

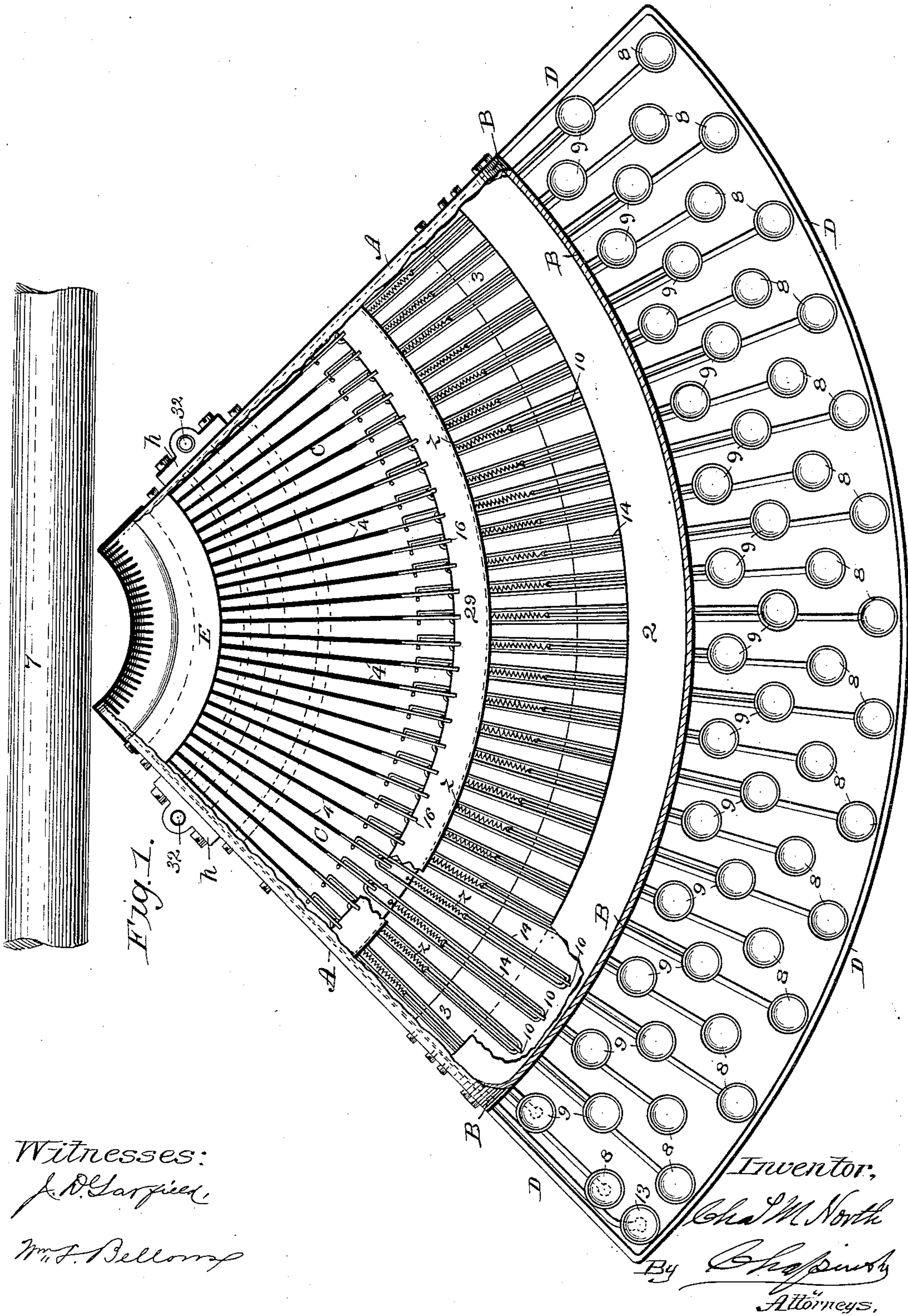
(No Model.)

5 Sheets—Sheet 1.

C. M. NORTH.
TYPE WRITING MACHINE.

No. 435,349.

Patented Aug. 26, 1890.



Witnesses:

