

(No Model.)

3 Sheets—Sheet 1.

J. R. ROBINSON.
TYPE WRITING MACHINE.

No. 414,588.

Patented Nov. 5, 1889.

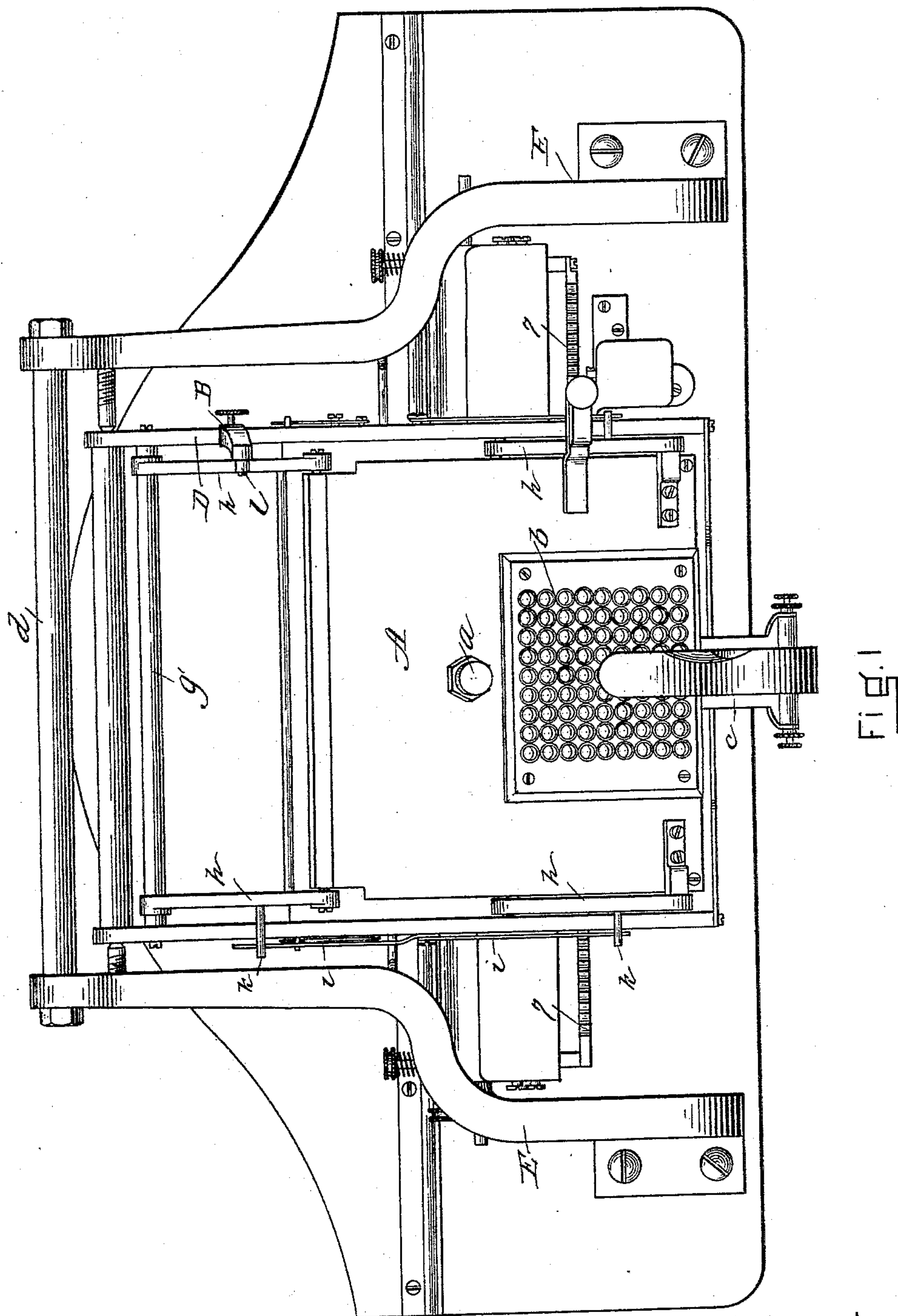


FIG. 1

WITNESSES.
J. E. Middleton
J. L. Middleton

INVENTOR
John R. Robinson
By Ellis Spear
his Attorney.

(No Model.)

