

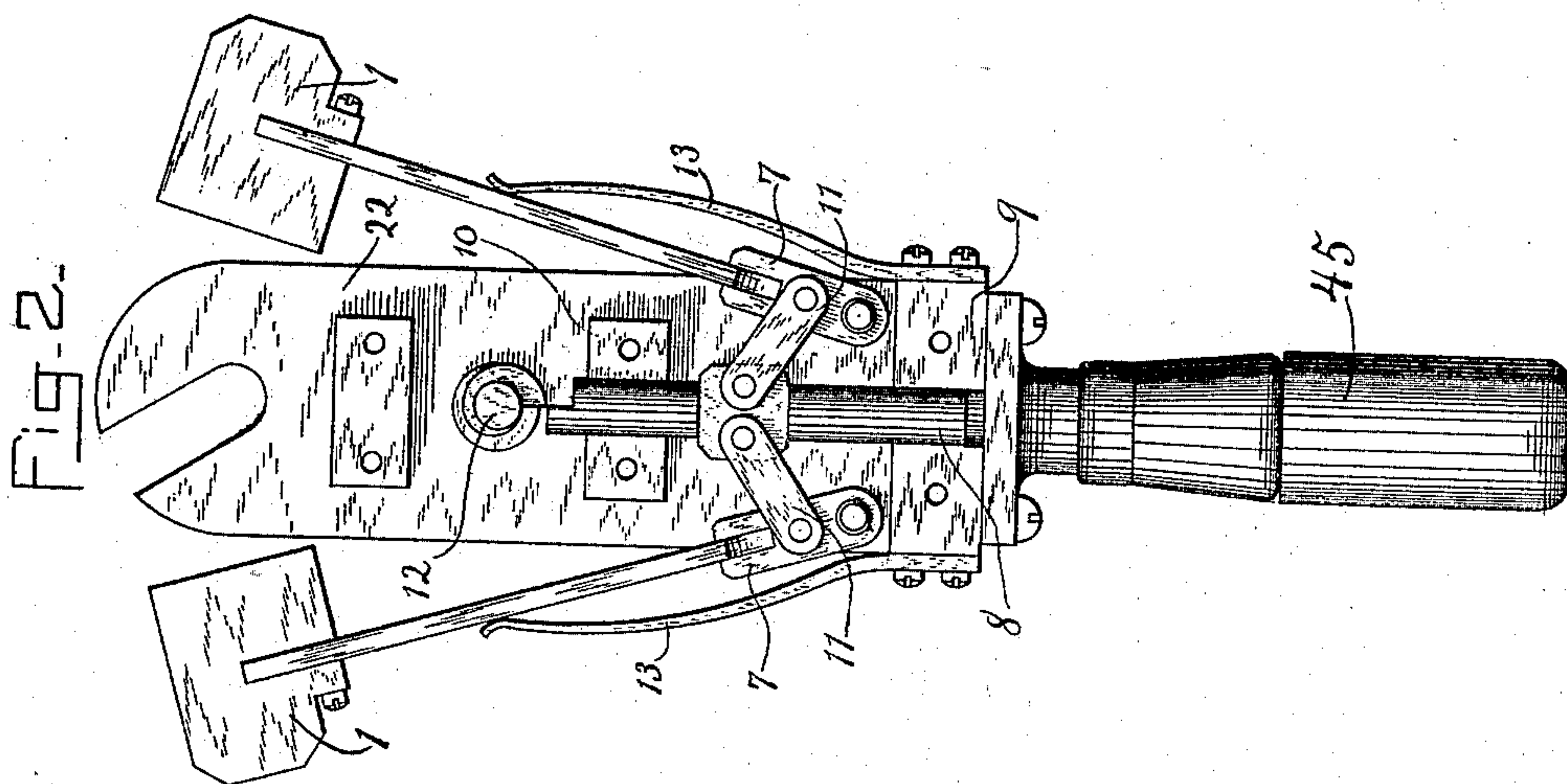
