

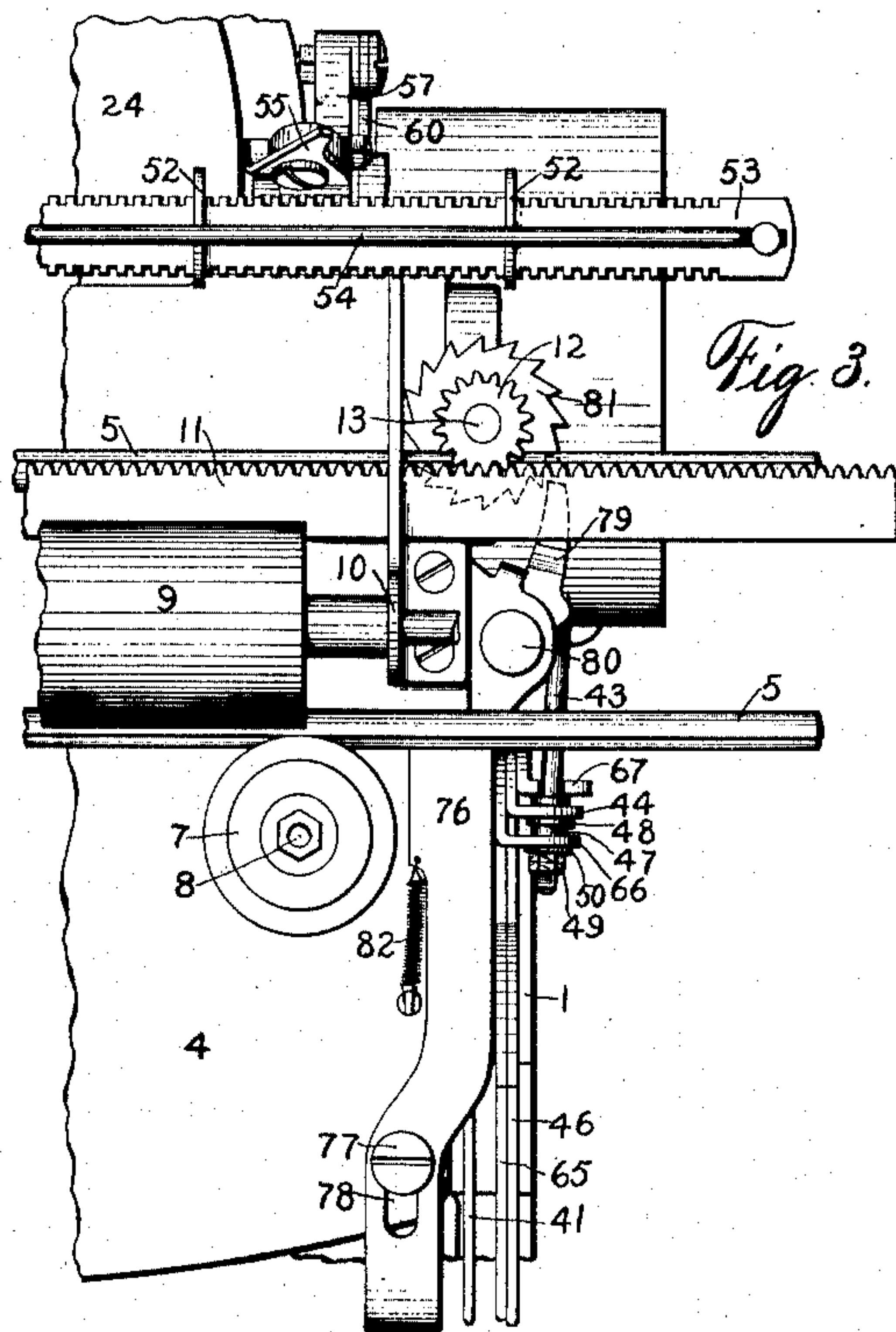
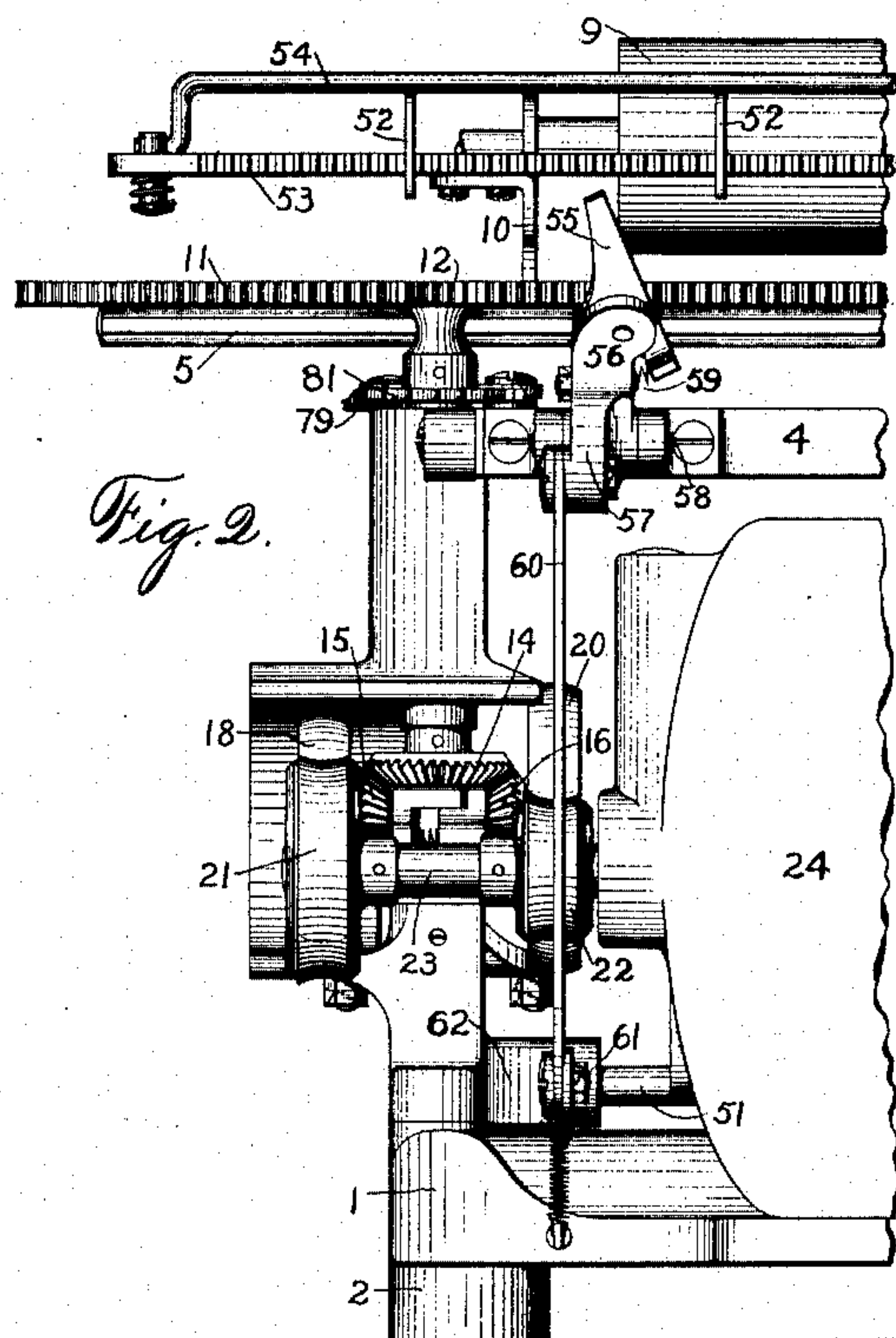