J. D. Garfield.

Wm. F. Bellows

Inventor,

Chas M North

By Chapman
Attorneys,

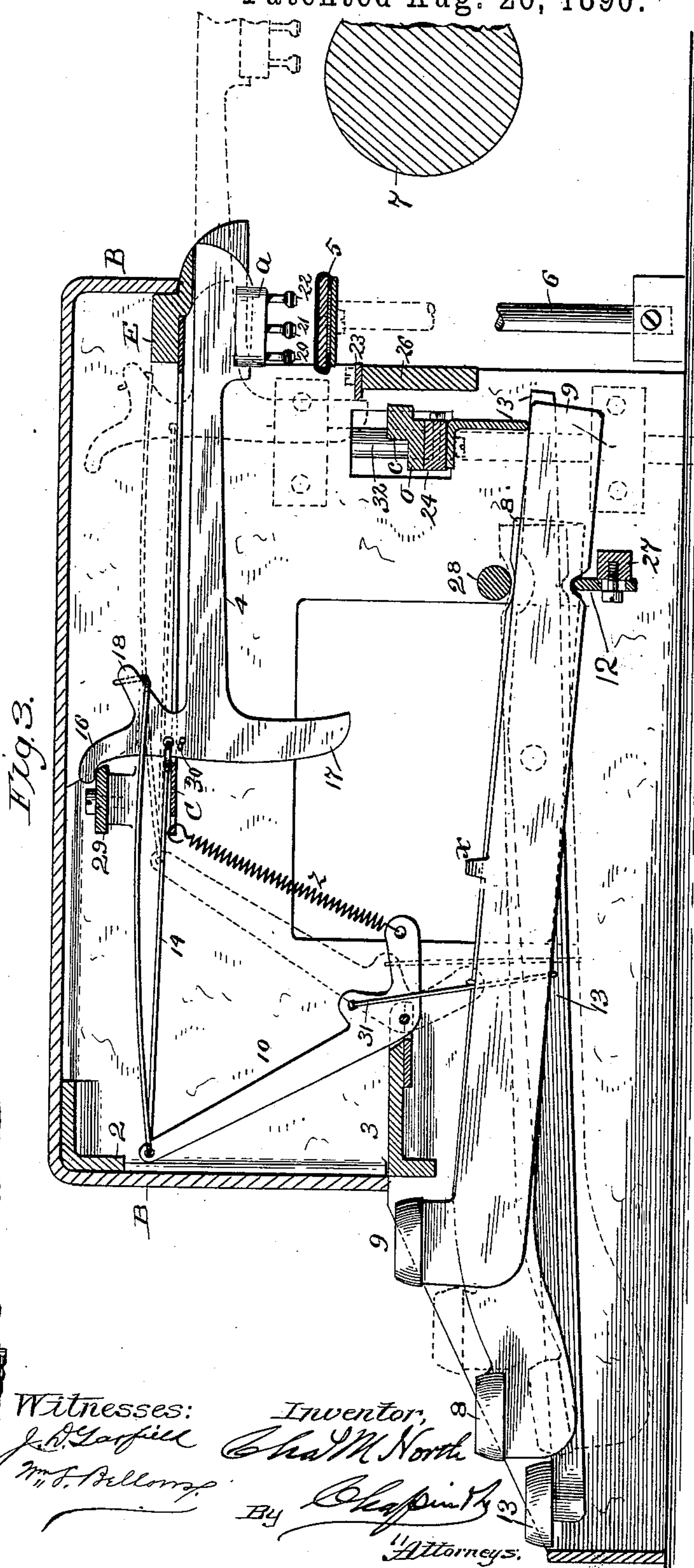
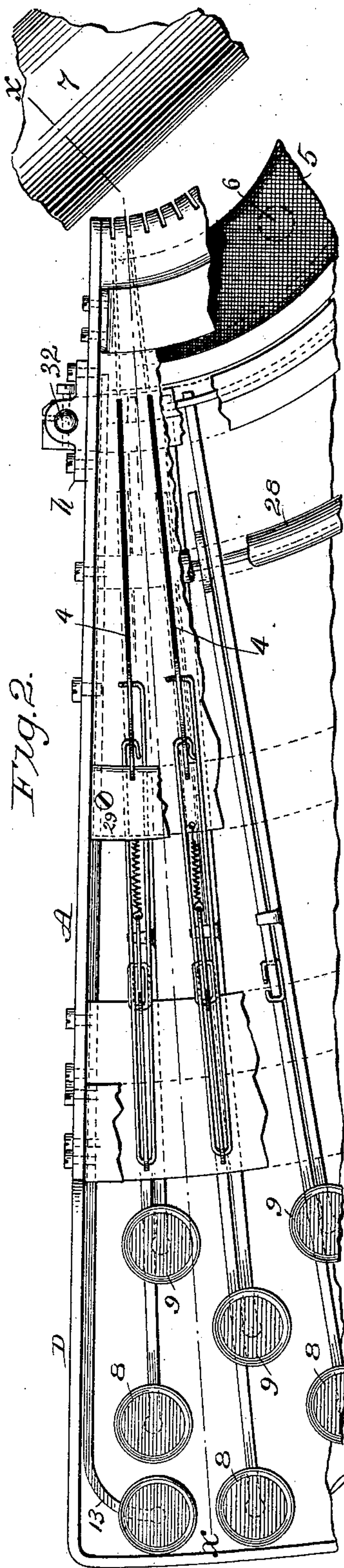
(No Model.)

5 Sheets—Sheet 2.

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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.)

5 Sheets—Sheet 3.

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Fig. 4.

