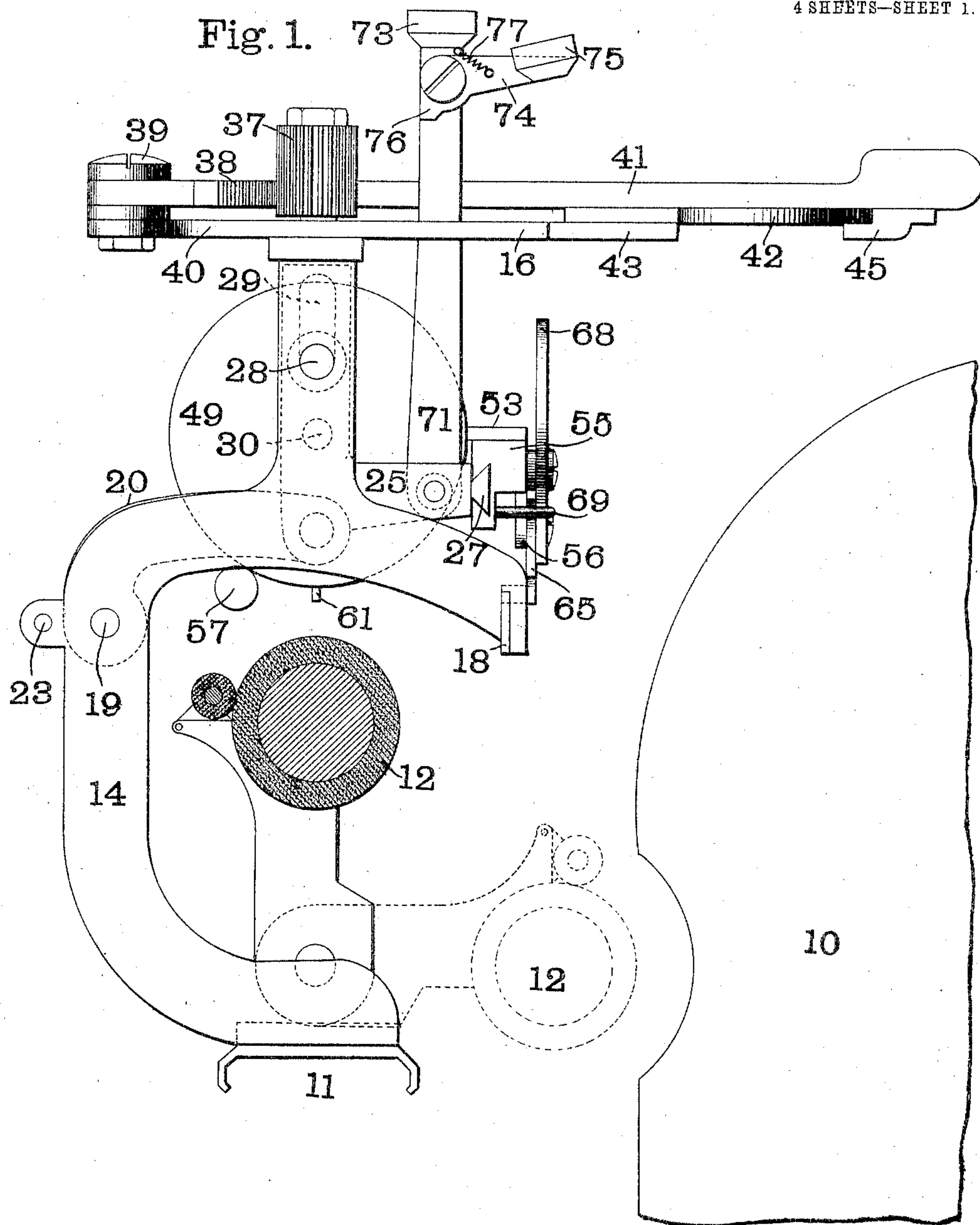


No. 779,992.

PATENTED JAN. 10, 1905.