3 Sheets—Sheet 2.

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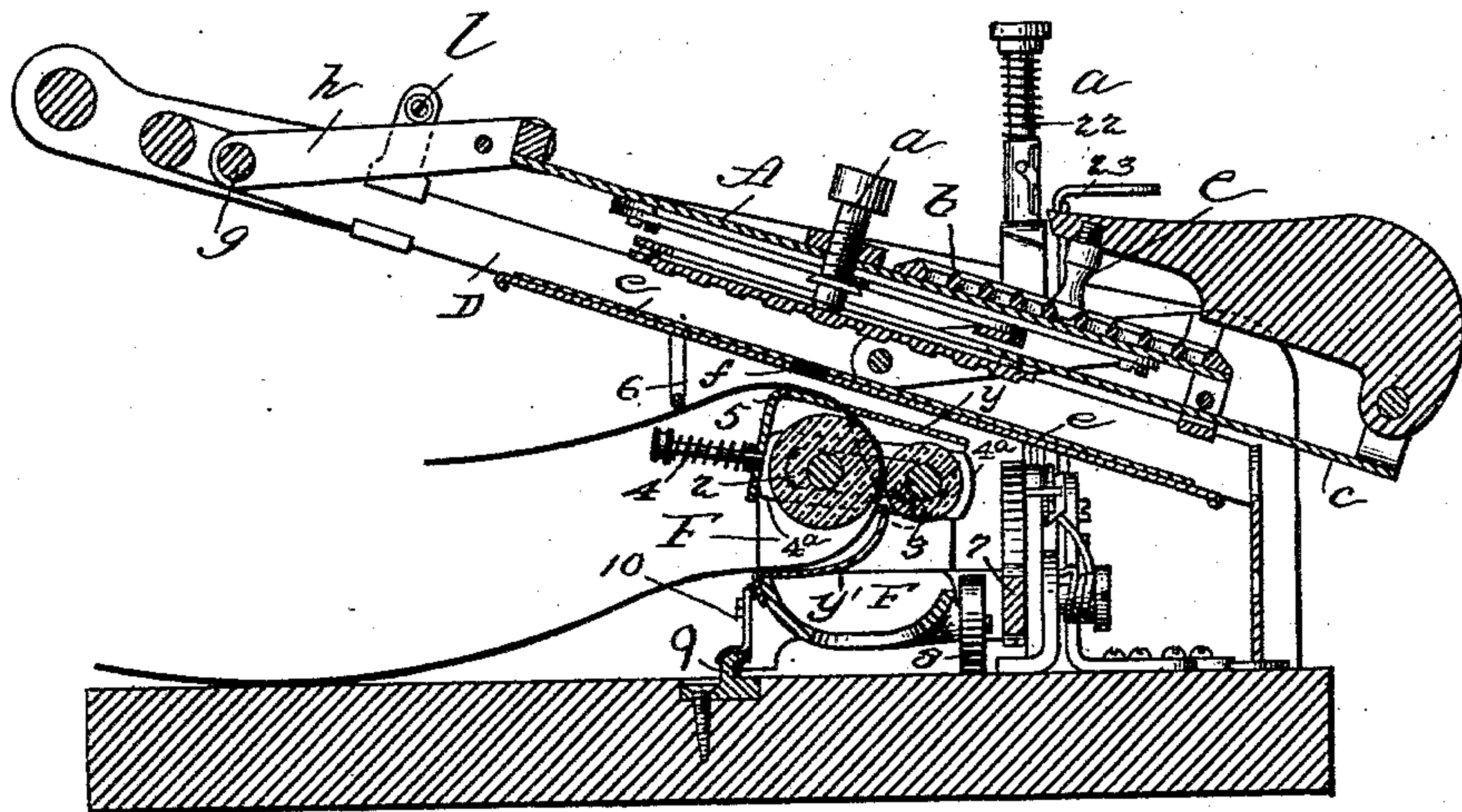


Fig. 2.