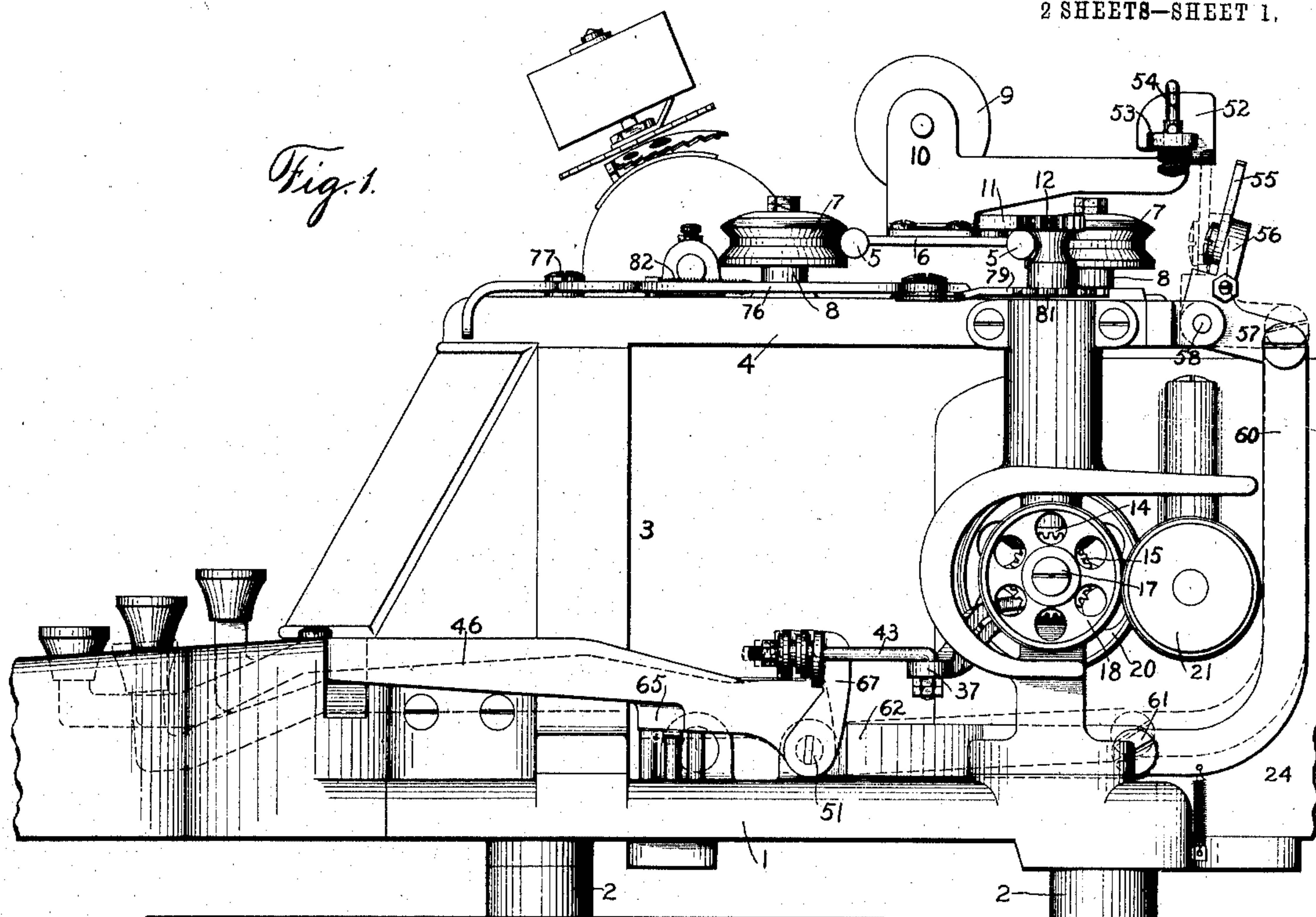
No. 864,505.