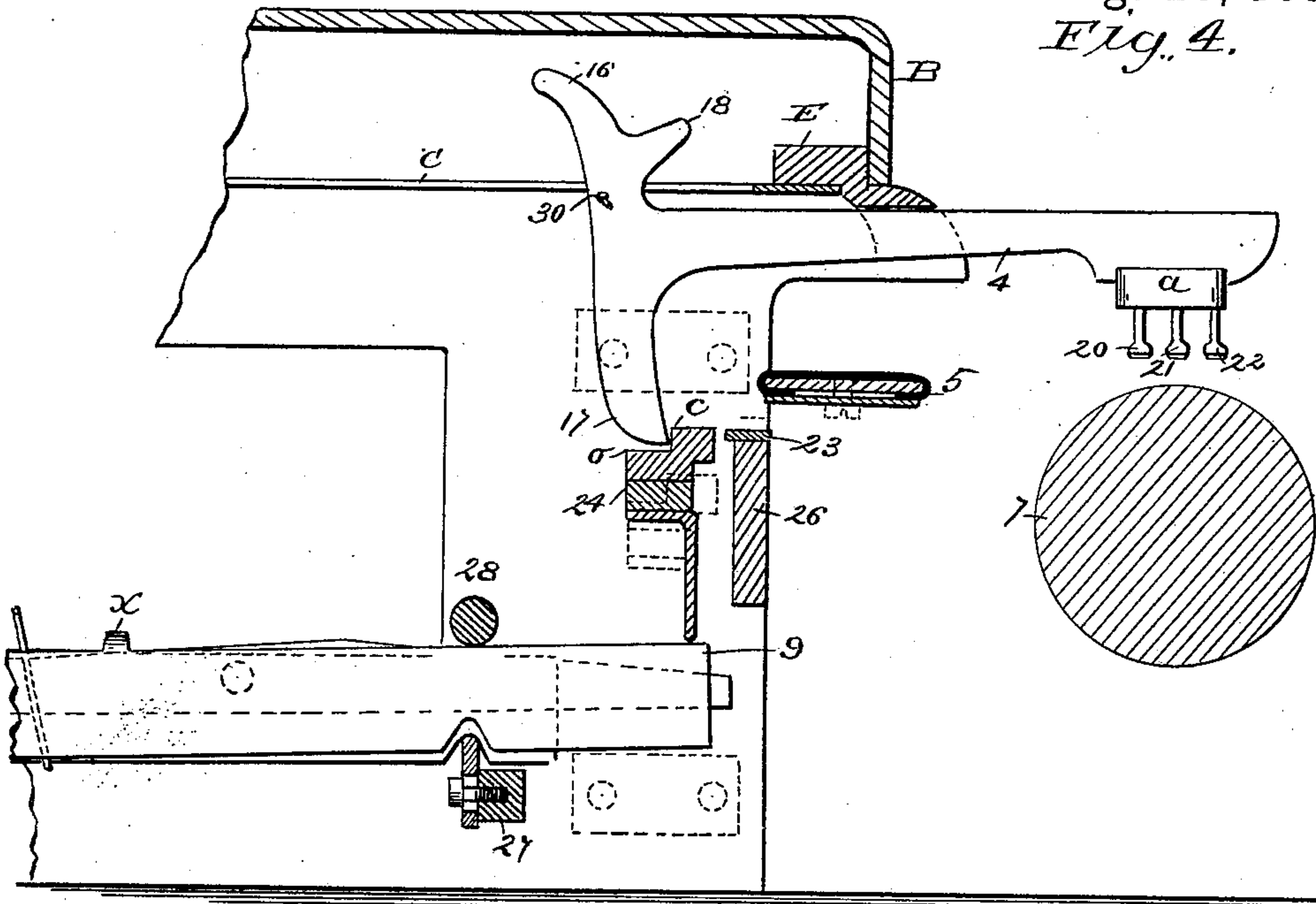
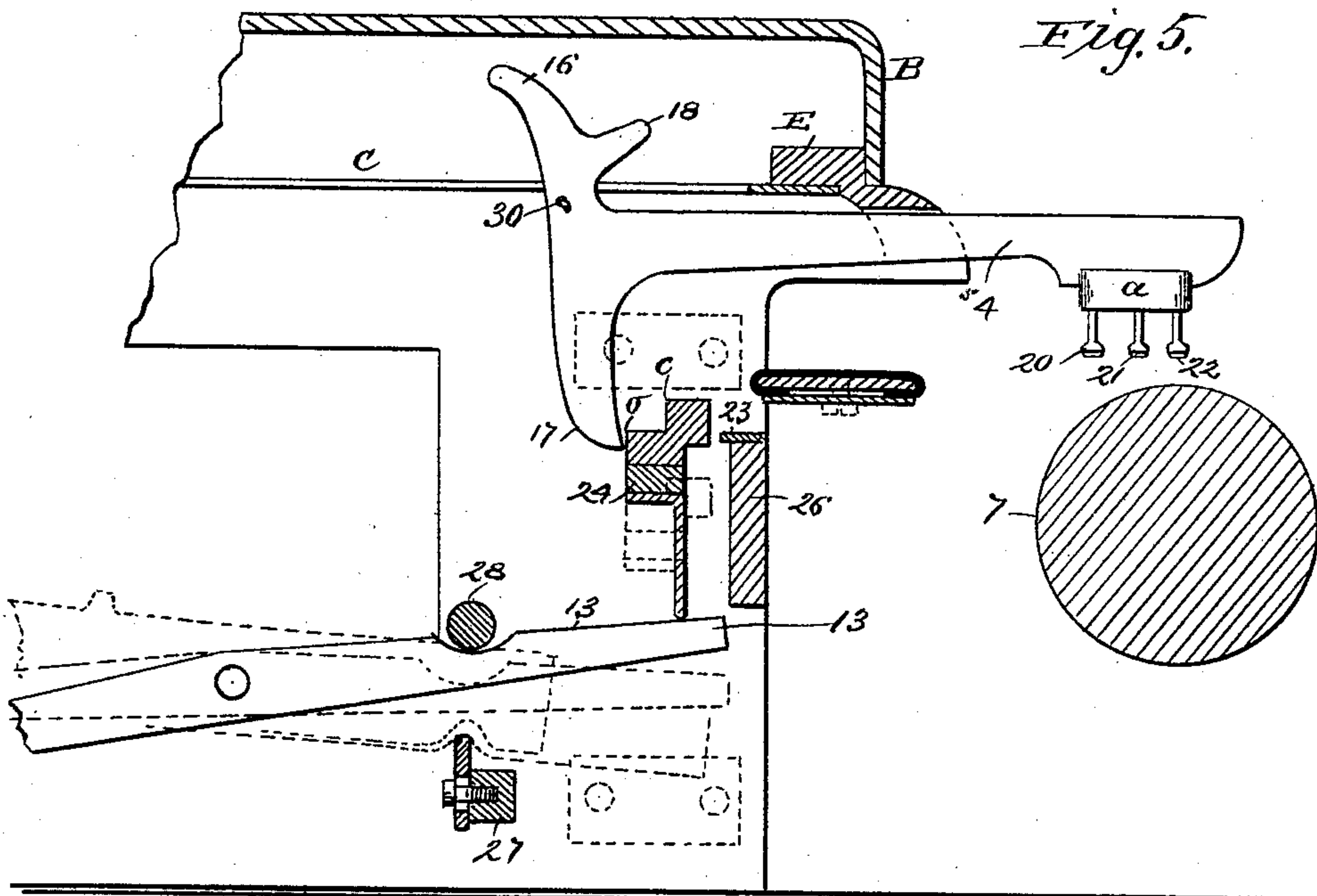


Fig. 5.



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(No Model.)

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Fig. 6.

