

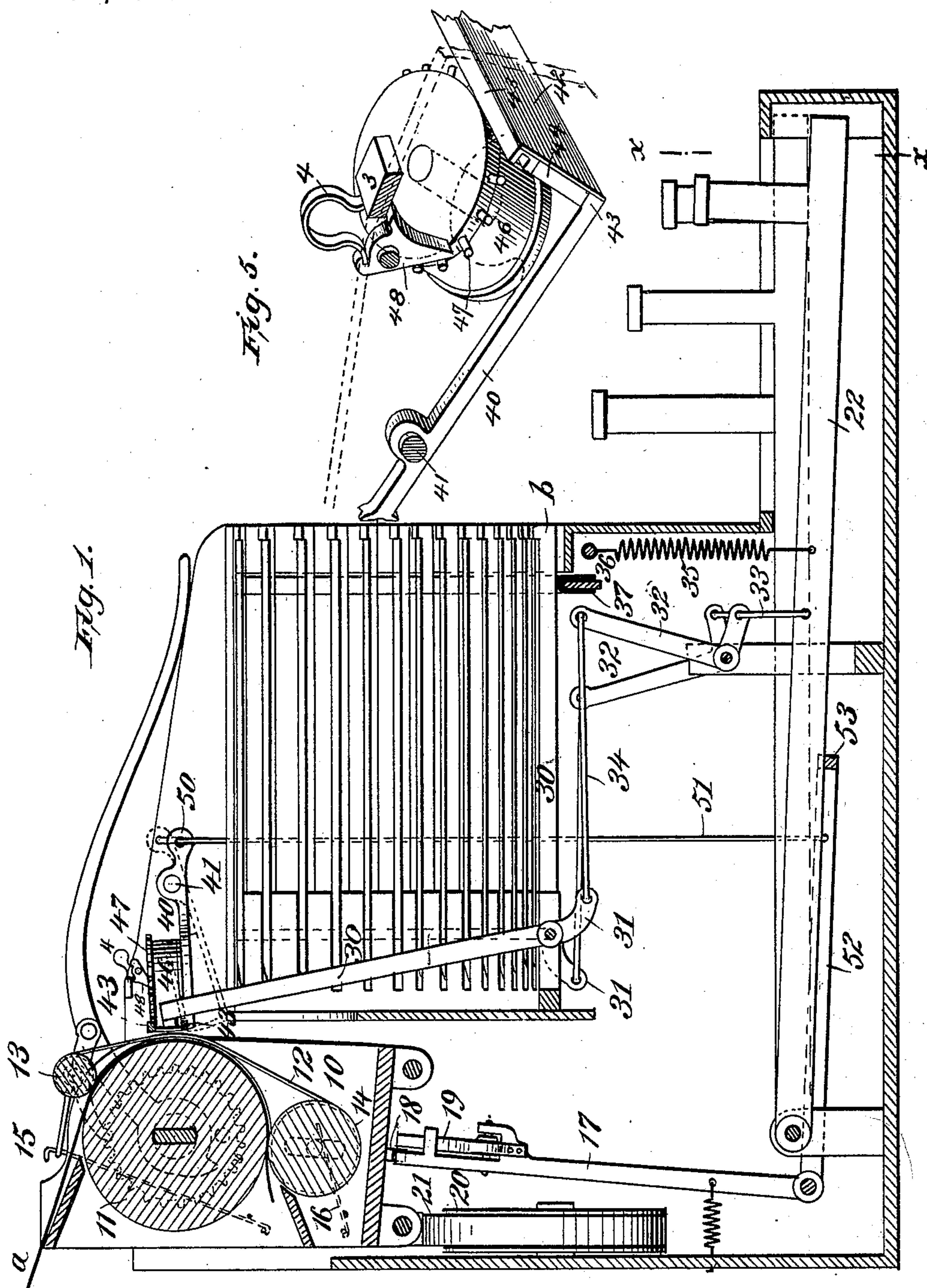
(No Model.)

3 Sheets—Sheet 1.

A. GRUNDY.
TYPE WRITING MACHINE.

No. 404,833.