PATENTED AUG. 27, 1907.

G. C. BLICKENSDEKFER.  
TYPE WRITING MACHINE.

APPLICATION FILED AUG. 10, 1905.

2 SHEETS—SHEET 1.



Witnesses:  
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*J. H. Graves.*

Inventor,  
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by *Philip S. Perry, Rice & Kennedy*  
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2 SHEETS—SHEET 2.

Fig. 4.

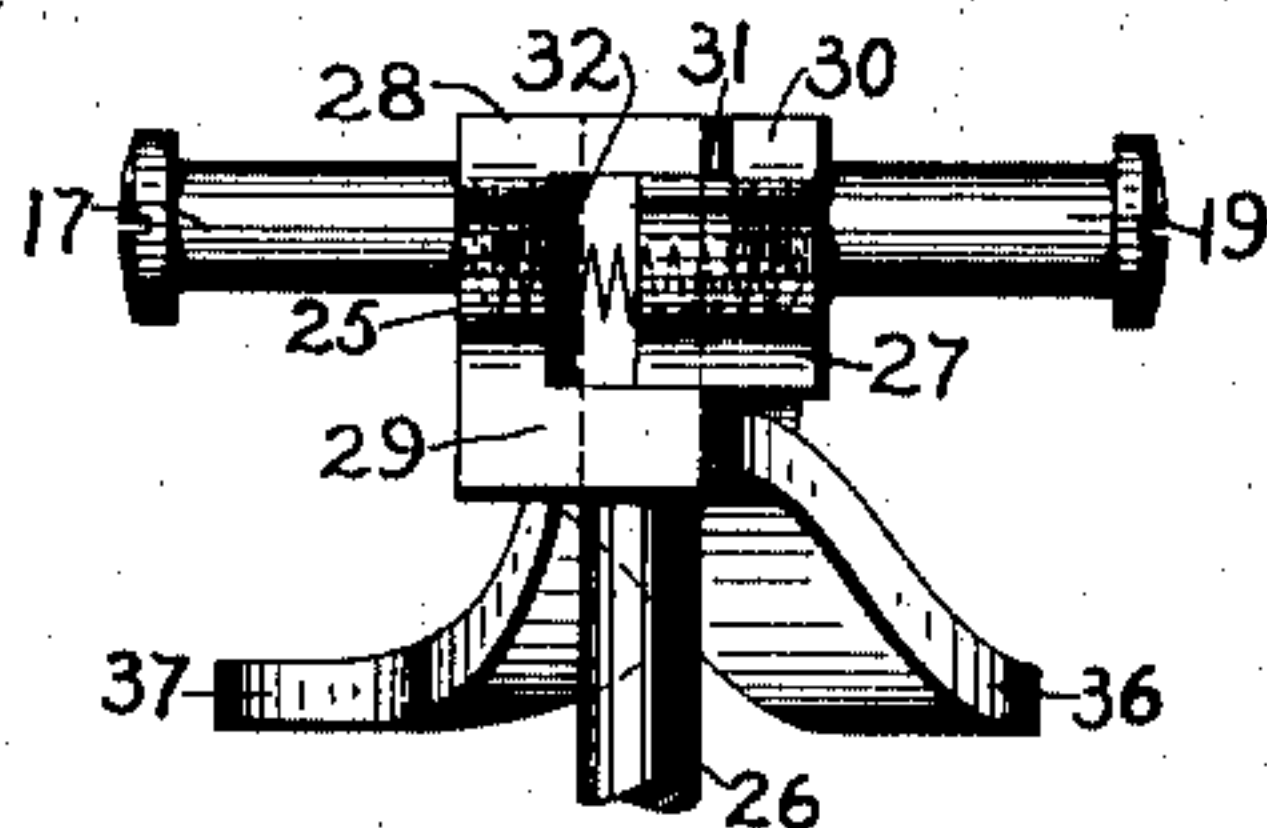


Fig. 5.

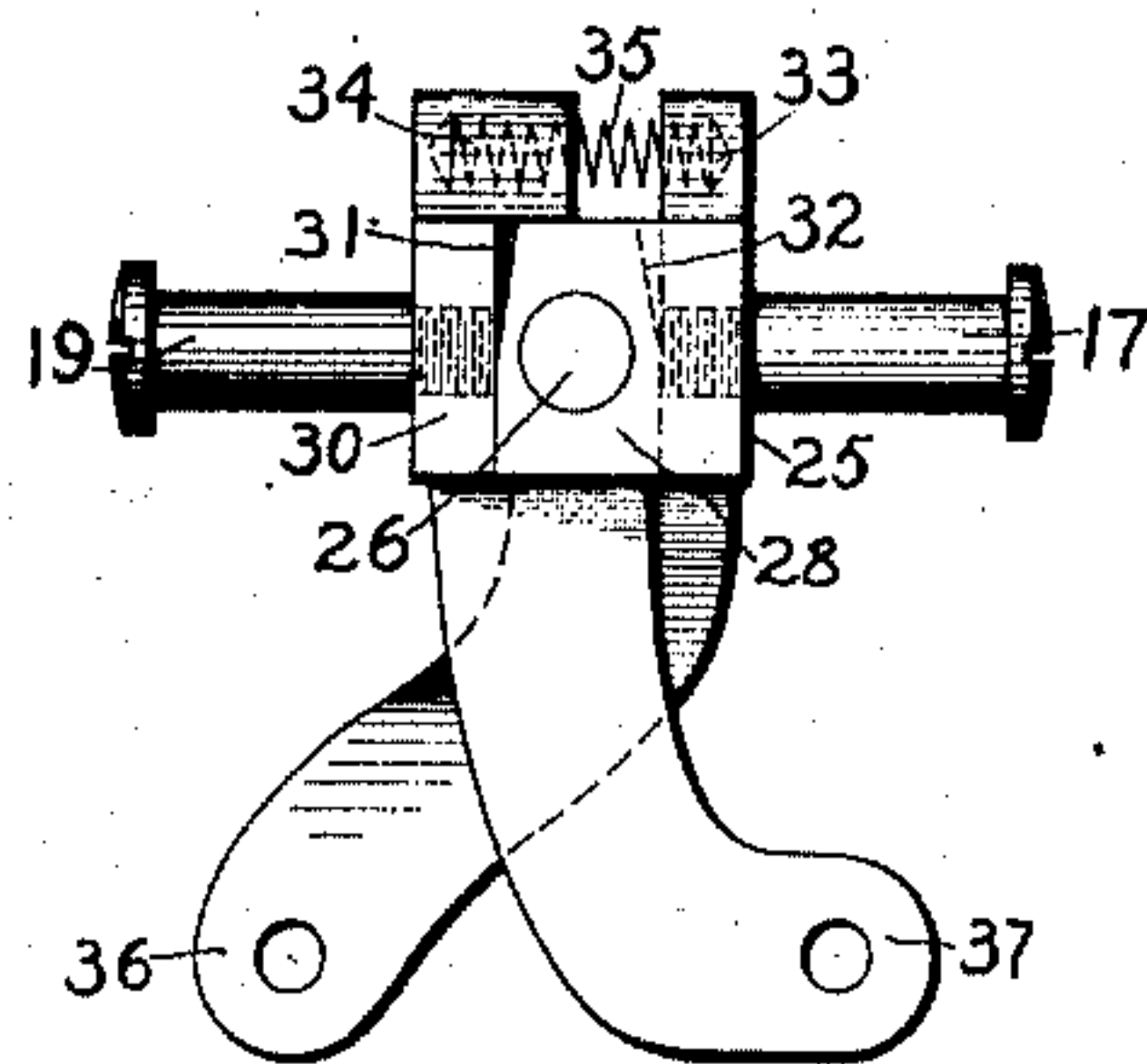


Fig. 6.

