

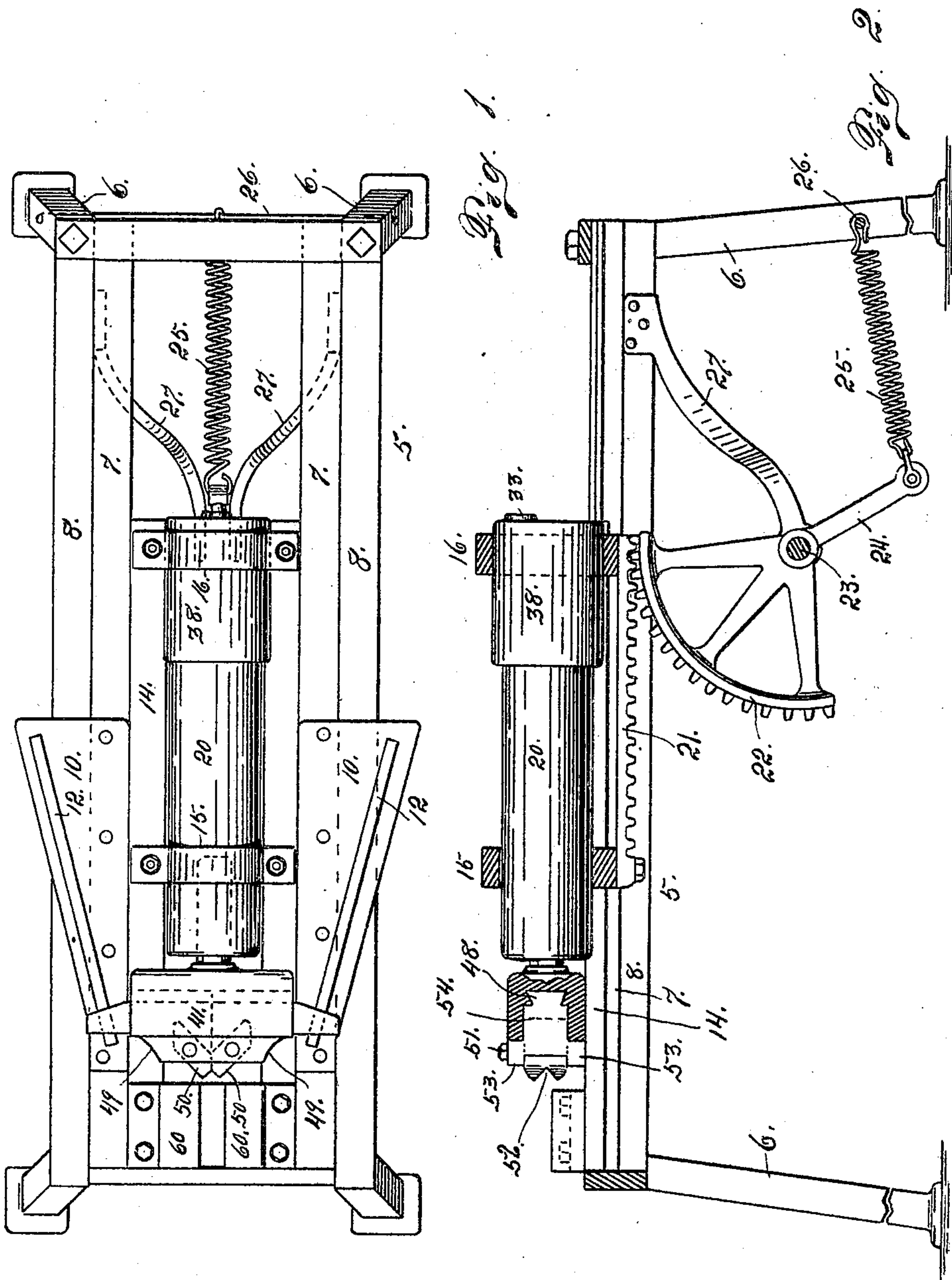
No. 820,023.

PATENTED MAY 8, 1906.

G. S. SPREYER.
DRILL SHARPENER.

APPLICATION FILED DEC. 14, 1904

4 SHEETS—SHEET 1.



Witnesses
Otto E. Hordelick.
Dena Nelson.