Patented June 11, 1889.



WITNESSES:

Dom Twitchell
C. M. Clark

INVENTOR:

Arthur Sundry
BY *Mumme*

ATTORNEYS.

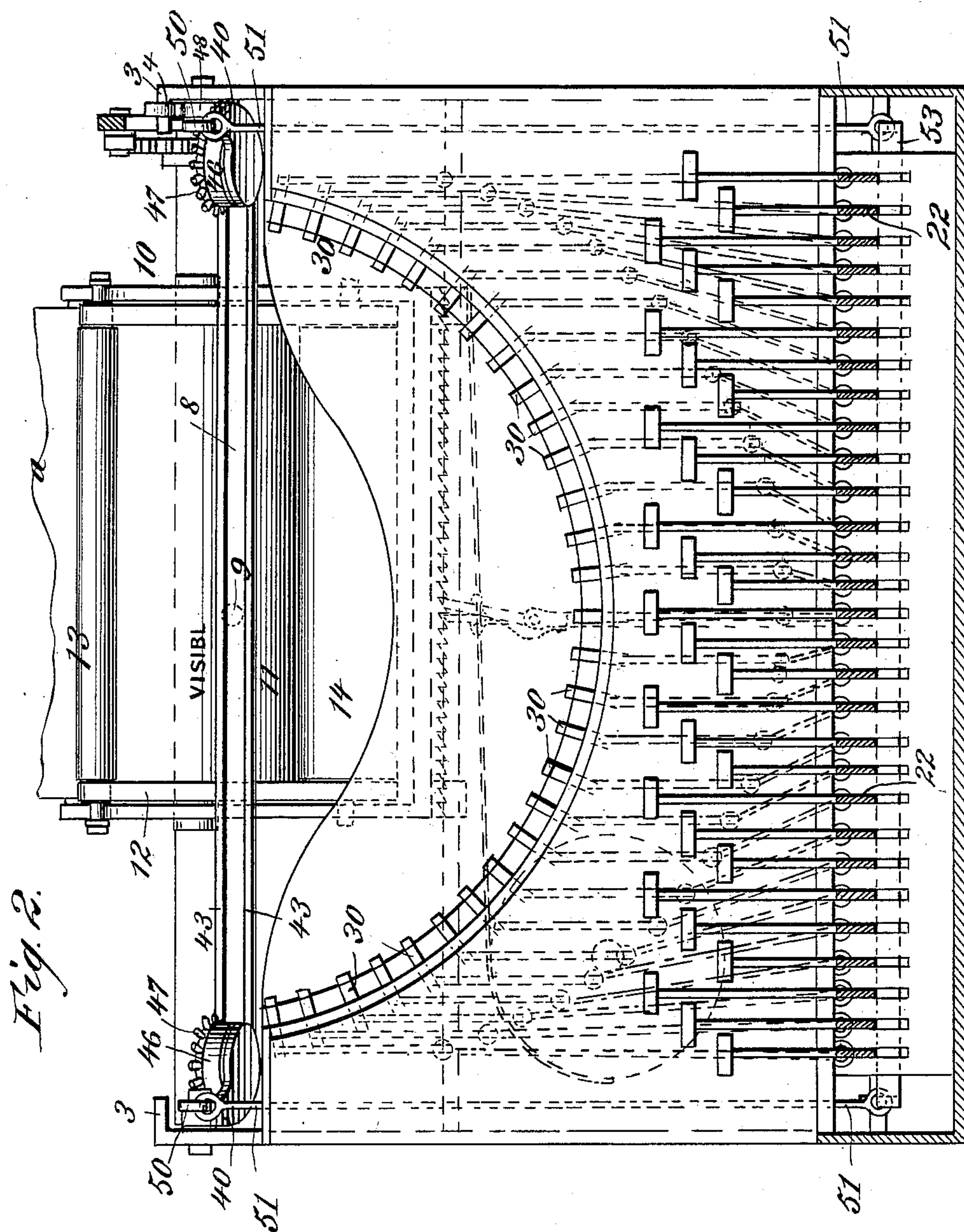
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3 Sheets—Sheet 2.

