

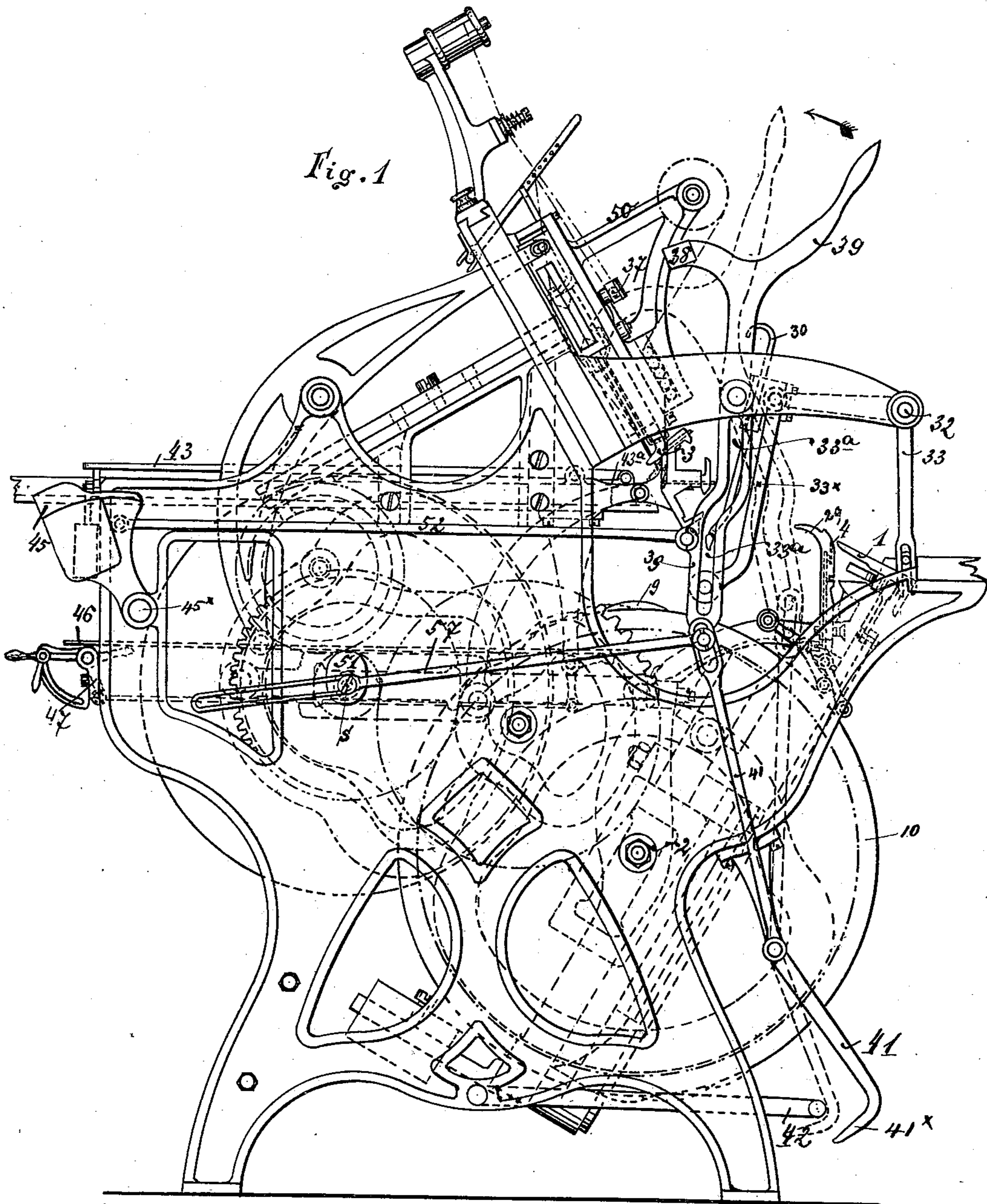
(No Model.)

8 Sheets—Sheet 1.

A. BREHMER.  
BOOK SEWING MACHINE.

No. 335,210.

Patented Feb. 2, 1886.



Witnesses.  
John P. Allen  
M. E. McHugh

Inventor.  
August Brehmer  
per Henry C. Rader  
attorney.

(No Model.)

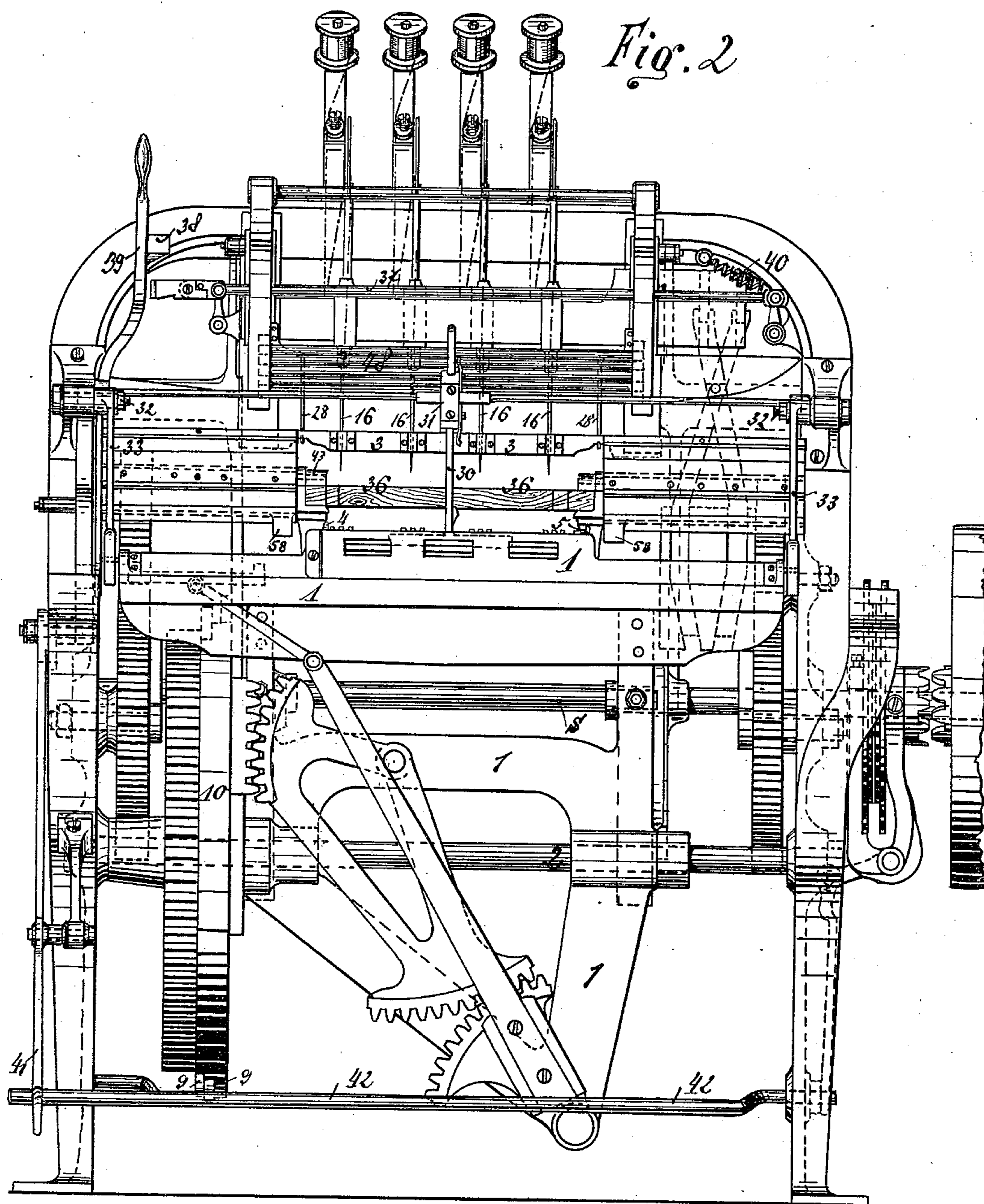
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*M. C. McHugh*

