

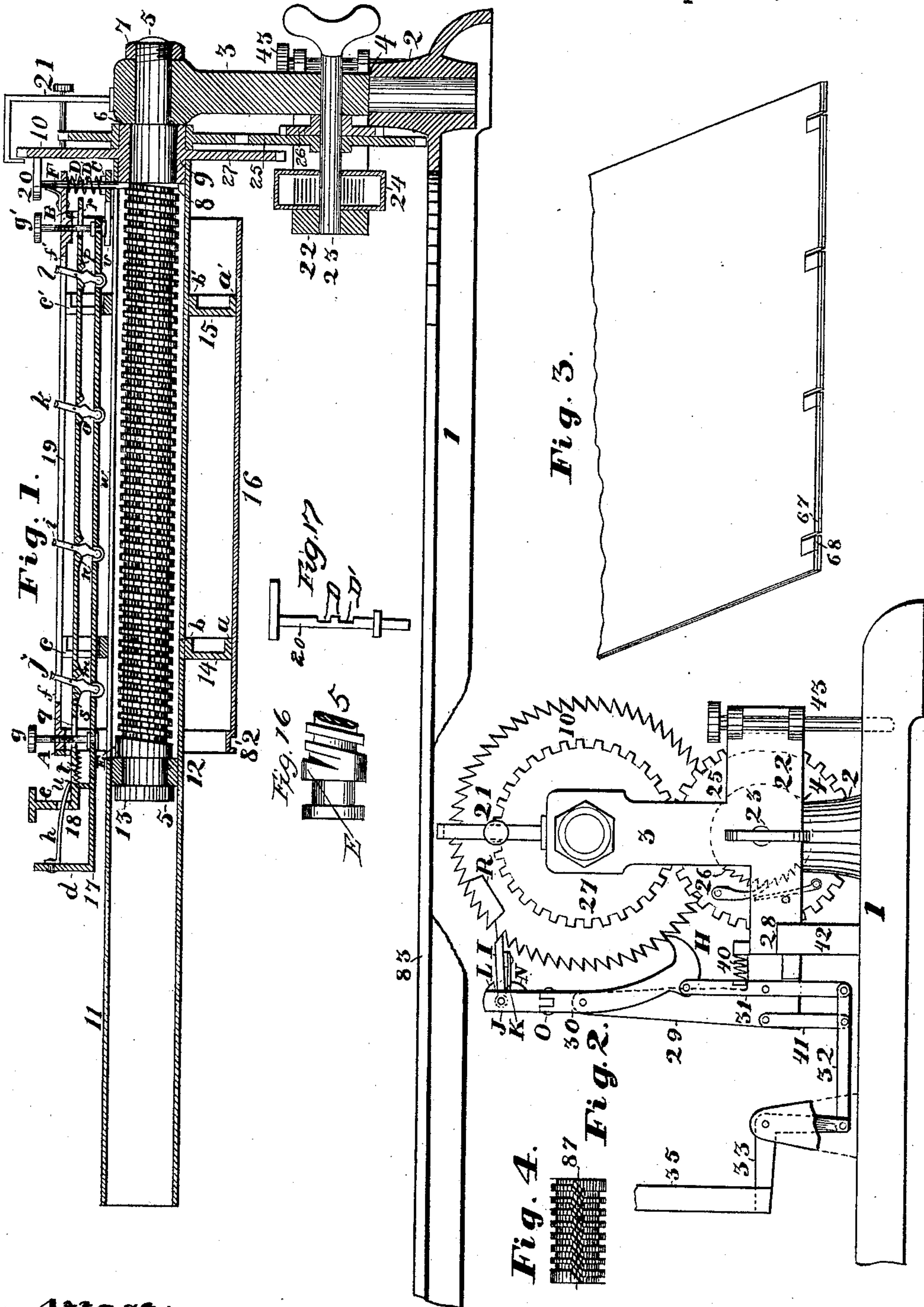
(No Model.)

4 Sheets—Sheet 1.

W. M. CARPENTER.  
TYPE WRITING MACHINE.

No. 437,090.

Patented Sept. 23, 1890.



Attest:

*J. P. Chrisman*  
Geo. Crehore

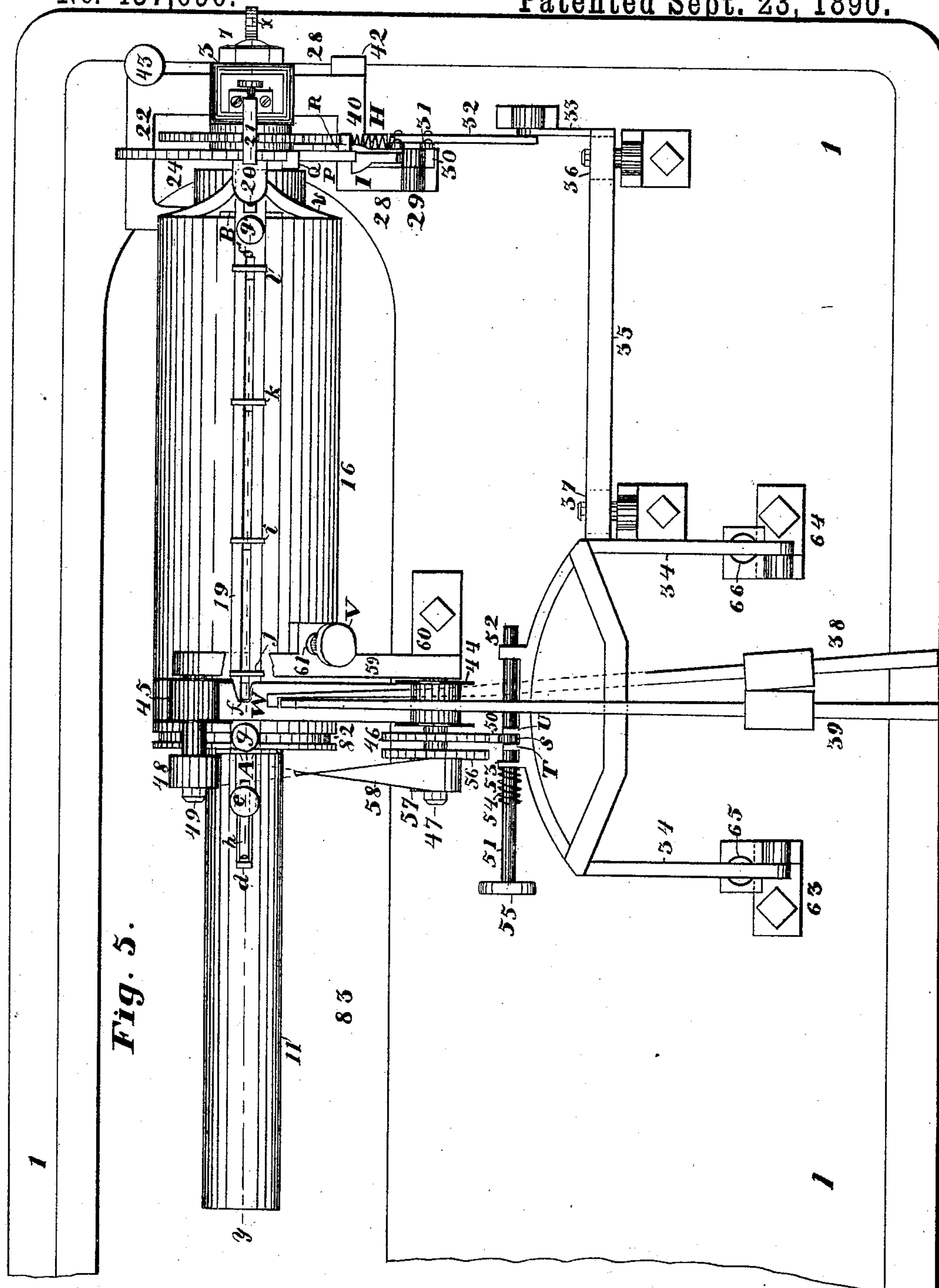
Inventor:

*Wilbur Marvin Carpenter*

4 Sheets—Sheet 2.

No. 437,090.