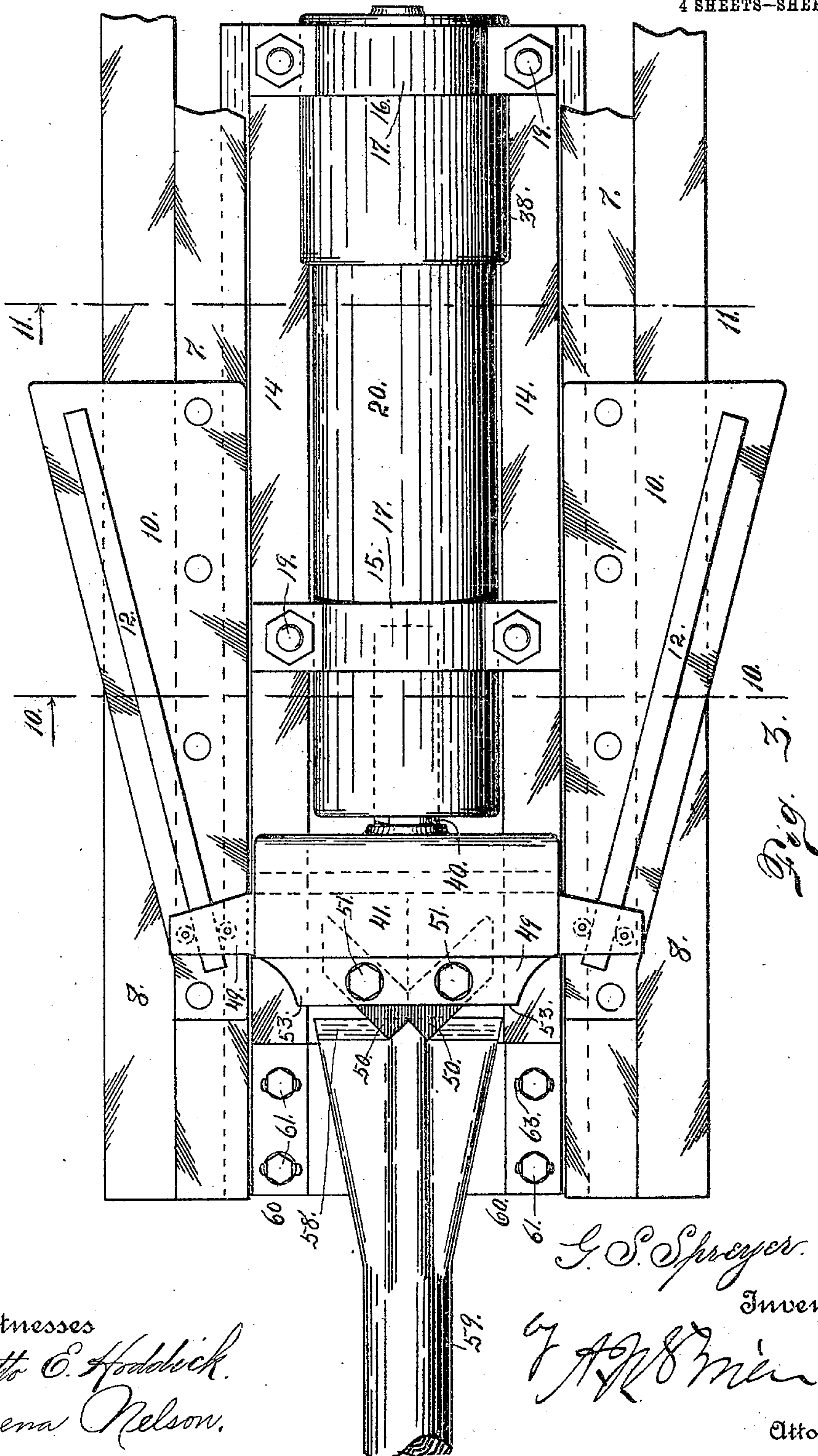
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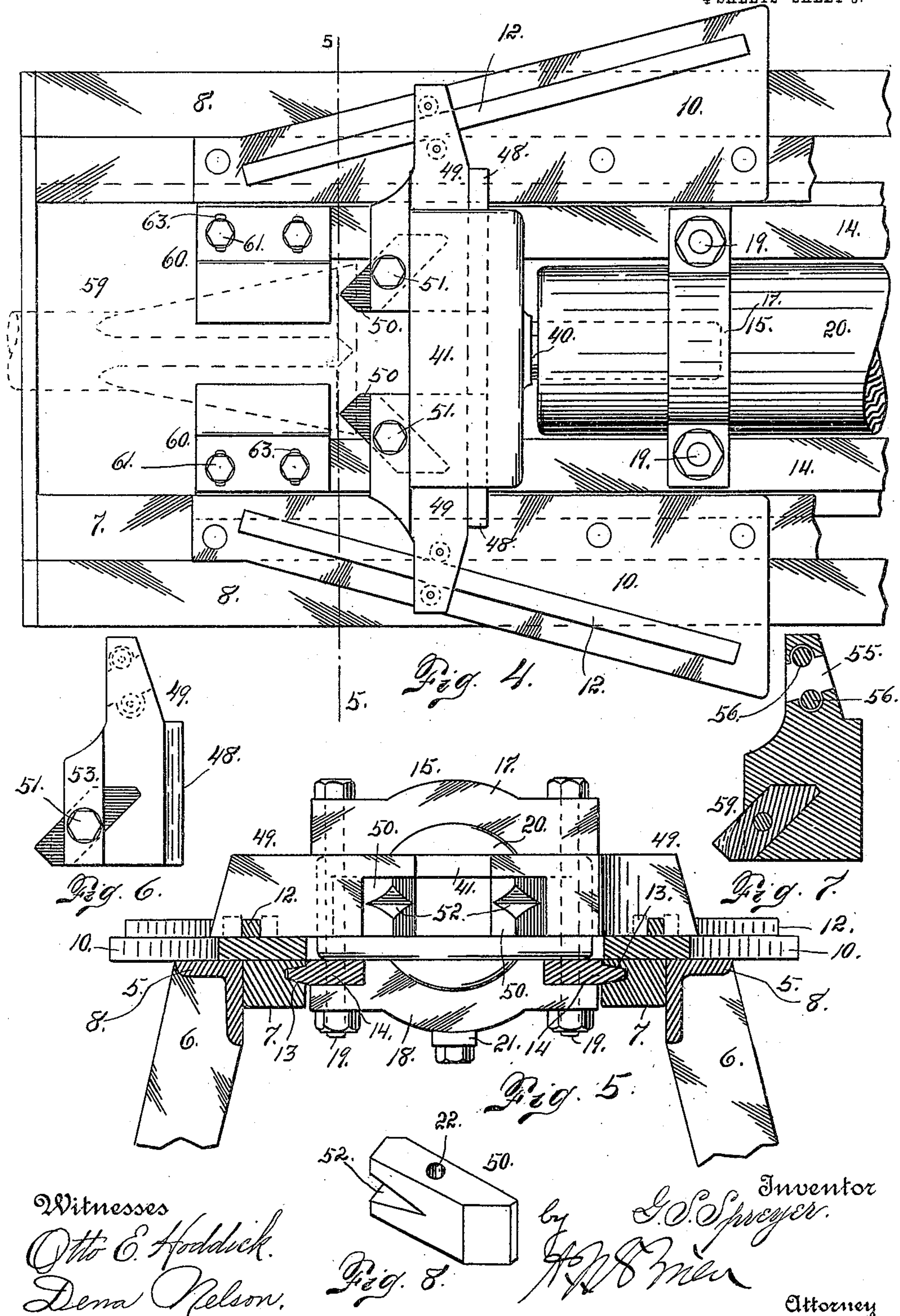
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Fig. 8.