*Inventor.*  
*August Brehmer*  
*per Henry E. Rader*  
*Attorney.*

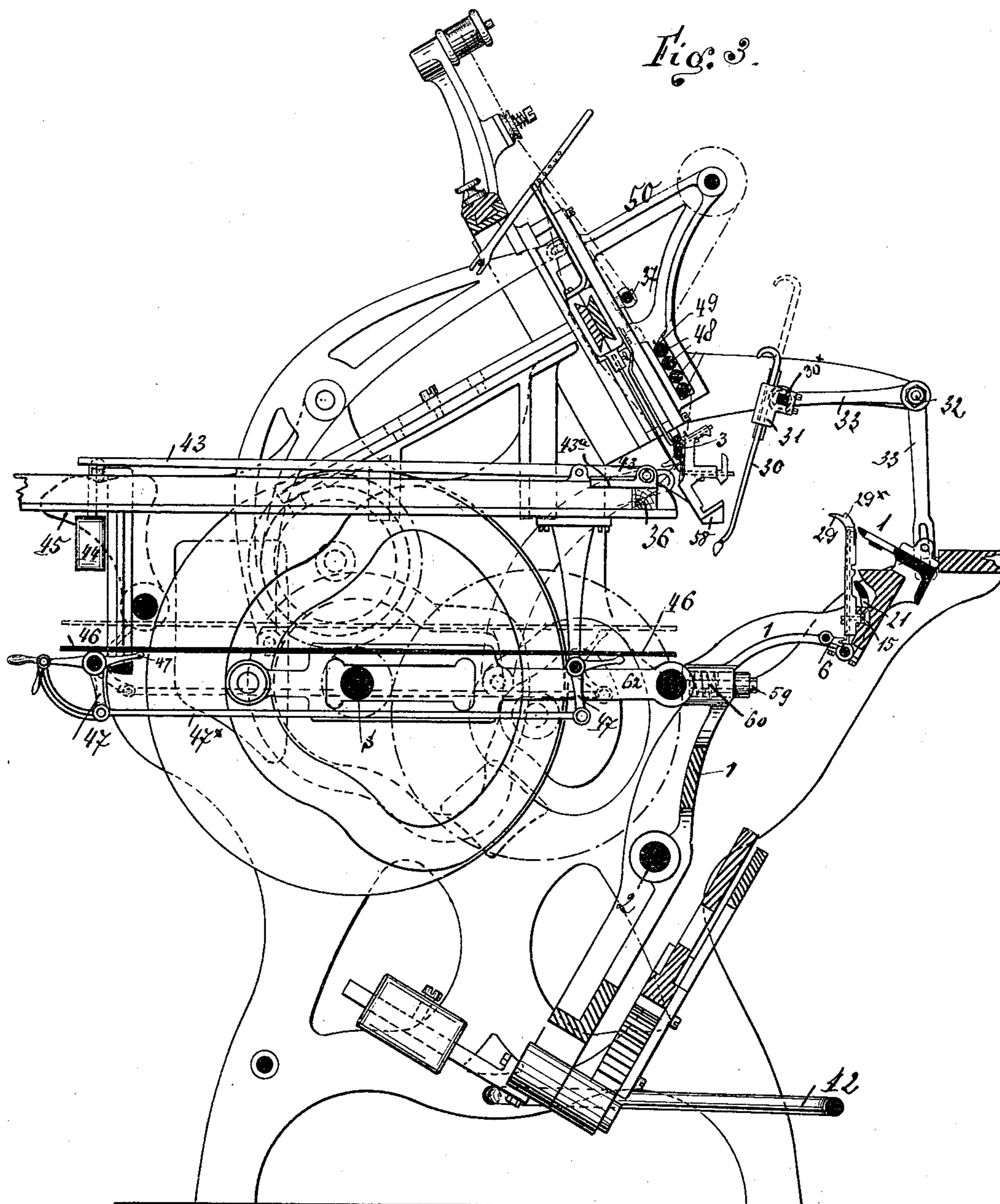
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*M. C. McLaugh*

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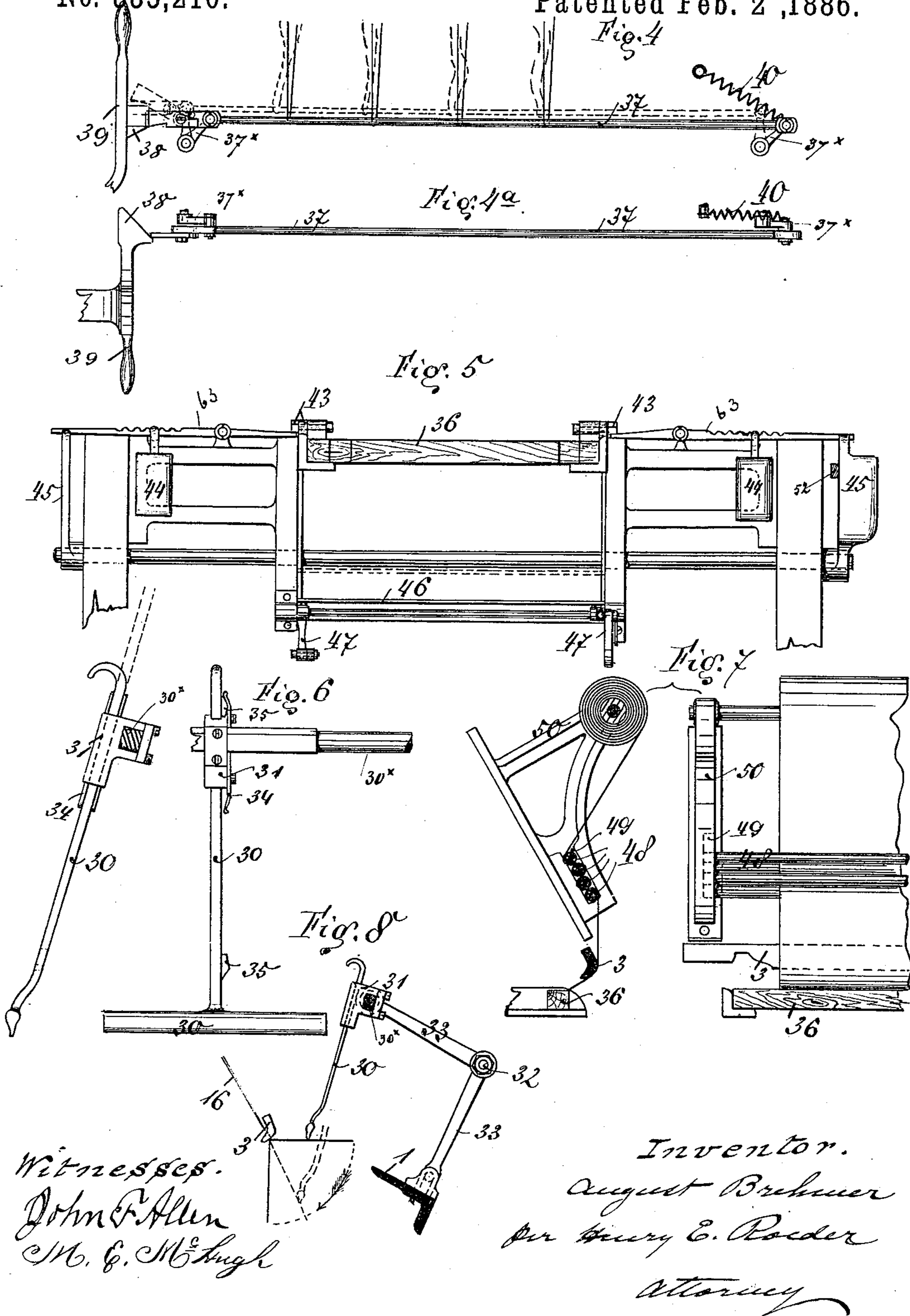
*per Henry & Raeder*