Patented Sept. 23, 1890.



***Inventor:***

Wilbur Marvin Carpenter.

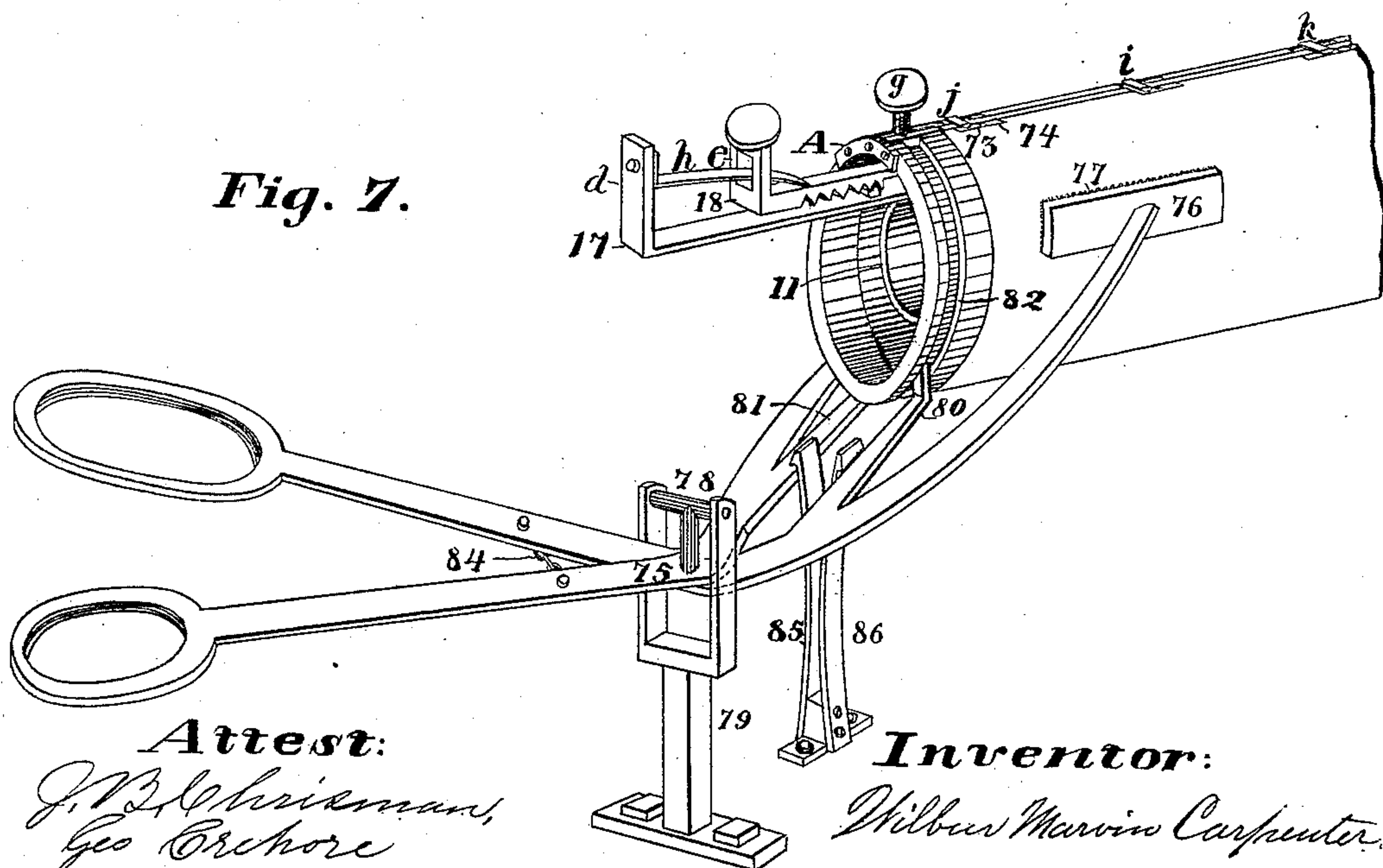
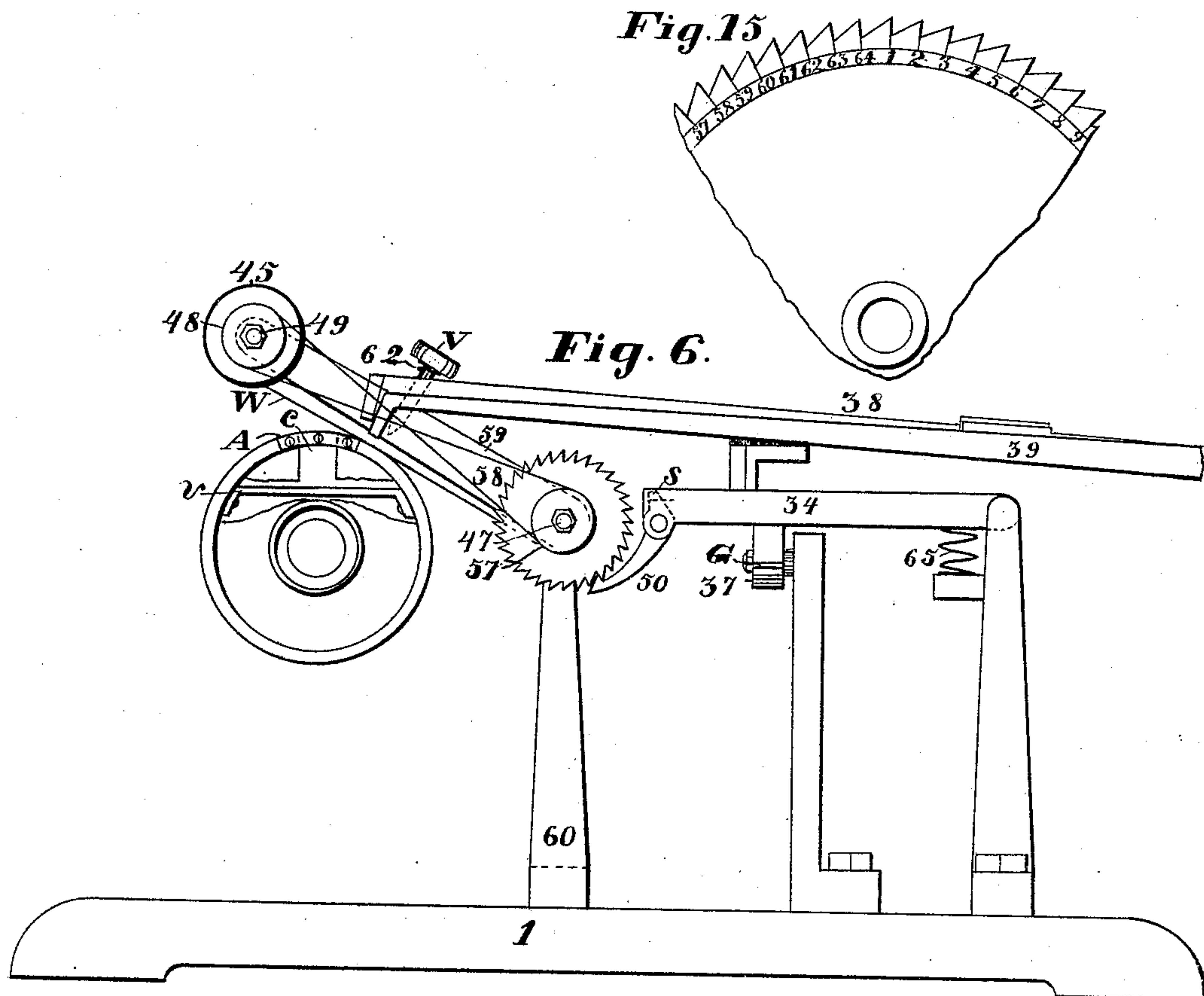
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4 Sheets—Sheet 3.