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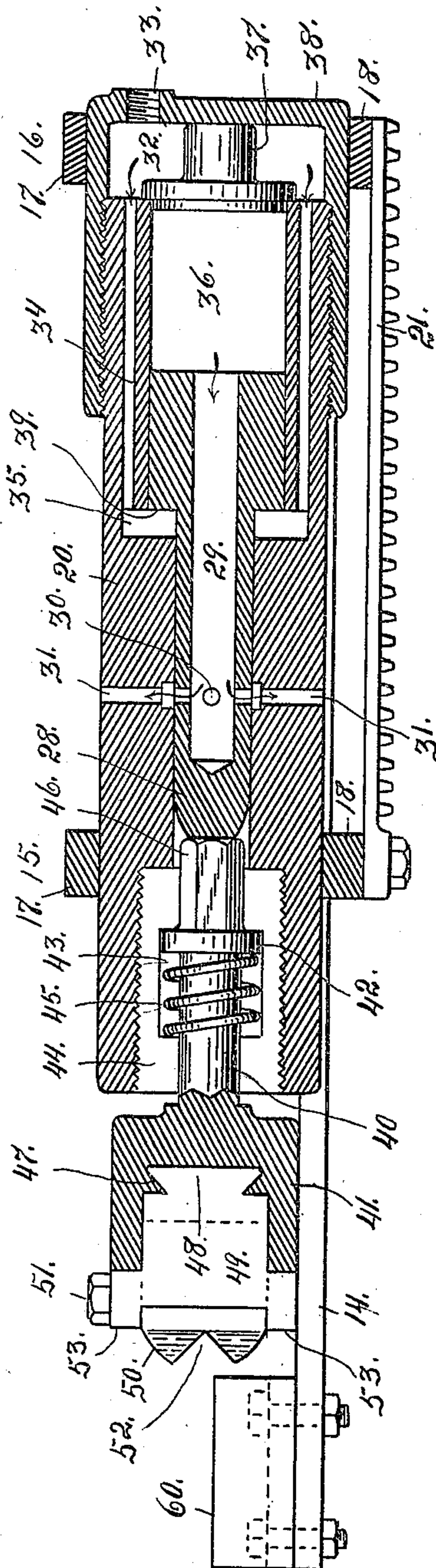