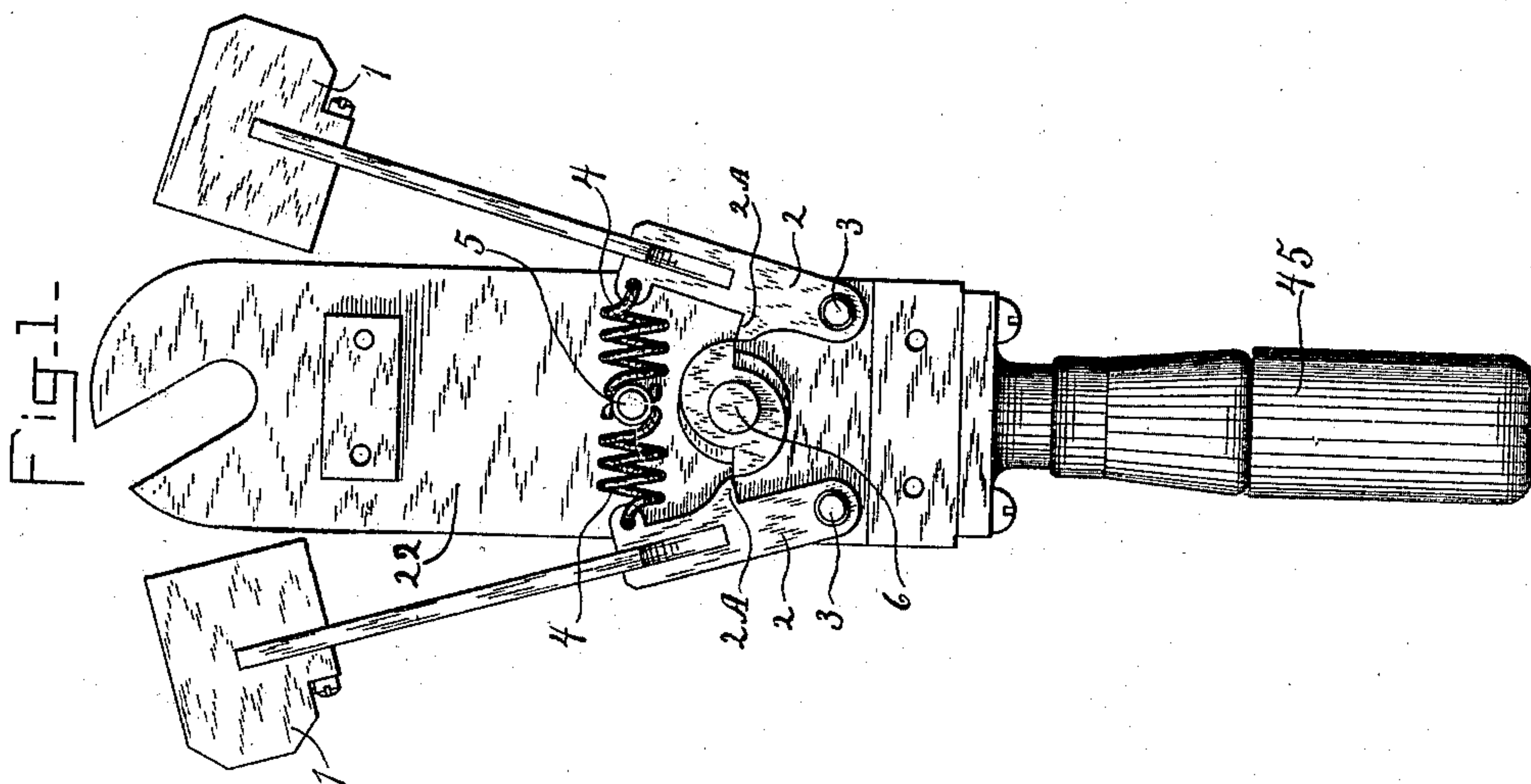
(No Model.)