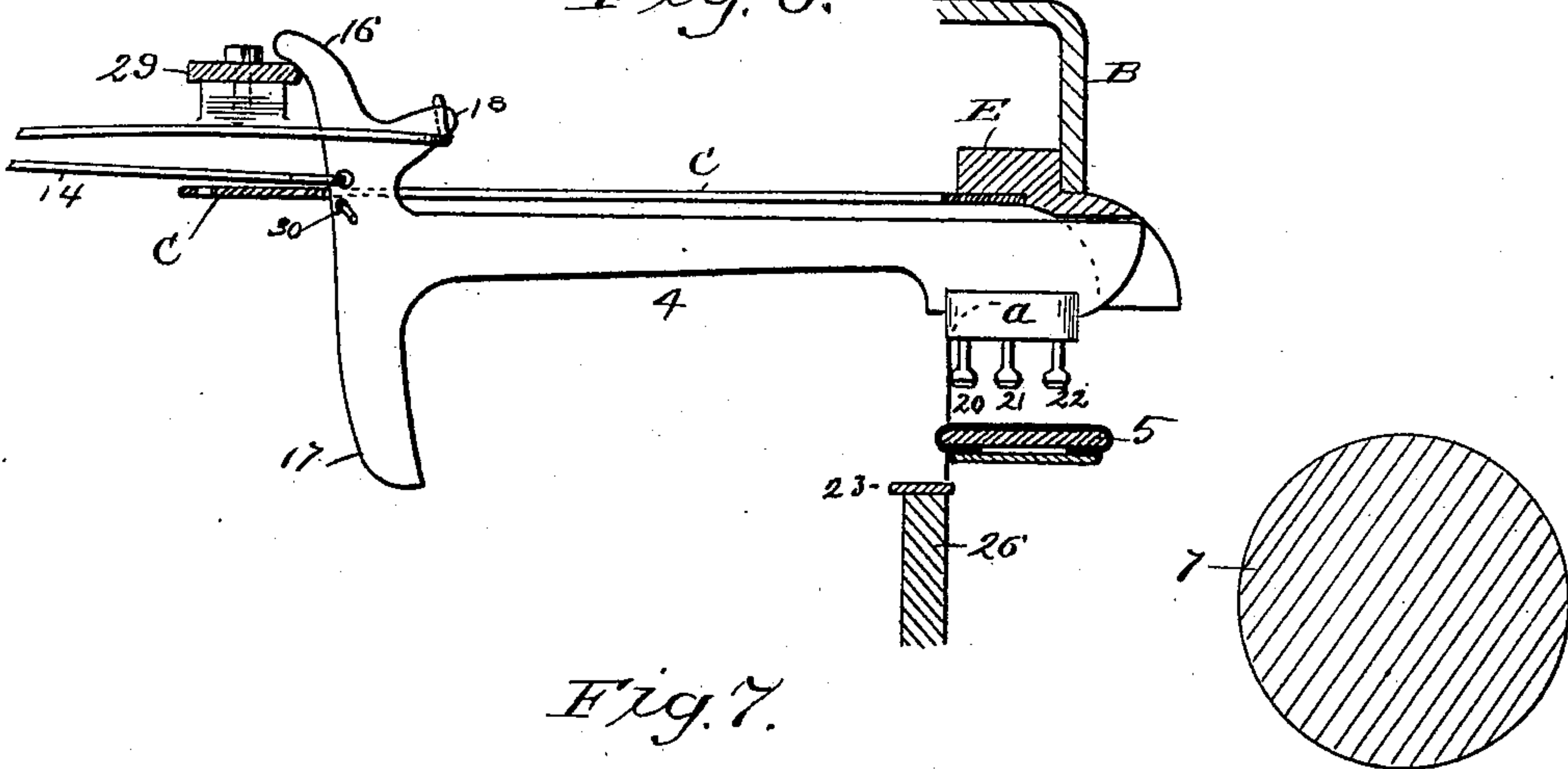


Fig. 7.