E. B. CRAM.  
TYPE WRITING MACHINE.  
APPLICATION FILED DEC. 21, 1903.

4 SHEETS—SHEET 1.



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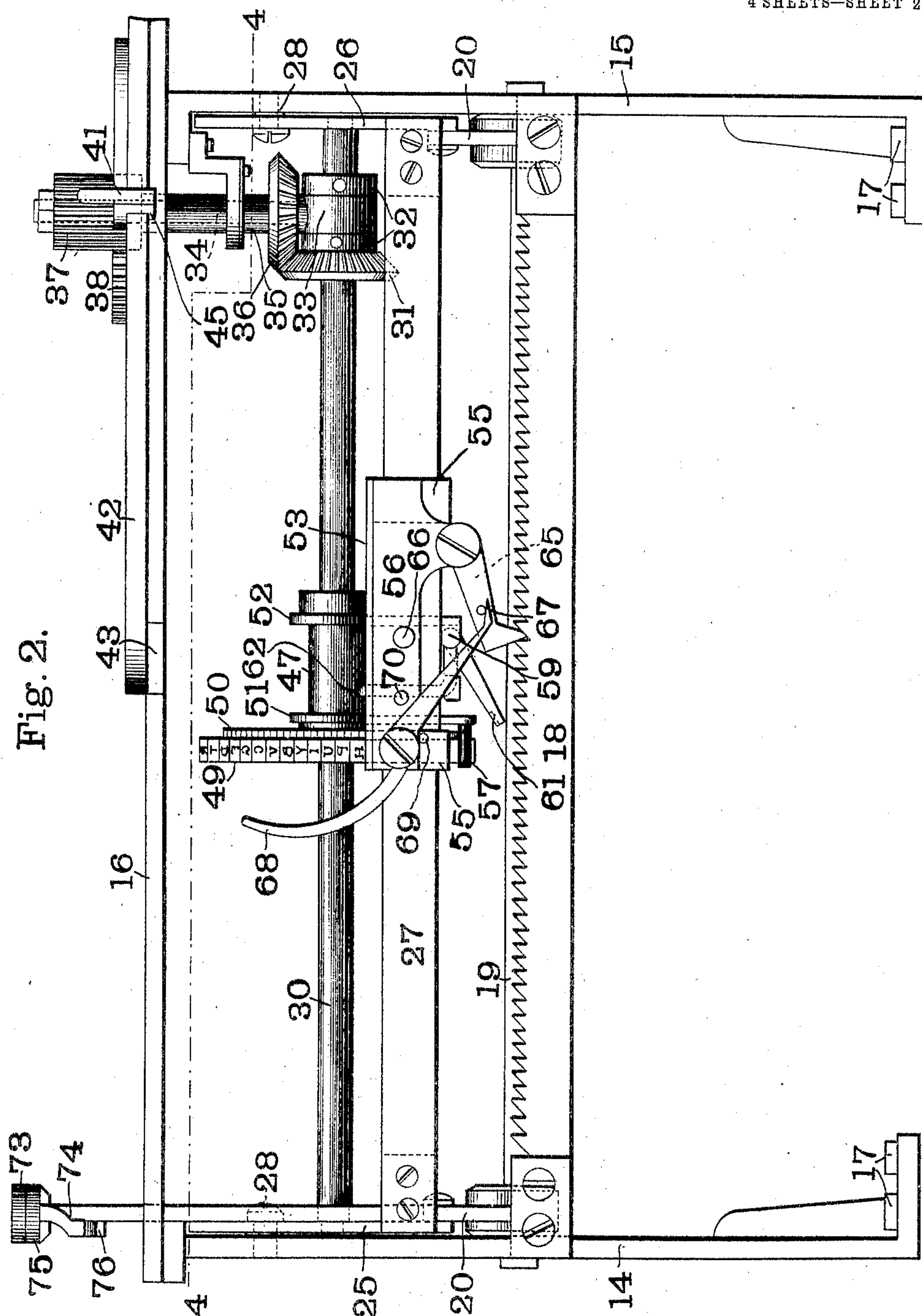
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4 SHEETS—SHEET 2.