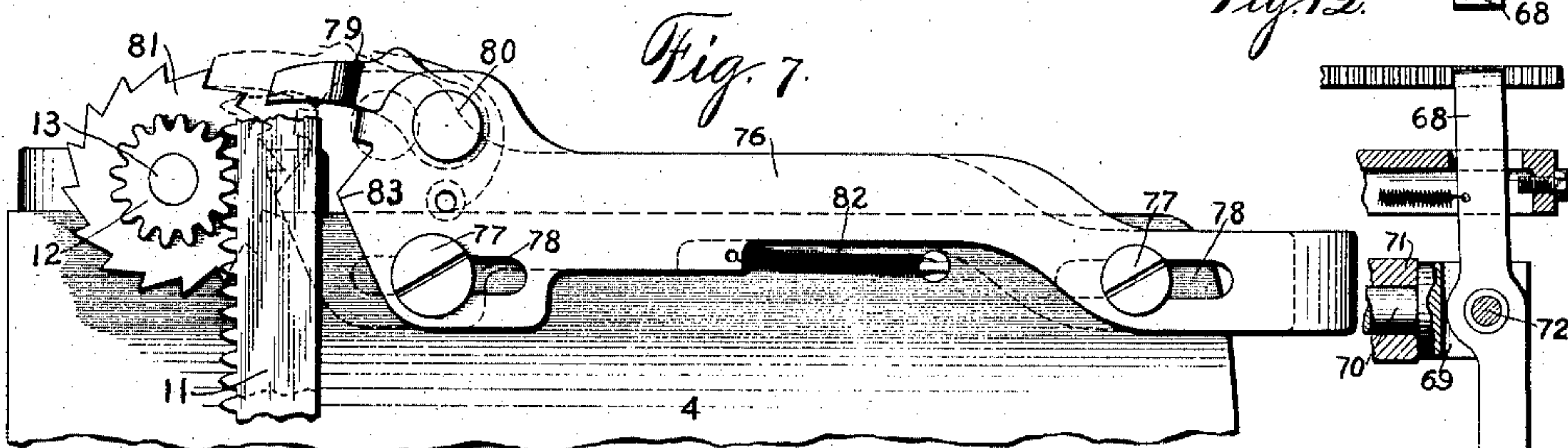
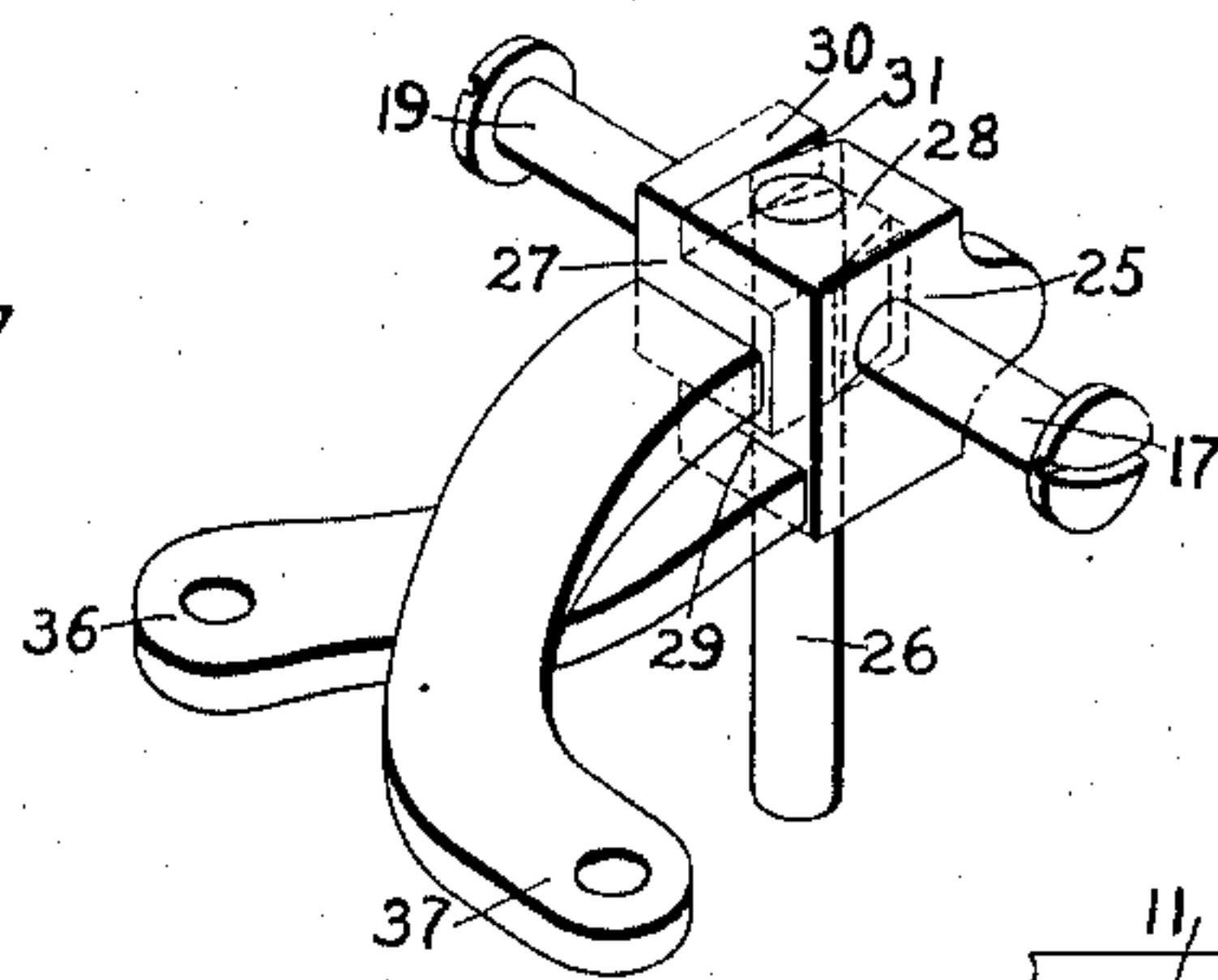


Fig. 12.

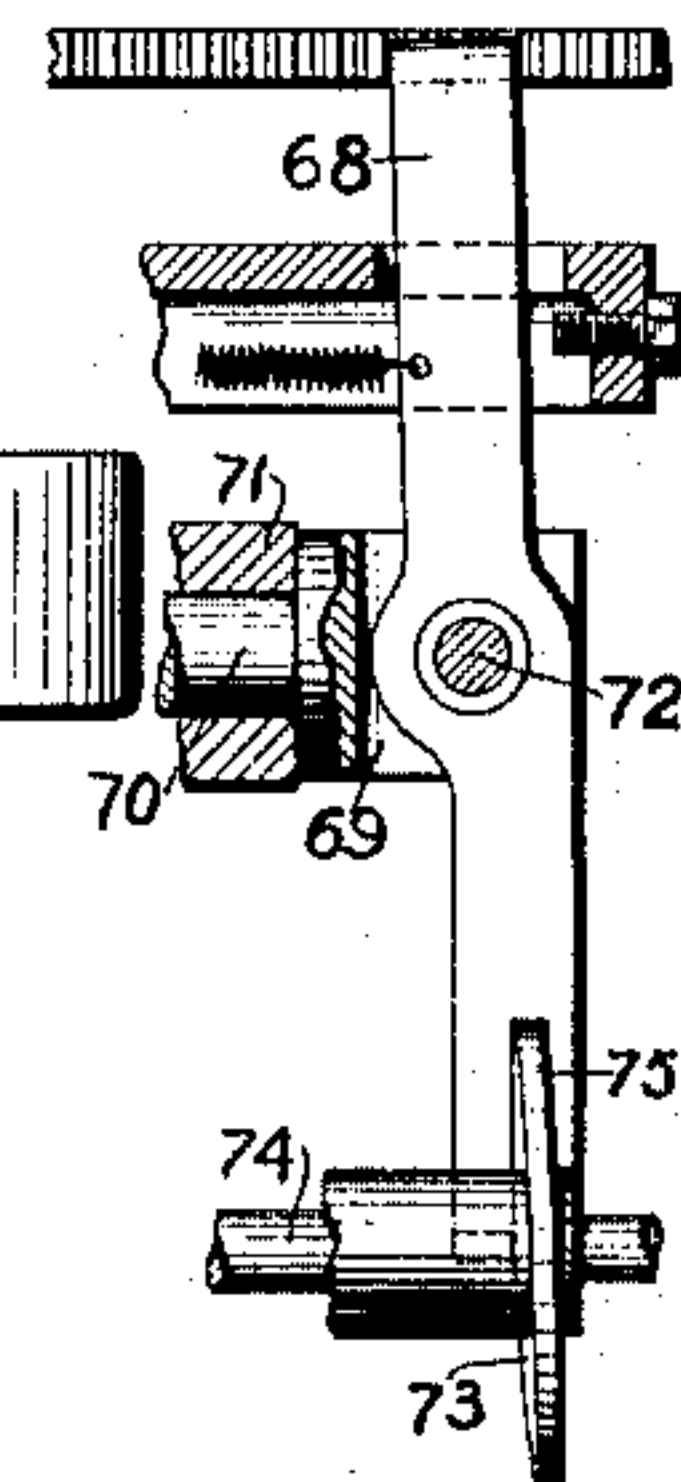
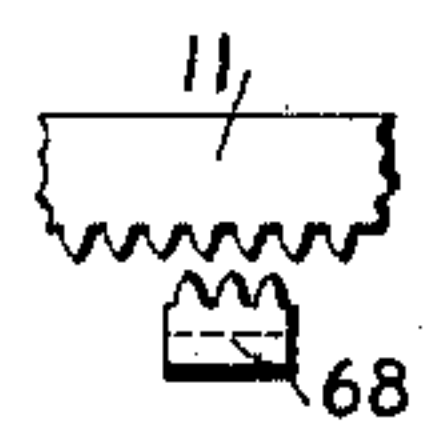


Fig. 8.