3 Sheets—Sheet 1.

H. LEMP, C. G. ANDERSON & G. LANDMANN.  
MECHANICAL HAMMER.

No. 513,516.

Patented Jan. 30, 1894.



WITNESSES:  
G. F. Courcy  
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Hermann Lemp  
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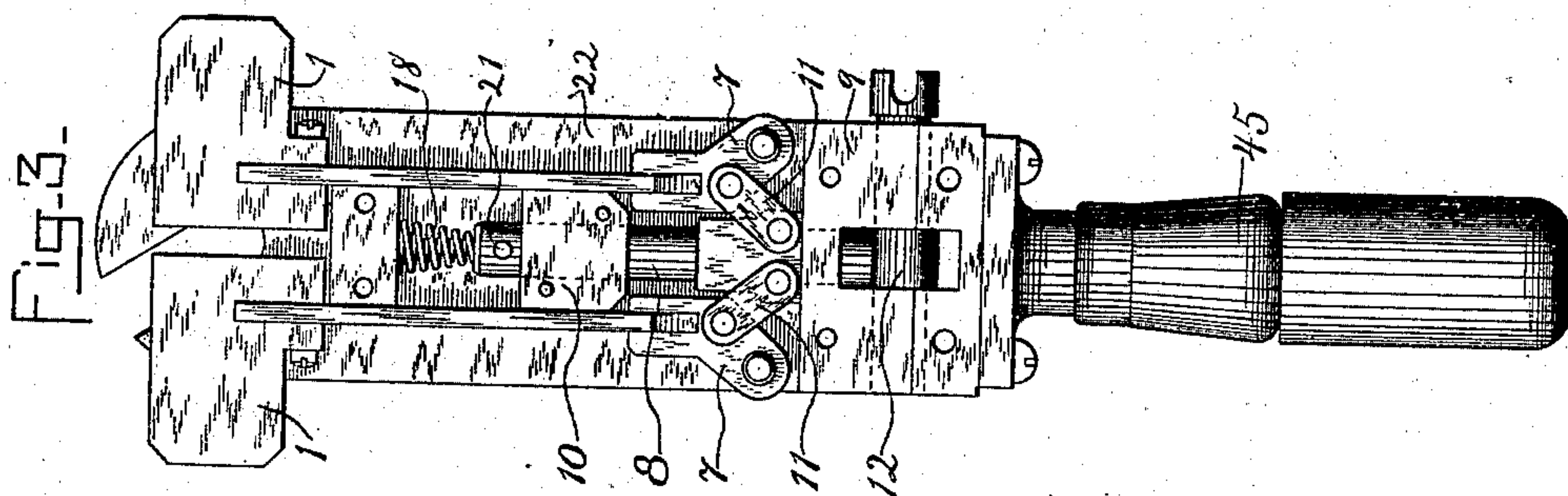
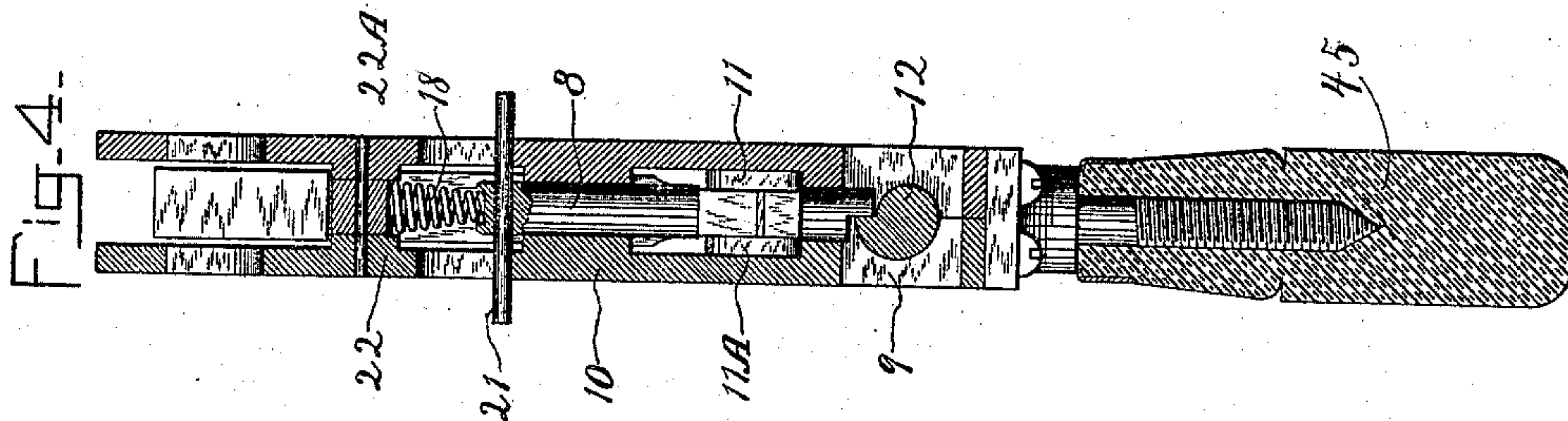
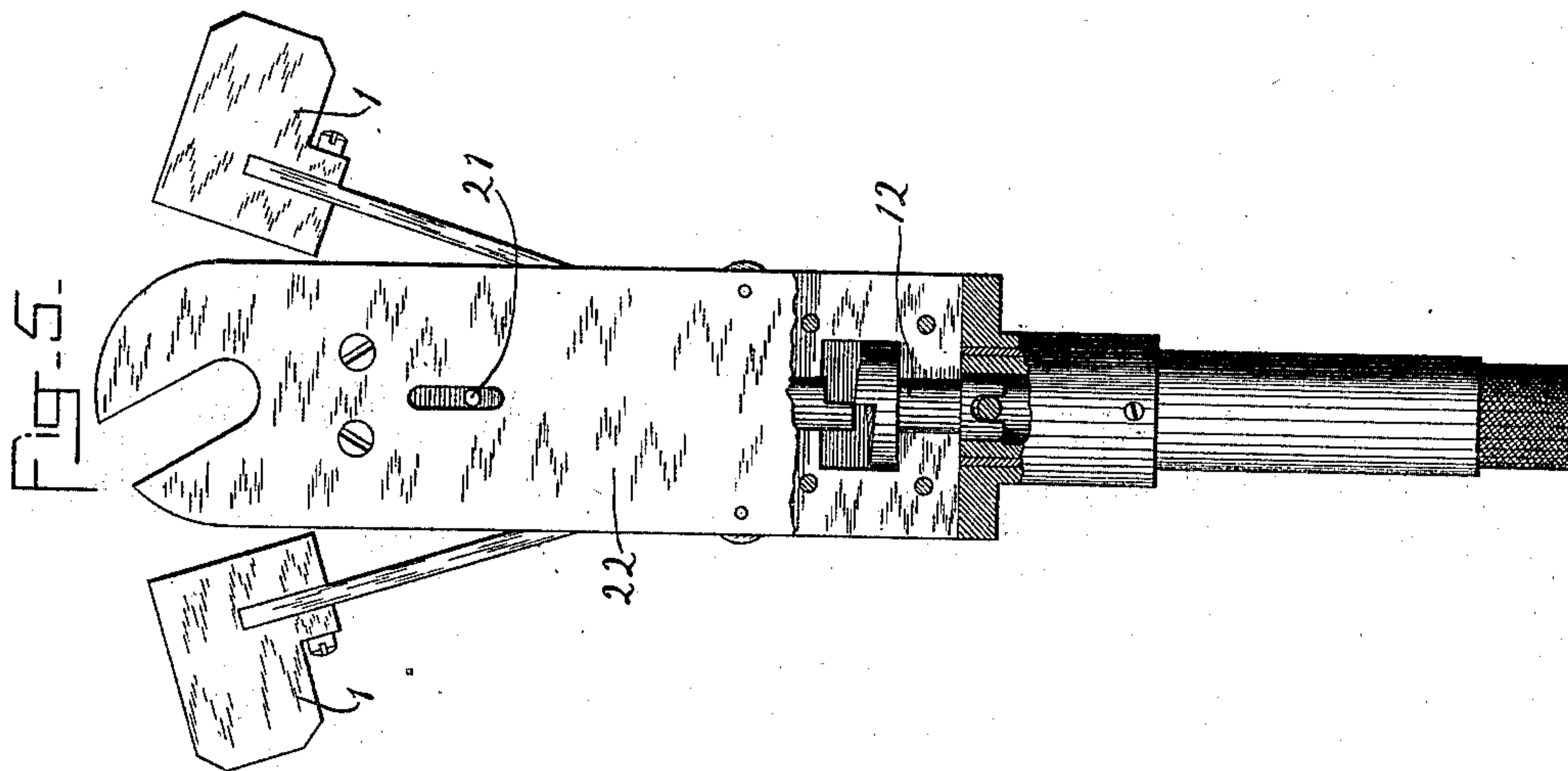
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WITNESSES:  