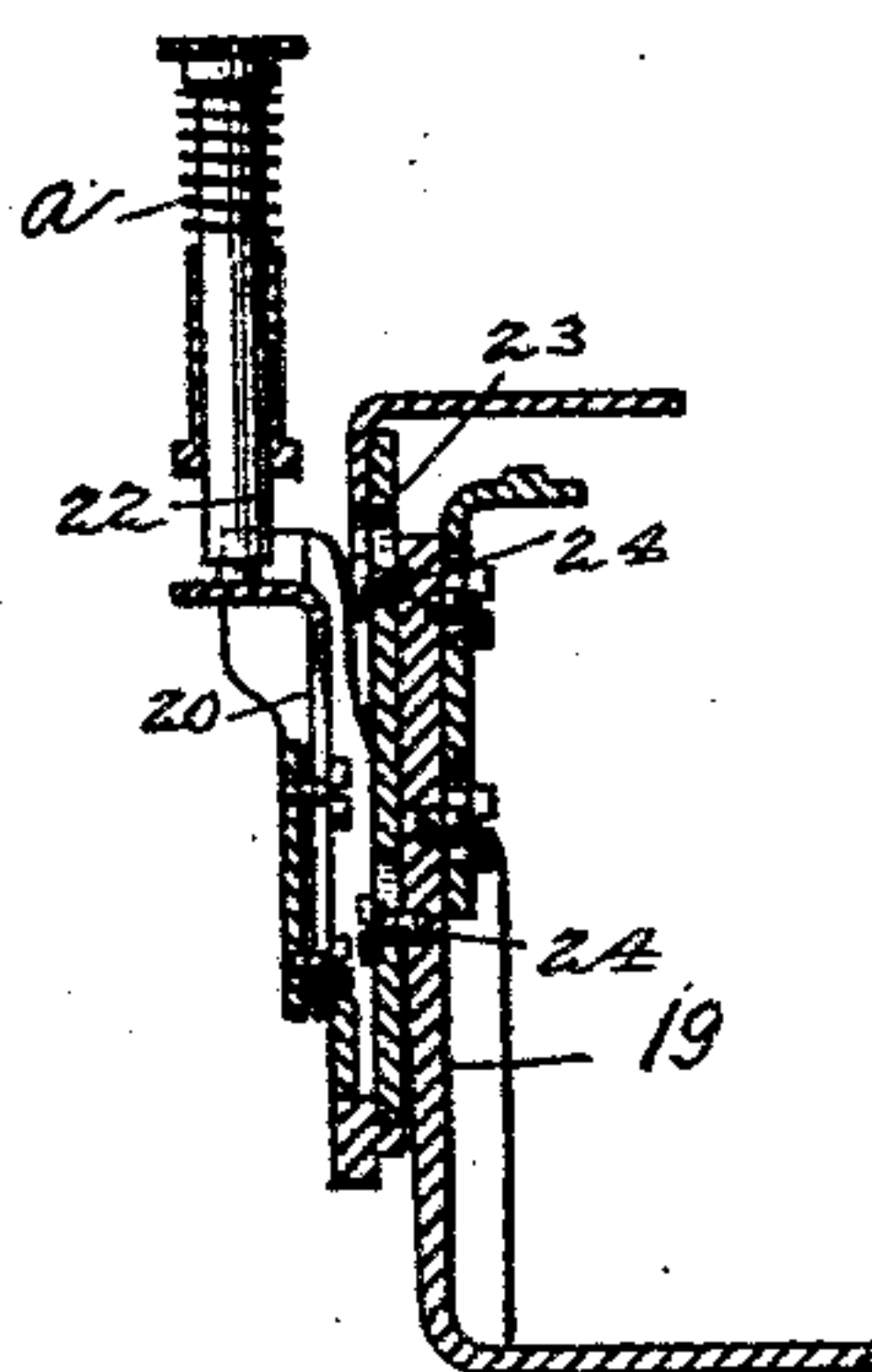


Fig. 4.