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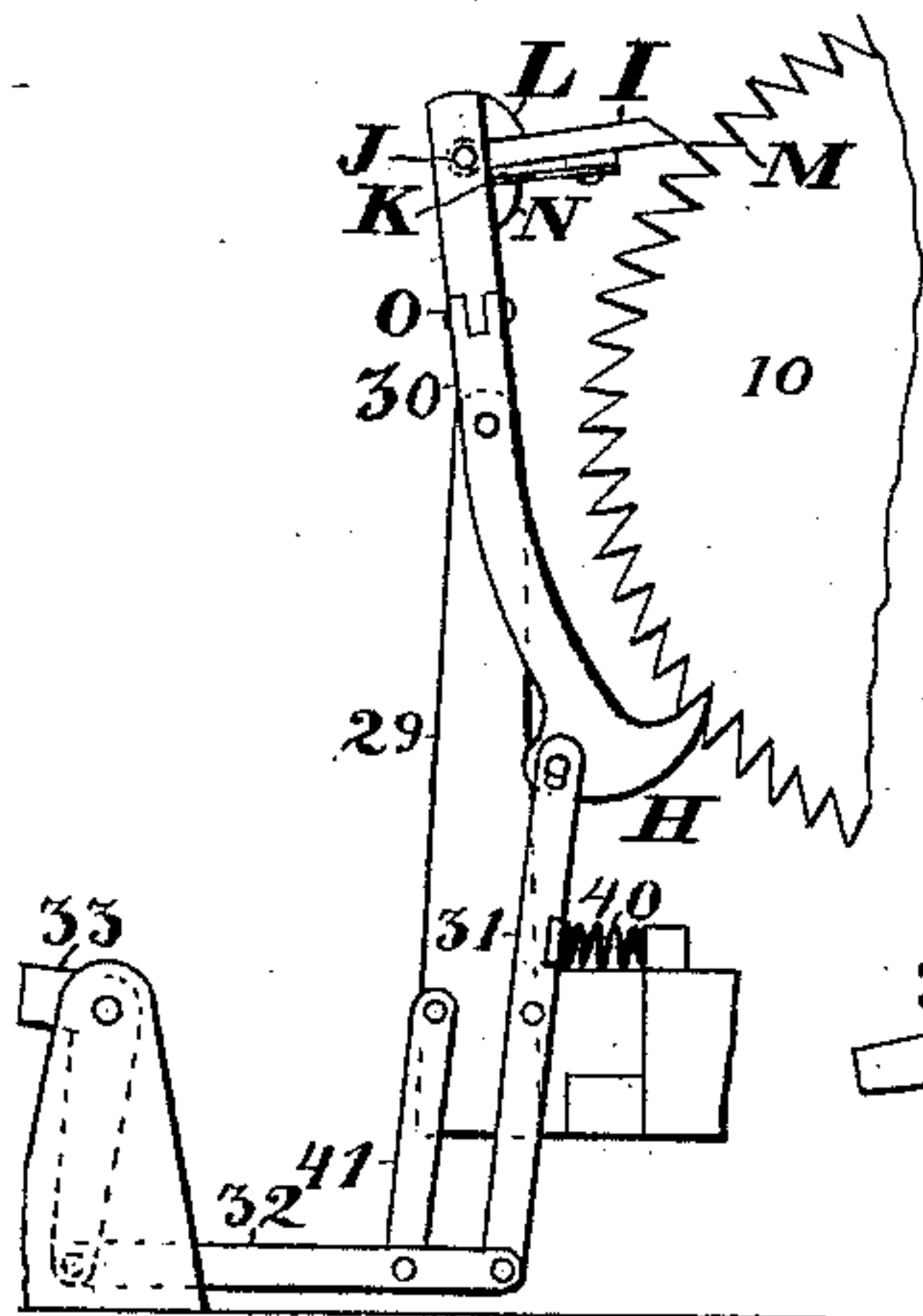
4 Sheets—Sheet 4.

W. M. CARPENTER.  
TYPE WRITING MACHINE.

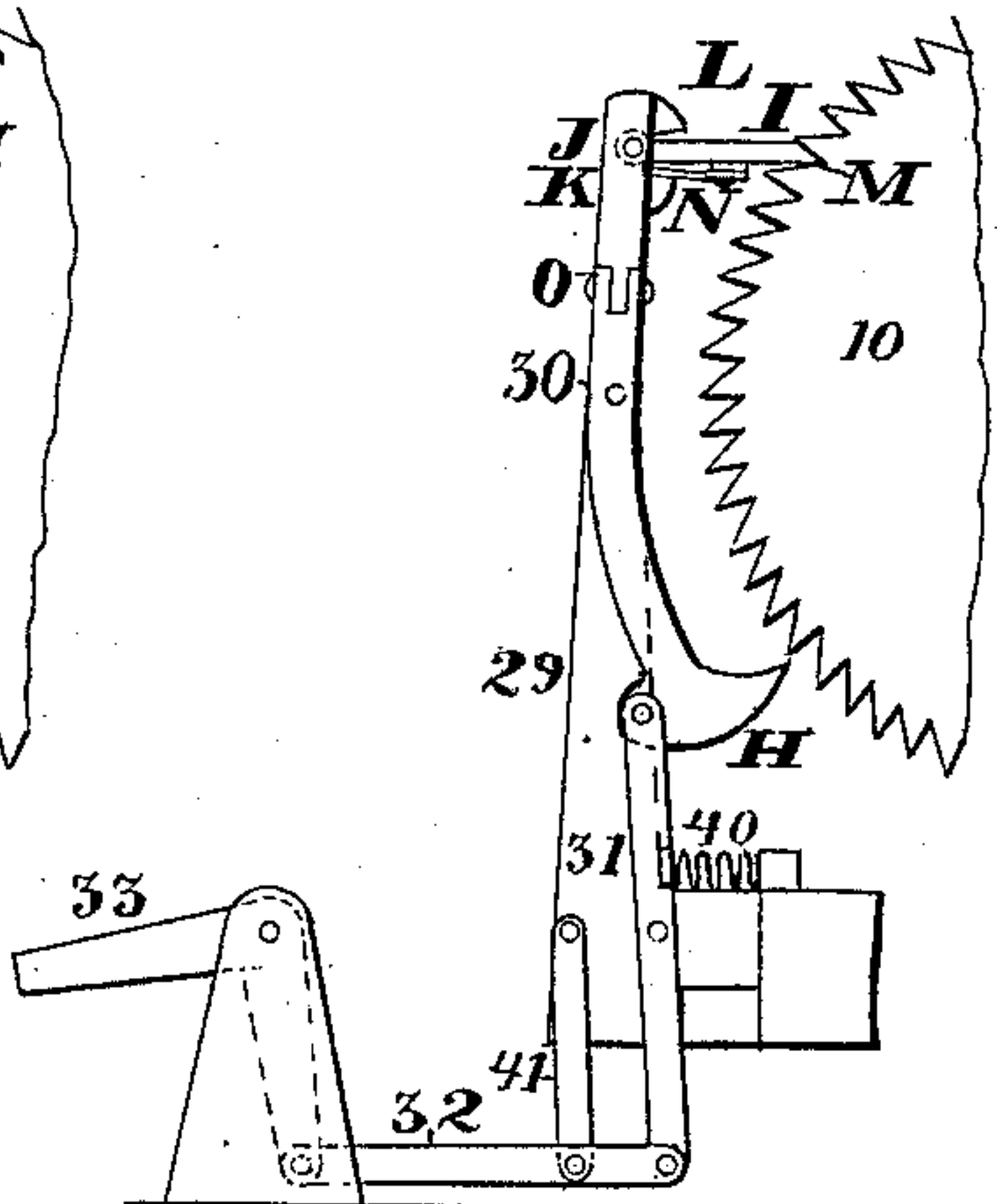
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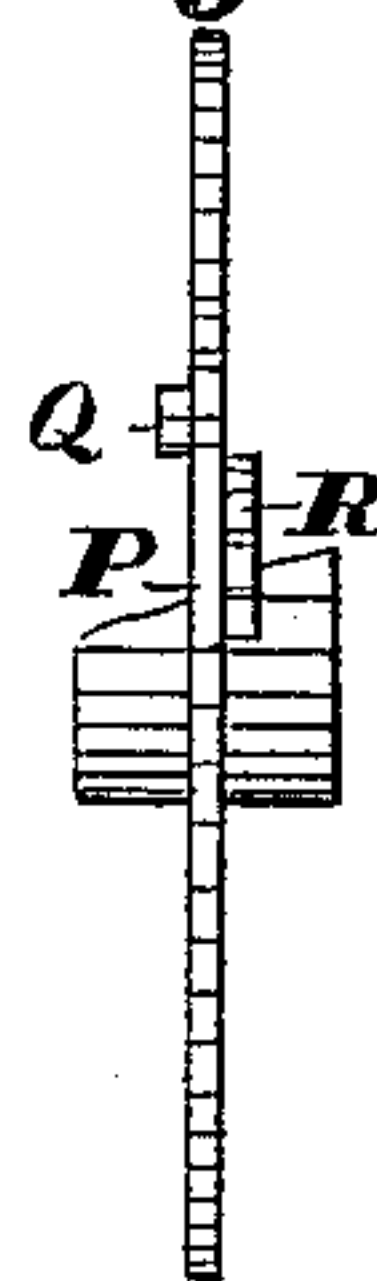
**Fig. 8.**