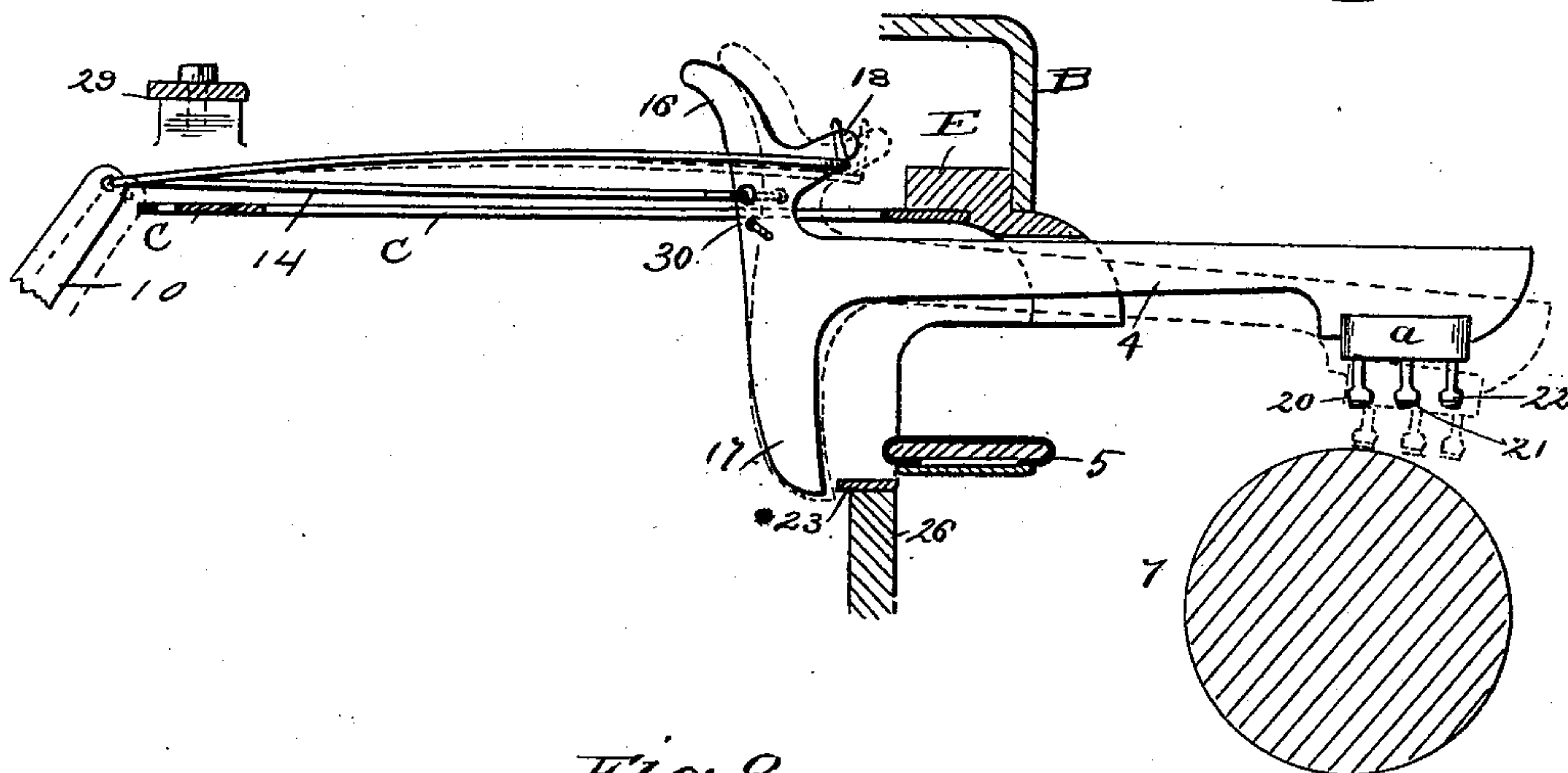
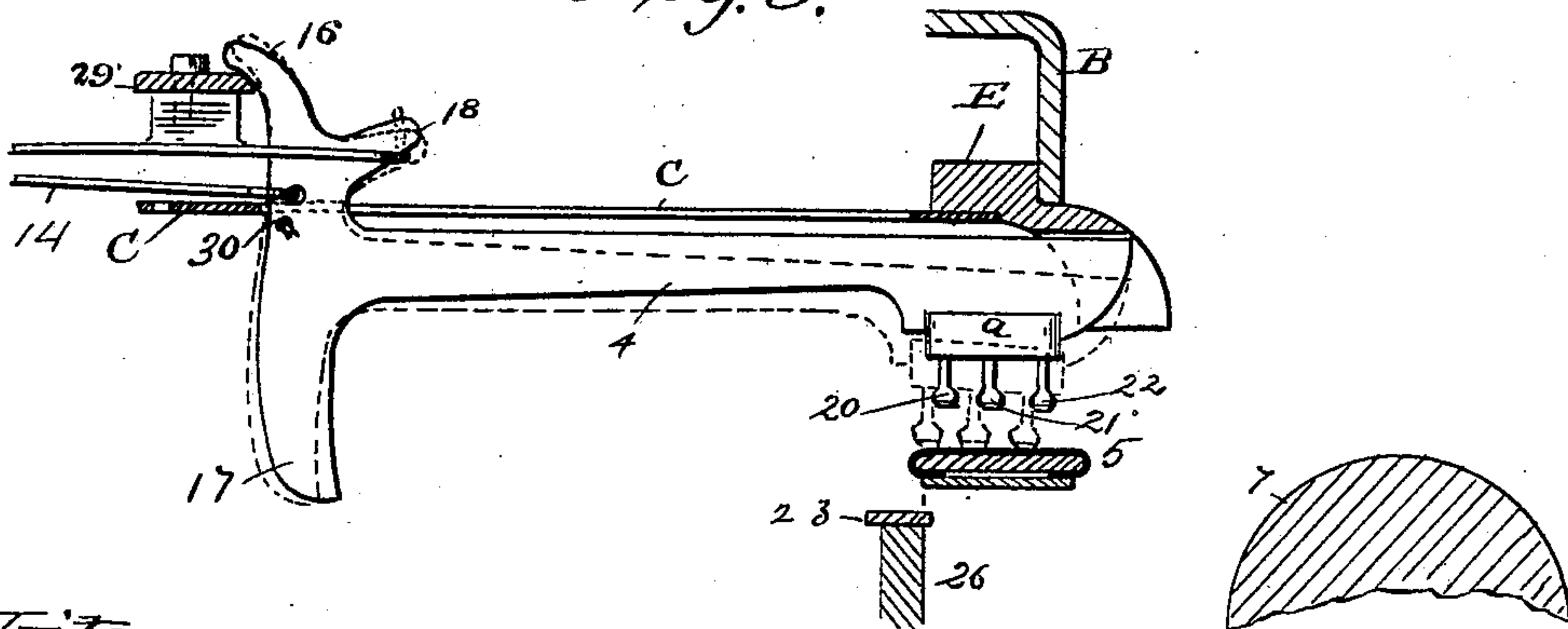


Fig. 8.



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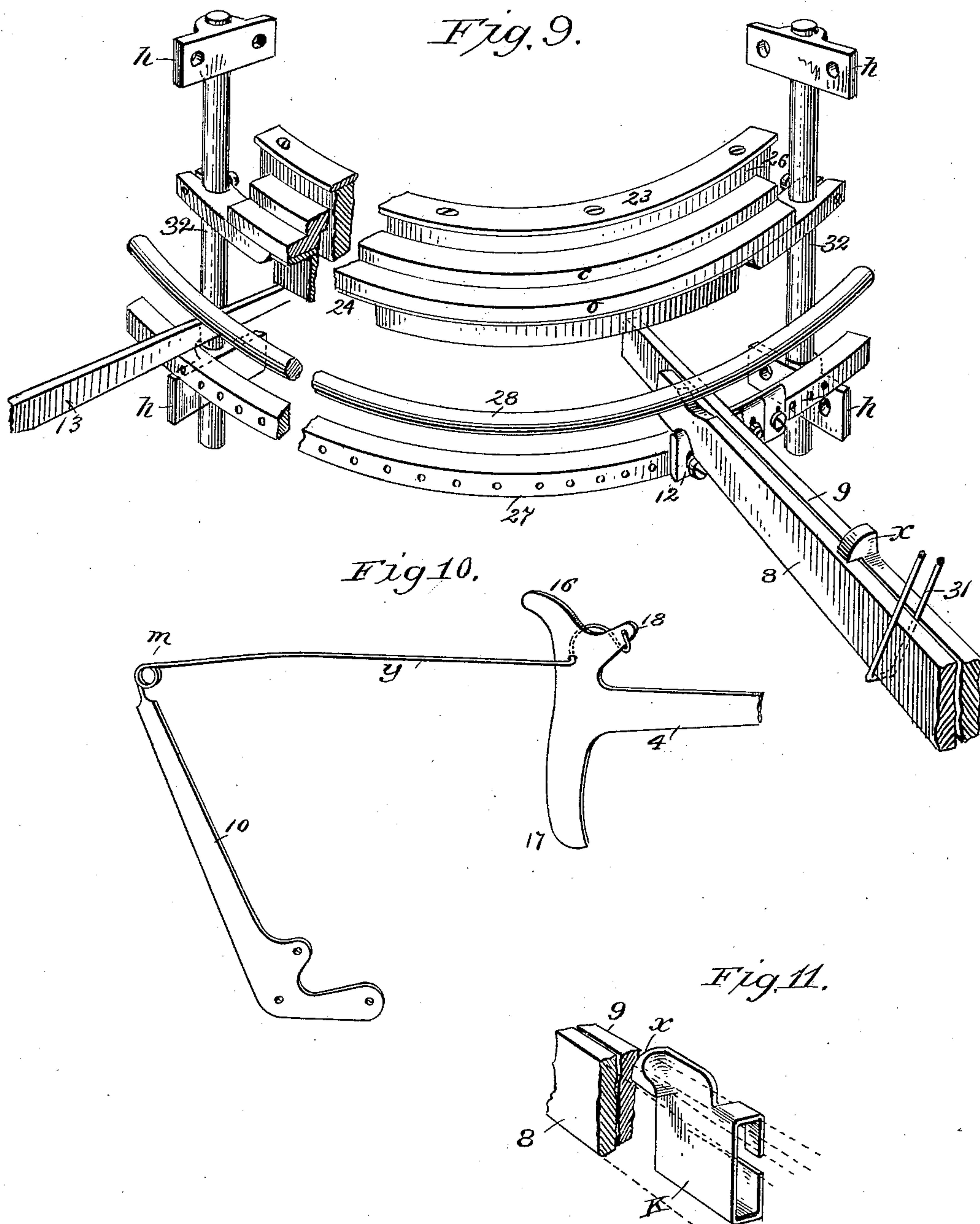
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5 Sheets—Sheet 5.