Fig. 9.

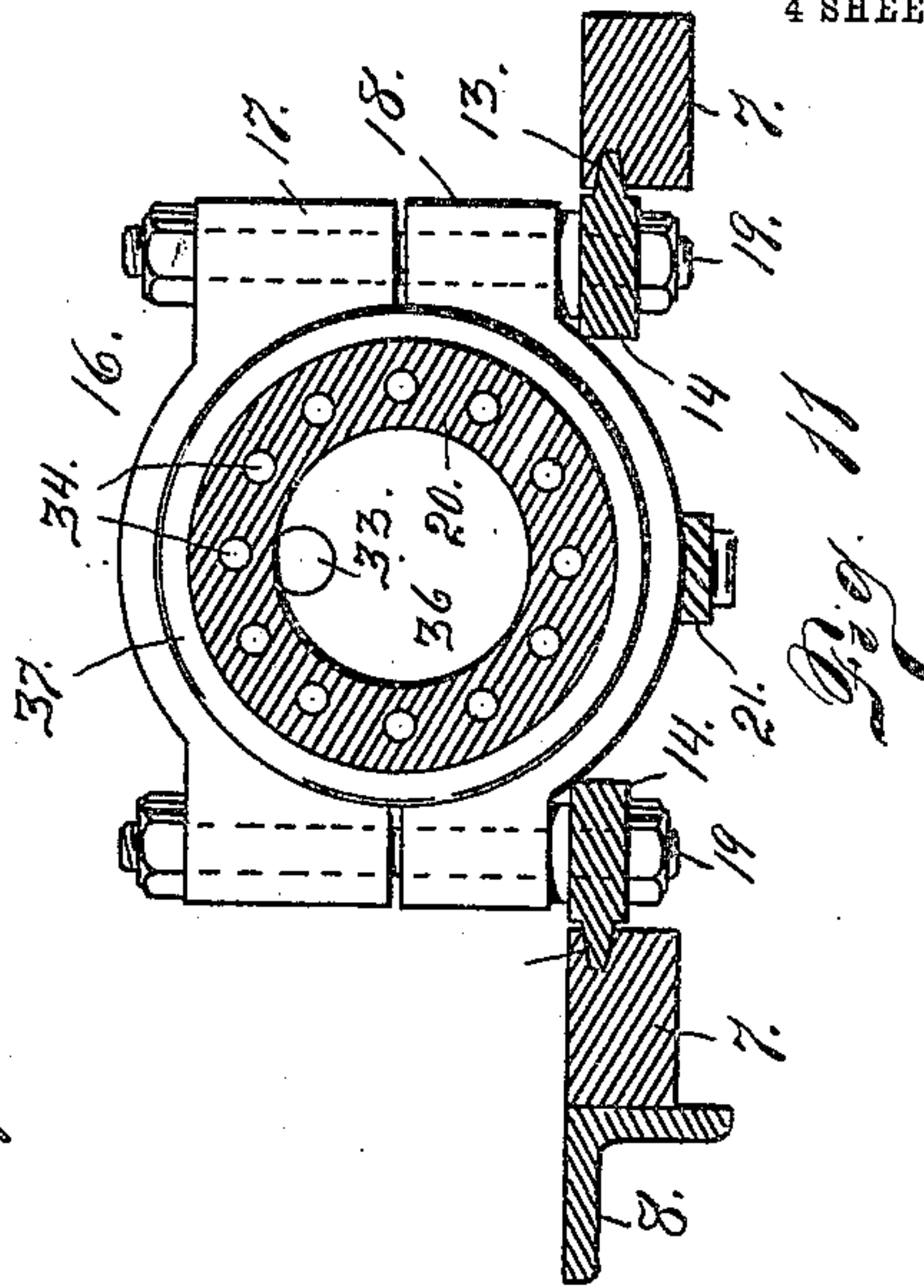


Fig. 11.