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3 Sheets—Sheet 3.

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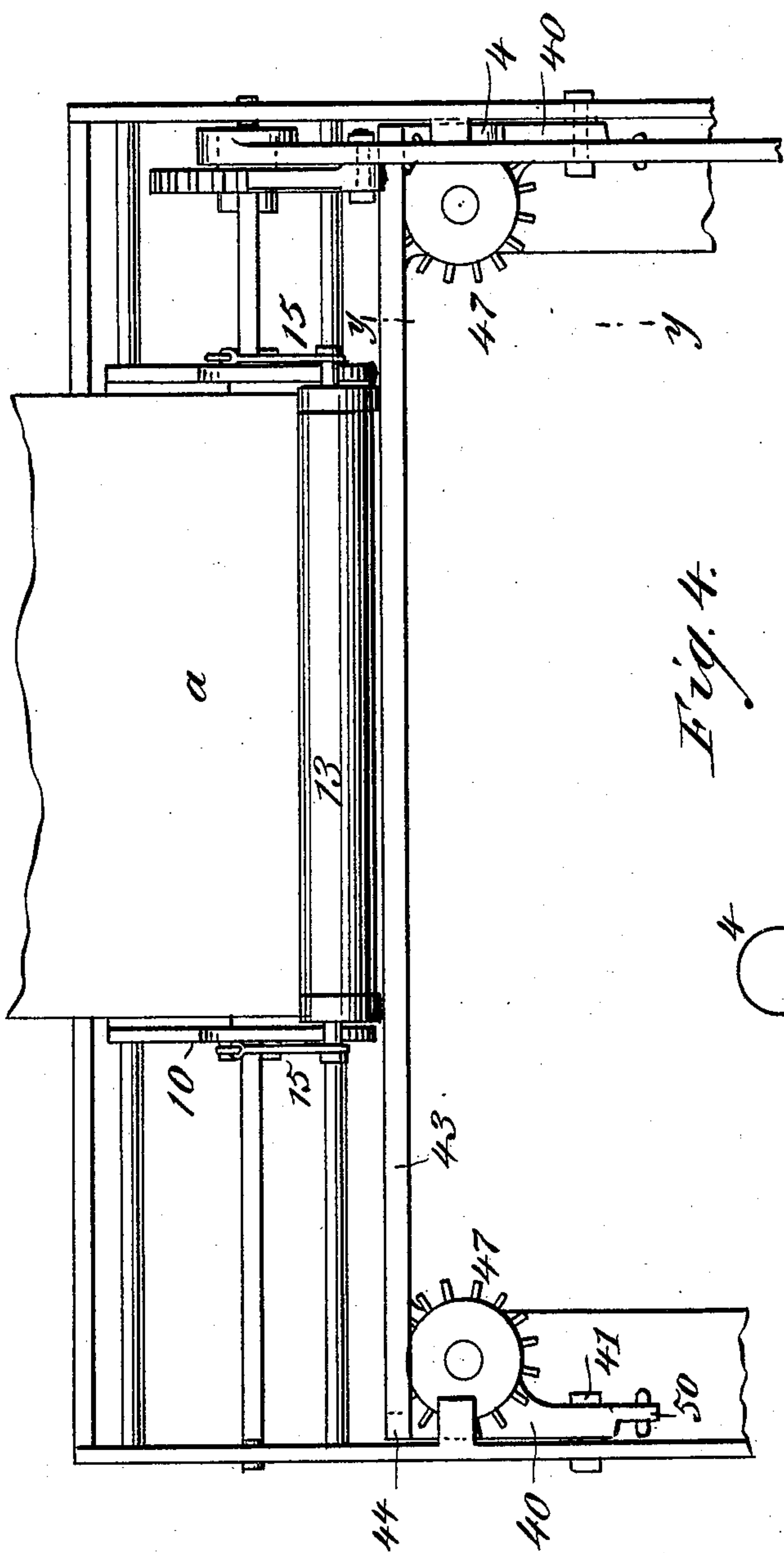


Fig. 3.