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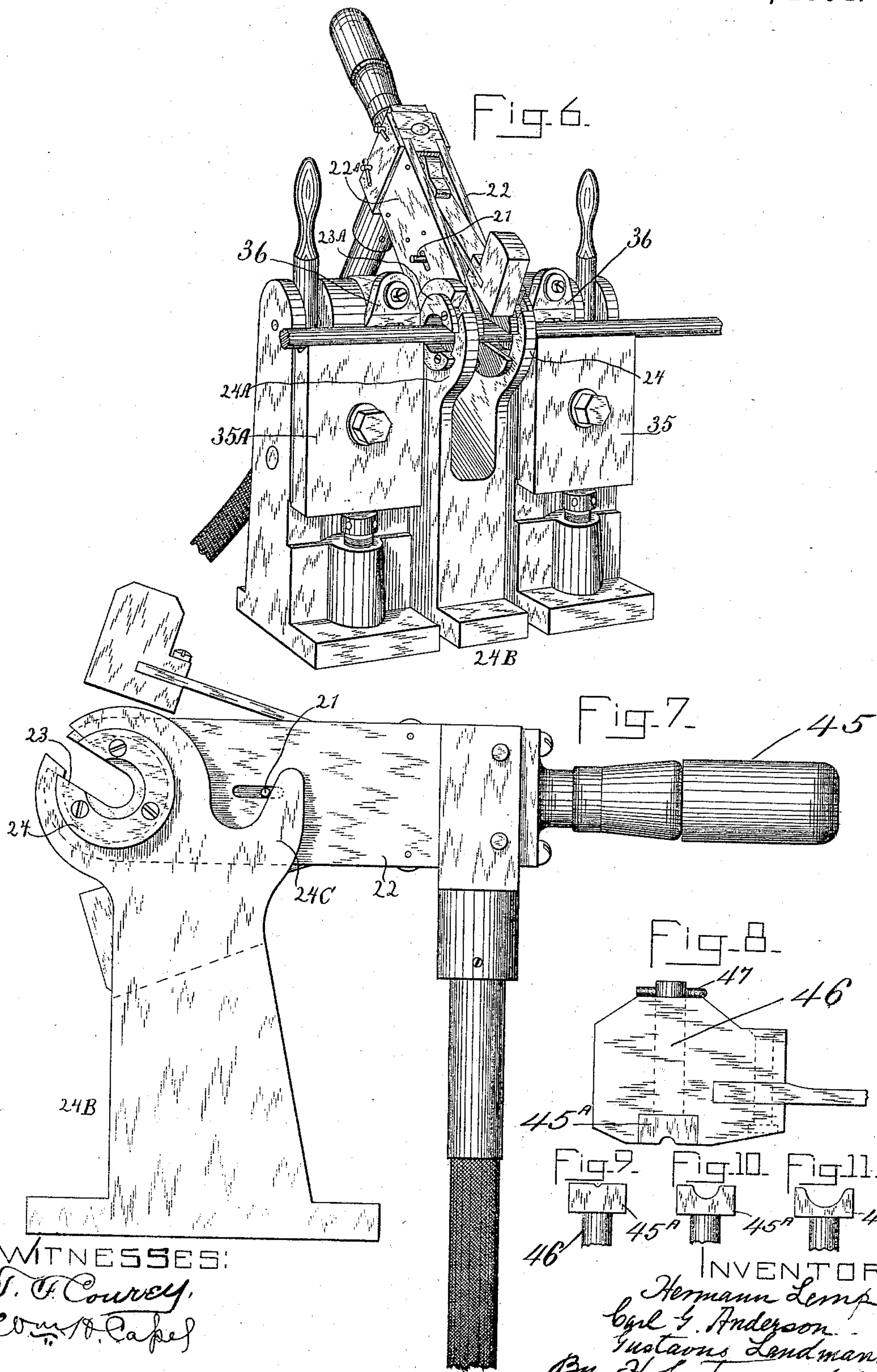
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H. LEMP, C. G. ANDERSON & G. LANDMANN.  
MECHANICAL HAMMER.