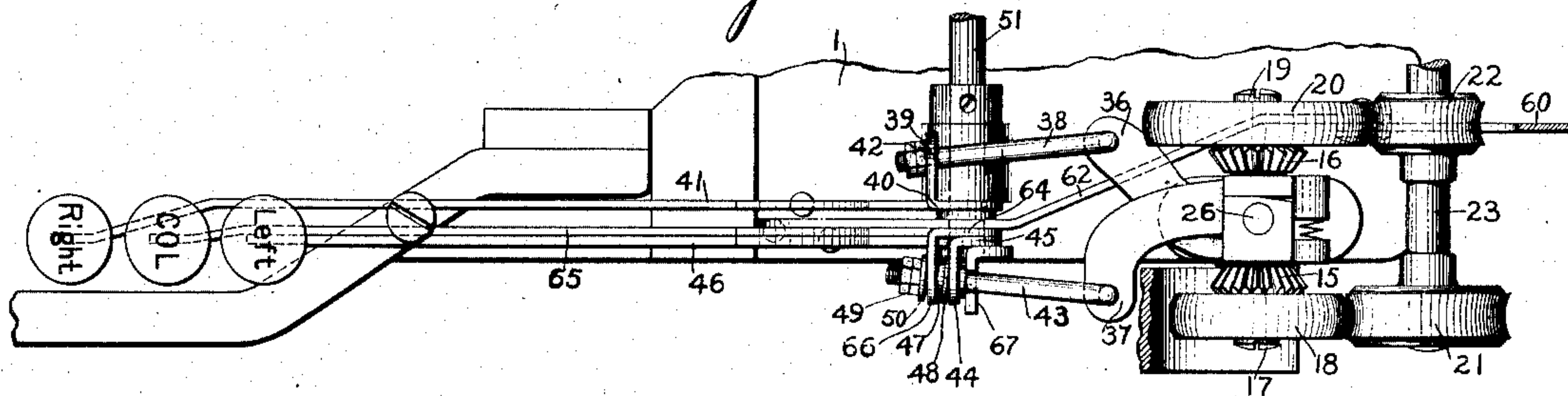


Fig. 9.

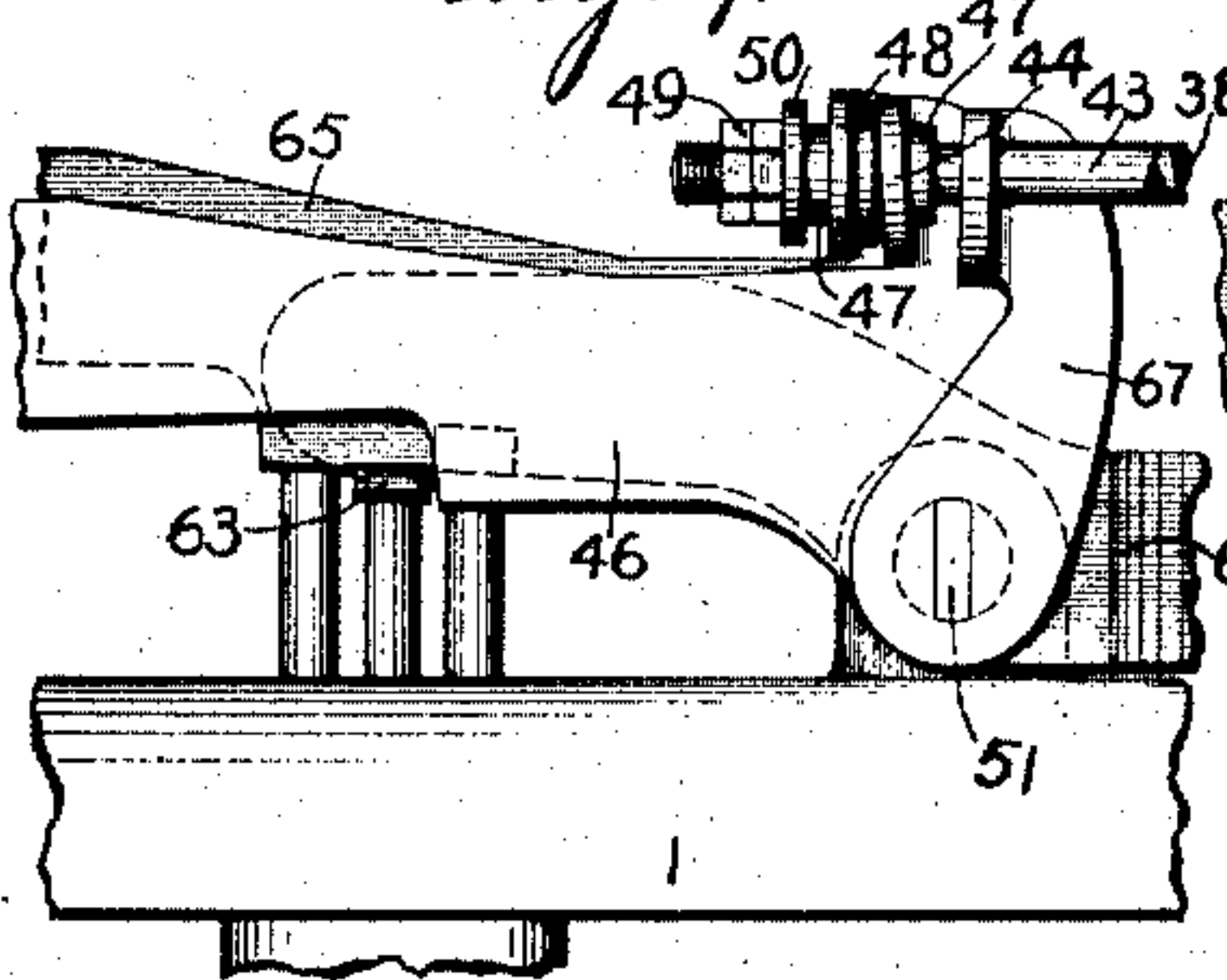


Fig. 10.