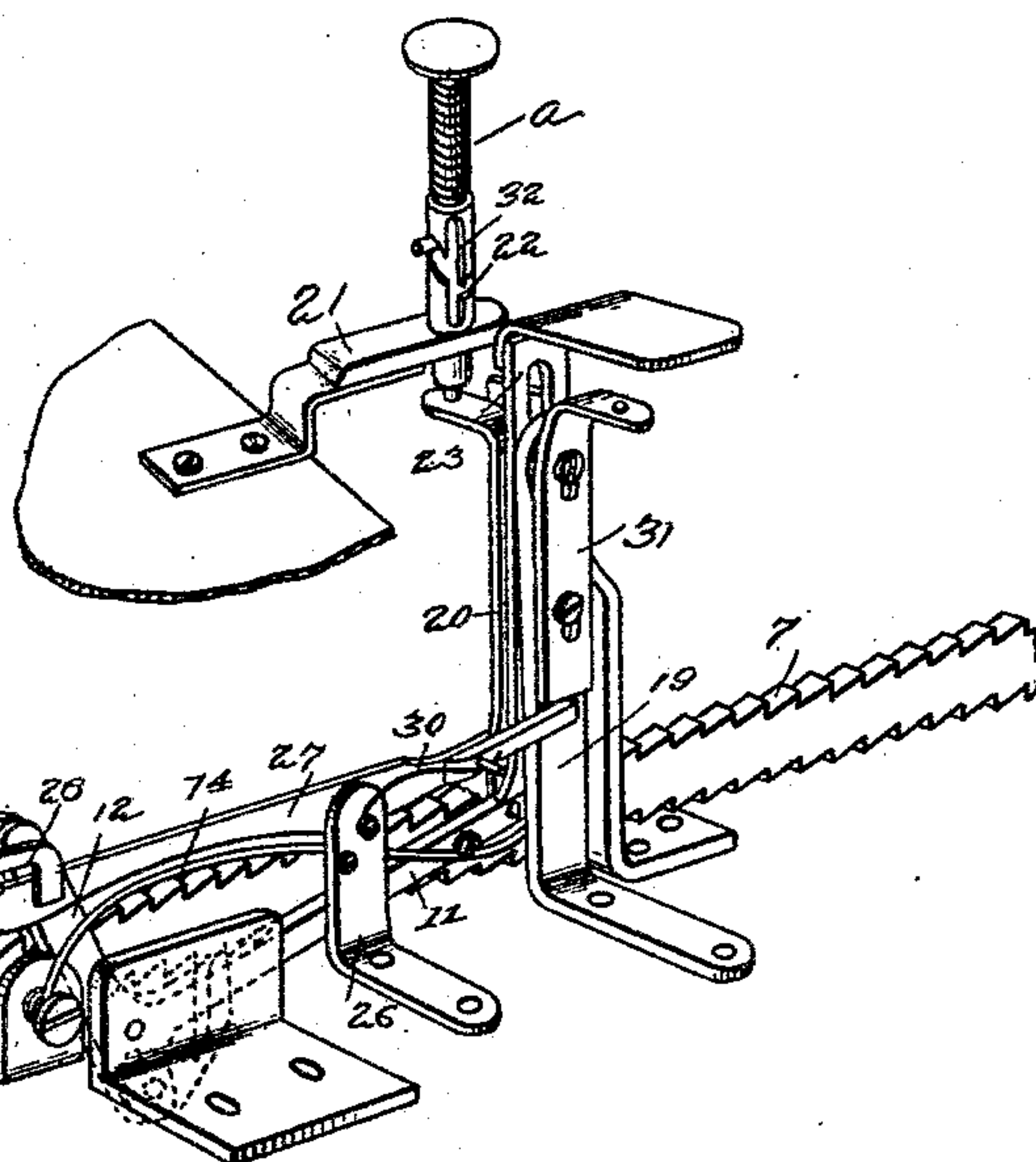


Fig. 3.

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3 Sheets—Sheet 3.

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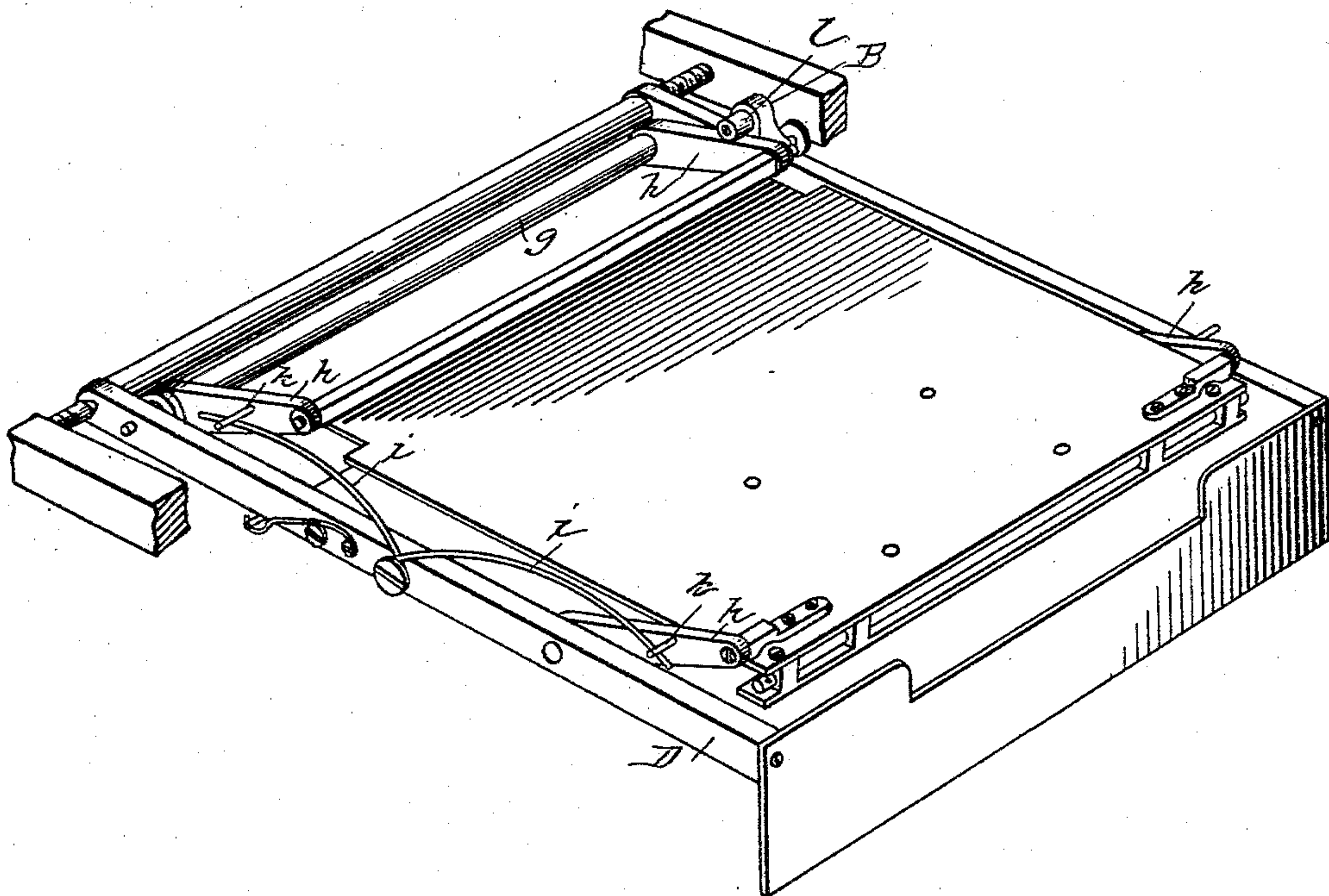