No. 513,516

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WITNESSES:  
*T. D. Courcy,*  
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# UNITED STATES PATENT OFFICE.

HERMANN LEMP, CARL GUSTAF ANDERSON, AND GUSTAVUS LANDMANN,  
OF LYNN, MASSACHUSETTS, ASSIGNORS TO THE THOMSON ELECTRIC  
WELDING COMPANY, OF MAINE.

## MECHANICAL HAMMER.

SPECIFICATION forming part of Letters Patent No. 513,516, dated January 30, 1894.

Application filed May 21, 1891. Serial No. 393,541. (No model.)

*To all whom it may concern:*

Be it known that we, HERMANN LEMP, a citizen of the United States, CARL GUSTAF ANDERSON, a subject of the King of Sweden and Norway, and GUSTAVUS LANDMANN, a subject of the Emperor of Germany, all residents of Lynn, in the county of Essex and State of Massachusetts, have invented a certain new and useful Mechanical Hammer, of which the following is a specification.

Our invention relates to the construction of mechanically operated hammers designed to strike blows in rapid succession, and has reference more particularly to an instrument in which a pair of hammers or hammer heads are employed and arranged to strike at the same time upon opposite sides of the work.

The object of our invention is to obtain by a simple and effective construction an action in which the impact of the two hammers upon the two sides of the work shall be exactly simultaneous so that each may act perfectly as an anvil to the other.

Our invention is an improvement upon a construction of tool previously employed wherein two hammers are used, and does away with certain difficulties incident to such prior construction as will hereinafter more clearly be shown.

A tool constructed in accordance with our invention is especially adapted for reducing burrs or enlargements upon metal rods or wires in which work the best results are obtained by imparting comparatively light impacts to the work but making the blows very rapid, sharp and quick.

The invention consists in the combinations of apparatus and details of construction hereinafter described and then specified in the claims.

In the drawings we have illustrated the old construction and the new construction constituting our invention together with variations of the latter.

Figure 1, shows in side elevation the working parts of a very simple form of hammer which is illustrated merely for the sake of pointing out the advantages of the later construction forming our present invention. Fig. 2, shows in side elevation the working parts

of a hammer made in accordance with our present invention. Fig. 3, shows in side elevation a modification of the construction. Fig. 4, shows a vertical cross section through a tool such as illustrated in Fig. 3. Fig. 5, illustrates a modification in the manner of conveying power to the actuating cam. Fig. 6, illustrates the complete tool mounted for commercial work. Fig. 7, illustrates a detail of the mounting which will be presently described. Fig. 8, illustrates a hammer head provided with a removable swedge. Figs. 9, 10, and 11, show a series of interchangeable swedges having differently shaped working faces. Fig. 1, illustrates the working parts of a hammer wherein two hammer heads are employed working toward one another so as to strike on opposite sides of the work. One of the two plates between which the working parts are mounted is removed in order to better exhibit the mechanism.

1, 1, are the hammer heads mounted on the ends of hammer arms or levers the inner ends of which consist of plates or shoes 2, 2, pivoted between the side plates 22, of the tool at 3, 3. The handle of the instrument by which it may be turned upon the work is indicated at 45.

4, 4, are springs attached to the hammer arms or levers and to a post 5, and normally tending to draw the hammers together.

6, is a cam working against the projections 2<sup>A</sup>, on the hammer arms or levers. This cam is rotated from a flexible shaft or by other means. The hammers, as shown, are at the point of just leaving the cam and springing together through the action of the springs to strike the blow.