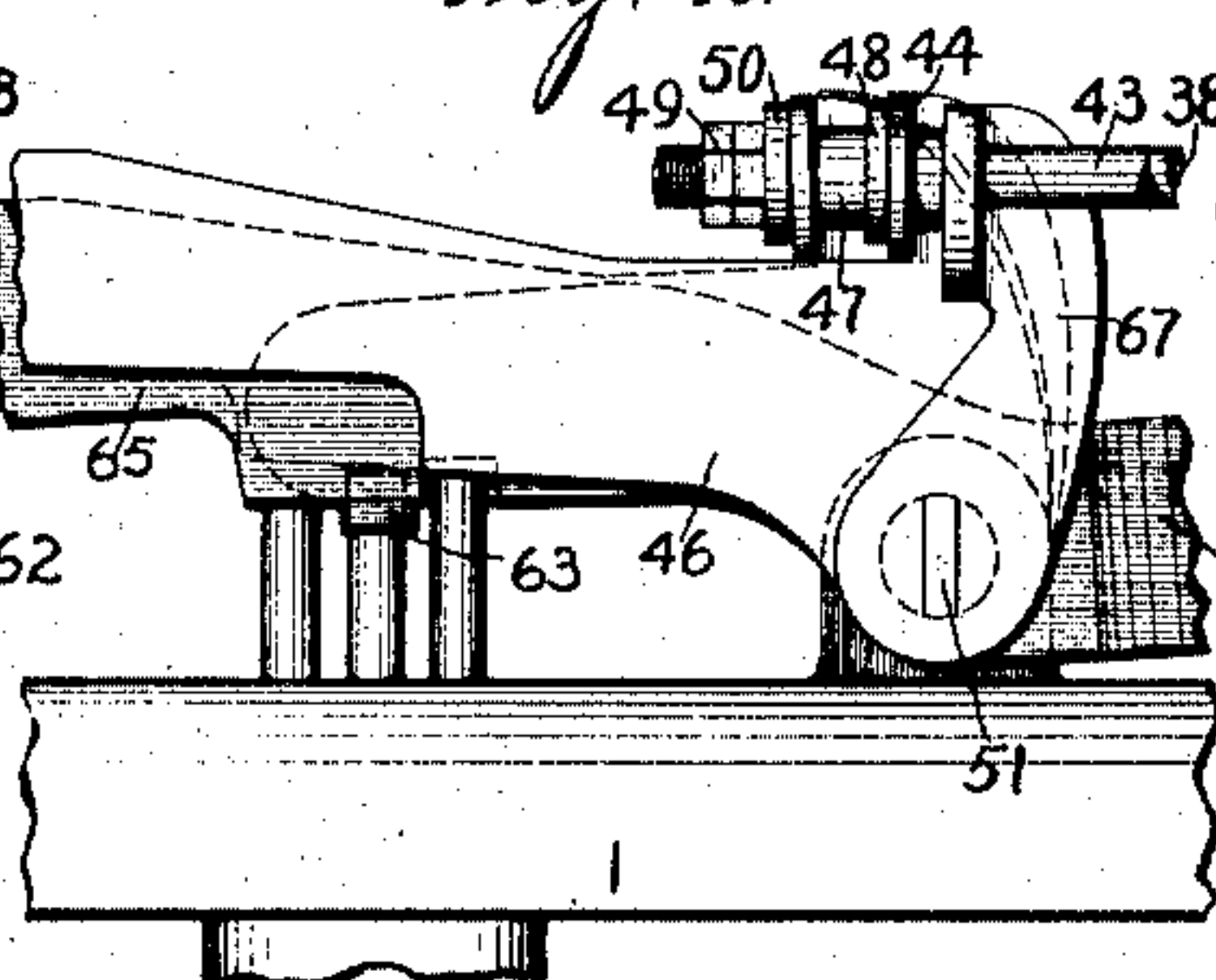
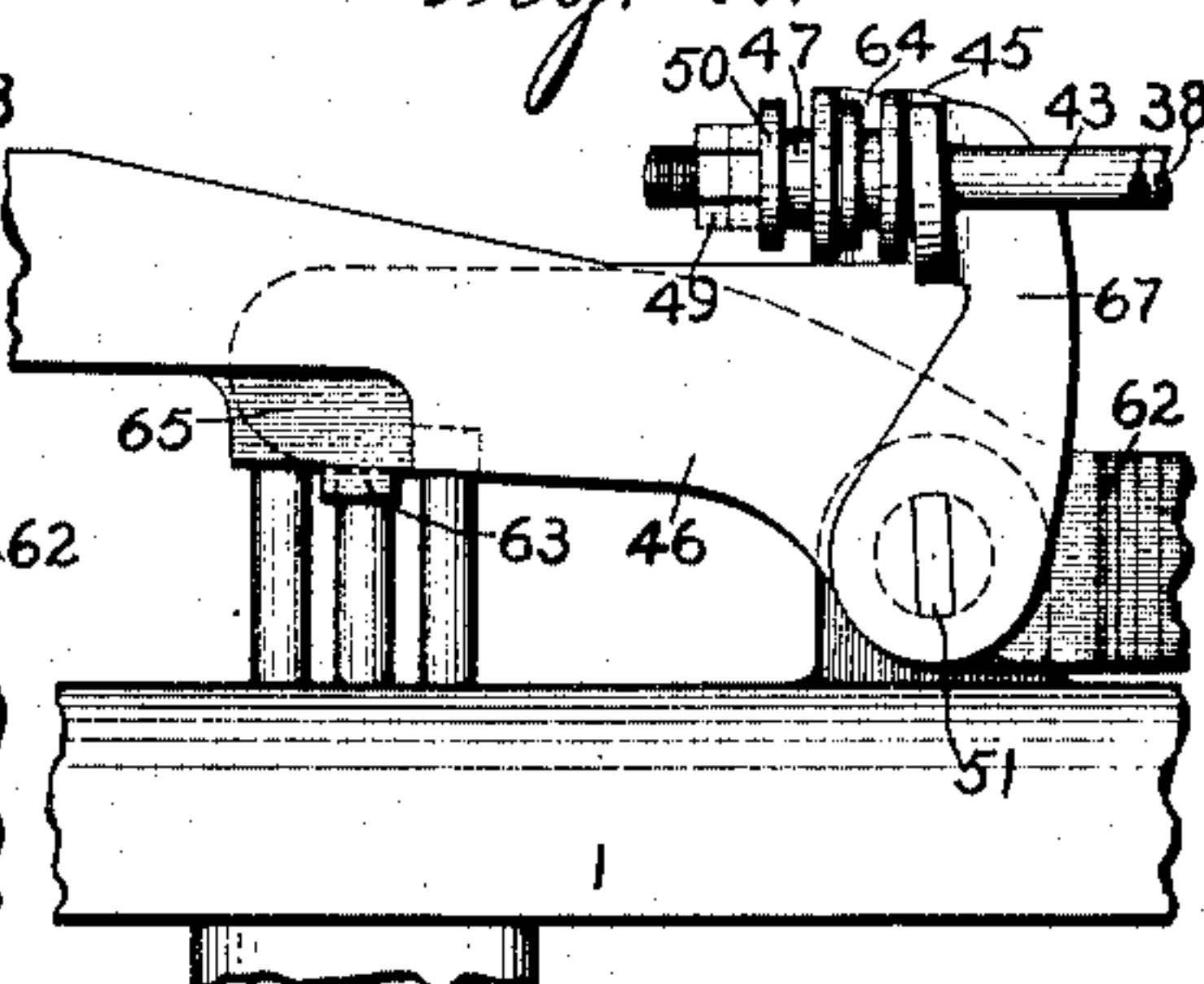


Fig. 11.