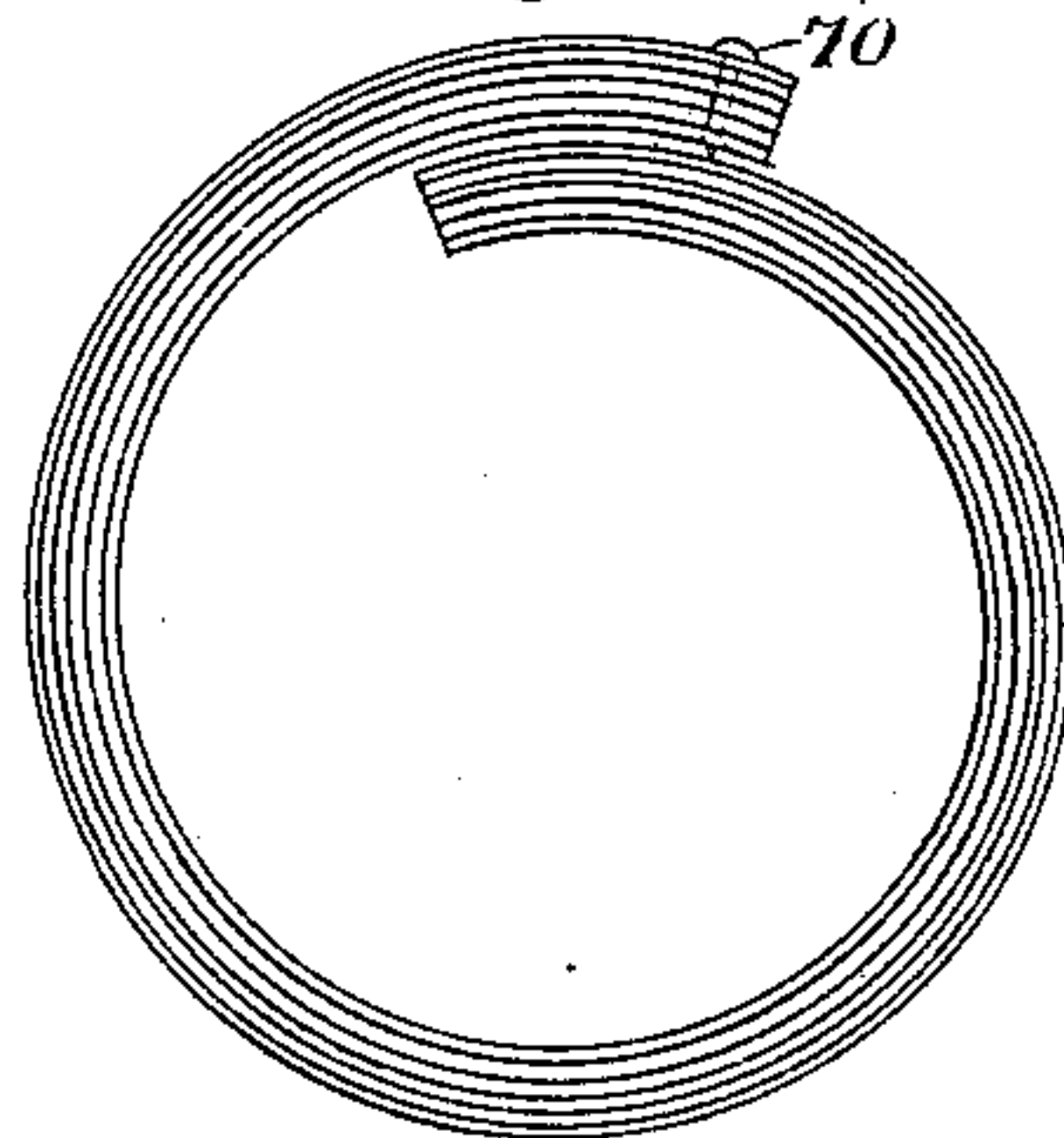
**Fig. 9.**



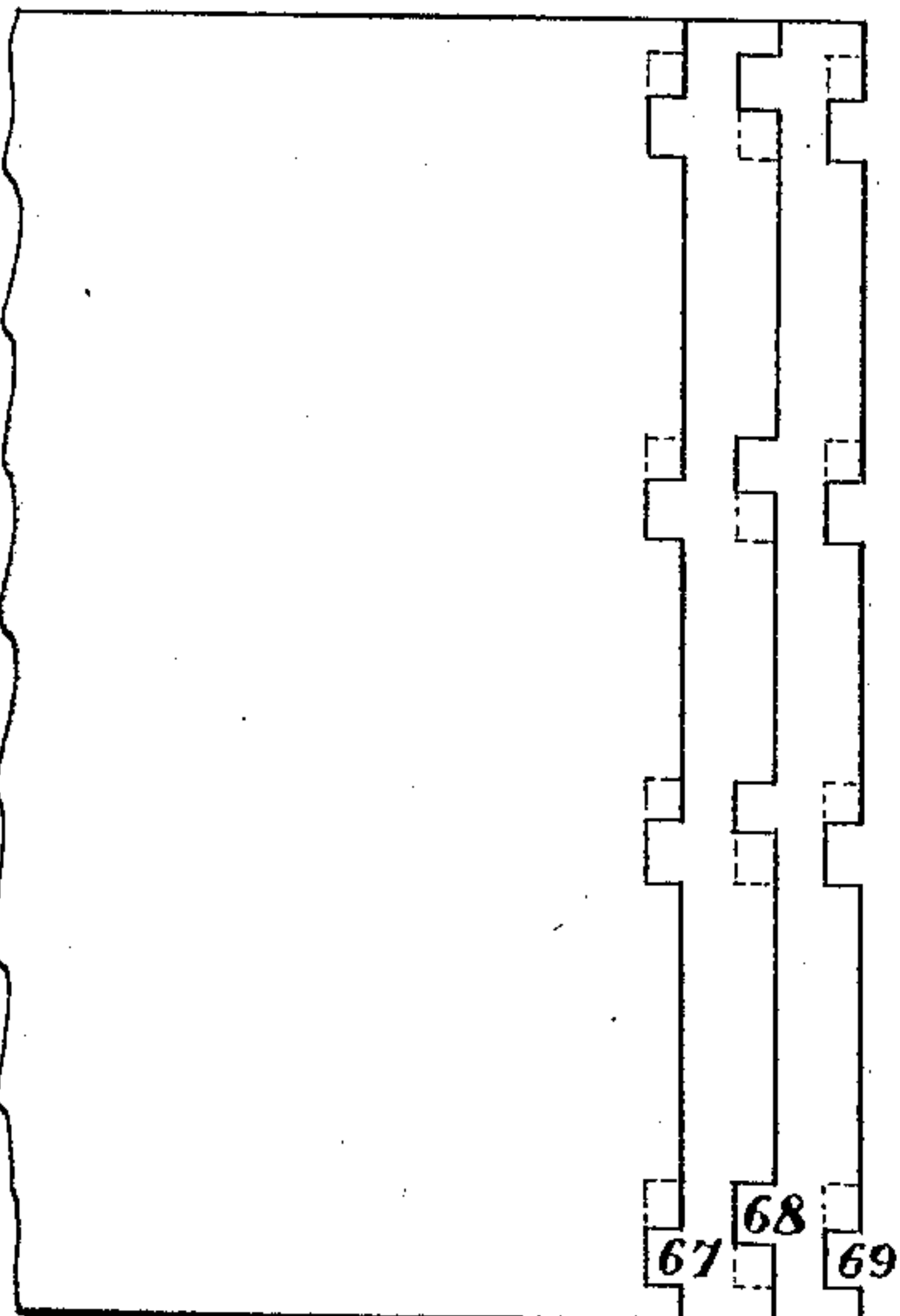
**Fig. 10.**



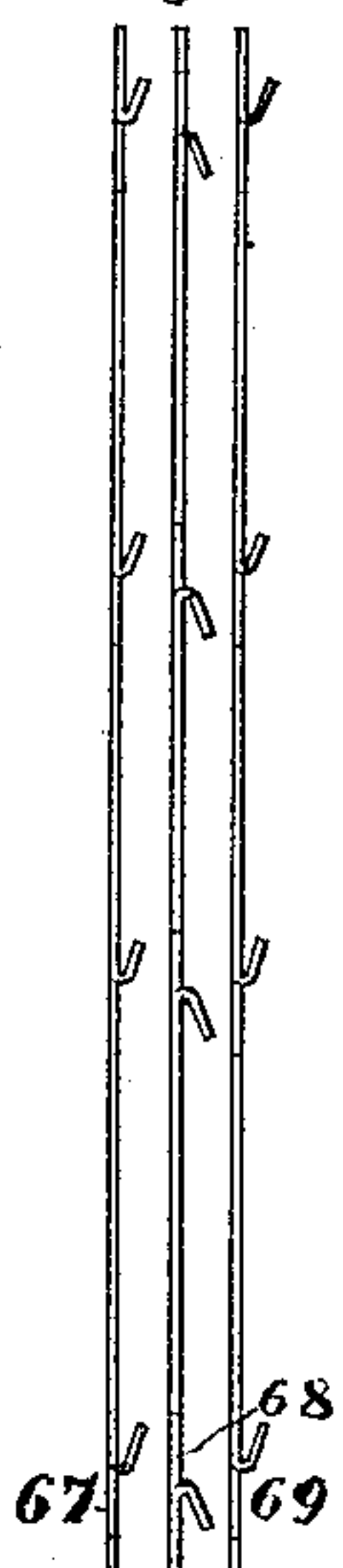
**Fig. 11.**



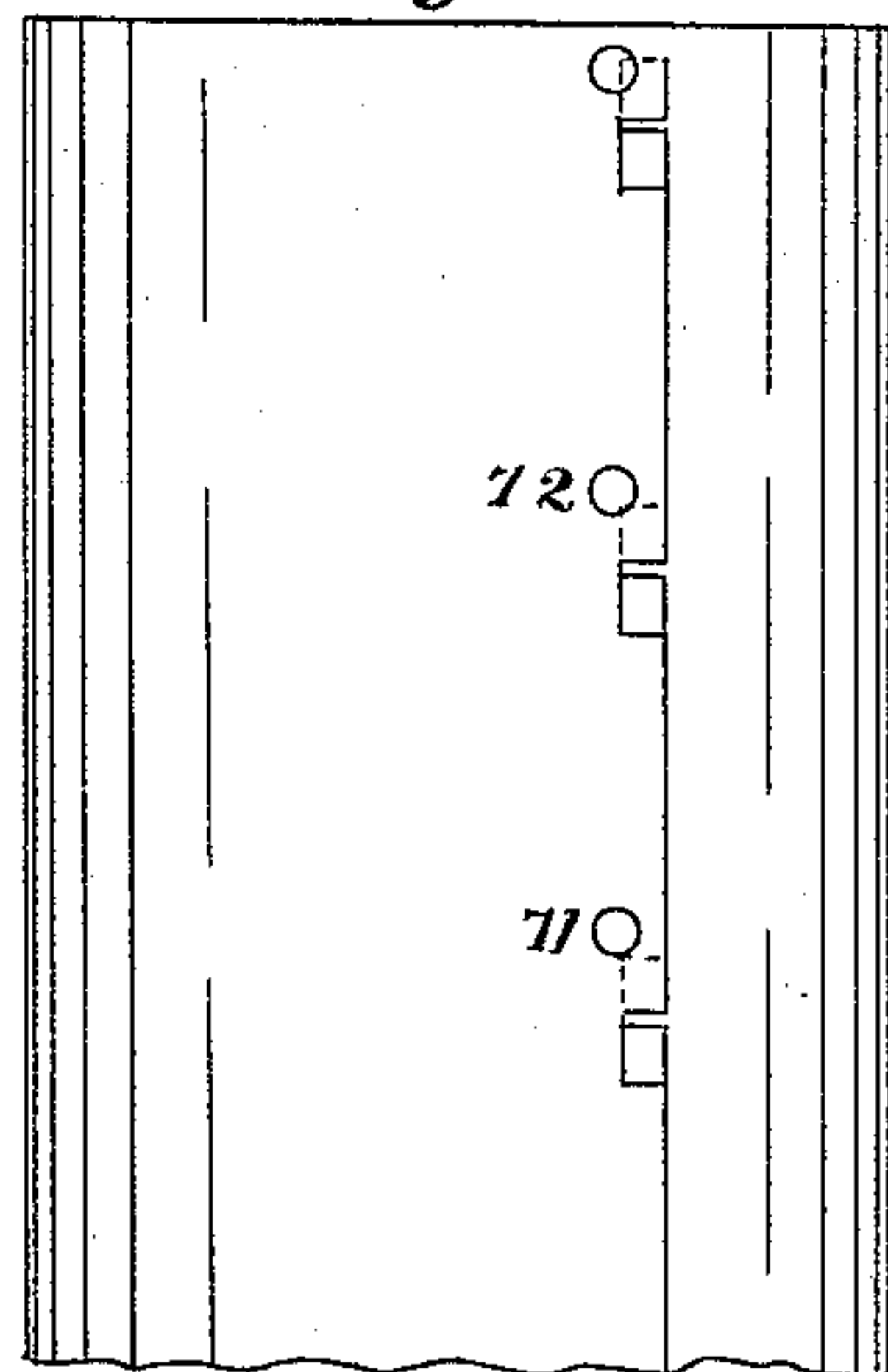
**Fig. 12.**



**Fig. 13.**



**Fig. 14.**



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*Geo. Brehore*

**Inventor:**

*Wilbur Marvin Carpenter*

# UNITED STATES PATENT OFFICE.

WILBUR MARVIN CARPENTER, OF ST. LOUIS, MISSOURI.

## TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 437,090, dated September 23, 1890.

Application filed September 21, 1886. Serial No. 214,198. (No model.)

*To all whom it may concern:*

Be it known that I, WILBUR MARVIN CARPENTER, a citizen of the United States, residing at the city of St. Louis, in the State of Missouri, have invented a new and useful Paper-Carriage and Inking-Ribbon Motor for Type-Writing Machines, of which the following is a specification.

My invention relates to improvements in feeding paper and inking ribbon simultaneously to short-hand machines, type-writers, and other machines, and has for its objects, first, to enable the operator (when using sheets in place of paper ribbon) to write a whole page by one adjustment of the paper, instead of having to adjust the paper for every line; second, to afford facilities for applying and removing the paper with celerity, and, third, to afford a simple and efficient way of moving the inking-ribbon in connection with the paper.

The idea governing the designing of this machine is to place several sheets of paper around a cylinder made to revolve by a kind of clock-work about a stationary rod having a screw-thread running nearly its whole length. At each revolution of the cylinder the screw causes it to travel (under the inking-ribbon) parallel to its axis a distance equal to the breadth of a printed line and the breadth of space between lines, and these two motions continue at the pleasure of the operator or until the sheet of paper is filled, when the operator removes the sheet by means of a pair of forceps designed especially for this purpose and slides the cylinder back to the starting-point ready for the next sheet to be printed or written upon.

The mode of preparing the paper and the parts of machinery above alluded to, together with other mechanism necessary to accomplish the results set forth, are fully described in the following specification and illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal section taken in the line *x y*, Fig. 5; Fig. 2, an end elevation of the mechanism which propels the paper-carriage; Fig. 3, a perspective view of prepared edges of paper; Fig. 4, a variation of the screw shown in Fig. 1; Fig. 5, a plan of the paper-carriage and inking-ribbon device;

Fig. 6, an end elevation of inking-ribbon device in relation to the paper-carriage; Fig. 7, a perspective view of one end of paper-carriage with forceps for removing paper; Figs. 8 and 9, views of a part of the mechanism which operates the paper-carriage; Fig. 10, a view of the edge of the main wheel in the machinery which operates the paper-carriage; Fig. 11, an end elevation of a roll of prepared paper; Fig. 12, a plan of the edges of prepared paper; Fig. 13, a view of the edges of prepared paper; Fig. 14, a plan of a roll of prepared paper; Fig. 15, a view of a part of main wheel in the mechanism which operates the paper-carriage, showing how it is indexed. Fig. 16 is a detail view showing the raised portion of the threaded bar for operating automatically the detachable connection. Fig. 17 is a detail of the said connection.

Similar numbers and letters refer to similar parts throughout all the views.

The bed-plate 1 supports all the mechanism and has a vertical bearing 2 rigidly connected to or cast with it. Into this bearing the journaled lower end of post or stud 3 snugly fits, but so as to turn about its axis readily and rests on its shoulder 4. Near the upper end of this stud 3 the screw-rod 5 passes through, having a nicely-fitted shoulder 6, which is drawn tightly to the stud by means of the nut 7. From the shoulder 6 to the screw-thread 8 the screw-rod is turned to fit the hub 9 of the main wheel 10, but loose enough to allow the wheel to turn easily. To the hub 9 the sleeve or tube 11 is rigidly connected also to the collar 12, which is fitted to turn on the screw-rod. The collar 13, made fast to the screw-rod, holds the tube and its appurtenances in place. Two disks 14 15, having flanges *a a'* and hubs *b b'* fitted to turn easily on the tube 11, have the cylinder 16 firmly attached, and have openings *c c'* to admit the paper-clamping device, which consists of two bars 17 18 with upright ends *d e*, one bar 19 with a slot from *f* to *f'*, two regulating-screws *g g'*, a spring *h*, and the T-headed uprights *i j k l*, hinged at their bases to bar 17, and passing through apertures having pendent shoulders *m n o p* in bar 18, which work against corresponding shoulders on the T-headed uprights, the bar 18 being held down to the



shoulders of the uprights in the present case by means of pins passing through them just above the top of bar 18. The bar 19 may be made fast to the cylinder 16 in numerous  
5 ways. In the present instance it is held by pieces A B, screwed to itself and the cylinder.

The screws  $g$   $g'$  work in threads in bar 19, pass through slots  $q$   $r$  in bar 18, and work loosely in and have collars both below and  
10 above bar 17, for the purpose of allowing the T-headed uprights to be raised or lowered at pleasure by turning these screws. The bar 18 is jointed at  $s$  to allow the teeth  $t$  to be engaged or disengaged with the catch  $u$ . The  
15 spring  $h$  is adjusted to press the teeth  $t$  to the catch  $u$ . In order that the teeth  $t$  may at all times be able to fully engage with catch  $u$ , the pendent shoulders on bar 18 are lined with some elastic material, as rubber. The  
20 slots  $q$  and  $r$  allow the bar 18 to have a motion backward and forward in the direction of its lengths, for purposes which will be shown farther on.

The pin 20 passes loosely through bar 19,  
25 the guide  $v$ , and the slot  $w$  in tube 11, having a tight collar C for a spiral spring, which holds it (the pin) in engagement with the screw 5 to abut against. This pin also has a recess D, which comes in use in this wise, to  
30 wit: Suppose the machine ready to use. As the operator begins, the top of the paper-carriage revolves toward us as we look at Fig. 1. The tube 11 and wheel 10, being rigidly connected and having a rotary motion, carry  
35 the paper-cylinder around with them by means of pin 20 passing through the slot  $w$ ; but as the paper rotates, pin 20 traverses the screw-thread the whole length, passing along the slot  $w$ . The bottom of the last half of the  
40 last thread on the back side of the screw in Fig. 1, and hence not seen, rises gradually till it lifts the pin up to the point E, this point being bossed to make it a little higher than the surface of the threads. At this point  
45 the recess D is raised so as to be made to engage with the end of bar 19 by the action of the spring F, when the operator removes the written sheet (in a manner to be described further on) and pushes the paper-carriage  
50 back to the position shown in Figs. 1 and 5. Here the head of pin 20 strikes against wheel 10 and disengages the recess D from bar 19, and the spiral spring forces the pin down to the screw-thread ready to start the writing  
55 of another sheet. It may sometimes be necessary to rotate the cylinder independently of the sleeve, and to effect this purpose the pin 20 has a second recess D', which will engage with the end of the bar when the lower end  
60 of the pin is raised entirely out of the slot. I do not wish to confine myself to the use of a stationary screw, though this is used preferably.

A standard 21 has an index pointing down  
65 to numbers on the inside of wheel 10. Fig. 15 shows some of these numbers. The purpose of this index is to enable the operator

to revolve the paper-carriage forward any given number of spaces, noting by the eye the movement of the paper-carriage as the  
70 space-bar is struck.