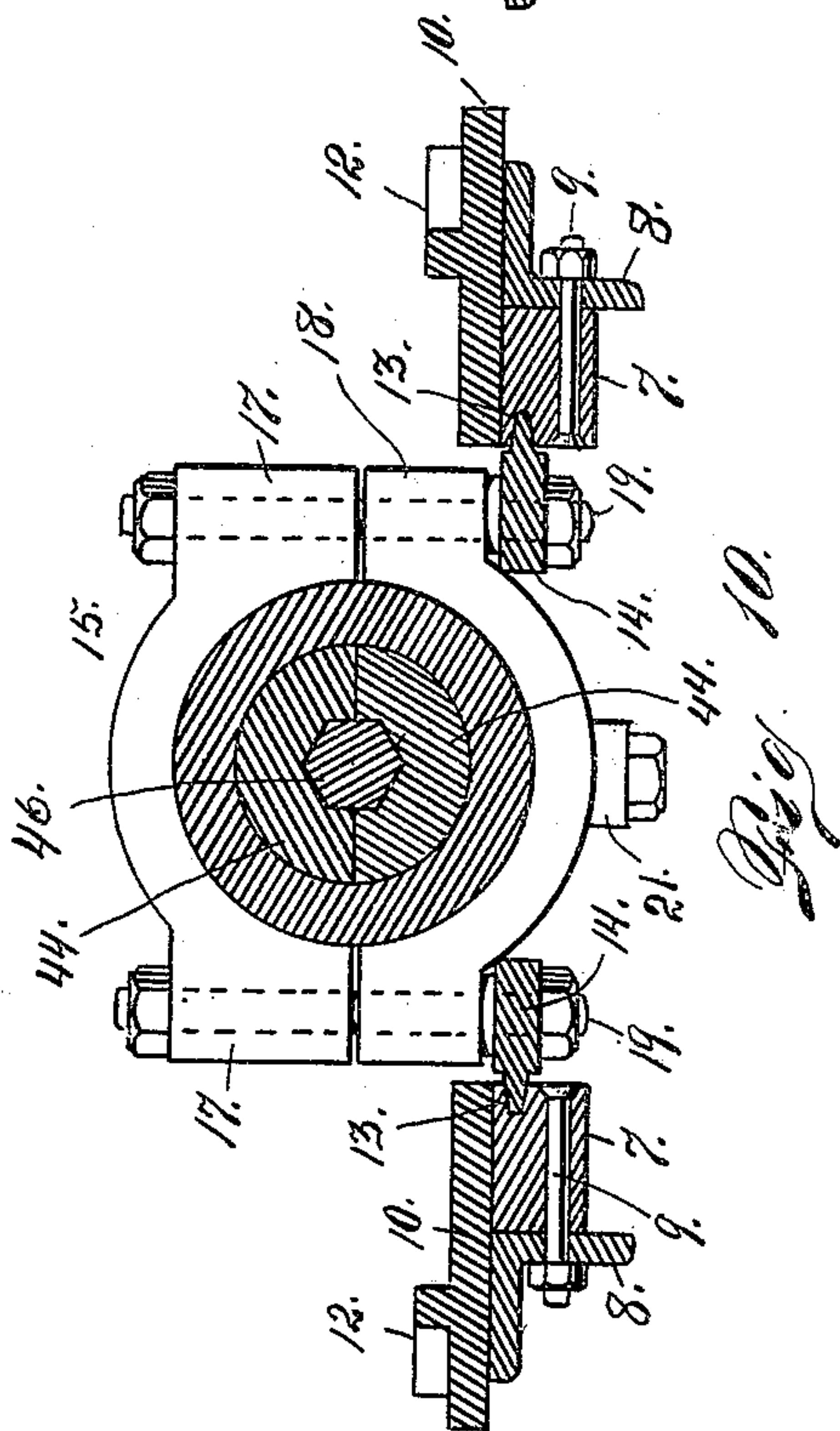


Fig. 10.

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UNITED STATES PATENT OFFICE.

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DRILL-SHARPENER.

No. 820,023.

Specification of Letters Patent.

Patented May 8, 1906.

Application filed December 14, 1904. Serial No. 236,803.

To all whom it may concern:

Be it known that I, GEORGE S. SPREYER, a citizen of the United States, residing at Elkton, in the county of Teller and State of Colorado, have invented certain new and useful Improvements in Drill-Sharpener; 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, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to improvements in sharpening apparatus for tools, being more especially intended for use for sharpening drill bits or steels.