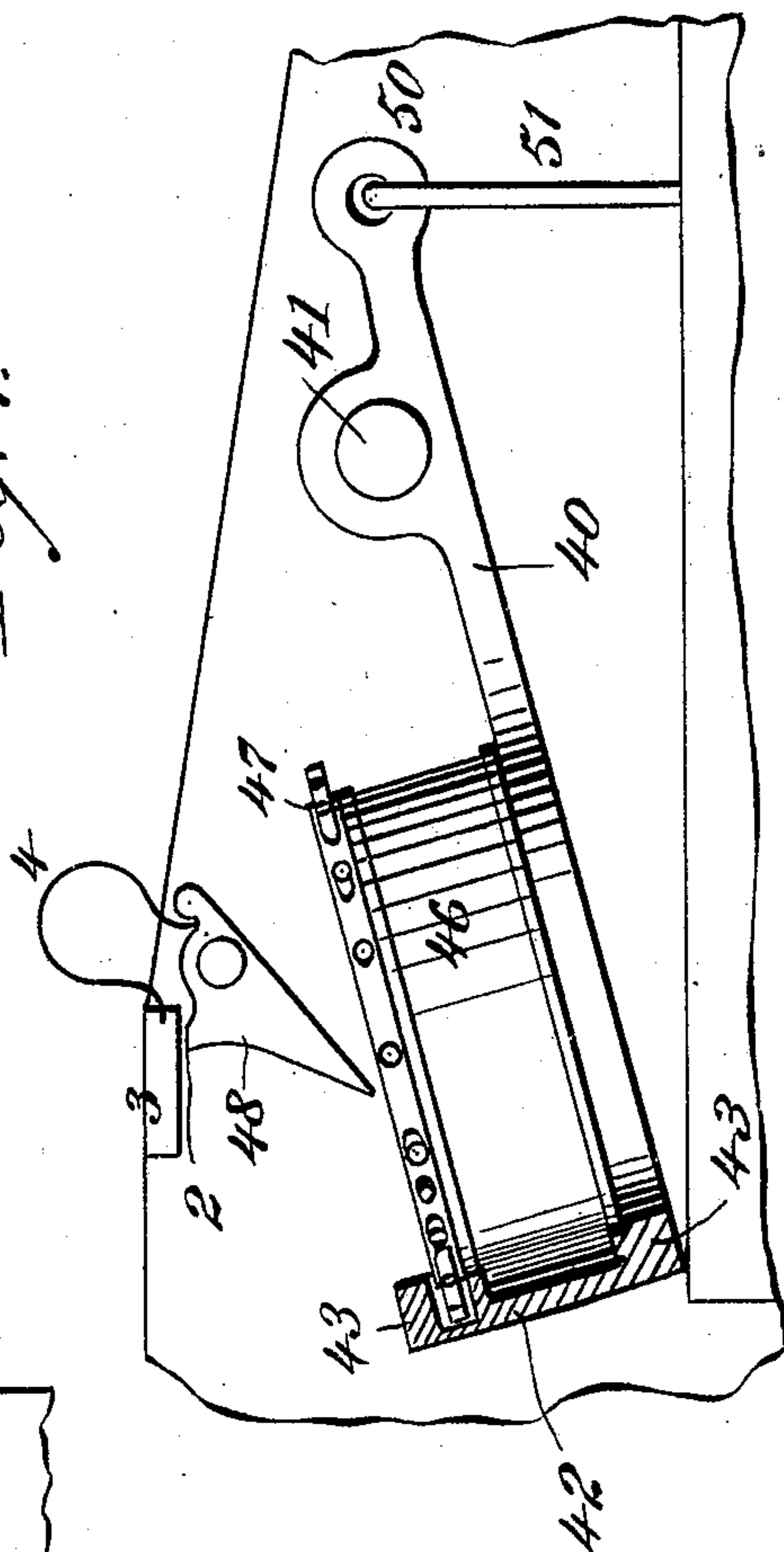


Fig. 4.

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UNITED STATES PATENT OFFICE.

ARTHUR GRUNDY, OF WHITESTONE, NEW YORK.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 404,833, dated June 11, 1889.