Fig. 6

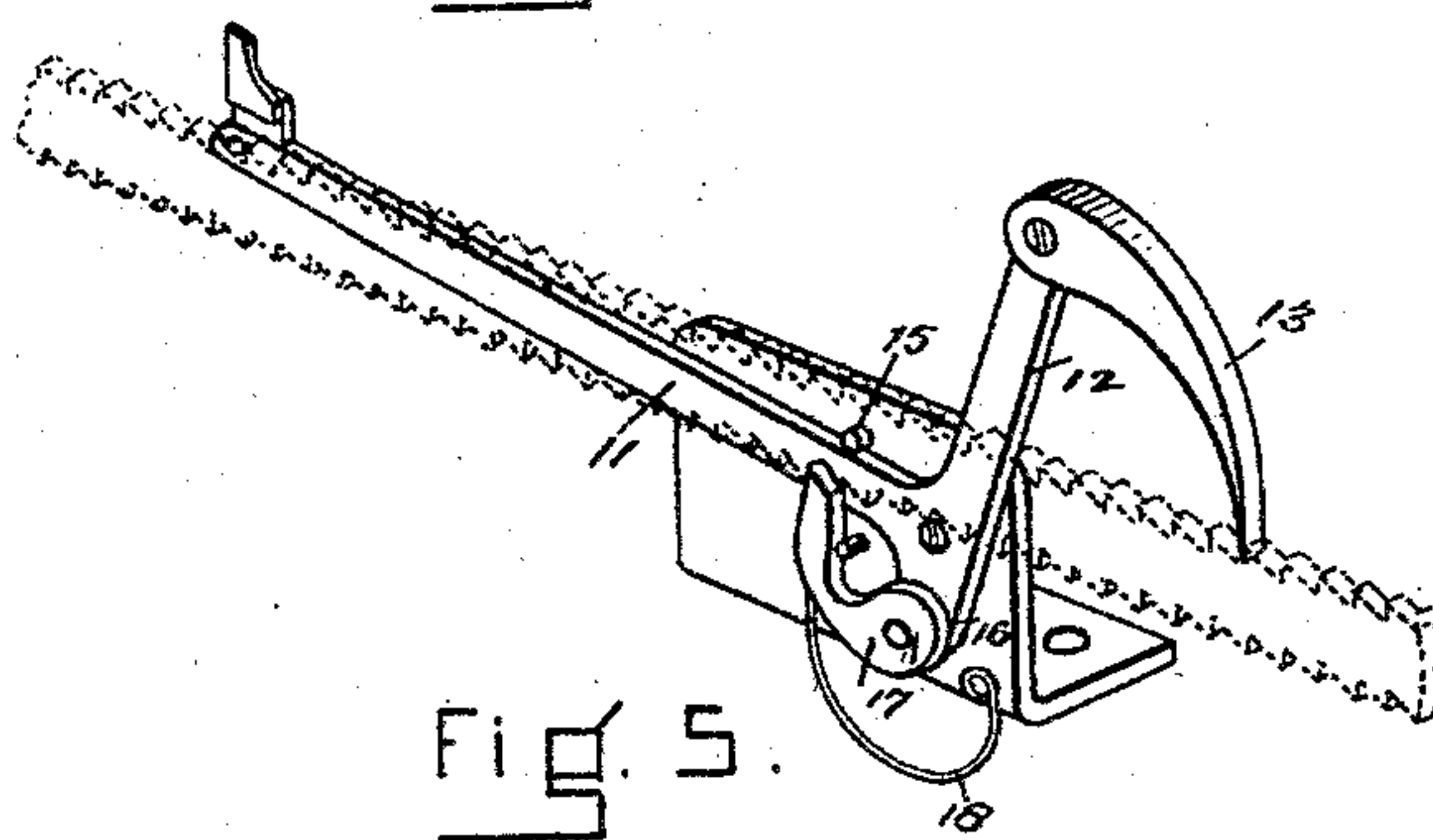


Fig. 5.

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UNITED STATES PATENT OFFICE.

JOHN R. ROBINSON, OF SALEM, ASSIGNOR, BY MESNE ASSIGNMENTS, TO
LYMAN S. HAPGOOD, OF BOSTON, MASSACHUSETTS.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 414,588, dated November 5, 1889.

Application filed April 24, 1888. Serial No. 271,681. (No model.)

To all whom it may concern:

Be it known that I, JOHN R. ROBINSON, of Salem, in the county of Essex and State of Massachusetts, have invented a new and useful Improvement in Type-Writing Machines; and I do hereby declare that the following is a full, clear, and exact description of the same.

My invention has for its object the improvement of the type-writer commonly known as "The Hall," which includes, as ordinarily constructed, a paper-holder or clip, which is stationary, and a moving printing mechanism.

In my improved writer my object is to retain the essential elements of the Hall printing mechanism; but, instead of adapting this mechanism to move, to arrange it stationary so far as longitudinal movement is concerned, and to adapt the paper-carriage to move step by step, thus securing desirable advantages hereinafter enumerated, and great economy in the manufacture of the machine, the parts omitted in this construction being particularly expensive to make and difficult to make interchangeable for different machines.