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# UNITED STATES PATENT OFFICE.

GEORGE C. BLICKENSDERFER, OF STAMFORD, CONNECTICUT.

## TYPE-WRITING MACHINE.

No. 864,505.

Specification of Letters Patent.

Patented Aug. 27, 1907.

Application filed August 10, 1905. Serial No. 273,607.

*To all whom it may concern:*

Be it known that I, GEORGE C. BLICKENSDERFER, a citizen of the United States, residing at Stamford, county of Fairfield, and State of Connecticut, have invented certain new and useful Improvements in Type-Writing Machines, fully described and represented in the following specification and the accompanying drawings, forming a part of the same.

This invention relates to certain improvements in typewriting machines, and has generally for its object to improve the details of construction of said machines, the scope of the invention relating more particularly to the mechanism for operating and controlling the carriage.

With this general object and other specific objects in view, the invention consists in certain constructions and in certain parts, improvements and combinations as will be hereinafter fully described and pointed out in the claims hereunto appended.

Referring to the drawings—Figure 1 is a side elevation of so much of the operating mechanism of a typewriting machine as is necessary to an understanding of the invention. Fig. 2 is a rear elevation of part of the construction shown in Fig. 1, the side selected being the side nearest the observer in that figure. Fig. 3 is a plan view of the construction shown in Fig. 2. Figs. 4, 5 and 6 are detail views, illustrating the construction of certain swinging blocks employed in the best form of construction. Fig. 7 is a detail view illustrating a mechanism for giving the carriage a movement in a direction reverse to the printing movement. Fig. 8 is a detail view illustrating a part of the mechanism for giving the carriage running movements in both directions. Figs. 9, 10 and 11 are detail views, and Fig. 12 is a detail view illustrating the step by step carriage advancing mechanism.

The machine selected to illustrate a practical application of the invention is a power machine of the Blickensderfer type.

In the drawings, the bed plate of the machine is marked 1, this plate being supported, as is usual, on suitable feet 2. The bed sustains by means of standards 3, or in any other suitable manner, a top plate 4 on which the carriage is mounted.

The carriage construction may be of any approved type. That selected to illustrate the invention embodies a pair of parallel rods 5 connected by cross pieces 6, these rods being supported in grooved wheels 7 mounted on studs 8 rising from the top plate 4. The impression roll of the carriage is indicated at 9, this roll being carried by side pieces 10 which are in turn supported by cross-pieces 6 before referred to. The carriage construction is more or less diagrammatically illustrated, it not being necessary to an understanding of the invention to fully illustrate the details thereof.

In the construction shown, means are provided for giving the carriage a running movement, that is, a continuous movement as distinguished from a step by step movement. In the best construction, this means will be of such a character that a running movement may be given the carriage in either direction. While the devices by which this running movement is produced, may be varied, in the construction shown the carriage is provided with a rack 11 which is in mesh with a gear 12 mounted on a vertical shaft 13, this shaft being supported in the frame and carrying on its lower end a beveled gear 14 which is in mesh with two other beveled gears 15, 16. It is obvious that by driving one of the beveled gears 15, 16, the carriage will be given a running movement in one direction, and by driving the other gear, the carriage will be given a running movement in a reverse direction.

While the mechanism by which the driving of the gears and the vertical shaft,—when these features of construction are employed,—to give the carriage a running movement, may be varied, in the construction shown, the gear wheel 15 is mounted on a stud 17 which also supports a friction wheel 18 to which the gear 15 is fast. Similarly the gear 16 is mounted on a stud 19 which also supports a friction wheel 20 to which the gear 16 is fast. These friction wheels 18 and 20 may be caused at proper times to engage with driving members, the driving member for the wheel 18 being a friction disk 21, and the driving member for the wheel 20 being the friction disk 22, these disks being mounted on a shaft 23 which, in the particular construction shown, is the shaft of a motor which is conventionally indicated at 24. In the best constructions this motor will be continuously driven so that the driving shaft and the driving members 21 and 22 will be constantly running.

The construction so far described is similar to the construction described in an application filed December 6, 1902, by George C. Blickensderfer, and serially numbered 134,104, which has been found to be an efficient mechanism for the purpose described. In the construction shown in that application, however, the parts corresponding to the studs 17, 19 were mounted in a swinging block, this block being moved through suitable instrumentalities, including keys, to bring one or the other of the driven members or wheels 18, 19 into engagement with its driving member. In other words, the carriage driving mechanism shown in that application, while it included a separate line of connections from each key to the block, had the block common to both lines. The result of this was that when operating one key lever to swing the block a strain was set up on the other line of connections which limited the movement of the block and unless the adjustment was fine, sometimes prevented a proper engagement of the wheels.

In the present construction the driving mechanism



while it includes keys as before, has an independent line of connection from each key, whereby each key may be operated without its operation being interfered with by the line of connection with the other key.

5 While the construction by which the separate lines of connection are established may be varied, as shown the stud 17 is mounted in a block 25 which is mounted on a vertical stud 26 suitably supported in the frame. The stud 19 is supported in a block 27 also supported on the  
10 stud 26. In the particular construction shown, in order to stiffen and strengthen the construction and also to simplify it, the block 27 lies in a recess in the block 25, this recess being formed by upper and lower members 28, 29, and this block 27 has an upward extending lip 30  
15 which lies along the edge of this upper member 28, the member being chamfered off at 31. The block 27 has a similar chamfer, indicated by dotted line at 32 in Fig. 5, these chamfers permitting the blocks to swing. The blocks have rearward extensions, that on the block 25  
20 being marked 33 and that on the block 27 being marked 34 (see Fig. 5) and between these blocks is located a spring 35 which serves to keep the blocks in normal position, that is, in the position where neither of the driven wheels 18, 20 is in engagement with its driving member.  
25 The sides of the block prevent the spring from throwing the blocks too far. In the particular construction shown, the block 25 is provided with an arm 36 and the block 27 is provided with an arm 37. The arm 36 is connected by a link 38 to an outwardly turned end 39 of an  
30 arm 40 of a bell-crank lever 40, 41, this lever being a key-lever, and bearing a key marked "Right". The link 38 passes loosely through an opening in the outwardly turned end 39 and is shown as provided with set nuts 42. Similarly, the arm 37 is connected by a link  
35 43 to an outwardly turned end 44 of a bell-crank lever 45, 46, this lever being a key-lever and bearing a key marked "Left".