Application filed January 18, 1887. Serial No. 224,692. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR GRUNDY, of Whitestone, in the county of Queens and State of New York, have invented a new and Improved Type-Writing Machine, of which the following is a full, clear, and exact description.

My invention relates to type-writing machines, the main object of the invention being to expose the line of print after each impression made by the type-arms, which object I accomplish by means of the novel parts and combinations of parts hereinafter described, and specifically pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures of reference indicate corresponding parts in all the views.

Figure 1 is a central vertical cross-sectional view of the machine, one of the type-arms being represented in the striking position. Fig. 2 is a front view of the machine, the key-levers being, however, shown in section taken on line *xx* of Fig. 1. Fig. 3 is a plan view of the carriage and tilting ribbon-frame. Fig. 4 is an enlarged detail view of the tilting ribbon-frame, which frame is shown in section taken on the line *yy* of Fig. 3; and Fig. 5 is a detail perspective view, partly broken away and partly in section.

In the type-writing machines which have heretofore been placed upon the market it has been necessary for the operator to raise the carriage, or at least the impression-cylinder, in order to obtain a view of the line of print, thus causing considerable delay each time the line of print is viewed, owing to the necessary stoppage of the printing action.

With my improved machine, however, the line of print is exposed after each impression made by the type-arms, and the operator is consequently enabled to immediately detect any error made in the printing of the text. The exposing of the line of print is brought about primarily by mounting the inking-ribbon upon a tilting frame, which is raised to printing position at every throw of the type-arms, which said type-arms are arranged and organized so that the several type carried thereby will be thrown to a common center, the said type-arms being preferably arranged

in a semicircular line below the common center to which the arms are thrown.

Referring now, briefly, to the construction illustrated in the drawings above referred to, 10 is the carriage; 11, the impression-cylinder to which the sheet *a* is held by tapes 12, which pass about rollers 13 and 14, said rollers being held in yielding contact with the peripheral face of the impression-cylinder by springs 15 and 16, the carriage 10 being fed by a feeding-lever 17, which engages with a rack 18, fixed to the under side of the carriage, said lever being provided with a spring-tongue 19, which acts in the usual well-known manner in connection with the rack, the carriage being returned to its normal position against the tension of a spring-drum 20, to which the carriage is connected by a strap or band 21, the lever 17 being actuated, as usual, by the key-levers 22.

The type-arms 30 are mounted in a curved plane in advance of the carriage, each type-arm extending forward from its pivotal connection in a line that is substantially horizontal, connection between the short arms 31 of the type-arms and the key-levers 22 being established by means of bell-crank levers 32, vertical connecting-rods 33, which extend from the short arms of said key-levers to the bell-crank levers, and connecting-rods 34, which connect the long arms of the bell-crank levers with the short arms of the type-arms. In connection with each of the key-levers I arrange a spring 35, which springs act to hold the type-arms in the position shown at *b* in Fig. 1, the lower edges of the arms resting upon a curved bar 36, that is covered with a rubber cushion 37.

Above the type-arms, and to each side of the main frame or case of the machine, I mount lever-arms 40, (see Fig. 5,) which are pivotally connected to the said main frame or case by studs, pins, or bolts 41, and these arms are connected by a metallic plate 42, which is made integral with or rigidly connected to strengthening-ribs 43, the lower rib being connected directly to the lever-arms 40, while the upper strip is connected to posts 44, that are carried by said arms.

Upon each of the arms 40, I mount a ribbon-spool 46, that is provided with a toothed

wheel 47, and in order that the type-ribbon which is carried by the spools 46 may be advanced at each throw of the ribbon-supporting frame I mount an inclined-faced pawl 48 in position to engage with the teeth of one of the wheels 47, said inclined-faced pawl being pivotally mounted and provided with a shoulder 2, that is normally held against a stop 3 by an exceedingly light spring 4, which spring is arranged as best shown in Figs. 4 and 5.