*attorneys.*

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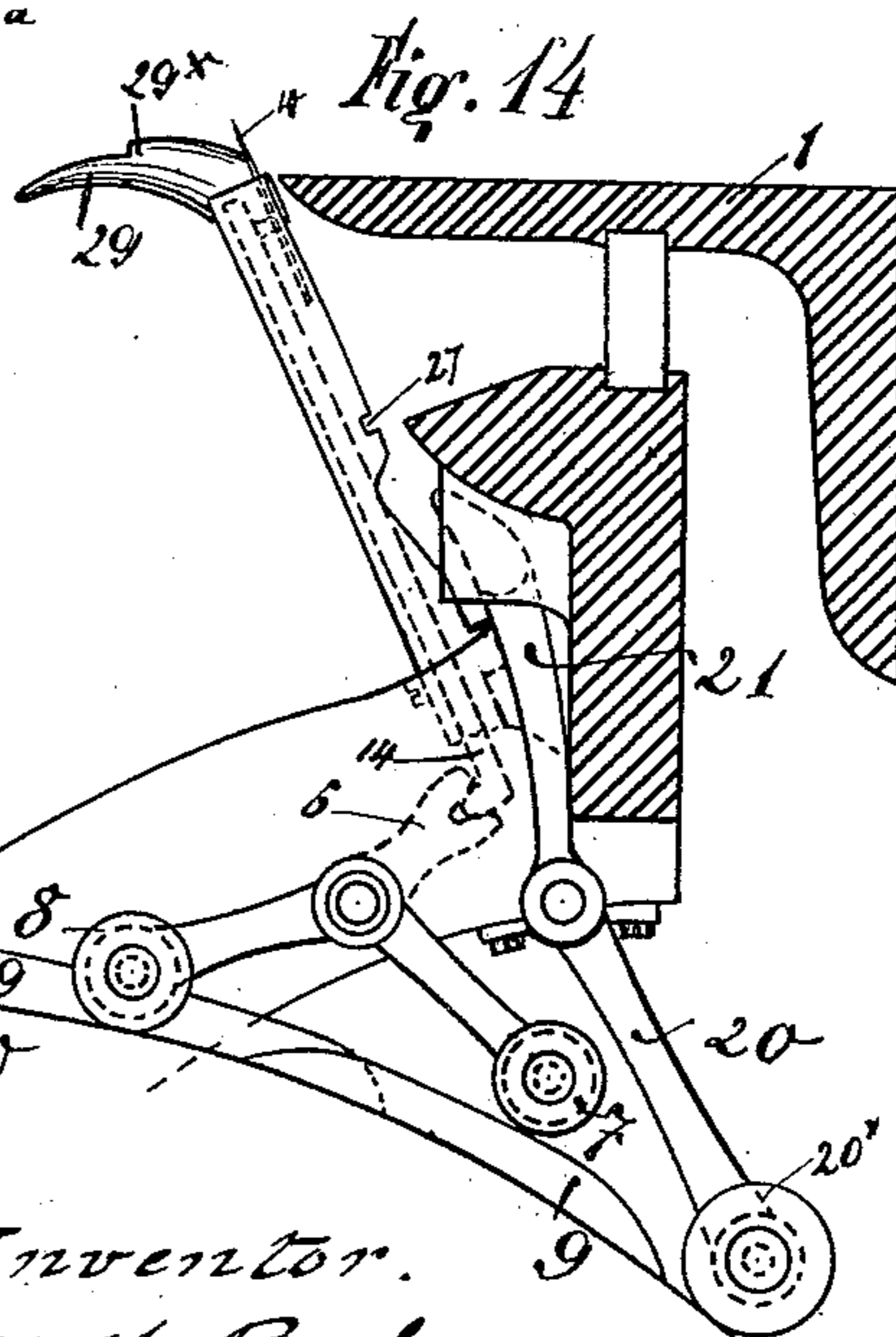
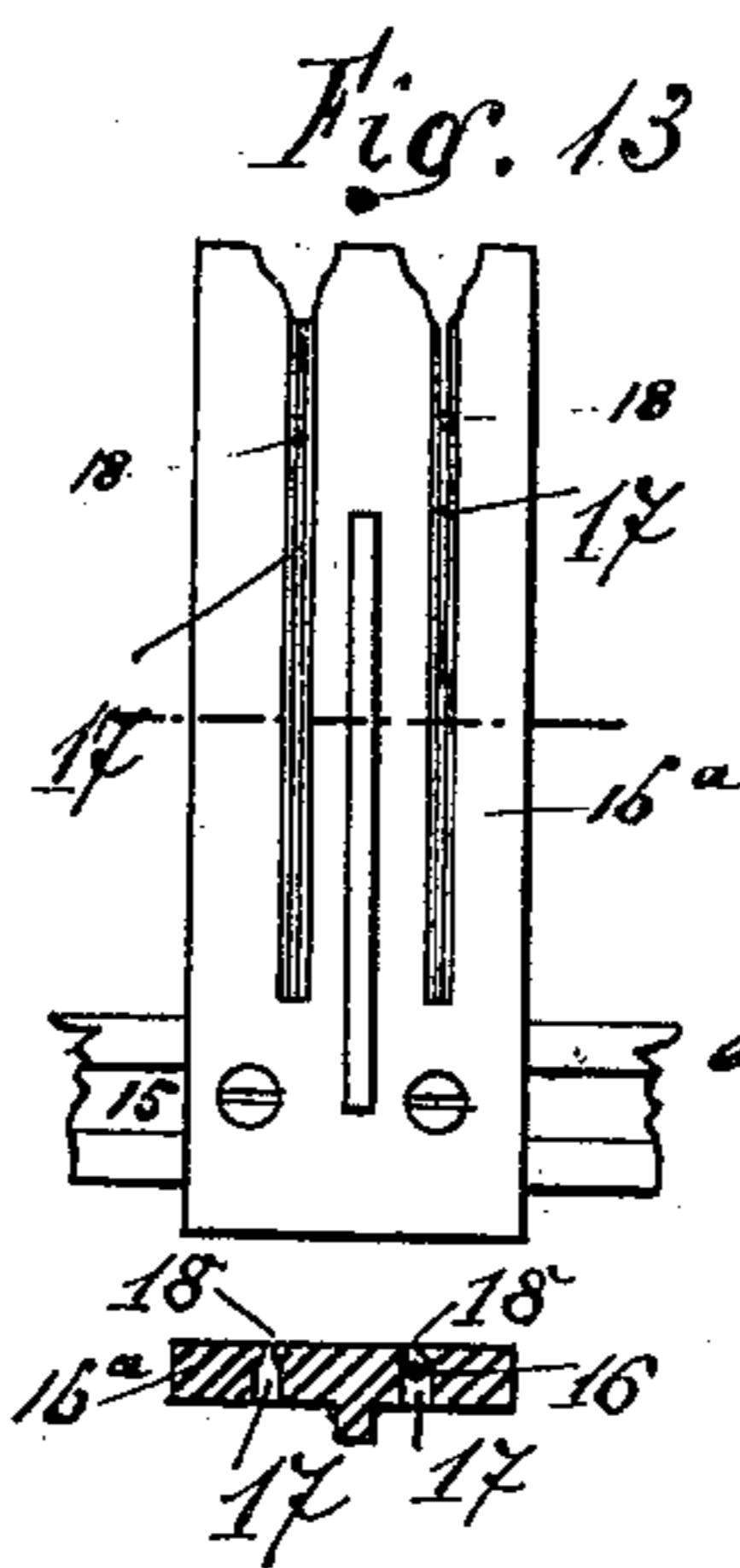
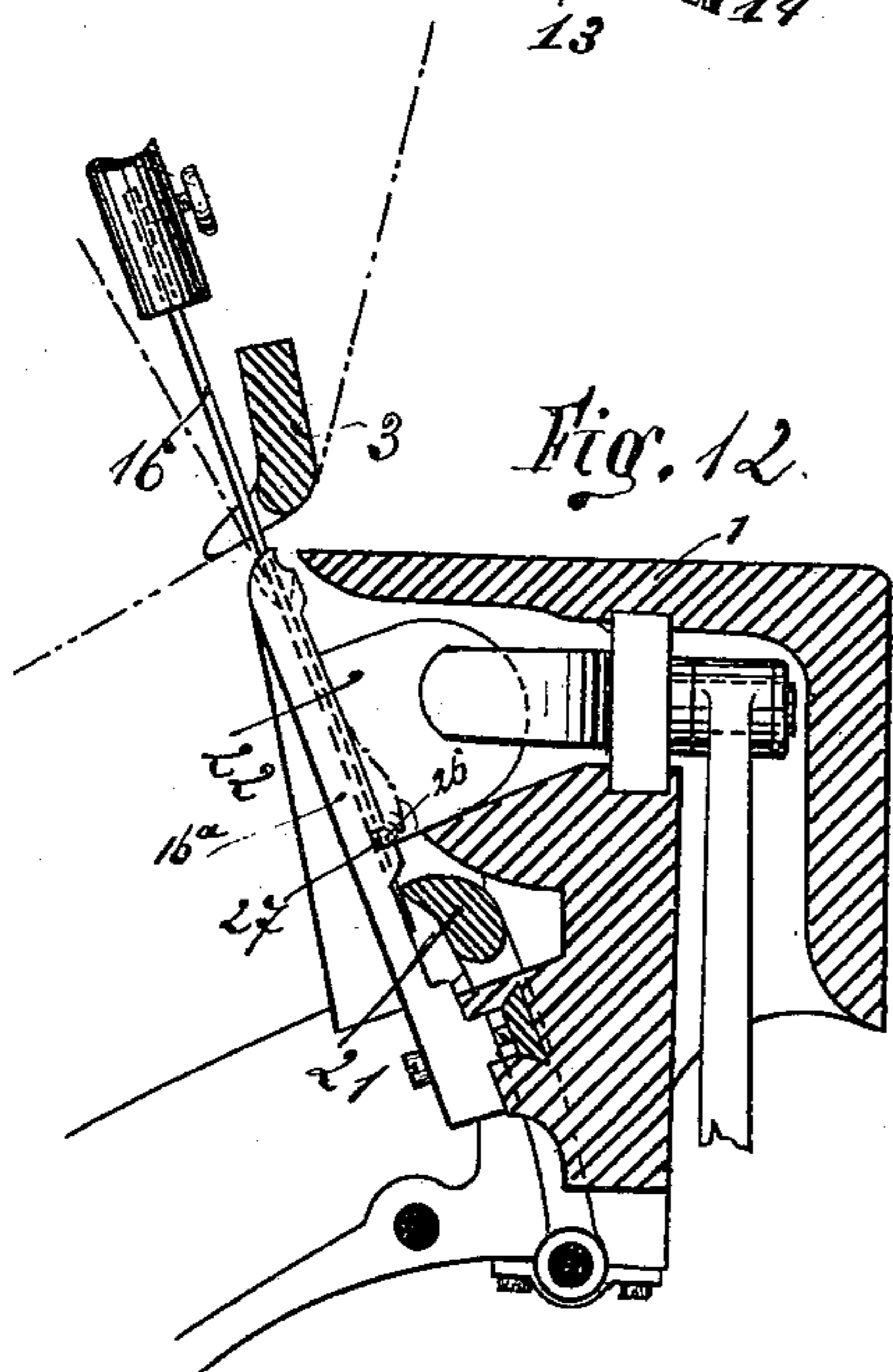