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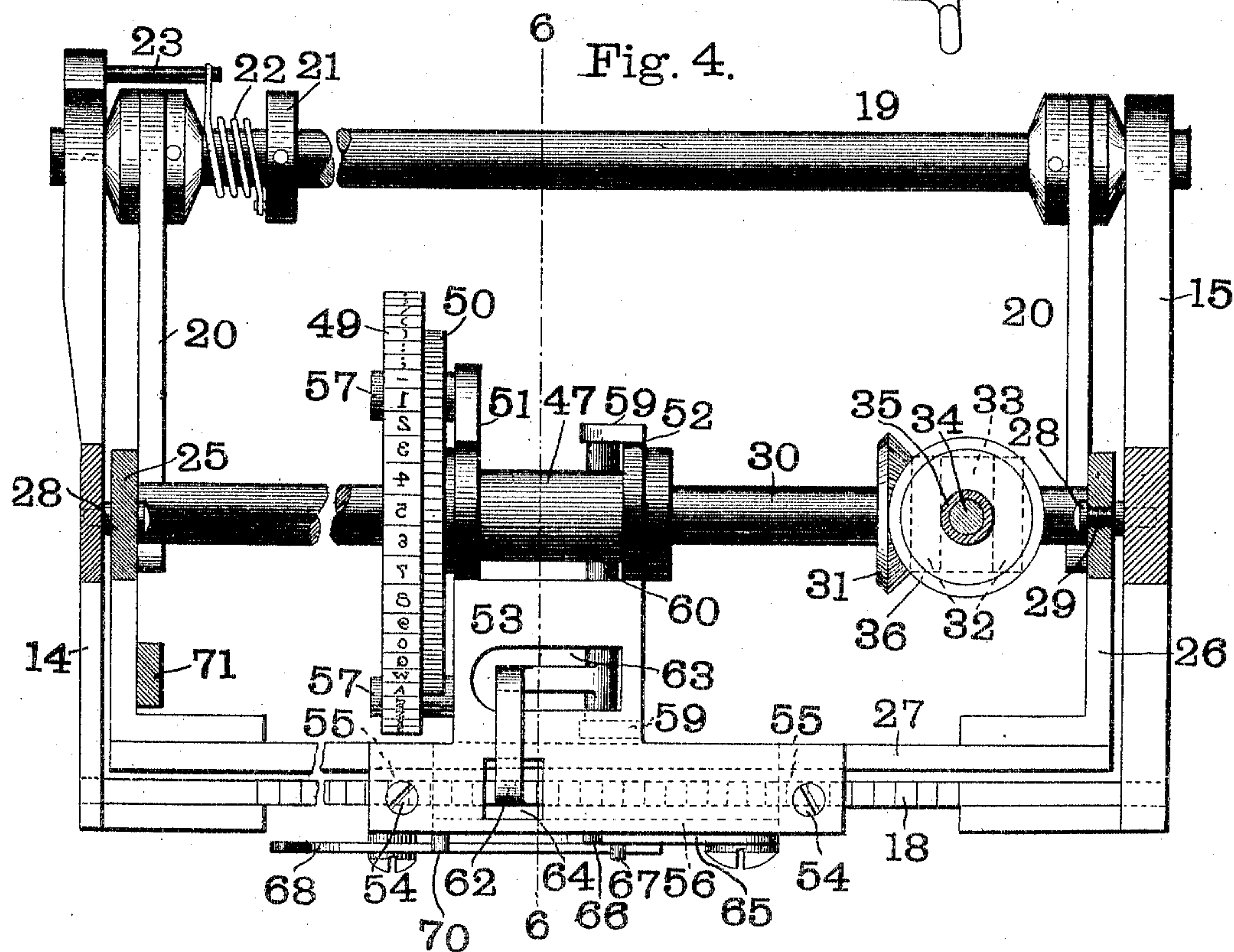
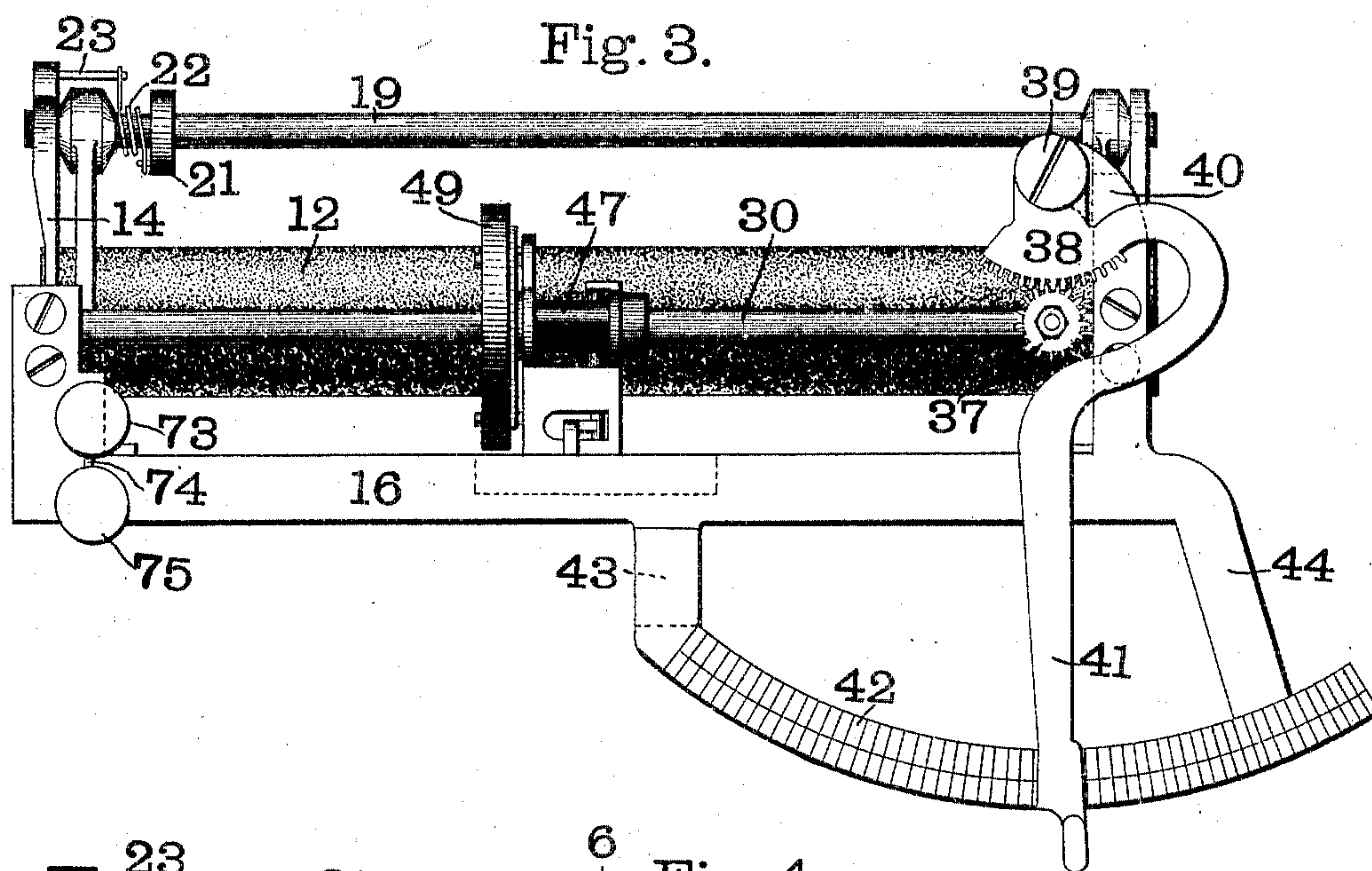
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E. B. CRAM.  
TYPE WRITING MACHINE.  
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4 SHEETS—SHEET 3.