Stud 3 has an arm 22 bent around to receive the end of the key-shaft 23, to which a clock-spring 24 is fastened and covered by a box made fast to arm 22. Wheels 25 and 26,  
75 with pawl, are arranged entirely similar to clock-work. Wheel 25 gears into 27, which is made fast to the hub of wheel 10, the object of this clock-work being to drive the paper-cylinder.  
80

Stud 3 has a second arm 28 terminating in an upright 29, which supports the escapement-lever 30 and its accessories. The escapement-lever is worked by the lever 31, through connecting-bar 32 and knee-lever 33,  
85 which may be connected to the spacer-bar 34 by a lever, or, as in the present instance, by a strap 35, passing over pulleys 36 37, Fig. 5, and being attached at G, Fig. 6, to a projection on the lower side of the spacer-bar, thus  
90 compelling an upward motion of the horizontal arm of the knee-lever when the finger-bars 38 39 &c., press the spacer-bar 34 downward, and at the same time pushing the lower  
95 branch H of the escapement-lever fully into the space between the teeth, as shown in Fig. 8. At this stage of the operation the upper branch I is wholly disengaged from the teeth, and being hinged at J and having a spring  
100 K on the under side is pressed up against a stop L, which is so placed as to allow the point of branch I to pass between the teeth at M when branch H recedes. When branch H becomes wholly disengaged from the teeth, branch I becomes wholly engaged, as shown  
105 in Fig. 9, and wheel 10 has revolved a distance equal to the space between two teeth, being arrested at this point by the stop N. On pressing the finger and spacer bars down to print a character or letter the point of branch  
110 H slides along the under side of the tooth till it assumes the position in Fig. 8, holding the paper-carriage perfectly still all the while. On letting the finger and spacer bars up the spring 40 moves the escapement-lever and its  
115 appendages to the position shown in Fig. 9. In Figs. 2, 5, and 6 the spacer-bar is shown at half-stroke, causing both arms of the escapement-lever to stand in contact with half the length of the teeth. A joint O in the escape-  
120 ment-lever allows the upper branch I to be disengaged from the teeth at the same time the bottom branch H is, when the paper-carriage can be revolved any desired distance backward or forward, where it may be held  
125 at pleasure by a pin on stud 21.

Two margins of the paper come together under the T-heads  $ij$   $kl$ , as will be seen further on. It is obvious that these margins and T-heads should not be struck by the  
130 types as they pass under the inking-ribbon. To effect this result, a few teeth are left off wheel 10 at the proper point, as at P, Figs. 5 and 10, causing one stroke of the spacer-bar



to move the paper-carriage forward the required distance. To obviate extra wear resulting from the blow given by the sudden stopping of the paper-carriage and wheel 10 after revolving this unusual distance, the branch I and tooth Q are broadened to the left. To enable branch H to operate while the space without teeth passes it, its extremity is broadened to the right, and a piece R with teeth is secured to the right side of wheel 10. Connecting-bar 32 is loosely secured to lever 31 and hanger 41 by rivets or bolts; but its connection with the knee-lever 33 is by means of a pin fast in 32 and loose in 33, or it may be fast in 33 and loose in 32, the object being to have it readily engage with or disengage from the knee-joint.

From the foregoing description it is obvious that the paper-carriage and all its appendages in front of the knee-lever are permanently connected directly or indirectly with stud 3, and consequently may be swung around to the right from under the inking-ribbon. When this is done, rod 32 disengages from the knee-lever, but is prevented from lowering by the hanger 41, which is the same length from pivot to pivot that 31 is, thus always holding rod 32 in position to engage with the knee-lever when the paper-carriage is swung to its working position. A stop 42 prevents the paper-carriage from swinging too far to the left, while a pin 43, lowered into the bed-plate I, holds it from moving to the right.

The inking-ribbon motor consists of two reels 44 and 45, which wind and unwind the ribbon W alternately. Reel 44 is rigidly attached to pawl-wheel 46 and turns on a spindle 47. Reel 45 is rigidly attached to pulley 48 and turns on a spindle 49. The pawl 50, having a projecting limb S, is set tight on shaft 51, which works loosely in bearings 52 53. A spring 54 is arranged to keep the pawl pressed against the teeth of the wheels. When the pawl works in wheel 46, its limb S works between two projecting parts T U of the spacer-bar, which keep the pawl from moving either to the right or left. By having a shoulder on shaft 51 abut against bearing 52 the projecting part U may be dispensed with. When reel 44 becomes full, the inking-ribbon must be wound on reel 45. To accomplish this, seize the button 55 and turn the shaft 51 forward till the point S of the pawl falls below the projection T. Then pull the shaft to the left till the point S will pass between projection T and bearing 53. The pawl will now work in wheel 56, which is fast to pulley 57. Both wheel 56 and pulley 57 run loose on spindle 47. A crossed belt 58 connects pulleys 57 and 48, thereby giving motion to reel 45, reel 44 being left free to unwind. The spindles 47 and 49 are made fast to an arm 59, which projects from stud 60, bolted to the bed-plate I. Arm 59 has a projection 61, through which a prodding-pin V, with flat head and sharp point, works.

The object of this pin is to mark the paper when it becomes necessary to remove the paper-carriage for any purpose in the midst of the writing of a sheet, the marking being done by striking the head of the pin and driving the point into the paper. A spring 62 carries the pin up after the blow. By marking the paper in this way the paper-carriage can be removed and returned to the exact point and the printing or writing be continued in an unbroken manner. The spacer-bar in the present case is attached to studs 63 64, which are bolted to the bed-plate; but any other convenient method may be used. Springs 65 66 keep it pressed up against the finger-bars, which may be connected with the bed-plate in any convenient manner.

The T-heads *i j k l* are designed to hold and release the paper at the pleasure of the operator. To this end I prepare the paper, first, by cutting one sheet just long enough to reach from one edge of the slot *ff'* around the cylinder to the other edge of said slot, then another sheet just long enough to cover the first, and so continue till I have, say, a dozen sheets so cut. Secondly, I slit up tag-pieces on the edges under where the T-heads will come and bend them back alternately in opposite directions, as shown in Figs. 12 and 13 at 67, 68, and 69, the tags all being bent downward. Fig. 3 shows how alternate tags may be bent up and down. Thirdly, I place the sheets together in their order, put tacks 70 71 72, &c., through one edge to hold the sheets from slipping on each other, and press them around a cylinder spiral or otherwise a little smaller than the paper-carriage cylinder. This is done to set the paper so that it will cling to the paper-carriage cylinder and not have a tendency to come off when the T-heads are loosened for an instant on the removal of a printed sheet. The paper, being thus prepared, is slipped on the paper-carriage cylinder and the T-heads are made to press down on the top sheet over the tag-spaces by moving bar 18 in the proper direction. Take Fig. 7. Suppose there are two sheets on the cylinder. Bar 18 is pulled to the left all it will go, and the T-heads press down on the top sheet at 74. Now to remove the outside sheet, push bar 18 to the right all it will go, and the T-heads will strike under the sheet at 74 and occupy the position shown in Fig. 1. The outside sheet is now free and may be removed. I proceed in the same manner to remove any number of sheets.

To facilitate the removal of the sheets from the paper-carriage the forceps 75 are provided, having a pad 76 at each end lined with some roughened material 77, as rubber. The rivet in these forceps is prolonged upward, having a T-head 78, which terminates at each end in journals which have bearings in two branches of a standard 79. The object of this construction is to allow the pads 76, &c., to be raised and lowered at pleasure, while the forceps are fixed at their central point. Two



branches 80 81 enter a groove 82, provided for them, for the purpose of holding the paper-carriage from moving either way while the operator manipulates the bar 18. Thus the operator seizes the forceps with his left hand, loosens the paper by moving bar 18 in or out, as the case may be, with his right hand, then elevates his left hand, bringing the pads of the forceps down to the bed-plate, carrying the paper with them and dropping it through the opening 83. A chain 84 holds the forceps from opening too far, and two springs 85 86, with catch-heads, prevent them from closing voluntarily or rising too high.