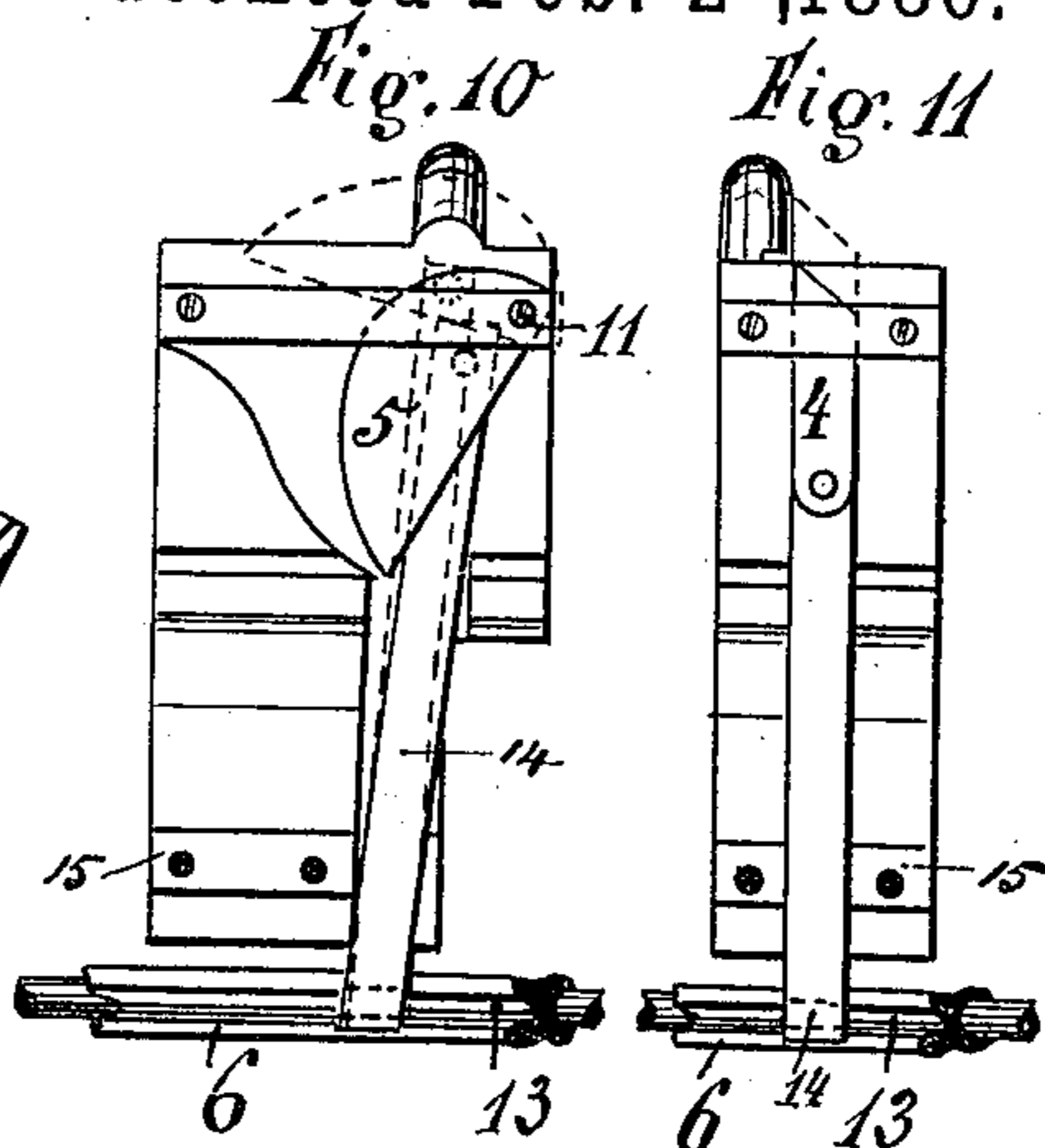
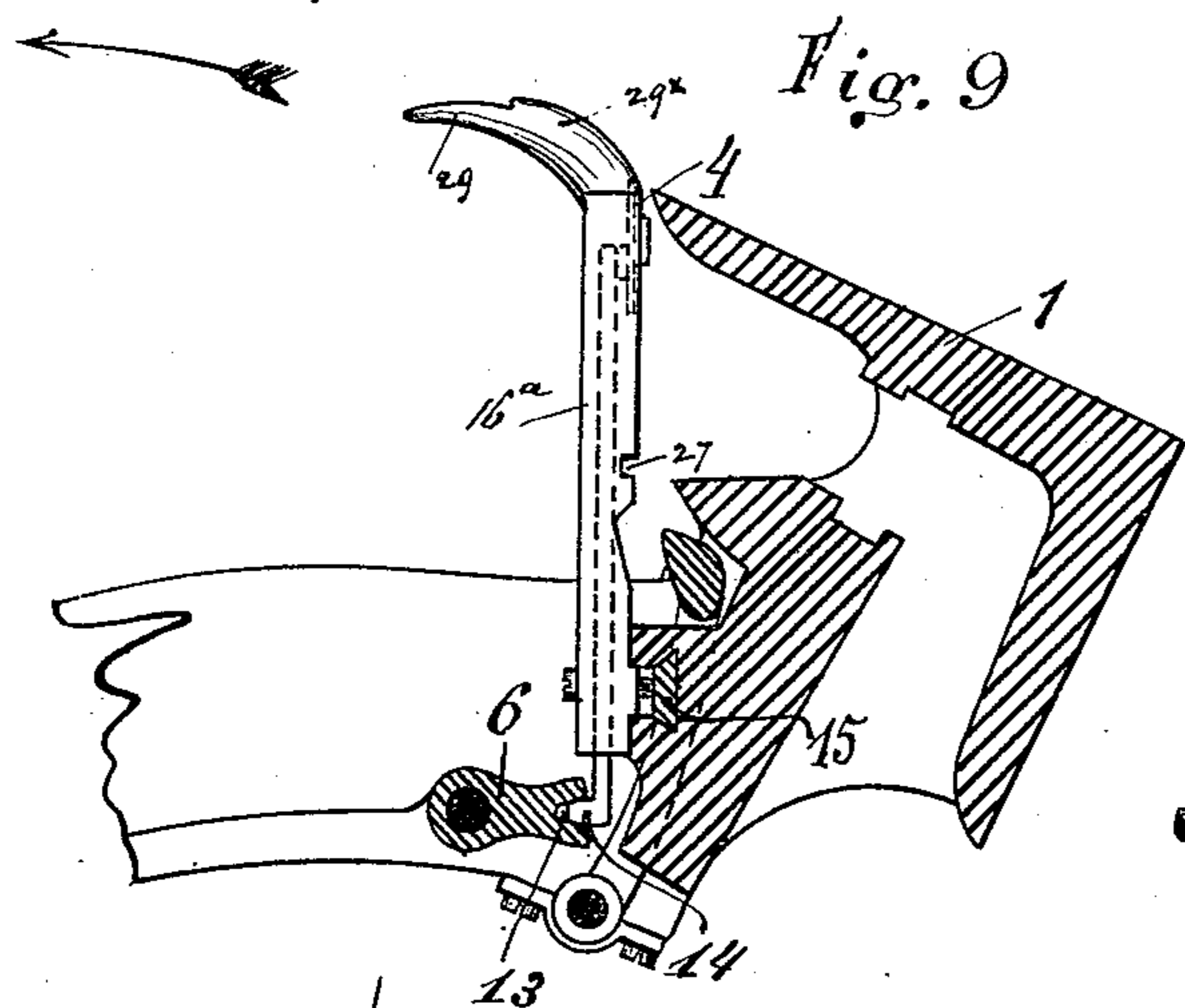
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Witnesses.  
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M. E. McLaughlin