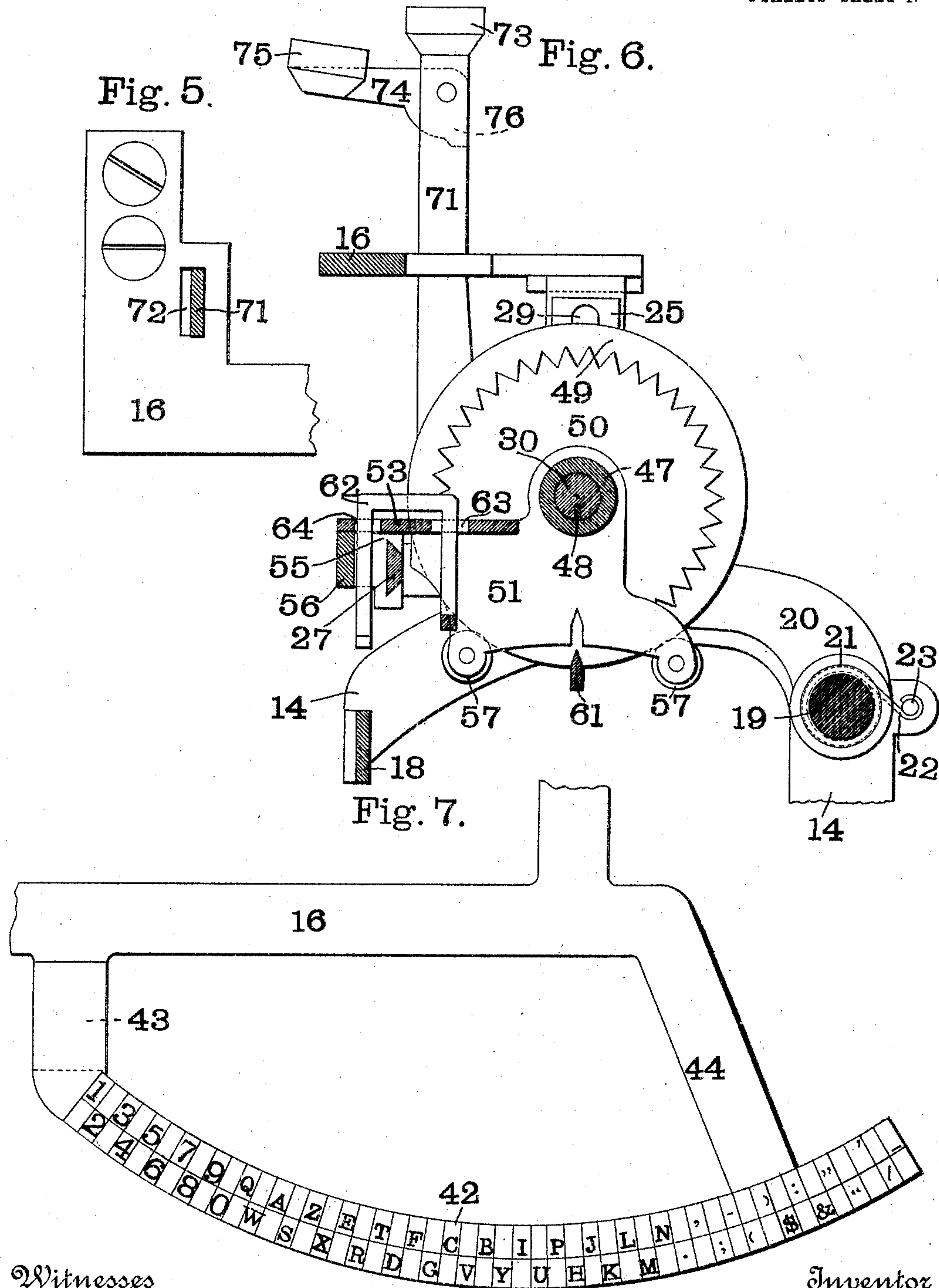


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APPLICATION FILED DEC. 21, 1903.

4 SHEETS—SHEET 4.



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## UNITED STATES PATENT OFFICE.

EDWIN B. CRAM, OF ST. LOUIS, MISSOURI, ASSIGNOR TO THE AMERICAN BILLING MACHINE AND IMPROVEMENT COMPANY, OF ST. LOUIS, MISSOURI, A CORPORATION OF MISSOURI.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 779,992, dated January 10, 1905.

Original application filed June 17, 1903, Serial No. 161,877. Divided and this application filed December 21, 1903. Serial No. 185,999.

*To all whom it may concern:*

Be it known that I, EDWIN B. CRAM, a citizen of the United States, residing in the city of St. Louis, State of Missouri, have invented a certain new and useful Type-Writing Machine, of which the following is such a full, clear, and exact description as will enable any one skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification.

The object of my invention is the production of a simple and inexpensive type-writing mechanism in which the printing mechanism is movable longitudinally of the platen and into and out of contact therewith and in which the platen is itself movable laterally into and out of the position in which it is adapted to make contact with the printing mechanism.

My invention also preferably embodies means whereby the type forming part of the printing mechanism may be properly positioned to print the desired character upon the platen before being moved into printing contact therewith.