The use of the invention is illustrated in the drawings and herein described in connection with a drill bit or tool whose cutting extremity is of cruciform shape in end elevation, being provided with four wings.

Generally speaking, the invention consists of a suitable frame upon which is slidably mounted a support for a reciprocating hammer, the support being constructed for the admission of operating fluid, as air, whereby the reciprocating movement is automatically imparted to the hammer. This hammer-support also carries a chuck in which the holding or carrying devices for the sharpening-dies are laterally movable, the said die-carriers or holders engaging guide-tongues which are inclined to the axis of the reciprocating hammer, whereby as the hammer-support is moved rearwardly the die-carriers are gradually separated from each other, whereby they are made to act upon different parts of two wings of the drill bit or tool. When the tool or bit is first applied to the sharpening-dies, the dies and the carrying devices are close together and the dies act upon the inner extremities of the two alined wings. Now as the drill-bit is pressed against the dies the hammer-support, which is spring-held, is moved rearwardly against the spring tension, and the inclined guides cause the die-carriers to separate or move away from each other, this lateral movement having a sufficient range to sharpen the two wings acted on their entire length. After two of the wings are sharpened the pressure on the drill-bit ceases and the spring returns the hammer-

support to its normal position. The drill-bit is then given a quarter-turn, after which the other two alined wings are in position to be sharpened in the same manner.

While I have shown and described in the drawings a specific construction for imparting the reciprocating movement to the hammer, it must be understood that the invention is not limited to any special mechanism for imparting this reciprocating movement, since any suitable means may be employed. It must also be understood that the invention is not limited to the precise construction herein shown and described, except so far as the claims hereinafter presented are specific to this construction.

Having briefly outlined my improved construction, as well as the function it is intended to perform, I will proceed to describe the same in detail, reference being made to the accompanying drawings, in which is illustrated an embodiment thereof.

In the drawings, Figure 1 is a top or plan view of my improved drill-sharpening apparatus. Fig. 2 is a side elevation of the same, partly in section. Fig. 3 is a top or plan view illustrating the main features of the mechanism, the parts being shown on a larger scale. Fig. 4 is a similar view, partly broken away, showing the dies in a different position from that illustrated in Fig. 3. Fig. 5 is a cross-section taken through the frame and also cutting the parts of the hammer-support which engage the grooves or guideways of the frame. This section is taken on the line 5 5, Fig. 4. Fig. 6 is a top view of a die-carrier and die, shown in detail. Fig. 7 is a longitudinal section taken through the same. Fig. 8 is a perspective view in detail of one of the sharpening-dies, shown on a larger scale. Fig. 9 is a longitudinal section taken through the hammer-support and hammer. The chuck in which the die-carriers are mounted is also shown partly in section in this view. Figs. 10 and 11 are cross-sections taken on the lines 10 10 and 11 11, respectively, of Fig. 3.

The same reference characters indicate the same parts in all the views.

Let the numeral 5 designate a suitable frame, which, as shown in the drawings, is mounted on legs 6. This frame consists of longitudinally-disposed separated side bars 7, to which are attached angle-bars 8 by means of bolts 9. On top of these parts 7 and 8 are

secured plates 10, having guide-tongues 12, whose forward extremities are nearest to each other. From this point these guide-tongues diverge or recede from each other, being inclined to the axis of the machine or a line passed centrally through the machine in alinement with the axis of the hammer. It is evident that any other suitable construction of frame may be employed. In the opposite side edges of the parts 7 are formed guideways or grooves 13, which are engaged by parallel longitudinally-disposed tongues 14, which are bolted to two sets of clamping devices, (designated 15 and 16, respectively.) Each of these clamping devices consists of two members 17 and 18, which are secured together and to the parts 14 by means of bolts 19. These clamping members 17 and 18 carry a cylinder or casing 20, the latter being held fast by the said clamping devices 15 and 16. To the lower part of the casing 20 is secured a rack-bar 21, which is engaged by a segmental gear 22, mounted on a shaft 23. This gear is also provided with an arm 24, to which is attached one extremity of a coil-spring 25, the opposite extremity of said spring being secured to a rod 26, supported by the two rear legs 6 of the machine. The shaft 23 is supported on the frame of the machine by means of depending brackets 27, the said brackets being attached to the opposite sides of the frame.