Inventor.  
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(No Model.)

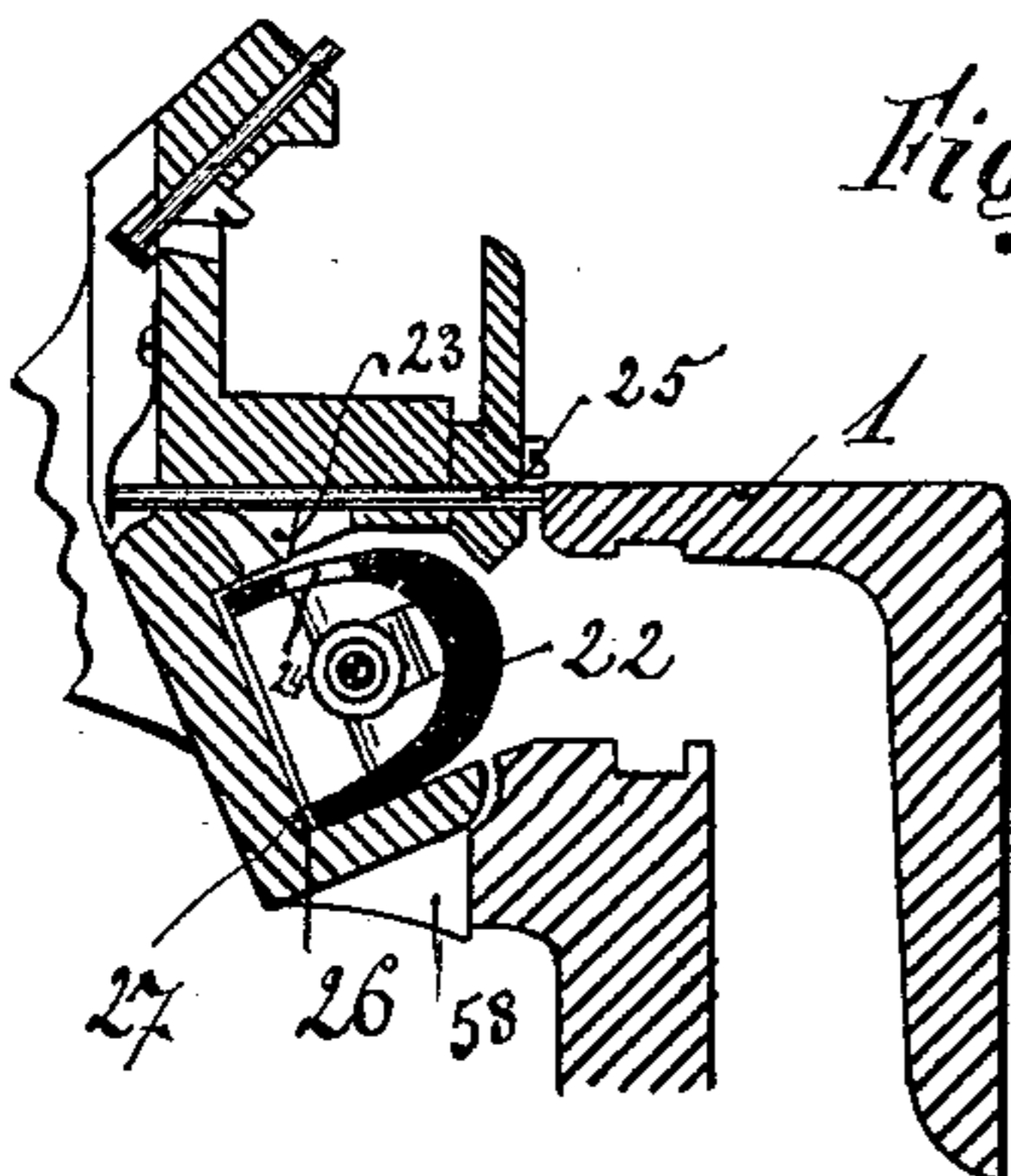
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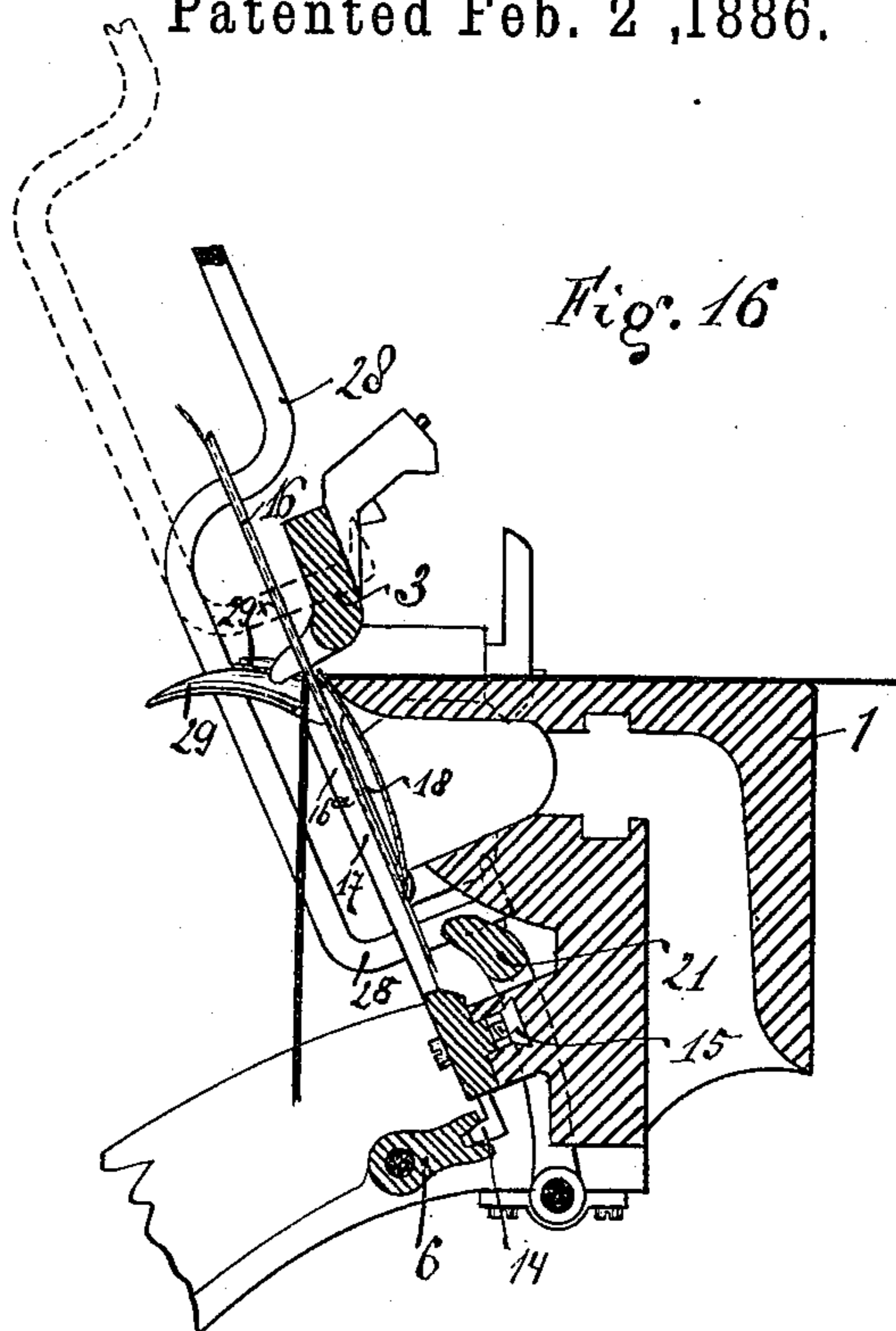
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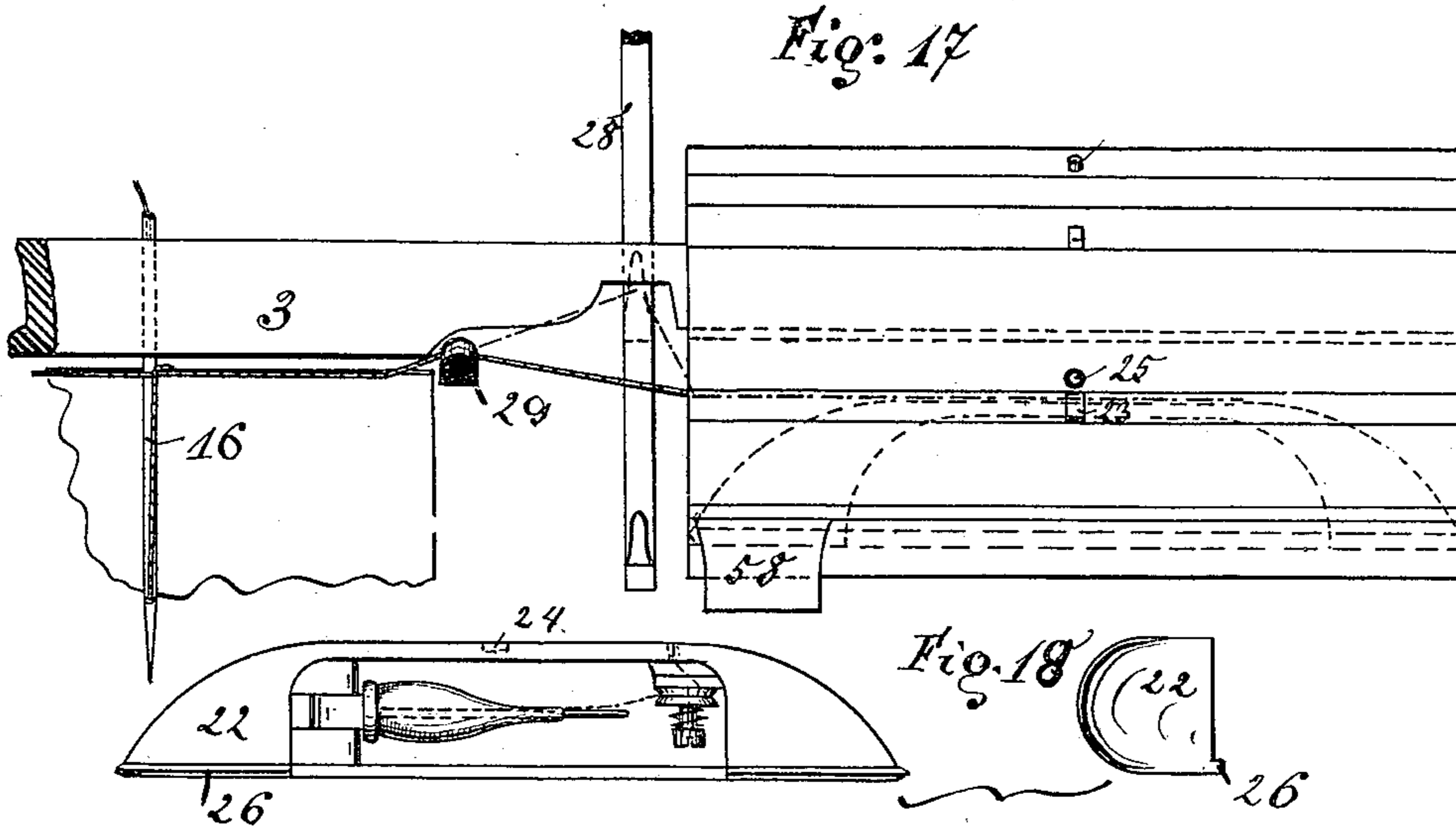
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*Fig. 15*



*Fig. 16*



*Fig. 17*



*Fig. 18*

*Witnesses.*  
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*W. E. McLaugh*

*Inventor.*  
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*per Henry E. Roeder*  
*Attorney.*

(No Model.)