My invention consists in various novel features and details of construction, all of which will be described in the following specification and pointed out in the claims.

This application is a division of my application, Serial No. 161,877, filed June 17, 1903, for a type-writing attachment for adding-machines, and relates more particularly to the peculiar form of type-writing mechanism shown and described in said prior application.

In the accompanying drawings, which illustrate one form of machine made in accordance with my invention, Figure 1 is an end elevation. Fig. 2 is a front elevation. Fig. 3 is a top plan view on a reduced scale. Fig. 4 is an enlarged section on the line 4 4 of Fig. 2. Fig. 5 is an enlarged view showing a detail of construction. Fig. 6 is a section on the line 6 6 of Fig. 4, and Fig. 7 is an enlarged view of the scale.

Like marks of reference refer to similar parts in the several views in the drawings.

In the drawings I have shown a form of my invention more particularly adapted for use in printing upon a pivotally-supported platen of the form commonly employed in that class of adding-machines known as the "American arithmometer." I do not, however, wish to limit my invention to use with this form of platen, as the same may be used with platens of other and different construction.

Referring first to Fig. 1, 10 indicates the rear portion of an adding-machine case, such as customarily covers machines of the arithmometer type. 11 is a bar or plate adjacent to the casing and supporting the type-writing mechanism hereinafter described. Pivoted to the bar or plate 11 is the printing roll or platen 12. This printing roll or platen 12 stands, when in position adapted to be acted upon by the printing mechanism, in the position shown in full lines in Fig. 1. It may, however, when desired be swung upon its pivot to occupy the position shown in Fig. 1 in dotted lines or any intermediate position between the two.

The main or stationary frame of my attachment consists of two end plates 14 and 15 and a top plate 16. The two end plates 14 and 15 are secured, by means of screws 17, Fig. 2, to the cross bar or plate 11. The end frames 14 and 15 also carry a rack-bar 18, which also forms part of the stationary or main frame of the attachment. Journaled in the rear part of the end frames 14 and 15 is a rock-shaft 19, to which are rigidly secured two arms 20. Secured to this rock-shaft 19 is a collar 21, to which is attached one end of a coil-spring 22, surrounding the said shaft. The opposite end of this spring 22 is attached to a pin 23, carried by the end frame 14. The two arms 20, together with the shaft 19, form a swinging frame, and the said arms 20 are pivoted to two end plates 25 and 26, respectively. The forward ends of the end plates 25 and 26 are connected by a cross-bar 27 and together with



it form a sliding frame. The end plates 25 and 26 are secured to the end frames 14 and 15, respectively, by means of studs 28 passing through slots 29 in the said end plates 25 and 26. Journaled in the plates 25 and 26 is a shaft 30. This shaft 30 has rigidly secured to it a bevel gear-wheel 31. Secured to the shaft 30 adjacent to the gear-wheel 31 are two fixed collars 32 and a loose collar 33. Carried by the loose collar 33 is a short shaft 34. Surrounding this shaft 34 is a hollow shaft or sleeve 35, having secured to its lower end a bevel gear-wheel 36, meshing with the bevel gear-wheel 31, hereinbefore described. Secured to the upper end of the sleeve 35 is an elongated gear-wheel 37. This gear-wheel 37 meshes with a toothed segment 38, pivoted at 39 to a rearward extension 40 of the top plate 16. Carried by the segment 38 is a forwardly-projecting handle or lever 41. This handle or lever travels over a curved scale 42, which is secured to forward extensions 43 and 44, respectively, of the top plate 16 and corresponds to the keyboard of a key type-writing machine. The lever 41 is preferably provided with a clip 45, as best shown in Fig. 1, so as to maintain the lever in contact with the said scale 42.