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UNITED STATES PATENT OFFICE.

CHARLES M. NORTH, OF BROOKLYN, NEW YORK.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 435,349, dated August 26, 1890.

Application filed March 20, 1889. Serial No. 303,984. (No model.)

To all whom it may concern:

Be it known that I, CHARLES M. NORTH, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to type-writing machines, and particularly to that class thereof in which the type-bars have a longitudinally-reciprocating motion; and the invention consists in the improved construction of the type-bars and their supporting and operating mechanism, and in improved means for inking the printing characters, all as hereinafter fully described, and more particularly pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a plan view, and Fig. 3 a longitudinal section, of a type-writing machine embodying my improvements, Fig. 1 showing a portion of a paper-supporting roll and representing the machine without any inclosing case or bed, and having portions broken away to better disclose certain parts thereof, and Fig. 3 showing a section of a paper-supporting roll and indicating the operative positions of certain parts in dotted lines. Fig. 2 is a plan view of a portion of the top of the machine, having portions thereof broken away for the purpose aforesaid. Figs. 4, 5, 6, 7, and 8 are vertical sections of certain parts of the machine and sections of the paper-support thereof, all hereinafter fully described; and side elevations of the type-bar and portions of the operating devices thereof, said figures illustrating said type-bar in various operating positions, all as fully described below. Fig. 9 is a perspective view of the fixed and adjustable type-bar stops, the supporting-posts of the latter, portions of the lever operating said adjustable stop, and of the primary and auxiliary levers and the parts in which their inner ends are supported. Fig. 10 is a side elevation of the elbow-lever, the rear portion of one of the type-bars, and of a modified connection between said lever and type-bar. Fig. 11 is a perspective view of a connecting device between the primary and auxiliary key-levers, which is below described. Said Fig. 3 is a section taken on line x , Fig. 2.

In the drawings, A is the outer frame of the machine, within which the operating devices thereof are secured and supported. 55

B is the cover of the machine.

C is a slotted guide-plate, in the slots of which the type-bars have a longitudinal movement.

D is a vertical border-plate attached by its ends to the frame A, and inclosing the outer ends of the key-levers, and E is a segmental slotted border-plate rigidly secured between the inner ends of the sides of frame A, and having a series of slots therein in a line or registering with the said slots in the guide-plate C. The sides of the said frame A are of suitable height above the bed or table on which the machine may rest to accommodate the operative parts which are contained therein. The said two side plates of the frame A are rigidly secured in perpendicular positions by a suitable metallic angle-piece 2 at their rear or outer ends and by a curved bar 3, extending between their rear ends at or near the lower edges of said side plates, and the opposite ends of said plates are secured to the opposite ends of the said segmental border-plate E. The union of said side plates of the frame A is still further strengthened by the curved bar 26, which extends between and is secured to said side plates at their converging ends, and by the curved fulcrum-bar 27 and the curved key-lever holder 28, both of which are attached by their ends to the inner sides of said side plates. The said slotted guide-plate C has one end extending under the edge of the segmental border-plate E, and from thence said plate extends between the sides of the frame A toward the wider end of the machine, terminating, as shown in Fig. 3, under the curved stop-bar 29, whose ends are attached to the inner sides of the frame-plates A, and said guide-plate is also suitably secured by its edges to the inner sides of said plates. 95

The type-bars 4 are made, preferably, of thin sheet metal and have the form shown in the several figures of the drawings, and to the outer extremity of each one is fixed a thickened type-head a , in which the type are fixed by their shanks, as shown, said type-bar having at its rear end an arm 16, which extends upwardly and rearwardly, and an arm 17, ex-

tending downward from the body of the bar at the rear end of the latter, and a third arm 18, extending in an upward direction from the forward edge of said arm 16.

5 The type-bars 4 of the machine are supported and operate one in each of the said grooves in the guide-plate C, and their normal position when so supported is that shown in dotted lines in Fig. 8, and when in this position the outer end of the type-bar rests partly in one of the said slots in the said segmental border-plate E, and the rear edge of the arm 16 on said bar rests against one edge of the stop-bar 29, and the outer end of the type-bar is held in said position with its type on the inking-pad 5 by the retracting force of the spring *z*, which acts on the elbow-lever 10.