The invention consists of a pivoted frame carrying an ink-supply, and of a second plate pivoted to the first plate so as to have movement above the same, but to always occupy a position parallel therewith, with a type-form connected to said upper plate, with an indicator on the upper side thereof and a pointer connected to the type-form, and a paper-carriage adapted to have intermittent movement.

The invention further consists, in combination with a moving paper-carriage and a pivoted frame carrying the printing mechanism of a Hall type-writer, of means in connection with the pivoted printing-frame for varying the step-by-step feed of the paper-carriage.

The invention further consists, in numerous details of construction relating to the arrangement of the printing devices in connection with the pivoted frame carrying the same, to means for adjusting the movement of the printing mechanism upward in relation to its pivoted frame, in devices for regulating the feed of the paper-carriage, in devices for moving the paper-carriage, and finally in means for holding and directing the paper as it is fed beneath the printing-point.

In the drawings, Figure 1 represents a plan view of a machine embodying the Hall printing-frame with my improvements attached. Fig. 2 is a central sectional view through the machine from front to rear. Fig. 3 is a detail view of the rack-bar of the paper-carriage and the means for moving the same. Fig. 4 is a detailed sectional view showing the levers or slides for actuating the rack-bar. Fig. 5 is a further detail of the operating-pawl and the holding-pawl for the rack-bar of the paper-carriage. Fig. 6 is a perspective view of the pivoted frame carrying the printing mechanism, with the indicator and pointer removed.

In the drawings, the printing mechanism, excepting the inking-pad, is mounted upon a plate A, which is provided with a central adjustable impression-stud *a*, projecting through to the other side. An indicator *b* is secured to this plate, and provided with a series of spaces having the different letters of the alphabet, figures, and other characters arranged therein. The type plate or form, which is composed of flexible material, arranged upon a suitable frame with the letters thereof either of rubber or of hardened material secured to the rubber background, is connected by means of loosely-connected levers to the under surface of the plate A, so as to have universal movement through the medium of the pointer C, pivotally connected to a rod *c*, rigidly fastened to the frame of the type-form. These parts are identical with similar parts of the Hall machine, and the method of operation is precisely the same.

Beneath the plate A is a supporting-frame therefor, (marked D,) which carries an inking-pad with an opening in the center directly beneath the impression-point. By the movement of the pointer the letters of the type-form are thoroughly inked by contact with the pad, and when the end of the pointer is placed in the recess in the indicator corresponding to the letter which it is desired to get an impression of, the position of the pointer brings the frame into proper position so as to have the desired letter directly beneath the impression-point and in line with the opening in the bottom of the frame D, and as pressure is applied to the pointer the impression-point forces the desired letter

through the opening, and the paper beneath receives the imprint thereof.

Instead of making the type mechanism longitudinally movable, as in the Hall machine mentioned, to allow for the proper spacing of the letters, I pivot this printing mechanism in bearings which have no longitudinal movement. It is held directly in the pivoted frame D, which has suitable bearings in the arms E, which project to the rear, as shown in Fig. 1, being held together by a tie-rod *d*. The side pieces of the frame D are connected throughout its front portion by a bottom plate which supports a suitable inking-pad *e*, both the pad and bottom plate having an opening therein, as shown at *f*.

Heretofore in the use of the Hall machine it has been difficult to secure carbon copies, by reason, first, of the softness of the rubber type, and, secondly, by reason of the small amount of leverage which was permitted in the movement of the printing-surface from its normal position to the point of contact with the surface of the paper. The first objection has been overcome by the use of hardened type, or metallic type on a flexible background, and one of the objects of my invention is to overcome the second objection, which is now the most serious one. To this end, I connect the printing-frame proper (indicated at A) to its supporting-frame by means of short links, all of the same length, two connecting the front end of the plate A with the side walls of the pivoted frame D, and the other two connecting the rear end of the plate with a cross-bar *g*, carrying said links and having bearings formed in the side walls of the said frame D. These links are indicated at *h*. The front links are pivotally connected by means of screws passing into studs secured near the front edge of the plate A, and these links extend rearwardly and have a screw-connection with the side walls. As the links are of the same length, and as the rear links extend rearwardly in the same way as the front links, it will be seen that the plate A has a movement independent of the frame D; but at all times, in the varying positions of the plate, it is in a plane parallel to that of the inking-pad carried by the frame D. By means of this independent movement the plate A, which, as before described, carries the type-form, may be lifted clear of the inking-pad while being accurately guided by its parallel links, and as these links are connected to the frame D a distance away from their connection with the plate A equal to the length of the said links it will be seen that great leverage is secured, and the impact of the type upon the paper may be greatly increased over that which is possible in the present Hall machine.

The plate A is kept normally out of contact with the inking-pad by means of springs *i*, secured to the side walls of the frame D and bearing beneath pins *k* on the links *h*. In order to adjust or limit the independent

movement of the plate A, I provide a movable stud 1, held to one of the side pieces of the frame D by means of a set-screw, with its upper end carrying a roller projecting in line with one of the pivoted links *h*, and thus the upward movement of the frame is limited. The stud is adjusted by shifting it on the side pieces.