Surrounding the shaft 30 is a hub 47, provided with a spline or feather 48, which engages with a longitudinal groove in the said shaft 30, so as to allow the hub to move longitudinally of the shaft, but to be incapable of rotation independently thereof. Carried by the hub 47 is a type-wheel 49, provided with characters corresponding to the characters on the scale 42. Secured to the type-wheel 49 is a star-wheel 50. Surrounding the hub 47 are two end plates 51 and 52, which together with a connecting top plate 53 form a carriage for controlling the movement of the type-wheel 49. Secured to the top plate 53 by means of screws 54, Fig. 4, are two blocks 55, provided with dovetailed openings for receiving the beveled cross-bar 27. The blocks 55 are connected by a front plate 56, preferably formed integral therewith. Carried by the end plate 51 are a pair of ink-rolls 57 for inking the type-wheel 49. Carried by lugs 59 on the end plate 52 is a rock-shaft 60. This rock-shaft 60 has secured to it a locking-arm 61, having a beveled upper edge adapted to engage with the teeth of the star-wheel 50, and thus retain the printing-wheel in alinement while printing. The rock-shaft 60 also has secured to it a bent arm 62, which passes up through an opening 63 in the top plate 53 and thence down through a second opening 64 in said plate and terminates directly above the rack-bar 18. Pivoted to the front plate 56 is a feed-dog 65, which engages with the teeth at the rack-bar 18 to feed the type-wheel along the shaft 30. 66 is a pin carried by the plate

56 for locking the feed-dog 65 when the carriage is in its depressed position. 67 is a pin carried by the dog 65 and adapted to be engaged by a finger-lever 68 to raise the dog out of engagement with the rack when it is desired to move the carriage toward the left. 69 and 70 are pins for limiting the movement of the finger-lever 68.

Pivoted to the end plate 25 is a key-bar 71, which passes up through an opening 72, Fig. 5, in the top plate 16. This bar 71 has secured to its upper end a key 73 for use in printing the various characters carried upon the type-wheel 49. Pivoted to this bar 71 is a short key-lever 74, carrying a key 75. This lever 74 is provided with a locking-finger 76, and it is held in its normal position by means of a small coil-spring 77. The opening 72 in the frame 16 is of such width as to allow the locking-finger 76 to pass down through it when the key-lever 74 is in its normal position. When, however, the bar 71 is depressed by means of the key 75, this finger 76 will be projected beyond the bar, so as to come in contact with the top plate 16, and thus limit the movement of the bar and prevent the wheel 49 from coming in contact with the platen to print.

The operation of my type-writing mechanism is as follows: When the roll or platen occupies the position shown in full lines in Fig. 1, it is adapted to be acted upon by the printing mechanism as follows: The type-wheel is first adjusted to the proper position by moving it longitudinally along the shaft 30. The lever or handle 41 is now moved along the scale until the edge of the lever indicates the character it is desired to print. The movement of this lever will be communicated, by means of the toothed segment 38, to the gear-wheel 37. This wheel, by means of the bevel gear-wheels 31 and 36, will impart movement to the shaft 30, which will rotate the type-wheel 49 so as to bring the desired type into position directly above the roll or platen 12. The finger-key 73 is now forced down. This causes the sliding rack to descend, carrying with it the carriage and printing-wheel. As soon as the end of the bent lever 62 comes in contact with the top of the rack-bar 18 it will force the locking-detent 61 up into the teeth of the star-wheel, thus insuring a perfect alinement of the type-wheel. At the same time the feed-dog 65 by its engagement with the rack-bar 18 will feed the carriage toward the right one space. When, however, it is desired to feed the carriage forward one space for printing, the key-bar 71 is depressed by means of the finger-key 75. The spring 77 will allow the bar 74 to swing on its pivot, and thus project the locking-finger 76 to the rear of the bar. This locking-finger will now come in contact with the top plate 16 and



limit the movement of the key-bar 71 so that the type-wheel will not be brought into contact with the platen, but the carriage will be depressed sufficiently to cause the feeding mechanism to operate to feed the carriage one space to the right. The platen being pivotally mounted may, when desired, be swung into and out of the position shown in full lines in Fig. 1.

10 Having fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a type-writing machine, the combination with a frame, and of printing mechanism 15 movable longitudinally of said frame, a paper-roll normally coöperating with said printing mechanism and pivoted at a point opposite to said printing mechanism to swing out of co-operation therewith, and means for moving 20 said printing mechanism independently of and into engagement with said paper-roll.

2. In a type-writing machine, the combination with a platen, of a shaft, printing mechanism movable longitudinally of said shaft 25 and positioned thereby, a manually-operated arm for actuating said shaft, and operating connections between said shaft and arm allowing said shaft to move toward and away from said platen independently of said arm.