Within the casing 20 is mounted the hammer 28, having a central longitudinal opening 29 and orifices 30, formed therein and registering with exhaust-openings 31 of the casing when the hammer is at its forward limit of movement. This casing is also provided with a rear chamber 32, into which operating fluid is admitted through an opening 33. From the chamber 32 passages 34 lead forwardly to a circular chamber 35, with which the orifices 30 of the hammer register when the latter is at its rearward limit of movement. In the rear part of the casing a chamber 36 is formed, which communicates with the central passage 29 of the hammer. The rear extremity of this chamber is closed by a plug 37, which is held in place by a rearwardly-located sleeve 38, interiorly threaded to screw upon the exteriorly-threaded portion of the body of the casing.

From the foregoing description it will be understood that as operating fluid, as air, is admitted to the chamber 32, it will flow through the passages 34 to the circular cavity 35 and acting on the circular shoulder 39 or the enlarged rear portion of the hammer, will cause the latter to move rearwardly into the chamber 36 until the orifices 30 are made to communicate with the cavity 35, in which event the operating fluid will enter the central part 29 of the hammer and pass to the rear extremity of the latter. In this case the surface exposed to the action of the air at the

rear extremity of the hammer being greater than the surface of the shoulder 39 the hammer will be moved forwardly, and as soon as it reaches its forward limit of movement the operating fluid within the chamber 36 and the passage 29 will exhaust through the openings 31 of the casing. The operating fluid will then again act on the shoulder 39 to impart the rearward movement to the hammer. In this manner the hammer will be rapidly reciprocated. As heretofore stated, while I have described this specific construction of hammer-operating mechanism it must be understood that the invention is not limited to any specific construction for imparting the reciprocating movement to the hammer.

In the forward extremity of the casing is mounted the shank 40 of the chuck 41. This shank is provided with a collar 42, which is located within a cavity 43, formed in a bushing 44, composed of two twin members which are applied to the shank of the chuck and screwed into the threaded cavity of the casing. Forward of the shoulder 42 and within the cavity 43 is located a coil-spring 45, which normally holds the chuck at its rearward limit of movement, whereby the rear extremity 46 of the shank is exposed to the action of the forward extremity of the hammer. The cavity 43 is of sufficient length to permit the necessary range of movement of the chuck during the sharpening operation.

The chuck 41 is hollow, and in the rear extremity of its hollow portion or cavity is formed a dovetail groove 47, which is engaged by a tongue 48 of counterpart shape formed on the rear part of a device 49, which forms a holder for the sharpening-die 50, which is preferably composed of steel. The device 49 will be termed a "holder" or "carrier" for the sharpening-die. This die occupies an inclined position in the carrier—that is to say, a position inclined to the longitudinal axis of the hammer and drill-bit to be sharpened. The die is held in place by a bolt 51, which passes through an opening 52, formed in the die. This die is inserted in a cavity formed in the carrier 49, and its operating extremity protrudes therefrom and is provided with a V-shaped groove 52, adapted to engage the cutting extremities of the drill-bit wings for sharpening purposes during the operation of the machine. There are two die-carriers, each being provided with a sharpening-die. Both of these carriers are mounted in the chuck, and as they are exactly the same in construction the description of one is a description of both. Each die-carrier has its forward portion reinforced both above and below by parts 53, as best shown in Fig. 2. The thickness of the sharpening-die 50 is just equal to the thickness of the body of the carrier, so that the recess which receives the rear extremity of the sharpening-die is exposed above and below—

that is to say, in the rear of the reinforced parts 53. It is through these reinforced parts 53 that the die-holding bolt 51 is passed. In Fig. 2 the dotted line 54 indicates the rear

5 extremity of the sharpening-die.

The outer extremity of each die-carrier 49 is provided with an opening 55, on opposite sides of which are located rollers 56, which protrude slightly into the opening 55 and en-
10 gage one of the guide-tongues 12, which passes through the opening 55 of each die-carrier. There are two of these tongues, and they are both inclined to the axis of the hammer. Their forward extremities are nearest
15 each other, and the two tongues diverge or recede laterally from each other as they extend rearwardly, whereby as the chuck and hammer-support are moved rearwardly the die-carriers and dies are separated, (see Fig. 4,) where-
20 by the dies are allowed to act upon every part of the laterally-alined wings 58 of the drill-bit 59.

To the forward extremities of the parts 14 of the sliding carriage or hammer-support
25 are attached two angle-blocks 60 by bolts 61, which form a rest for the drill bit or tool 59 to be sharpened. The two laterally-alined wings of the cruciform drill-bit rest on the horizontal members of these angle-blocks 60
30 when the machine is in operation. This is best illustrated in Fig. 4 of the drawings. The blocks 60 are capable of lateral adjustment, whereby the structure is adapted for use with bits of different sizes. For this pur-
35 pose the openings through which the bolts 61 pass are elongated, as shown at 63.

