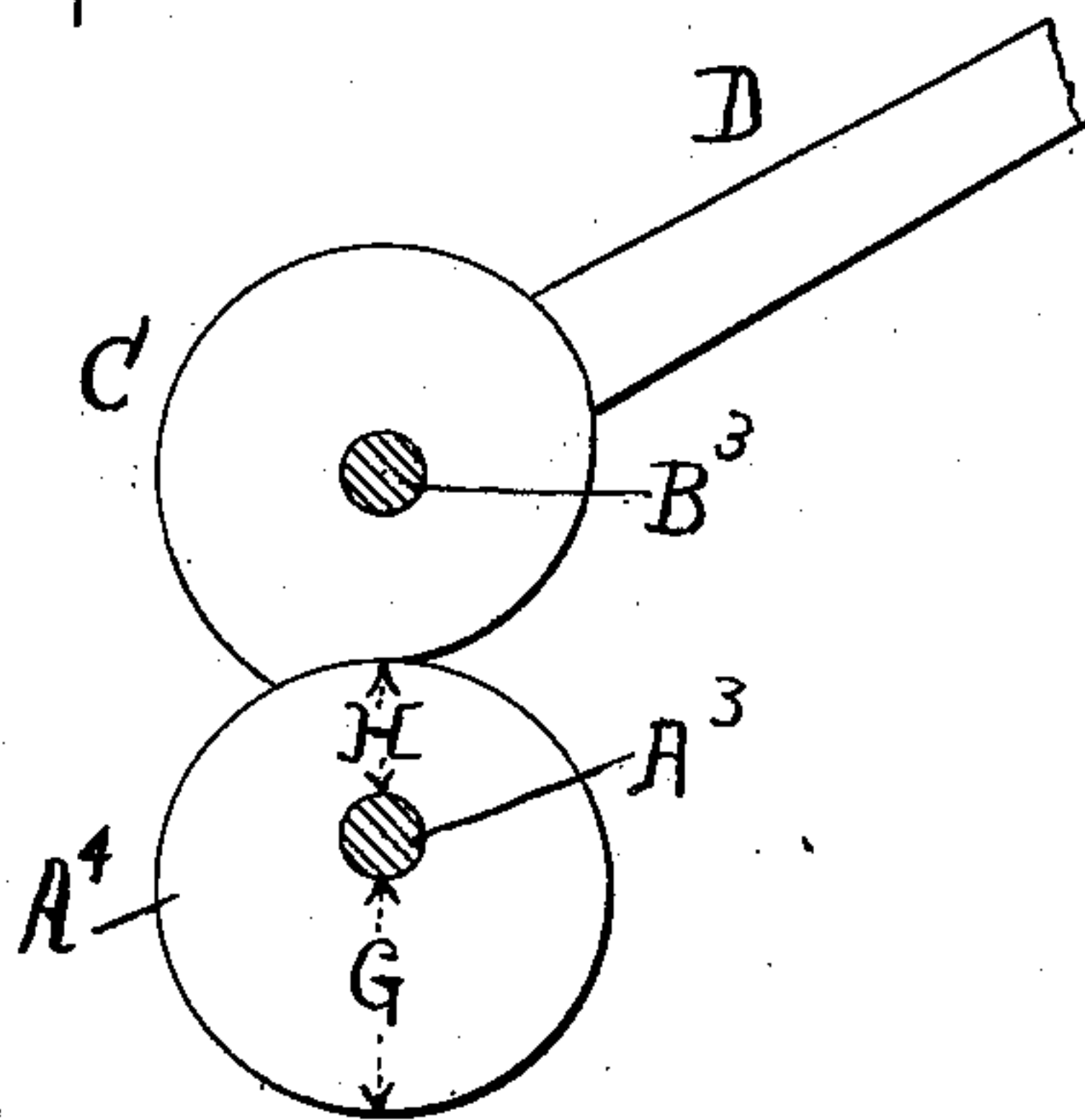


FIG. 7.



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UNITED STATES PATENT OFFICE.

THOMAS A. WESTON, OF ARDEN, NORTH CAROLINA.

APPLIANCE FOR OPERATING PUNCHES OR THE LIKE.

SPECIFICATION forming part of Letters Patent No. 747,521, dated December 22, 1903.

Application filed June 17, 1898. Serial No. 683,743. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. WESTON, a citizen of the United States of America, residing in Arden, county of Buncombe, State of North Carolina, have invented an Improved Appliance for Operating Punches or the Like, of which the following is a specification.

The object of my said invention is to provide an inexpensive movement or appliance of few parts, great power, and varied adaptability, for the purposes of punching, cutting, shearing, swaging, pressing, embossing, grasping, cutting, and for other allied uses of which it may be capable.

To illustrate my said invention, the accompanying drawings show it embodied in a simple type of hand-punch, Figure 1 being a longitudinal elevation, and Fig. 2 a plan; Fig. 3, an end elevation; Fig. 4, a vertical section in the line 4-4, Fig. 1; and Fig. 5, a side view of the cam and roller. Fig. 6 is a view illustrating a modification, and Fig. 7 is a view of another modification.