The paper-carriage is shown at F. It is composed of a suitable metal frame having end walls in which are supported, in suitable bearings, feed-rollers 2 3, the roller 2 being larger and provided upon its end with a milled thumb-nut. The smaller roller is held in adjustable bearings 4^a, which are under spring-tension by means of the projecting stems 4, threaded on their ends and carrying milled nuts with interposed springs, suitable tension thus being applied upon the rollers to increase the frictional contact of the rollers with the paper. After the paper is inserted between the rollers it is directed over a smooth surface consisting of a plate 5 overlapping a portion of the large roller and serving as a bearing for the paper when receiving the impression from the letter. Between the side standards of the machines I pivot a bent bar 6, the lower surface of which is below the level of the feed-rolls, and as the paper passes beneath the bent bar 6 it is kept away from contact with the operating parts and directed smoothly beneath the machine. A spring-clip *y*, pivoted to the end walls of the carriage, as shown in dotted lines, Fig. 2, is adapted to be swung back to disclose the bite of the feed-rolls to receive the paper, and after the paper is in place to be pushed forward, thus holding the paper firmly in position and down close upon the plain surface 5, before referred to. This clip has a beveled edge, which may also serve as a paper-cutter to tear off portions of the paper.

The carriage F is provided with a light metal frame having a rack-bar 7 on its front side, with a space between this rack-bar and the lower part of the frame, and in this space I provide two supporting-wheels 8, which serve to support the front side of the carriage. For the rear of the carriage I provide a track 9, on which bear flanges 10, extending from the rear of the machine, as shown in Fig. 2. The frame of the machine beneath the large roller is provided with a curved metal plate which serves to direct the paper to the bite of the rollers and at the same time keeps it free from grease or oil.

The paper-carriage moves freely from left to right, its extreme movement in this direction being limited by means of any suitable fixed stop on the base (not shown) coming in contact with one of the bearing-flanges on the rear of the carriage. Its movement in the opposite direction is step by step to allow for the printing of letters alongside each other, and the mechanism for thus feeding forward the carriage I will now describe. The rack-bar which I have referred to has teeth upon

its upper edge extending its whole length, and teeth upon its lower edge extending its whole length, but in an opposite direction. Upon a bracket fixed in the base of the machine I provide a lever 11, which has an upwardly-projecting arm 12, carrying a pawl 13, pivoted thereto and engaging with the teeth on the upper edge of the rack. The long arm 11 extends rearwardly and is held normally up with the pawl 13 in engagement with the rack by means of a spring 14, supported upon a post connected to the base of the machine, and extends beneath a projection on the said arm 11. A stop 15 on the supporting-bracket limits the upward movement of said arm. The arm 11 has a downwardly-depending portion beneath its pivot, (marked 16,) to which is pivoted a second pawl 17 under spring-tension through a spring 18, fastened to the bracket and bearing against the end of said pawl, so as to keep it constantly in engagement with the under teeth of the rack-bar, and thus prevent the free movement of the paper-carriage from right to left, this movement being only permitted on the depression of the long arm 11, which, as it carries the pawl 17, will, when it is so depressed, depress the pawl with it, and thus disengage it from the teeth of the rack-bar. I have provided means for moving the carriage step by step through the depression of the plate A, carrying the type-form, and also by means of an independent lever, which provides for the proper spacing between words, the movement of the paper-carriage through the depression of the plate A providing for the spacing for letters. Upon a post 19, supported from the base-plate, I arrange a slide 20, supported loosely upon said post and bearing directly upon the end of the arm 11, being held in its highest position upward by said arm through its spring. In a bracket 21, extending from the plate A, I arrange a pin 22, the end of which is in line with the turned-over end of the slide 20, as shown in Fig. 3, and in the depression of the plate A in the printing operation the point of the pin 22 comes in contact with the slide, depressing the same, which in turn depresses the arm 11, lifts the pawl 13, and causes it to engage with another tooth, and as the movement ceases the spring 14, which has been compressed, exerts itself and feeds the carriage forward one step.

For operating the carriage forward to form spaces between words I provide a slide 23, which is supported by pins 24, passing through slots in said slide to the post 19. This slide terminates in a finger-plate arranged at right angles to the body of the slide and adapted to be operated upon to effect the movement of the carriage. A spring keeps this slide normally in a raised position. The lower end of the slide bears upon a projection on the arm 11 of the operating-lever, and in the depression of the slide operates precisely in the manner of the slide 20 to depress the arm 11, and thus feed forward the carriage. The carriage

is fed forward, as has been described, by the pawls and its operating-lever from right to left, and in order to allow it to be pushed back from left to right to begin a new line I provide the following means for lifting the pawl 13 out of engagement with the teeth of the rack-bar. Upon a post 26, I pivot a lever 27, having at its forward end a slot 28, which is adapted to receive a pin 29, projecting from the pawl 13 in front of the pivot-point of said pawl. A spring 30 bears against a pin on the rear end of the lever 27, and tends to keep it normally in a raised position with the front end depressed, thus offering no obstruction to the proper and regular operation of the pawl 13. Loosely connected to the post 19 is a slide 31, the lower end of which is in line with and bears upon the rear end of the lever 27, this slide being kept in a raised position normally by the tension exerted by the said lever through its spring. By depressing the slide 31, either independent of the spacing mechanism or by forcing the finger-plate of the spacing-slide down, so as also to depress the slide 31, the forward end of the lever 27 is raised, which lifts the pawl 13 out of engagement with the teeth and allows the carriage to be moved back to its extreme position on the rack.