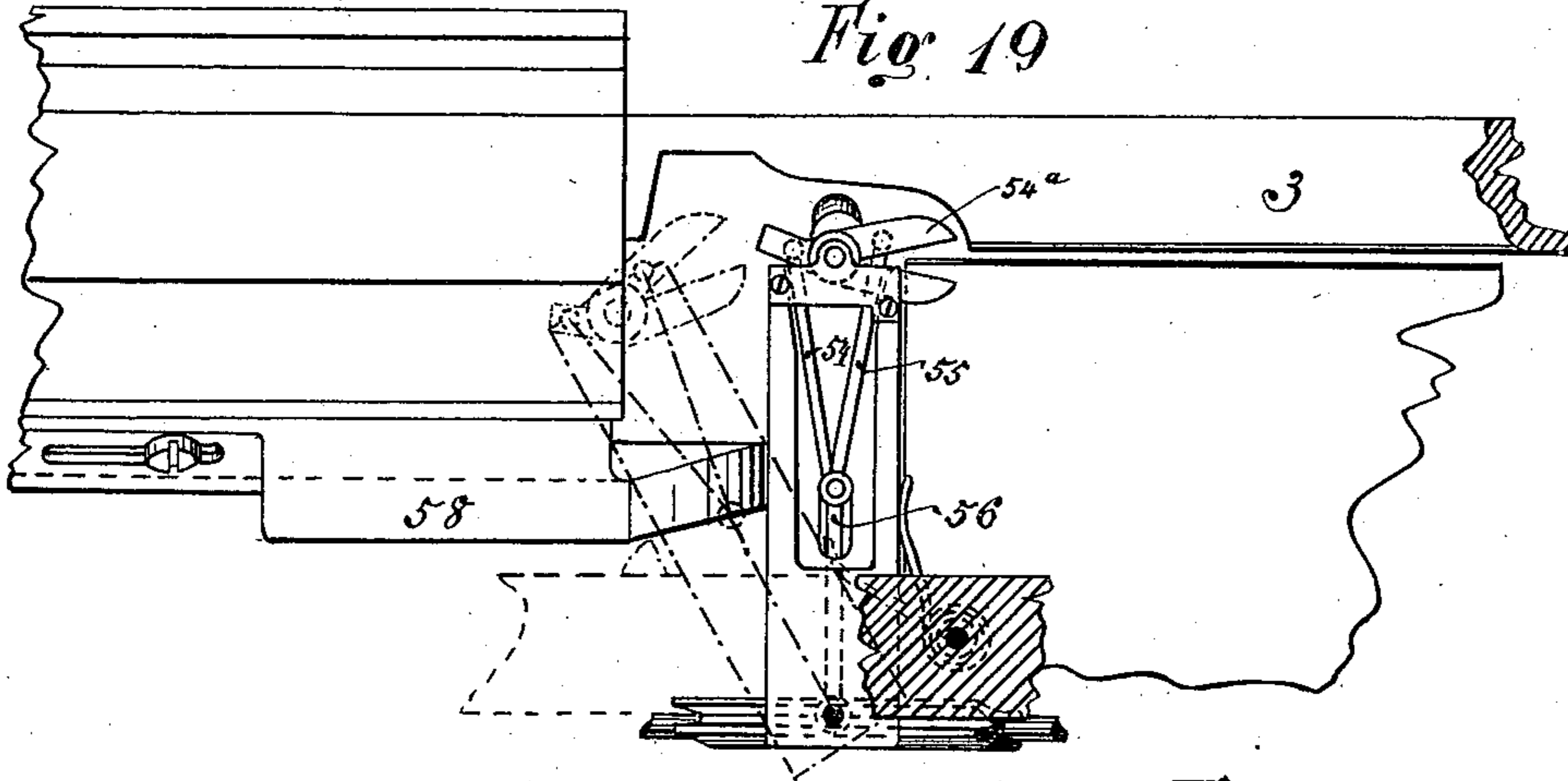
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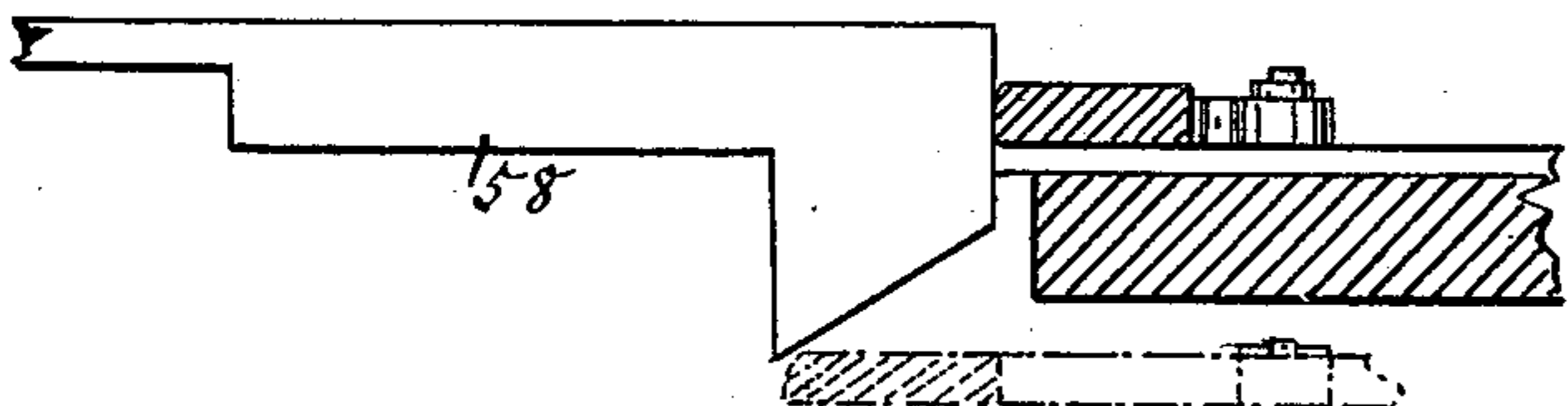
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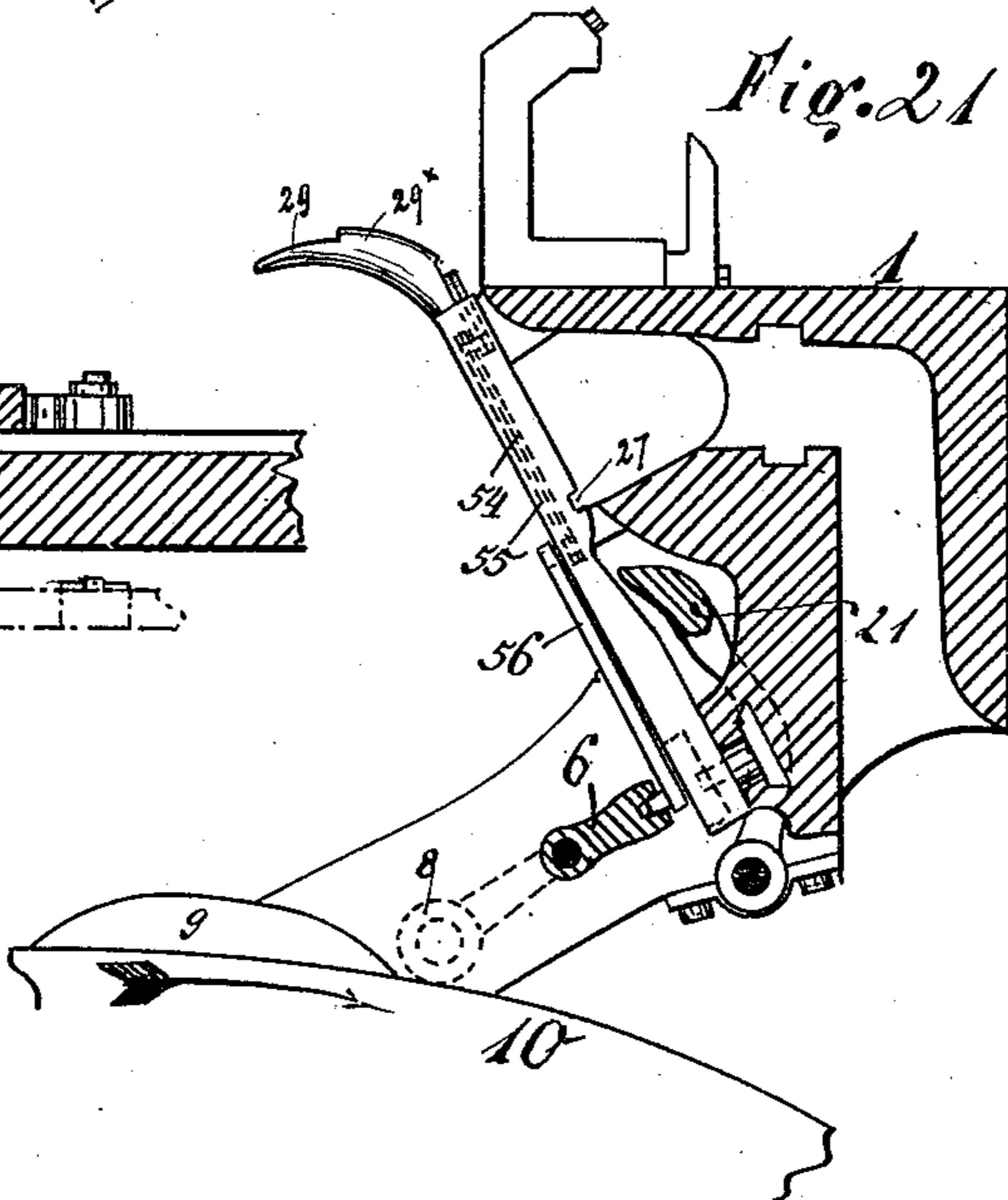
*Fig. 19*



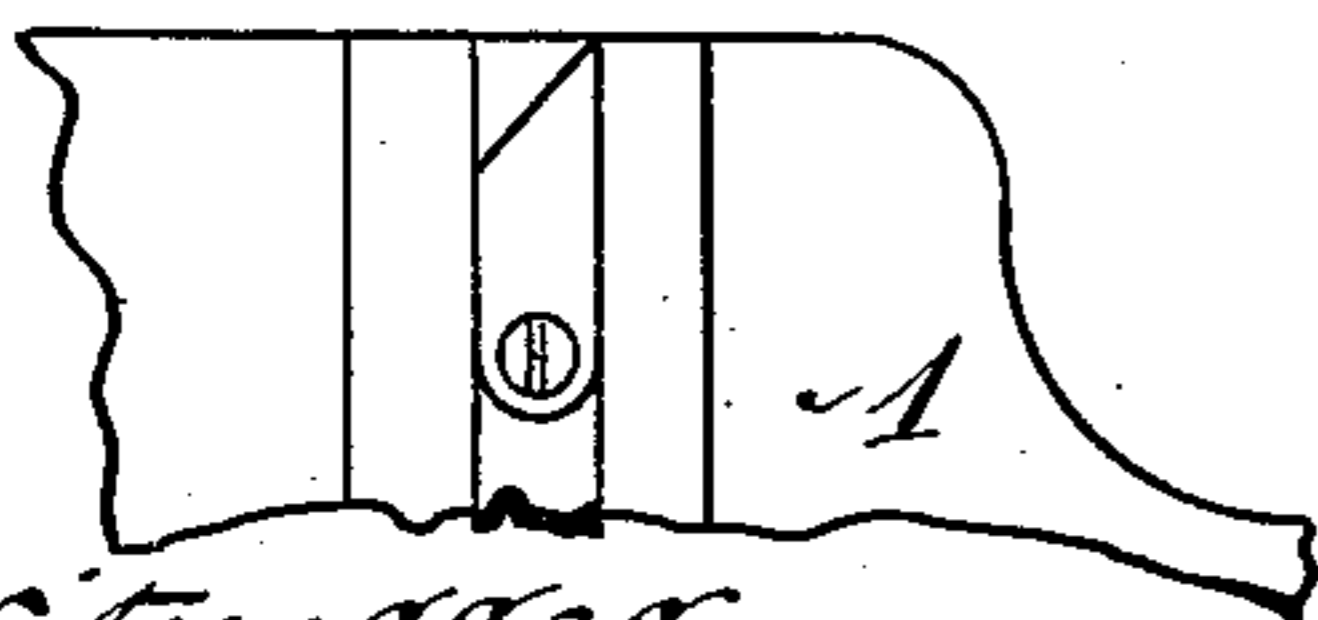
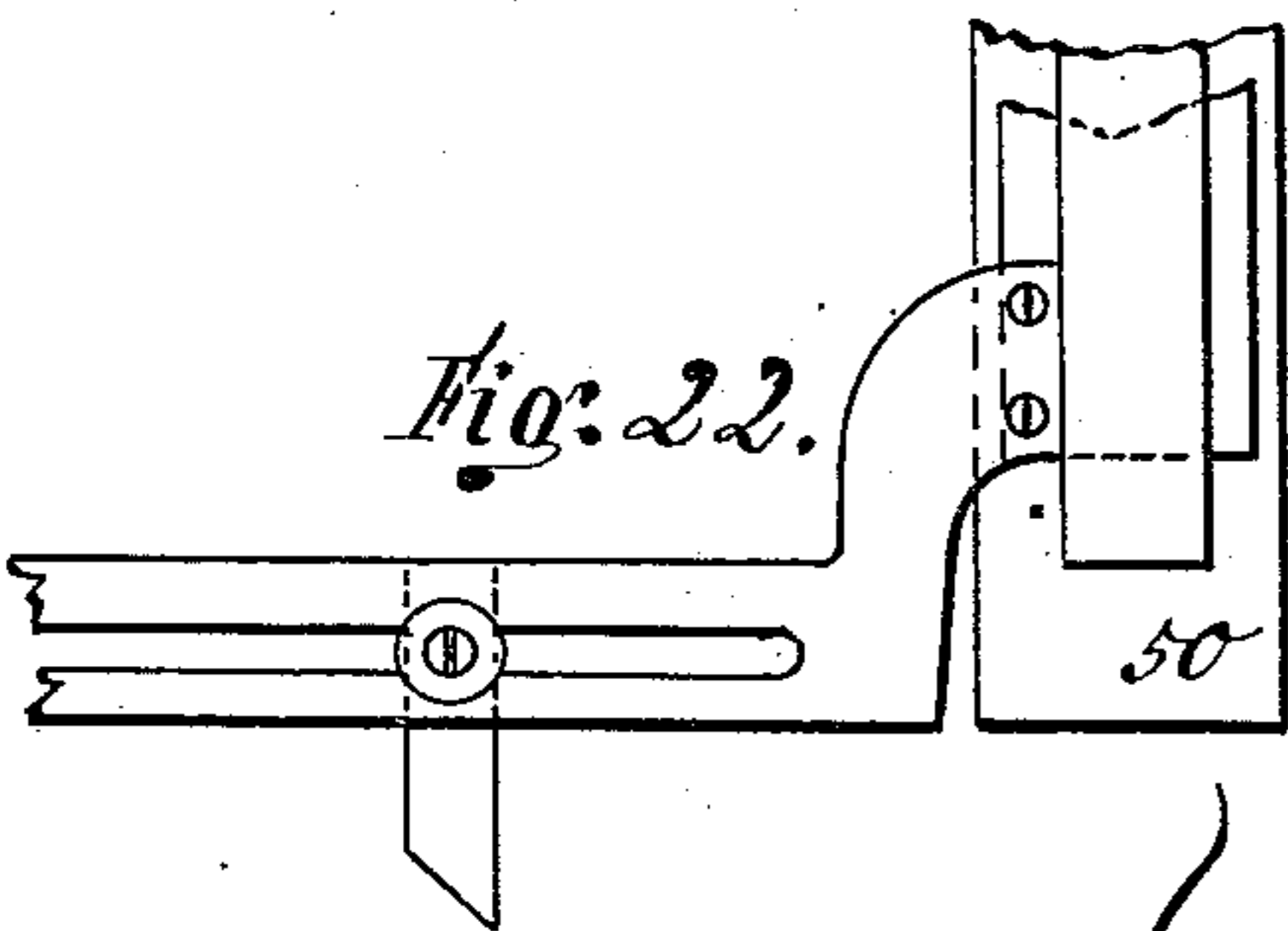
*Fig. 20.*