The devices by which each type-bar is given a longitudinally-reciprocating motion in its above-described supporting parts of the machine, whereby the types carried thereby are brought to an operative position over the paper-supporting roll 7 for printing upon paper carried thereon, consist of an elbow-lever 10, having a pivotal connection with said curved bar 3, a spring *z*, connected to the short arm of said elbow-lever and to the rear edge of said slotted guide-plate C, and a combined connecting rod and spring 14, connected by one end to the long arm of said elbow-lever and having one of its opposite ends hooking through a perforation in the type-bar and its other or spring end engaging under the arm 18 on said bar. The said elbow-lever is given a vibratory motion by means of either one of two key-levers 8 9, lever 8 operating said elbow-lever independently of lever 9 and the latter operating lever 8 and through the latter said elbow-lever by a hook-like connection therewith. (See Fig. 9.) The said key-lever 8 is connected with said elbow-lever 10 by a metal link 31. The said key-levers 8 and 9 are supported on the edges of adjustable fulcrum-plates 12, secured on the edge of the fulcrum-bar 27, and between the latter and the said curved key-lever holder 28, said levers having such engagement with said fulcrum-plates and holder 28 as prevents their having any endwise movement therebetween. By reference to Figs. 3 and 9, and also to Fig. 5, it will be seen that the lever 9 has its inner end extending considerably beyond the inner end of the adjoining lever 8, the purpose of which is below described. Said levers 8 and 9 are designated, respectively, as the "primary" and the "auxiliary" levers.

A wire link 30 is attached to the type-bar under the plate C, which prevents the rear end of the said bar from rising up.

60 The said type-bar 4, as shown in the drawings, has three type or printing characters attached to its head, as aforesaid. One of said types 20 bears a small letter, the intermediate one 21 bears marks or figures, and the outer one 22 bears a capital letter; and it is obvious that if the said several type or print-

ing characters are to constitute parts of written matter on the same line on paper supported by the roll 7 the degree of endwise movement of the type-bar toward said roll must be variable, and said variable endwise movement is produced by the below-described mechanism. On the upper edge of the said curved bar 26 is fixed the type-bar stop 23, and by the side of and slightly removed from the said bar 26 is hung on the posts 32 (see Fig. 9) a vertically-movable type-bar stop 24, having two offsets or ledges thereon *c* and *o*, with which the arm 17 on the type-bar engages, as below described. The said posts 32 are supported on the outer sides of the side plates of the frame A in the boxes *h*, which are secured to said plates and arms, as shown. The ends of said type-bar stop 24 pass through openings in said side plates and are clamped to said posts, the latter having a vertically-sliding movement in said boxes *h*. The said stop 24 is capable of being operated to move it upward by the said key-lever 9, one end of which extends under it, and by the shifting-lever 13, as and for the purposes below described, and when free it again drops to its normal or lowest position, or to that shown in Fig. 3.

An inking-pad 5, having an ink-absorbing cover of felt or other suitable material, is attached to a suitable curved plate, and is supported directly under the type-head *a* of the type-bar when the latter is at rest, as shown in Fig. 8 in dotted lines. The support for said inking-pad consists, preferably, of a vertical post 6, to the upper end of which the inking-pad is attached, and the lower end of said post enters a suitable perforation in a block, as shown, and is vertically adjustable therein to bring the inked surface of the pad to a proper position under the said type-head *a* to permit the type to rest upon it, and thereby become inked. A screw in said block is adapted to screw against the post 6 and hold it and the inking-pad in such position as they may be adjusted to.

The modified construction of the connection between the long arm of the elbow-lever 10 and the type-bar shown in Fig. 10 provides for dispensing with the combined connecting rod and spring 14, as shown in Fig. 3, by making a spring-arm *y* (either with or without the coil *m* therein) as an integral part of said elbow-lever and passing its end through a perforation in the type-bar, then curving it upward, and finally hooking it under the arm 18. The connection thus made between the elbow-lever and the type-bar serves to impart the requisite reciprocating horizontal motions to the type-bar and to swing its type-bearing end upward, as does said connecting rod and spring, and is more simple in construction.

In Fig. 11 is illustrated a manner of attaching the lever-hook *x* to the key-lever 9 when the latter is made of wood or other non-metallic material, which consists in attaching said

hook to a shell K, of sheet metal, and said shell is wrapped around and suitably secured on the said key-lever.

The operation of the within-described improvements is as follows, and in describing the same reference is particularly made to Figs. 4 to 8, inclusive, which illustrate the various positions of the type-bar and the type-bar stops above referred to during said operation, said illustrations being necessary to a clear understanding thereof: Presuming that the types 20, 21, and 22 are inked, either one or all of them, and that a sentence is to be written commencing with the usual capital letter, the operator first bears down upon the end of the shifting-lever 13, thereby lifting the type-bar stop 24 to the position shown in Fig. 5, and while holding said lever in that position the operator strikes the end of a key-lever 8 or a primary lever, thereby operating the elbow-lever 10 and the type-bar, and throwing the latter outward to the position shown in said last-named figure, thereby bringing the type character 22 directly over the center of the paper-roll 7, and bringing the lower end of the arm 17 on the type-bar forcibly against the vertical face of the ledge *c* of the adjustable type-bar stop 24, and thereby causing the outer end of the type-bar to be thrown downward, as indicated by dotted lines in Fig. 7, whereby the said capital letter is caused to strike the paper, and immediately the type-bearing end of the type-bar swings up to the position shown in said Fig. 5, and upon the operator's releasing the key-lever the retracting-spring *z*, connected with the short arm of the elbow-lever 10, swings said lever backward, and the type-bar is thereby drawn back to the position shown in Fig. 3, and as it comes back with considerable force the arm 16 of the type-bar strikes the edge of the stop-bar 29, thereby causing the type-bearing end of said bar to be thrown downward, thereby bringing the faces of the types against the top of the inking-pad 5, as indicated in Fig. 8 in dotted lines, and after printing said capital the shifting-lever 13 is freed to allow the type-bar stop 24 to drop to its normal position. Assuming that the operator then commences to write a word beginning with a small letter 20, the type-bar is given its aforesaid forward motion by striking the requisite key-lever 8; but in this instance the arm 17 of the type-lever is brought forcibly against the edge of the fixed type-bar stop 23, which allows of more endwise motion to the type-bar than in the first instance, whereby the said small letter is brought over the center of the paper-roll, as indicated in Fig. 7, and the end of the type-bar in this instance has then the same vibratory motion toward and from said roll as when said capital was printed, and upon releasing the key-lever the type-bar moves back to its normal position, and the same motion is given to its type-bearing end, whereby the types are inked, as before. It should be observed that the upper spring portion of the