The mounting of the tool is illustrated in another figure of the drawings and need not be described in connection with this figure as the latter is shown merely to point out the disadvantages of the construction.

The principal difficulty in this hammer is the inability of producing simultaneous blows of the two hammer heads. The two springs may vary slightly, or the cam may be a little uneven causing one hammer to strike before the other, perhaps. The rod hammered will spring away from the blow and its full force



will not be used in accomplishing the desired end. It is desirable that both hammers strike together, each acting as a kind of anvil for the other.

5 The desired result is obtained in the construction shown in Fig. 2. In this figure, also, one of the two side plates is shown removed.

10 In the construction herein illustrated we combine the two hammers with a single actuating cam-bar or slide operated by the cam, said hammers being positively connected together through the said actuating cam bar or slide so that they can only move together.

15 12, is the cam shaft carrying one or more cam projections and rotated by a flexible shaft or otherwise, and 8, is a cam bar, rod, or slide having bearings in blocks 9, 10, between the plates 22, of the tool so that it may work  
20 freely up and down by the action of the cam.

The two hammers are connected by any suitable means with the cam bar or slide as, for instance, by means of links 11, 11, pivoted to the cam bar or slide and to the hammer levers at their inner pivoted ends 7.

The hammers are moved to impact with the work by means of stiff springs 13, applied as shown or in any other suitable way. The cam bar or slide when moved in one direction  
30 by the cam will evidently spread the hammers apart at the same time extending the springs or putting the same under tension while the latter will throw the hammers together when the cam releases the bar or slide.

35 In the latter movement the hammers obviously can only move together as the movement of each is dependent upon the other and one can not therefore strike before the other if the mechanism is properly put together and arranged with relation to the work. The piece hammered will receive a sharp blow at two opposite points simultaneously and will therefore not spring away from the blow of either hammer.

45 Figs. 3 and 4, illustrate a slight variation in the construction. In this construction the cam shaft 12, is placed below the levers near the handle 45, and at right angles to that shown in Fig. 2. The spring acts on the cam  
50 rod or bar directly instead of upon the hammer levers. The blocks or plates 9, 10, forming the bearings or guides for the cam rod or bar are preferably a part of the inclosing plates 22, as indicated in Fig. 4. The spring which acts on the cam rod or bar and serves  
55 also to move the hammers inward, is indicated at 18. The spring is made preferably conical in order to obtain an equal pressure or force throughout its whole motion. Otherwise the

60 construction is practically the same as in Fig. 2, the only difference being that the plates 7, 7, are somewhat differently shaped. There are, preferably, links on both sides of the shoes or plates 7, as indicated at 11, 11<sup>A</sup>, making  
65 four links in all. 21, is an additional projection from the cam bar or slide extending beyond the side plates for operation in connec-

tion with another cam upon the support of the tool as will be presently described.

The construction illustrated in Figs. 3 and 4, possesses all the advantages of that illustrated in Fig. 2, with the additional advantage of requiring but one spring which is inside and out of the way.

Fig. 5, illustrates only the modification which consists in mounting the cam shaft parallel to the cam rod which actuates the hammers and connecting it with a flexible shaft mounted in the handle of the tool. The construction otherwise may be the same as in Fig. 3.

Fig. 6, illustrates the manner of mounting the tool so that the work may be readily centered with regard to the hammers and the tool may be rotated about the piece to be hammered. The inclosing plates 22, 22<sup>A</sup>, at the end nearest the hammer heads are provided with flanged collars 23, 23<sup>A</sup>, fastened to the plates. Bearings for these collars are formed at the upper ends of a standard 24<sup>B</sup>, which is solid at its base but bifurcated at its top, the hammer being supported in the bifurcation between the two arms 24, 24<sup>A</sup>. The flanges on the collars hold the instrument from side movement. The bearings for the collars are formed by the openings in the parts 24, 24<sup>A</sup>. A wide slot or cut is made in the plates 22, 22<sup>A</sup>, the collars 23, 23<sup>A</sup>, and the parts 24, 24<sup>A</sup>, so that the work to be hammered may be inserted into place between the hammers when the slots are brought into line by throwing the tool back beyond the inclined position indicated in Fig. 6.