Referring to Figs. 1 to 5, A and B are two levers of the third order—that is, each lever is constructed to have the power applied between its fulcrum and the load. The two levers have their fulcrums near to each other and preferably coincident by being mounted upon a common pivot *a*. As a matter of preference in construction each lever is bifurcated, the forks being solidly united at the free or acting ends A' B' of the lever, which carry the coacting, punching, cutting, or other tools. The said levers are constructed to overlap each other transversely. The lever B, which in the present instance may be referred to as the "lower" one, has upwardly-extending cheeks B² B², which overlap and guide (and in this case embrace) the downwardly-extending cheeks A² A² of the lever A. The cheeks A² A² are united to each other by the stay A³, firmly fixed or riveted therein. The cheeks B² B² are united to each other by the stay B³, which passes free and clear through slots A⁵ A⁵ in the lever A to allow the latter its motion upon its fulcrum. From the overlapping form of the levers and the position therein of the stays A³ B³ the forcing apart of the said stays brings together or toward each other the acting ends of the levers A B along with

the tools there carried. Also by the said overlapping construction of the levers I am enabled to place compactly within their transverse dimensions or width the device or means whereby the said levers can be forced together or apart at their acting ends carrying the tools or dies, thereby making a strong, compact, symmetrical, and self-contained appliance, movement, or device.

While I do not wish to limit myself to particular devices for operating the levers, I employ, preferably, a cam C, which may be conveniently mounted to turn upon the stay B³ and may act upon a roller A⁴, which may be mounted to turn on the stay A³. The cam C may have sockets C' (four or more) to receive the hand-lever D, whereby the cam may be rotated.

In the drawings I have shown a punch E in the lever end A' and a corresponding die fixed in the lever end B'.

G G are set-pins, the inner hardened ends of which in contact with the outer ends of the stay A³ form adjustable lateral guides to the lever A.

Any suitable means may be employed for separating the acting ends of the levers after action. For instance, as shown in Figs. 1, 4, and 5, a stud or pin H may be fixed in the cheek A², with its inner hardened end entering a cam-groove C² in the cam C, by which stud and groove the lever A and the roller A⁴ are lifted back to their upper normal position (shown in the figures) and are at all times kept in proper relative position to the cam C. In large machines the stud H may be duplicated—that is, another one fixed upon the opposite cheek A², with a corresponding groove to C² upon the adjacent side of the cam C. The said studs may be provided with rollers, if desired, to diminish wear.

In place of the die and punch E F the acting ends A' B' may be provided with shear-blades, embossing-dies, swaging, riveting, or other tools, or with crushing or grasping faces and respectively being capable of operation by my invention.

The action is as follows: The substance to be cut, swaged, pressed, grasped, or punched is placed upon the anvil-die F. The upper tool E is then brought down upon it by rotating the cam C in the direction of the arrow,

Fig. 5. The further rotation of the cam C causes the tool E to descend upon or enter the die F and in its descent to indent, cut, or crush the material between the tools E F.

- 5 The said downward movement of the tool E is due to the eccentric rim of the cam C depressing the roller A⁴, with the lever A carrying it. In Fig. 5 the cam is shown with its shortest radius in contact with the roller A⁴.
 10 Its longest radius is at C³, and when this is in contact with the opposite vertical radius of the roller A⁴ the lever A will be at the lower extreme of the stroke. By continuing the rotation of the cam in the direction of the
 15 arrow, Fig. 5, the groove C², acting upon the stud H, lifts upward thereby the lever A, restoring it and all the parts to the normal positions shown in Figs. 1, 3, 4, and 5.

When less than the entire downward stroke
 20 of the upper tool E is required, the latter may be lowered to any convenient point by turning the cam C, and from that point downward and back again an up-and-down motion can be given to the tool E by a correspond-
 25 ing up-and-down motion of the lever D in the manner of a bench-shears or cutting-nippers. For all of these and other kindred uses my invention is designed as a basic mechanical movement. It is also obvious that the roller
 30 A⁴ may be pivoted eccentrically, as shown by Fig. 7, or have its periphery cam-shaped—that is, of varying radius—so that by pressing its periphery at different portions to the cam C (say the long radius G or the short
 35 one, H) the normal distance of the cam-axis B³ from the axis of the roller or cam A⁴ may be varied, thus effecting a varied normal opening between the tools E F.

It is obvious that the stays A³ B³ could be
 40 forced from each other and together and operated by toggle-links uniting them, in effect radii, respectively, of the cam C and roller A⁴, in order to close and open the acting lever ends A' B' for the purposes set forth, as represented in Fig. 6. B⁵ C⁵ are the toggle-le-
 45 vers, and K is an operating-rod with rack $\frac{1}{2}$ gearing into a pinion P, through which the power may be applied.

I claim as my invention—

- 50 1. The herein-described appliance comprising two levers of the third order having cor-

responding parts overlapping each other, in combination with operating means to cause the ends of the overlapping parts to diverge to make the free ends of the levers approach
 55 each other, substantially as set forth.

2. The herein-described appliance, comprising two levers of the third order having overlapping parts and having coacting dies or other tools at their free ends, in combina-
 60 tion with operating means to cause the ends of the overlapping parts to diverge to make the free ends of the levers approach each other, substantially as set forth.

3. The herein-described appliance comprising
 65 two levers of the third order having coacting dies or other tools at their free ends and having overlapping parts at opposite sides, in combination with an operating means between said overlapping parts to cause the
 70 ends of the latter to diverge to make the free ends of the levers approach each other, substantially as described.

4. The herein-described appliance, comprising two levers of the third order, having
 75 coacting dies or other tools at their free ends, in combination with an operating-cam and roller carried by the two levers within the width thereof, substantially as set forth.

5. The herein-described appliance comprising
 80 two levers of the third order having coacting dies or other tools at their free ends and having overlapping parts, in combination with an operating-cam within the width of said levers and an operating-lever for said
 85 cam, whereby the ends of the overlapping parts are diverged to close the free ends of the levers and converged to open them, substantially as set forth.

6. The herein-described appliance, com-
 90 prising two levers of the third order having parts embracing and guiding each other in combination with an operating means contained within the said embracing parts, sub-
 95 stantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS A. WESTON.

Witnesses:

A. K. ALEXANDER,
 HUBERT HOWSON.