The arms 40 are provided with forwardly-extending short arms 50, which are engaged by vertical connecting-rods 51, the lower ends of which rods 51 are connected to the forwardly-extending side bars 52, by means of which the feed-lever 17 is thrown, said arms 52 being connected by a cross-bar 53, which extends from side to side of the machine beneath the key-levers, as best shown in Figs. 1 and 2. In the center of the plate 42 there is formed an aperture 9, in front of which the inking-ribbon, which is shown at 8, passes, the ends of the ribbon being secured to the spools 46.

Such being the general construction of the machine, the operation is as follows: Paper is inserted in the usual way, assuming the position indicated in Fig. 1, when, if any one of the key-levers be depressed, the bell-crank lever 32, arranged in connection therewith, will be thrown, as indicated, in connection with the first lever shown in Fig. 1, and as the bell-crank lever is so moved the type-arm will be moved upward to the position in which the first type-arm is shown in said figure, and at the same time that the key-lever 22 is depressed the side bars 52 will be carried down and the ribbon-supporting frame will be raised to the position in which it is shown in full lines in Fig. 1, the type carried by the type-arm striking against the ribbon directly in front of the aperture 9 of the plate 42, forcing the ribbon against the paper *a*, and immediately upon the removal of the finger from the key-lever 22 the spring 35 will act to return the lever to its normal position and the type-arm will drop back against the rubber-faced curved bar 36, the ribbon-frame at this time dropping back to the position indicated by dotted lines in Fig. 1, which position is shown in full lines in Figs. 4 and 2, and as the ribbon-frame so drops back the line of print will be in plain view of the operator, as indicated by the letters "visibl" shown in Fig. 2, the feeding of the carriage being brought about by means of any of the well-known feeding mechanisms—such, for instance, as the one illustrated in the drawings and partially described herein.

It will be noticed that the arms 40 are rigidly connected, and in the claims to be hereinafter presented the parts so rigidly connected will be called a "tilting ribbon-frame."

Having thus fully described my invention, I claim as new and desire to secure by Letters Patent—

1. In a type-writing machine, the combination, with the type-arms and their operating-levers, of a tilting frame, ribbon-spools mounted on said tilting frame, and intermediate mechanism, substantially as described, for operating the tilting frame from the type-operating levers, as and for the purpose specified.

2. In a type-writing machine, the combination, with the type-arms and their operating-levers, of a tilting frame operated by the type-operating levers, ribbon-spools mounted on the tilting frame, and means, substantially as described, for turning the ribbon-spools at each throw of the said tilting frame, as specified.

3. In a type-writing machine, the combination, with the carriage and means for operating the same, of pivoted type-arms, a tilting frame, ribbon-spools mounted on said tilting frame, and a connection, substantially as described, between the said tilting frame and the carriage-operating mechanism, as set forth.

4. In a type-writing machine, the combination, with the main frame, of a tilting frame pivoted thereto, a ribbon-spool mounted on the said tilting frame, and a pawl on the main frame engaging the ribbon-spool to turn it at each throw of the said tilting frame, substantially as described.

5. In a type-writing machine, the combination, with the main frame, of pivoted key-levers, pivoted type-arms, a tilting frame, ribbon-spools on the said tilting frame, toothed wheels carried by the spools, a spring-pressed pawl arranged in connection with one of the toothed wheels, and means, substantially as described, for operating the type-arms and tilting frame from the key-levers, substantially as specified.

6. In a type-writing machine, the combination, with the levers 22, of the type-arms 30, arranged in front of the carriage in a curve about a common center and pivoted a short distance from one end, the crank-levers 32, the rods 34, connected to long arms of the crank-levers and to the short arms of the type-arms, the rods 33, connecting the short arms of the crank-levers to the levers 22, and the springs 35 for returning the type-arms to their normal positions, substantially as described.

7. In a type-writing machine, the combination, with the carriage and its operating-frames 52 and 53, of the type-arms 30, the key-levers 22, intermediate mechanism, substantially as described, between said levers and type-arms, the pivoted ribbon-carrying frame 40, and the connection 51 between the ribbon-frame and the frames 52 and 53, substantially as described.

ARTHUR GRUNDY.

Witnesses:

E. TAPSCOTT,
JAS. H. BURNSIDE.