*Fig. 21*



*Fig. 22.*



Witnesses.

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W. E. McLaughlin

*Inventor.*

August Brehmer  
per Henry C. Haeder  
Attorney

(No Model.)

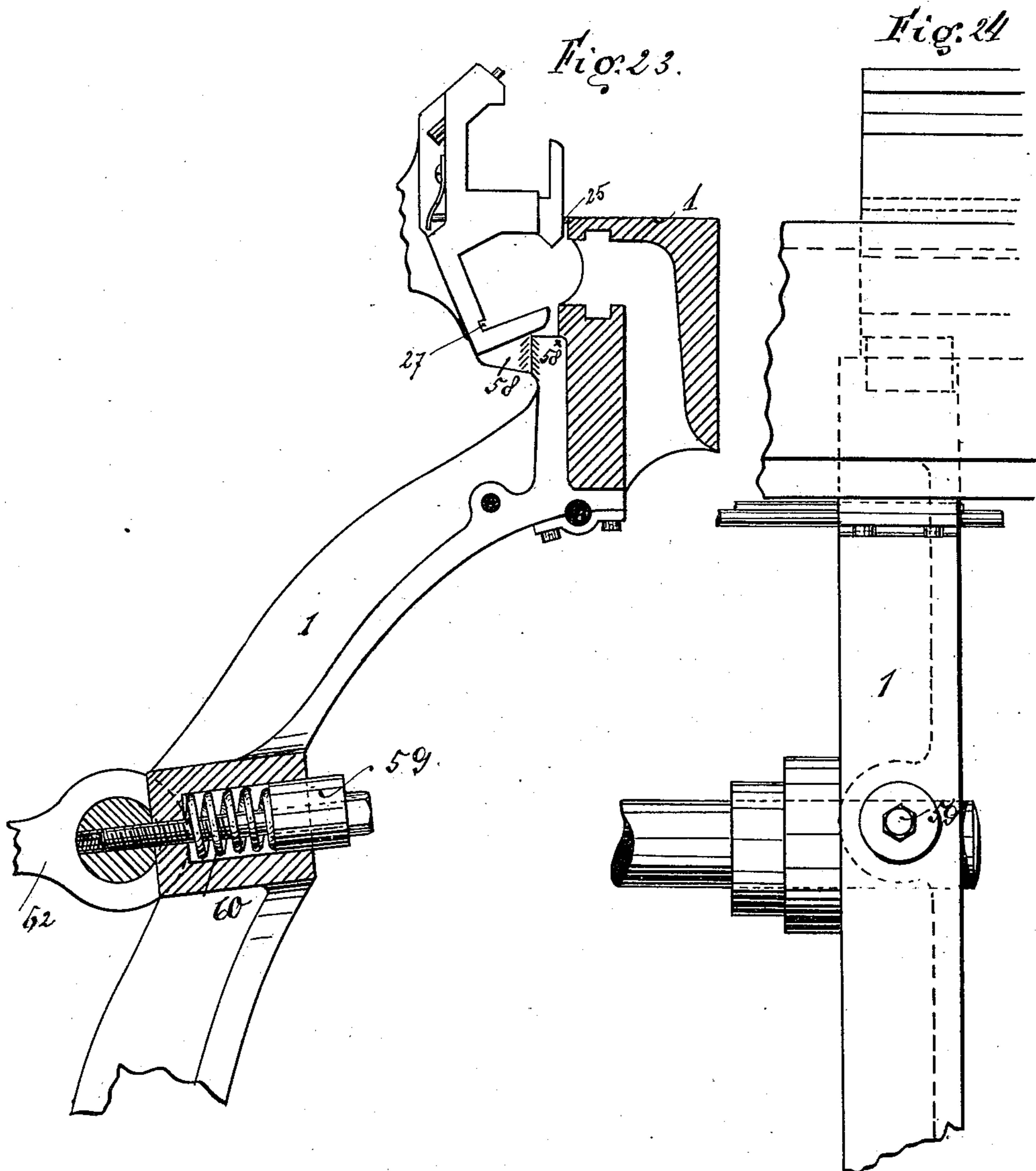
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# UNITED STATES PATENT OFFICE.

AUGUST BREHMER, OF LEIPSIC, GERMANY.

## BOOK-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 335,210, dated February 2, 1886.

Application filed December 17, 1884. Serial No. 150,605. (No model.)

*To all whom it may concern:*

Be it known that I, AUGUST BREHMER, a citizen of Germany, residing at Leipsic, in the Empire of Germany, have invented a new and useful Improvement in Book-Binding Machines, of which the following is a specification.

This invention relates to a new book-binding machine; and it consists in the various features of improvement hereinafter more fully pointed out.

In the accompanying drawings, Figure I represents a side view of my improved machine. Fig. II is a front view of the same. Fig. III is a cross-section of the same. Figs. IV to XXIV are details, on an enlarged scale, of various parts, more fully referred to in the following description.

Similar letters or figures represent similar parts in all the figures.

The sheets to be sewed are placed upon the swinging sheet-carrier 1, which turns on a center, 2, toward the sheet-backing plate 3. When arrived at the latter position, the knives 4 5, Figs. IX, XI, XIV, begin to act for penetrating the sheet to make the required slits at the edge of the sheet for the needle and thread.

In Fig. XIV the knife 4 is shown directly in front of carrier 1, ready to cut the slit.

The knives 4 and 5 are operated by means of the levers 6, connected with levers carrying the rollers 7 and 8, Fig. XIV, bearing upon the surface of a disk-wheel, 10, having suitable projections, 9, on its periphery, to operate the rollers, and consequently the lever 6 and knives 4 and 5, so as to penetrate the sheet from the under or inner side of the sheet. The knife 4 makes a straight cut, while the knife 5, turning around the center 11, Fig. X, makes a sliding cut, similar to scissors. The ends of the rods 14, which operate the knives, work in suitable grooves, 13, of the levers 6, to allow a sidewise regulation of these knives, according to the width of the sheets to be sewed. The knife-frames work in a suitable groove, 15, to allow of this required sidewise movement of the knives.

In place of the above-described knives, scissors, Figs. XIX and XXI, may be arranged. These scissors are connected, through rods 54, 55, and 56, with the lever 6, and operated, as above described, from the projection 9 and the disk 10.