30 3. In a type-writing machine, the combination with a platen, of a shaft, a type-wheel movable longitudinally of said shaft and positioned thereby, a manually-operated arm for actuating said shaft, and operating connections 35 between said shaft and arm allowing said shaft to move toward and away from said platen independently of said arm.

4. In a type-writing machine, the combination with a platen, of a shaft, a type-wheel 40 movable along said shaft, a manually-operated toothed member, a gear-wheel, said toothed member and wheel coöperating and one of said parts slidingly movable relative to the other, and operating connections between said 45 gear-wheel and shaft.

5. In a type-writing machine, the combination with a platen, of a shaft, a type-wheel 50 movable along said shaft, a manually-operated toothed segment, a gear-wheel, said segment and gear-wheel coöperating and one of said parts being slidingly movable relative to the other, and operating connections between said gear-wheel and shaft.

6. In a type-writing machine, the combination 55 with a platen, of a shaft, a type-wheel movable along said shaft, a manually-operated toothed segment, a gear-wheel coöperating with said segment and movable transverse thereto, and operating connections between 60 said gear-wheel and shaft.

7. In a type-writing machine, the combination with a platen, of printing mechanism, a carriage controlling said printing mechanism,

means for moving said printing mechanism into contact with said platen, a movable locking device carried by said carriage, and a fixed 65 abutment for operating said locking device to retain said printing mechanism in alinement while printing.

8. In a type-writing machine, the combination 70 with a platen, of a type-wheel, a carriage controlling said type-wheel, means for moving said type-wheel into contact with said platen, a movable locking device carried by said carriage, and a fixed abutment for oper- 75 ating said locking device to retain said type-wheel in alinement while printing.

9. In a type-writing machine, the combination with a platen, of a fixed frame, a movable 80 frame, a printing mechanism carried by said movable frame, a carriage controlling said printing mechanism, a rock-shaft journaled in said carriage, a locking device carried by said rock-shaft for holding said printing mechanism in alinement while printing, and an oper- 85 ating-arm carried by said rock-shaft and co-operating with said fixed frame to operate said shaft.

10. In a type-writing machine, the combination with a platen, of a fixed frame, a movable 90 frame, a type-wheel carried by said movable frame, a carriage controlling said type-wheel, a rock-shaft journaled in said carriage, a locking device carried by said rock-shaft for holding said type-wheel in alinement while print- 95 ing, and an operating-arm carried by said rock-shaft and coöperating with said fixed frame to operate said shaft.

11. In a type-writing machine, the combination with a platen, of a printing mechanism, a 100 key for forcing said platen and printing mechanism into contact, a feeding device operated by the movement of said key, a second key pivotally mounted on said first-named key, and a finger carried by said second key and 105 limiting its movement, whereby said printing mechanism is fed forward without printing.

12. In a type-writing machine, the combination with a stationary frame, of a swinging 110 frame pivoted thereto, a frame carried by said swinging frame and slidingly connected with said stationary frame, printing mechanism carried by said sliding frame and movable longitudinally of said sliding frame, and a platen coöperating with said printing mechanism. 115

13. In a type-writing machine, the combination with a stationary frame, of a swinging 120 frame pivoted thereto, a frame pivoted to said swinging frame and slidingly connected with said stationary frame, a shaft carried by said sliding frame, a type-wheel movable longitudinally of said shaft, a carriage carried by said sliding frame and controlling said type-wheel, and a feeding device carried by said carriage and coöperating with said stationary frame. 125

14. In a type-writing machine, the combina-



tion with a stationary frame, of a swinging  
frame pivoted thereto, a frame pivoted to said  
swinging frame and slidingly connected with  
said stationary frame, a shaft carried by said  
5 sliding frame, a type-wheel movable longitu-  
dinally of said shaft, a carriage carried by said  
sliding frame and controlling said type-wheel,  
a feeding device carried by said carriage and  
coöperating with said stationary frame, and  
10 locking mechanism for said type-wheel also

carried by said carriage and coöperating with  
said stationary frame.

In testimony whereof I have hereunto set  
my hand and affixed my seal in the presence  
of the two subscribing witnesses.

EDWIN B. CRAM. [L. s.]

Witnesses:

D. C. BETJEMAN,  
JAMES H. BRYSON.