From the foregoing description the use and operation of my improved apparatus will be readily understood. Assuming that air or
40 other suitable operating fluid is turned into the chamber 32 of the casing, the hammer 28 will be given a rapid reciprocating movement in the manner heretofore explained. As the hammer reciprocates it acts on the
45 rear extremity of the shank of the chuck 41, in which are slidably mounted the carriers for the sharpening-dies 50. Now if a drill-bit 59 of the construction heretofore explained be placed upon the tool-rest composed of the members 60, as heretofore explained, and the cruciform extremity of the
50 drill-bit be moved rearwardly to engagement with the operating or grooved extremities of the sharpening-dies, the said dies will act upon the two horizontally-alined wings of the
55 drill-bit to sharpen the same in a manner that will be readily understood. As soon as the inner extremities of the wings 58 are suitably sharpened the operator moves the bit 59 rearwardly, thus forcing the chuck and hammer-support in the same direction, whereby the carriers and dies are moved horizontally outwardly by virtue of the engagement of the carriers with the inclined guide-tongues
60 12, and this operation is continued until the

horizontally-alined wings of the drill-bit are sharpened their entire length. Thus it will be observed that only a portion of each wing is acted on at any one time; but by forcing the hammer-support and chuck rearwardly, 70 whereby the die-carriers are separated, the complete sharpening operation is accomplished. As soon as two of the wings are sharpened the operator ceases to press upon the chuck, whereby the hammer-support and
75 chuck are allowed to return to their forward limit of movement by virtue of the action of the spring-actuated gear 22. The drill-bit is then given a quarter-turn, whereby the wings heretofore occupying a vertically-alined po-
80 sition are brought into the horizontal position, after which the sharpening operation heretofore explained is repeated.

Attention is called to the fact that in my improved construction each die 50 acts on
85 only a small portion of the wing of the tool to be sharpened at one time. This makes it practicable by commencing the sharpening operation on a wing at the center of the tool to sharpen the said wing gradually from its
90 inner extremity outwardly, whereby the corners or outer extremities of the wings are drawn out or elongated, thus putting the wing in practically the same condition as when the tool was new.

Having thus described my invention, what I claim is—

1. In a drill-sharpener, the combination with a frame, of a spring-held support slid-
able thereon, a hammer mounted to reciprocate in the support, a chuck supported to be
100 acted on by the hammer, laterally-movable sharpening-dies carried by the chuck, and means for causing the dies to recede from each other as the chuck and hammer-support
105 are moved rearwardly, and arranged to be rendered effective by the rearward movement.

2. The combination with a suitable frame, of a spring-held casing, a slidable support there-
110 for movable back and forth on the frame, yielding means connected to act on the support whereby the casing is normally held at its forward limit of movement, a hammer mounted to reciprocate in the casing, means for impart-
115 ing a reciprocating movement to the hammer through the instrumentality of a suitable operating fluid, a chuck connected with the casing and arranged to be acted on by the hammer, the chuck having a limited movement in the
120 casing, sharpening-dies laterally movable in the chuck, and means connected with the dies for causing the latter to recede from each other as the chuck and casing are moved rear-
125 wardly in opposition to the yielding means acting thereon, and arranged to be rendered effective by the rearward movement.

3. The combination with a support, of a chuck, sharpening-dies mounted to have lat-
130 eral movement in the chuck, means for im-

parting the lateral movement to the dies as they are moved rearwardly with the chuck, said means being arranged to be rendered effective by the rearward movement, a reciprocating hammer mounted to act on the chuck, and a connection between the chuck and the hammer whereby the two elements are adapted to be simultaneously moved rearwardly by pressure upon the sharpening-dies, said connection being slidable on the support.

4. The combination of a relatively stationary frame provided with separated guide-tongues which diverge from each other as they extend rearwardly, a casing slidable longitudinally on the frame, a reciprocating hammer carried by the casing, a chuck connected with the casing to be acted on by the hammer, and sharpening devices carried by the chuck and laterally movable therein, the

said devices protruding from the chuck laterally, their protruding extremities having openings which the inclined guide-tongues engage, whereby the dies are separated from each other as the chuck and casing are moved rearwardly.

5. In a drill-sharpener, the combination with a frame, of a spring-held support slidable thereon, a chuck, laterally-movable sharpening-dies carried by the chuck, and means for causing the dies to recede from each other as the chuck is moved rearwardly, said means being arranged to be rendered effective by the rearward movement.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE S. SPREYER.

Witnesses:

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A. J. O'BRIEN.