Fig. 7, shows the parts as brought nearly to the position required. The hammers are spread or thrown back automatically to permit the work to be readily inserted by means of a cam working in conjunction with a projection 21, before referred to and properly arranged so that when the tool is swung back the pin 21, will engage with said cam and force the actuating cam bar 8, in a direction to move the hammers back, as indicated in Fig. 7. The cam working in conjunction with the pin 21, may be formed on ears attached to the standard or support 24<sup>B</sup>, one of which ears is shown at 24<sup>C</sup>, and is finished with an inclined or curved edge where the pin may engage in such manner that when the tool is thrown back, the pin by engaging with the cam thus provided draws the cam rod down into the position into which it would be forced by the main operating cam. The piece to be hammered may then be inserted readily, or removed.

Clamps or holders for the work to be hammered are preferably provided as indicated in Fig. 6 at 35, 35<sup>A</sup>, and form the bearings or supports for the rod or piece of metal to be hammered so arranged with reference to the hammer and hammer support as to center the rod with relation to the hammer. These holders may be modified in construction, as desired, and provided with any suitable clamping



jaws, as indicated at 36, which are operated by any desired mechanism.

While we have described the use of such holders and of a standard or support in which the tool is mounted, we do not limit ourselves to these auxiliary devices though they are a convenience in the practical use of the mechanism.

Our present invention consists more particularly in the hammer proper and its peculiar construction without reference to any particular use or attachment to any particular machine.

In order that the same hammer may be employed with different sizes or shapes of work we construct the hammer head for use with a series of removable and interchangeable swages, as shown more fully in Figs. 8, 9, 10 and 11. The hammer head which, as shown in Fig. 8, has a hole drilled through it to receive the shank or stem 46, of the swage 45<sup>A</sup>, on the hammer face. The swages are fastened in place on the hammer head by means of a split pin 47, passing through the shank of the swage.

By providing a series of swages, as indicated in Figs. 9, 10 and 11, each adapted to be applied to the hammer head but having differently shaped faces shaped according to the diameter or form of the work, it is obvious that the same hammer may be readily employed for different classes of work.

What we claim as our invention is—

1. The combination, of a movable frame, a pair of co-operating hammers pivoted therein, an actuating rod, links connecting the hammers thereto, a spring mounted in said frame for operating said rod in one direction, a cam also mounted in said frame for operating said rod in the opposite direction, and a flexible shaft connected to said cam.

2. The combination substantially as described, of a hammer operating cam bar or slide, a rotary cam for engaging the same, a support for the hammer and its actuating devices, a swinging frame carrying the ham-

mers and their actuating cam, and an auxiliary cam fixed in position and engaged by the said cam bar or slide, as and for the purpose described.

3. The combination substantially as described, of a pair of hammers, a cam bar or slide and a spring operating in reverse directions upon the hammers, of a support on which the instrument is mounted, a swinging frame the hammers and their actuating cam carried thereby, an auxiliary cam, and a projection from the cam bar or slide engaging with said auxiliary bar or cam to throw the hammers apart when the tool is swung on its support.

4. The combination, substantially as described, of a pair of mechanically actuated hammers adapted to engage with the work on opposite sides thereof, a pivoted frame carrying the hammers, a standard or support in which said frame is journaled or pivoted so that it may be swung around the work, said frame and its support being provided with openings or slots in their sides adapted to be brought into line with one another to permit the insertion and removal of the work.

5. The combination, substantially as described, of a pair of mechanically actuated hammers adapted to engage with opposite sides of the work and pivoted between two side plates or frames through which the work to be hammered extends, and a bifurcated standard or support through which the work also extends and having side plates or frames journaled on it, said side plates and standards being provided with lateral slots or openings to permit the work to be readily removed.

Signed at Lynn, in the county of Essex and State of Massachusetts, this 18th day of May, A. D. 1891.

HERMANN LEMP.

CARL GUSTAF ANDERSON.

GUSTAVUS LANDMANN.

Witnesses:

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