connecting-rod 14, the tendency of whose end which is connected to the arm 18 of the type-bar is to swing upward, causes by said tendency, the lifting of the type-bearing end of the type-bar from the paper-roll and the inking-pad, as above described. Assuming now that the operator desires to print some punctuation-mark or figure after the aforesaid small letter, the auxiliary key-lever 9 is pressed down, and by the engagement of its inner end under the movable type-bar stop 24 causes the latter to be raised, and by the engagement of said auxiliary lever 9 by its hook *x* with the primary key-lever 8 the latter is likewise made to follow the downward movement of said auxiliary lever, and consequently the type-bar which carries the said punctuation-mark or figure is given the above-described forward movement to bring said mark or figure over the center of the paper-roll 7, as shown in Fig. 4, and the type-bar is stopped in that position, and the said type is made to strike the paper, as aforesaid, by the engagement of the arm 17 with the vertical face of the ledge *c* of the movable type-bar stop 24, as shown in Fig. 4, and upon releasing the said two key-levers the type-bar moves back to the position shown in Fig. 3, the same vibratory motion taking place over the paper-supporting roll and the inking-pad, as aforesaid.

In practice the letters are connected with the primary key-levers and the marks and figures with the auxiliary levers, this being the preferable arrangement.

In the last-described operation, whereby the mark or figure is printed, it will be observed that the type-bar stop 24 is raised only to such height opposite the edge of the fixed stop 23 as will bring the ledge *c* to a position where it will arrest the movement of the type-bar by the engagement of the arm 17 with said ledge, and upon the release of the key-levers said stop resumes its normal position. To cause the last-named partial upward movement of the stop 24, the end of the lever 9 beyond its fulcrum is made considerably shorter than the corresponding end of the shifting-lever 13.

In the drawings a paper-supporting roll 7 is simply indicated in the position which, in practice, such a roll occupies—that is to say, extending in front of the end of the machine—as shown in Fig. 1, and having its upper side, upon which the printed portion of the paper which it may bear is operated upon, below the normal plane of the faces of the types or printing characters, as shown in Fig. 3. None of the ordinary supporting devices and devices for rotating said roll and causing it to have the usual longitudinal movement while printing is being done are shown in the drawings, for the reason that the roll and said devices form no part of the improvements described and claimed in the present application, and any suitable roll and devices referred to may be used in connec-

tion with the above-described type-writing mechanism.

I disclaim—

5 In a type-writer, the combination of a series of lower-case keys and levers actuated thereby, with a special capital key and lever for each lower-case key, and fulcrum for the levers located to establish and maintain proximity and correlation of the keys.

10 In a type-writer, the combination of a series of lower-case keys and levers connected therewith, with a series of special capital keys and levers—one for each lower-case key in operative relation therewith—and a common fulcrum for the two levers, whereby the operative relation of the keys is maintained.

20 In a type-writer having a type-shifting mechanism, the combination, with a special capital-key lying upon or replacing part of a letter-key, of a lever attached to the same, a fulcrum therefor coincident with that of the letter-key, and the type-shifting mechanism in operative relation therewith.

What I claim as my invention is—

25 1. In a type-writer, a horizontally-moving type-bar, a slotted guide-plate through which a supporting part of said type-bar projects, whereby said bar is maintained with its sides in substantially a vertical plane, a segmental border-plate rigidly secured to the end of said 30 guide-plate, having therein slots registering with the slots in said guide-plate, the slots in said border-plate being open at their lower edges, thereby permitting the extremities of the type-bar to vibrate downwardly in printing and inking, combined with a support for the paper on which the matter is written, arranged below the normal plane of the types, substantially as set forth.

40 2. In combination, a paper-supporting roller, an inking-pad, a longitudinally-reciprocating type-bar carrying several printing characters and having thereon two stop-arms, and two fixed stops with which said arms engage 45 at the extremities of the reciprocating movements of said type-bar, whereby the type-bearing end of said bar is given a vibratory movement over the paper-support and over the

inking-pad, and an operating-key lever, and connections between the same and said type- 50 bar for imparting said reciprocating movements thereto, substantially as set forth.

3. In combination, a horizontally-reciprocating type-bar having an arm thereon at right angles to the direction of its move- 55 ment, on which is a second arm in a line with said bar, an elbow-lever pivoted to the machine, a combined connecting rod and spring forming a connection between said right-angled arm and the elbow-lever, said spring engaging with said second arm to swing the free end of the type-bar upward, substantially as set forth.

4. The combination, in a type-writing machine, of a horizontally-reciprocating type- 65 bar, an elbow-lever pivoted to the machine, and a spring-connection between said type-bar and elbow-lever, whereby the reciprocating movements are imparted to said bar and its type-bearing end is caused to swing up- 70 ward from the inking-pad and from the paper-supporting roll of said machine, substantially as set forth.

5. In a type-writing machine, a type-bar having a longitudinally-reciprocating motion 75 and a stop-arm thereon, combined with a stop with which said arm engages, whereby the movement of said bar is arrested and its type-bearing end is swung against the paper-support of the machine, said stop being movable 80 toward and from said arm, and a lever for operating said stop, substantially as set forth.

6. In a type-writing machine, a type-bar having a longitudinally-reciprocating motion and a stop-arm thereon, combined with a stop 35 having a variable degree of movement with which said arm engages, whereby the movement of said bar is arrested and its type-bearing end is swung against the paper-support of the machine, said stop being movable to- 90 ward and from said arm, and levers for operating said stop, substantially as set forth.

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