It is obvious that the line of printing will run slightly diagonal across the sheet. For parties who object to this I substitute in place of the screw-rod 5 a rod having the threads cut in rings which lead into each other, as shown along the line 87, Fig. 4, placing this rod in such a position as will cause the pin 20 to cross line 87, while the space of vacant teeth in wheel 10 passes branch I of the escapement-lever, thus giving with one stroke of the spacer-bar all the motion of the paper-carriage in a direction parallel to its axis, which is required for one line and space in writing or printing. This feeding device is shown as applicable to a short-hand machine whose marking-keys are provided with combination, types and strike downward; but it can be used in writing-machines having keys striking upward by placing the inking device below the cylinder.

I do not limit the scope of my invention to all the details of construction herein described and shown.

What I claim is—

1. In combination, the revoluble cylinder, means for revolving the same, a screw, and a connection between said cylinder and screw for moving the cylinder longitudinally, the said connection being movable and automatically detachable, whereby the connection is broken when the cylinder completes its longitudinal movement to allow the same to be returned to normal position.

2. In a type-writing machine and in combination, the cylinder, means for rotating the same, the screw for giving the said cylinder endwise movement, and the pin, as 20, by which operative connection is made between the cylinder and the screw, the said screw having a raised portion of its thread rising above the line of the thread, whereby the pin is automatically raised to permit the return of the cylinder to normal position, substantially as described.

3. In a writing-machine, the combination of an inking-ribbon, the cylinder for the paper, and the stud for supporting the cylinder, said cylinder having pivotal movement in a horizontal plane by means of the stud, so that it may be swung around and away from the ribbon, substantially as described.

4. In combination, the cylinder, the inking-ribbon, a rod 5, extending through the cylin-

der to support the same, and the vertically-arranged movable stud 3 to turn in its bearings, the said rod being supported by the said movable stud, whereby the cylinder may be swung aside in a horizontal plane, substantially as described.

5. In combination, the paper-carriage adapted to have longitudinal movement and provided with a groove, and a movable holding-arm, as 80, suitably supported to engage with said groove for holding the same against longitudinal movement while the paper is being manipulated, substantially as described.

6. In combination, the paper-carriage adapted to receive and hold the paper, and paper-removing forceps suitably supported, substantially as described.

7. In combination, the cylinder adapted to receive and hold the paper, the forceps suitably supported and provided with an arm for engaging and holding the carriage, and an arm for removing the paper, substantially as described.

8. In combination, the revoluble cylinder, the support extending therethrough, the disks for supporting said cylinder fitted to turn on said support, a clamping mechanism consisting of clamps, and a bar movable longitudinally of the cylinder for operating said clamps from one end of said cylinder, the said disk having openings to admit said mechanism.

9. In combination, the cylinder, the screw having its thread raised at the end, the movable pin 20 in engagement with the screw and cylinder and having recess D, and the springs for moving said pin, substantially as described.

10. In combination, the cylinder, the screw, the movable pin in engagement with the screw and cylinder, the raised surface whereby the pin is disengaged from the screw-threads when the carrier is moved in one direction, means for holding the pin in its raised position during the return of the carrier to normal position, and the abutting surface whereby the said pin is released and engaged with the threads when the cylinder is moved back into normal position, substantially as described.

11. In combination, the cylinder, clamps carried thereby, and a longitudinally-movable bar 18 extending along the cylinder and in engagement with the clamps for operating the same, substantially as described.

12. In combination, the cylinder, paper-clamps carried thereby arranged to clamp the paper to said cylinder, and adjusting-screws for moving said clamps nearer to or farther from the cylinder, substantially as described.

13. In combination, the cylinder, the clamps *j i k l*, the supporting-bar 17, the operating-bar 18, and the adjusting-screws 9 9', substantially as described.

14. In the paper-clamping device for a paper-carriage for a writing-machine, the T-headed uprights *i j k l*, slotted bar 19, screws *g g'*, bar 17, bar 18, with teeth and joint s,



and spring *h*, all in combination with a cylinder, substantially as and for the purposes specified.

15. In combination, the cylinder, the clamps 5 carried thereby, the ratchet-wheel 10, for transmitting movement to the cylinder, the branches H and I of the escapement acting upon wheel 10, the said wheel having a portion of its teeth removed at P to enable the 10 wheel to turn under one branch, as I, and having supplemental teeth R, secured to its side and in line with the broadened end of the branch H, substantially as described.

16. In combination, a cylinder, the inking- 15 ribbon and key-levers, the vertically-arranged supporting-post 3, having rotary movement in its bearings, a connection between the movable post and the cylinder, and a train of driving mechanism, also carried by the post, where- 20 by the cylinder and its driving mechanism may be swung aside from the inking-ribbon and key-levers in a horizontal plane, substantially as described.

17. In combination, the inking-ribbon and 25 key-levers, the vertical post 3, the cylinder supported thereby and movable in a horizontal plane, whereby the cylinder may be horizontally swung away from the said ribbon and key-levers, and the stops 42 and 43 to 30 limit the movement of the cylinder in both directions.

18. In a paper-carriage motor for writing and other machines, a system of levers 31 33, rod 32, strap 35, and pulleys connecting the 35 escapement-lever with the spacer-bar, in combination with the escapement-lever and spacer-bar, substantially as and for the purposes specified.

19. In combination, the inking-ribbon, the 40 supporting-reels 44 and 45, a pulley for each reel, a belt connecting the two pulleys, a ratchet-wheel and pawl for operating one of said reels, and the space-bar acting upon the pawl and operated by the keys, substantially 45 as described.

20. In combination, the inking-ribbon, the reels for the same, a toothed wheel 46, in connection with one reel, and a second toothed wheel 56, a belt 58, and pulley 48, connecting 50 said toothed wheel with the other reel, and a shifting operating-pawl arranged to be brought into engagement with either toothed wheel, substantially as described.

21. In combination, the inking-ribbon, the 55 two reels, the two ratchet-wheels located side by side, each independently connected with one of the said reels, the pawl laterally shifting in front of said ratchet and adapted to

be moved to engage with either of the wheels and having a projecting limb, and the spacer- 60 bar operated by the keys and having projections to engage with the limb of the pawl for holding the same in place, substantially as described.

22. In combination, the cylinder for holding 65 the paper, means, substantially as described, for moving said cylinder, and a movable prodding-pin supported in a fixed relation to the cylinder and adapted to be thrust there- 70 against, substantially as described.

23. In combination, the cylinder for the pa- 70 per, means for moving said cylinder, and a movable prodding-pin supported in a fixed relation to the cylinder and adapted to be 75 thrust thereagainst, and a spring for returning the prodding-pin to normal position, substantially as described.

24. In a writing-machine where sheets of paper are carried on a cylinder, a pair of for- 80 cepts having roughly-padded grappling ends, branches to enter a groove in the paper-carriage, and a T-headed rivet with journals resting on bearings, in combination with the 85 paper-carriage cylinder, substantially as described.

25. In a writing-machine where sheets of paper are carried on a cylinder, the T-headed rivet, in combination with a pair of forceps and a support therefor, substantially as and 90 for the purposes specified.

26. In combination, the cylinder provided with a slot and adapted to receive the paper, the clamps pivoted within the cylinder to have pivotal movement longitudinal thereof, 95 said clamps projecting through the slot and having lateral projecting ends to bear upon the paper, and means for operating the said clamps, substantially as described.

27. In combination, the cylinder, the mov- 100 able post 3, with connection to the cylinder, whereby said cylinder may be swung aside, the train of driving and escapement mechanism carried by the post, the keys, and in- 105 termediate connections, substantially as described, between said keys and said driving and escapement mechanisms, the said con- 110 nections being detachable from the driving mechanism, substantially as described.

28. In combination, the cylinder, the clamps, and the operating-bar 18, said bar be- 110 ing combined with a holding-catch, substantially as described.

WILBUR MARVIN CARPENTER.

Witnesses:

J. B. CHRISMAN,  
GEO. CREHORE.