In order to allow for greater or less movement of the paper-carriage on the depression of the printing mechanism in case one, two, or more spaces are required between letters, I provide a sleeve as a bearing for the pin 22, the said pin having a finger-piece on its upper end, with a spring interposed between said finger-piece and the upper end of the sleeve. The sleeve has a vertical slot 32 in one side, with two branch slots extending at an angle therefrom and in connection therewith, one inclining upward and the other inclining downward. A projection on the spacing-pin 22 is adapted to engage with these slots and to regulate the position of the spacing-pin.

I claim as my invention—

1. The combination, with a pivoted printing-frame carrying the type-form and ink-supply, and operating means therefor, of a paper-carriage having a rack-bar, and means independent of said carriage for operating the same, consisting of a pawl for engaging the rack, a pivoted lever carrying said pawl and having a long arm extending to the rear, a spring for holding the long arm of said lever in a raised position, and a slide in connection with the long arm of the lever for depressing the said lever against the pressure of its spring, whereby in the upward movement of the said lever the carriage is advanced one step to form a space, substantially as described.

2. The combination, with a paper-carriage having a rack, of a pivoted lever, a pawl carried thereby and engaging said rack, said lever having a long arm extending to the rear, a spring for holding the long arm of

said lever in a raised position, a slide in connection with the lever, a pivoted printing-frame, and a spacer connected to the pivoted printing-frame and extending in line with the operating-slide, substantially as described.

3. In combination, a paper-carriage, means for operating the same step by step, an actuating-slide in connection with the operating means, a pivoted printing mechanism, as described, and an adjustable spacing-pin carried upon the pivoted plate of the printing mechanism and arranged in line with the operating-slide, and adapted to engage therewith to feed the carriage forward step by step, substantially as described.

4. In combination with the carriage for the paper, a rack carried thereby, operating means therefor, a slide in connection with the operating means, a pivoted plate carrying the type-form, and a spacing-pin supported from said plate in line with the operating-slide, said pin being fitted to work under spring-tension within a bearing having a series of slots therein, the pin engaging with said slots through a projection carried thereby, whereby the said spacing-pin may be adjusted in different positions, so as to cause the carriage to feed more or less at each depression, substantially as described.

5. In a type-writer, and in combination with the printing mechanism, a paper-carriage carrying a rack-bar upon one side, a pawl in engagement with said rack, a pivoted lever carrying said pawl and having one end under spring-tension to keep the pawl in engagement with the rack, a spacing-slide adapted to depress the end of said lever to allow the spring to react and feed forward the carriage, a second lever 27, pivoted upon a suitable supporting-post having one end in connection with the operating-pawl, and a slide 31, in connection with the other end of said lever 27, said slide being arranged beneath the spacing-slide, whereby in the depression of said spacer to its lowest extent the slide 31 is operated to elevate the forward end of the lever 27 to lift the pawl 13 out of engagement with the rack, thus allowing the carriage to be returned for a new line, substantially as described.

6. In a type-writer, and in combination with the printing mechanism, substantially as described, a paper-carriage carrying a rack-bar having teeth on its upper and lower edges, reversely set, a pivoted lever 11, carrying a pivoted pawl 13 upon its upper end for operating the carriage forward, and a second pawl 17, under spring-tension, pivoted to the lower end of the operating-lever and in engagement with the teeth on the lower edge of the rack, with means for operating the lever 11, the parts being so arranged that the lower pawl 17 will hold the carriage against free movement toward the left except when the lever 11 is depressed to feed forward the carriage, substantially as described.

7. In a type-writer, a pivoted frame D, carrying an inking-pad, and a frame or plate carrying a printing-form pivoted to said frame at front and rear, so as to have movement independent thereof, but always in a plane parallel therewith, substantially as described.

8. In combination, a pivoted frame carrying an inking-pad, and a type frame or plate pivoted thereto by link-connections, whereby the said type plate or frame has independent movement by reason of its link-connection, the position of the plate being always parallel to the inking-pad, substantially as described.

9. In combination, a pivoted frame carrying an inking-pad, a type plate or frame pivoted thereto by link-connections, as described, and interposed springs between said plate and its pivoted frame, substantially as described.

10. In combination, a pivoted frame carrying an inking-pad, a type-plate carrying a printing mechanism, link-connections between the frame and plate, whereby the said plate has independent movement, and a stud for limiting said movement, substantially as described.

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

JOHN R. ROBINSON.

Witnesses:

FRANK G. WOODBURY,
W. W. DAVIS.