Fig. XXII is a diagram of a modification, in which a lower oscillating knife attached to lever 1 is used in connection with an upper reciprocating knife attached to needle-carrier. The outer knives slit the ends of the paper for the threads, while the central knives perforate the sheets for the needles. When the sheets have been cut, the needles 16 are moved downward. These needles enter into suitable guide-plates, 16<sup>a</sup>, fastened in the groove 15 in the swinging lever 1. The holes or slots 17 in these guide-plates 16<sup>a</sup> are made tapering at their upper ends, to allow even bent or crooked needles to enter and force the same into the proper position. These slots 17 have openings 18, Fig. XIII, at the side of the guides next to the shuttles, smaller in width than the diameter of the needles, to prevent the needles passing out, but of sufficient width to allow the thread-loop to pass through. When the needle has completed its downward motion, and has moved a short distance upward, so as to form the thread-loop in the usual manner, the lever 21 is brought against the points of the needles, so as to hold the same. This lever or arm 21 is operated through the lever 20, carrying roller 20<sup>x</sup> at its end and working upon the face of disk 10, (see Fig. XIV,) upon the periphery of which said disk 10 a suitable projection, 19, is arranged to operate the lever 20 and arm 21 as desired and at the required moment. The end of the arm 21 is made straight and of considerable width, so as to hold the ends or points of the needles flat until the shuttle has passed through the loops. When the shuttle 22 is not in operation, the same is retained in its position by means of a nose or projection, 23, coming into the recess 24 on the shuttle. This nose 23 is fast on a sliding spring-rod, 25, which is acted upon by the end of the swinging lever 1 coming in contact with said rod 25 just before the shuttle has to move, and forcing thus the nose 23 out of the recess 24 of the shuttle, Fig. XV. A projection, 26, is made on the lower front side of the shuttle, working in a corresponding groove, 27, provided in the surface against which the shuttle works, to insure the entering of the shuttle 22 through the thread-loop lying just above this groove 27. (See Fig. XII.) The shuttle-thread is carried by a bent or hooked lever, 28, (see Fig. XVI,) and held upward

when the needles are in their upward position. When the needles are moved downward, these hooked levers 28 are moved downward at the same time, when the shuttle-thread is taken  
 5 hold of by the hook 29, attached to the swinging arm or lever 1, and there retained until the shuttle 22 has passed through the thread-loop. A nose, 29<sup>x</sup>, is made on this hook 29 to retain the thread. This nose 29<sup>x</sup> on the  
 10 hook 29 serves likewise to pull the shuttle-thread tight out of the previously-sewed sheet, and to hold the same tight during the operation of cutting the sheets, so that the thread does not come in danger of being cut by said  
 15 knives. Another use of this hook 29, with its nose 29<sup>x</sup>, is that it holds the shuttle-thread in such a position as to insure the certain entrance of the shuttle-thread into the cut part of the sheet under operation, as the same holds  
 20 said thread fast until the motion of the shuttle is nearly completed, when this thread is allowed to slide off from the hook 29, when the shuttle will draw the thread tight. (See Figs. XVI and XVII.)

25 On the swinging arm or carrier 1 bell-cranks 33 are attached, turning on fixed centers 32, (see Figs. II, VI, and VIII,) the other end of which carries a shaft, 30<sup>x</sup>. Upon this shaft 30<sup>x</sup> the sheet-removing lever 30 is attached,  
 30 for the purpose of removing and folding the finished sewed sheet from the swinging arm 1, to be replaced by a new sheet. This lever 30 is fastened to a socket, 31, attached to the shaft 30<sup>x</sup>, and is secured in said socket by  
 35 means of springs 34 and projections 35, fast on the lever 30, so as to be moved upward or downward in said socket 31. When moved down, as shown in Figs. VI and VIII, the lever 30 will operate upon the sheet; but in  
 40 case the sheet is to be sewed double, this lever 30 must be moved upward to allow the operation to sew the sheet twice, and is then moved down again for operation. The backward motion of the swinging lever 1 will move this lever 30  
 45 downward, so as to remove the sheet from the end of the swinging lever 1 and fold the same. (See dotted lines, Fig. VIII.) During the forward motion of the swinging lever 1 this lever 30 will be moved again upward. To move  
 50 and keep the end of this lever 30, during its upward motion, clear of the sheet, the shaft 30<sup>x</sup>, which can turn freely in the ends of the bell-cranks 33, is provided with a lever, 33<sup>x</sup>, Fig. I, the end of which works in the cam-  
 55 shaped groove 33<sup>a</sup> of the lever 39, through the action of which the shaft 30<sup>x</sup> can be turned, and with it the lever 30, which is fixed upon a square part of this shaft 30<sup>x</sup>. The lever 39 receives its required motion through  
 60 the connecting-rod 57 and eccentric 51, attached to the main shaft s. (See Fig. I.)

To separate two finished books from each other, and at the same time give sufficient of the backing material, which is afterward  
 65 pasted on the covers of the book, blocks 36, of the required thickness, are placed between one book and the next one. For this purpose

it is necessary to loosen the needle-threads as much as the thickness of these blocks 36 requires to facilitate the introducing of these  
 70 blocks. For this purpose the needle-threads are passed over a rod, 37, hinged to and supported by suitable levers, 37<sup>x</sup>, Fig. IV. The lever 39 is provided with a projection, 38, which latter comes, during the motion of said  
 75 lever 39, in contact with the end of this rod 37, moving the same sidewise and partly downward, and thereby drawing the required amount of thread from their respective bob-  
 80 bins corresponding with the thickness of the blocks 36. A spring, 40, moves the rod 37 back again into its original position.

To the lower end of the lever 39 a lever, 41, is connected, provided with a suitable hook, 41<sup>x</sup>, at its end, which, when the lever 39 is  
 85 moved so as to operate the bar 37, and at which time the blocks 36 are inserted between the finished book and the sheets for the next book, comes under the treadle 42, through which the machine is operated or set in motion, and thus  
 90 locks the same to prevent any possible motion of the machine, and thus prevent any danger to the operator while inserting the blocks 36. To the lever 39 a rod, 52, is likewise connected, the other end of which is attached to a disk-  
 95 plate, 45, turning on a fixed center, 45<sup>x</sup>, Fig. I. The blocks 36 are acted upon by the brake-levers 43<sup>a</sup>, which are operated upon by one end of the levers 43, on the other ends of which  
 100 levers 63, having weights 44, are made to work, and whereby any desired pressure may be placed upon said blocks 36. After the folded-down sheets have been moved back, and during the operation of sewing the next sheet, the  
 105 end of the swinging arm 1 presses against the previously-sewed sheets, the blocks 36 acting at that time for a backing. The lever 43 is acted upon at its outer end by a lever, 63, to which the weight 44 is attached. This lever  
 110 63, acting against the under side of lever 43, will, by the action of its weight 44, press the forward end, to which the brake-lever 43<sup>a</sup> is attached, downward upon the block 36, and thus produce the desired friction on said block  
 115 36. (See Fig. V.) As sheet after sheet is turned down, these blocks 36 and the already-sewed sheets must be allowed to move gradually backward. This operation is performed  
 120 at the proper time through the lever 39, acting through its rod 52 upon the disk 45, so as to move the same under the ends of the levers  
 125 43 to counteract their weights 44, and slightly lifting said levers, whereby the friction produced by the same upon the blocks 36 is reduced to allow said blocks 36, as well as the  
 already-sewed sheets, to move the required distance backward to make room for the next sheet.

To support the sewed sheets or books, a table, 46, Fig. III, is arranged, supported upon  
 130 the ends of bell-crank levers 47, by means of which the position of this table 46 can easily be regulated and fixed to correspond with the depth of the sheets or books.

To give the desired tension to the backing-bands or other material sewed to the back of the sheets, friction-rollers 48, Figs. III and VII, are arranged, between which the backing bands or material is passed. These rollers 48 turn loose in recesses 49 in the frames 50, and according to the number of rollers the tension may be increased or diminished.

To insure the exact position of the swinging arm 1 at the end of its stroke to correspond with the position and movement of the needles, projections 58 (see Figs. III and XXIII) are arranged on the main frame of the machine, against which the corresponding projections, 58<sup>x</sup>, on the swinging arm 1 abut at the end of its stroke, and to regulate this required exact motion of the swinging arm 1 the connecting-rod 62, which operates this swinging arm 1, is provided at its end with a spring-bolt, 59, acted upon by a suitable spring, 60, Fig. XXIII, whereby the length of the rod 62, and consequently the exact motion of the swinging arm 1, can be regulated.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination of grooved lever 6, adapted to receive vibrating motion, with rods 14, having noses which enter the grooved lever, and with the knives 4 5, which receive reciprocating motion from rods 14, substantially as specified.

2. In combination with the needles 16 of a book-binding machine, the guiding-plates 16<sup>a</sup>, with guide-holes 17, tapering on their upper ends, and contracted openings 18 at the side next the shuttle-way, in the manner and for the purpose substantially as described.

3. The combination of the levers 21, lever 20, with roller 20<sup>x</sup>, and projection 19 on disk 10, with the needles 16 of a book-binding ma-

chine, in the manner and for the purpose substantially as set forth.

4. The combination of hook 29, having projection 29<sup>x</sup>, with knife 4, lifter 28, and swinging arm 1, constructed substantially as described, so that the hook holds the thread tight during the cutting operation, as set forth.

5. The combination of the swinging arm 1, bell-crank 33, rod or shaft 30<sup>x</sup>, lever 30, lever 33<sup>x</sup>, lever 39, with cam-shaped groove 33<sup>a</sup>, rod 57, eccentric 51, and driving-shaft s, arranged to operate in the manner and for the purpose substantially as described.

6. The combination of rod 37, pivoted to links 37<sup>x</sup>, with the lever 39, having projection 38, adapted to move the rod 37 in one direction, and with spring 40, adapted to move the rod in the opposite direction, substantially as specified.

7. In combination with the lever 39, the lever 41, with hook 41<sup>x</sup> on its end, and the treadle 42, in the manner and for the purpose substantially as set forth.

8. The combination of blocks 36, levers 43, and weight 44 with disk-plate 45, rod 52, and lever 39, arranged to operate in the manner and for the purpose substantially as described.

9. In combination with the swinging arm 1, the abutment-pieces 58, attached to the main frame, and the spring-bolt 59 in the end of the connecting-rod 62, in the manner and for the purpose substantially as described and set forth.

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

AUGUST BREHMER.

Witnesses:

EDMUND BACH,  
HEINRICH ZUSKE.