In the particular construction shown, and for reasons which will hereinafter appear, the connection between  
40 the link 43 and the outwardly turned end 44, is made by means of a sleeve 47 having a collar 48 against which the outwardly turned end 44 of the arm 45 of the lever bears, this sleeve being held in position by set nuts 49, or in any other suitable manner, and having a washer  
45 50 interposed between the nuts and the end of the sleeve. The levers 40—41 and 45—46 are, in the particular construction shown, journaled on a shaft 51, though they might be mounted in any other suitable manner. This shaft 51, it may be here remarked, may  
50 be a shaft forming a part of a tabulator mechanism if one is employed. If a tabulator mechanism is not employed, these levers may be supported in any suitable manner, but when the tabulator mechanism is employed, this shaft forms the best means for support-  
55 ing the levers.

With the construction so far described, it will be seen that by operating the key marked "Right", the block 25 will be swung, this moving the wheel 18 into engagement with the wheel 21. The movement of the  
60 block will, therefore, through the connections heretofore described cause the carriage to be moved to the right, that is, in the direction opposite to that in which it moves during the printing operation. By operating the key marked "Left", the block 27 will be swung,

this movement of the block, through the connections 65 before described, causing the carriage to move to the left, that is, in the direction in which it moves during the printing operation.

In machines designed for certain classes of work what is known as the column stopping mechanism is 70 employed, this mechanism operating, as is well-known, to bring the carriage to a stop at a point or points across the sheet, so as to enable work to be printed in columns, having their initial letters in the same vertical line or lines. Such a mechanism may be advantageously 75 employed in connection with machines provided with means for giving the carriage the running movements referred to, and particular mechanism for giving the carriage the running movement to the left, or in the direction which may be termed the "printing" direction. 80 When such a column stopping mechanism is employed, it may be varied in construction.

The mechanism shown embodies a plurality of stops 52 mounted on and movable along a notched bar 53 connected to the carriage, the stops being located in 85 the notches of the bar and being held in position by a swinging bail 54. Coöperating with these stops is a stopping member or arm 55, this arm being mounted on one of the arms 56 of a bell-crank lever 56—57, this lever being pivoted at 58 to the machine frame. The 90 member 55 is normally held in the position illustrated in Fig. 2 by a light spring 59. The arm 57 of the bell-crank lever is connected to a bent link 60 pivotally connected at 61 to a lever 62 pivoted on the shaft 51 before described. The lever 62 has (see Figs. 9 to 11) 95 a lip 63 which underlies the arm 64 of a bell-crank lever 64—65, this lever being a key-lever bearing a key, in the particular construction shown, marked "Col" and being pivoted on the shaft 51. It is obvious that by operating the key marked "Col" the column stopping 100 mechanism will be operated and the member 55 will be positioned so that it will be struck when the carriage moves by one of the stops 52.

While the movement of the carriage to cause it to advance when the column stopping mechanism has 105 been brought into position, may be produced in any desirable manner, it will, in the best constructions, as has been heretofore indicated, be a continuous movement and be produced by the operation of the column stopping operating key, and the connections will be 110 of such a character as to enable a movement of the carriage in the same direction as that produced by the column stopping key to take place without operating the column stopping member or arm.

In the particular construction shown, the arm 65 of 115 the lever 64, 65 has an outwardly bent end 66, and the sleeve 47 passes through an opening in this outwardly bent end, the bent end resting against the washer 50 before referred to. The operation of the column stopping lever will, therefore, not only set the column 120 stopping device, but also rock the block 37 and produce the running movement to the left before referred to. It is also obvious that the depression of the "left" key will produce the same running movement without disturbing the column stop operating connections. 125

In the particular construction illustrated, the shaft 51 is also provided with an arm 67 through which the link 43 passes, so that the rocking of the shaft which is



incidental to the operation of the tabulating mechanism, not herein claimed, will also produce this continuous running movement to the left.

The machine will be provided with a step by step  
5 advancing feeding device which, while it may be of  
any suitable character, in the best constructions will  
be of such a character as to leave the carriage entirely  
free, so that it may be moved in either direction. As  
shown, this movement is effected by means of a lever  
10 68 pivoted in a rocking block 69, this block being  
mounted on a stud 70 which engages a bearing 71 suit-  
ably supported on the frame of the machine and on the  
side of the machine opposite to that illustrated in Fig. 1.  
The pivot of the lever 68 is marked 72. This lever  
15 is provided with a bent toothed end, as shown, which  
engages the rack 11 before referred to. The lever is  
operated by means of a cam 73 mounted on a shaft 74  
suitably supported in the machine. This cam has a  
second cam 75 on its periphery. As the shaft rotates,  
20 the disk first operates on the lever, rocking it at right  
angles to its pivot 72, this movement being permitted  
by the turning of the block 69 on its pivot 70. This  
movement of the lever brings its teeth into engagement  
with the teeth on the rack 11. When this engagement  
25 has taken place, the cam 73 comes into operation and  
rocks the lever on its pivot, thus advancing the carriage  
one space. After the feeding movement of the lever  
68 has occurred, it is pulled out of engagement with the  
teeth in the rack 11 by means of a spring, not shown.  
30 This step by step carriage advancing mechanism is not  
specifically herein claimed, the same being claimed  
in an application No. 181,265, filed Nov. 16, 1903, by  
Geo. C. Blickensderfer. A full description of specific  
means for mounting this lever and its various connected  
35 parts will be found in said application, such description  
and illustration being omitted from this application  
as they are unnecessary to an understanding of the  
invention, and in the interest of brevity.

It may happen in moving the carriage to the left  
40 or printing direction, either by the step by step move-  
ment or the running movement, that it will be car-  
ried a space or a few spaces too far. In the best con-  
structions, therefore, means will be provided for  
giving the carriage a step by step movement to the  
45 right, that is, in a direction opposite to what has  
been termed a printing movement. While this may  
be effected in various ways, in the particular con-  
struction shown, there is provided a slide 76, this  
slide being mounted on the top of the top plate 4,  
50 this movement being permitted and guided by means  
of screws 77 cooperating with slots 78, or in any other  
suitable manner. This slide carries a pawl 79 piv-  
oted to the slide at 80. This pawl cooperates with a  
ratchet disk 81 mounted on the shaft 13 before re-  
55 ferred to. By operating this slide, the carriage may  
be jigged back a space or a number of spaces, if de-  
sired, the return movement of the slide after it has  
operated being conveniently produced by means of  
a spring 82. To prevent an overthrow of the disk 81  
60 the slide is provided with a locking projection 83  
which engages the teeth of the ratchet disk after the  
ratchet has been moved sufficiently to move the car-  
riage one space. While this jigging back of the car-  
riage is important for the reason before stated, it is

particularly important when used in connection 65  
with a free carriage, that is, a carriage which bears  
such a relation to its feeding devices that it may be  
moved in either direction at any time by hand. When  
such carriages are used, it is necessary after erasing  
a misstruck letter to bring the carriage back to the 70  
exact point necessary to print in the proper letter.  
When this is done by moving the carriage by hand,  
there is danger that the carriage may not be accu-  
rately positioned, but by jigging it back the carriage  
can be accurately positioned. 75

Changes and variations may be made in the con-  
struction described for carrying the invention into  
effect. The invention is not, therefore, to be lim-  
ited to the details of construction hereinbefore de-  
scribed and shown in the accompanying drawings. 80

What is claimed is:—

1. In a typewriter, the combination with a carriage, of  
means for giving it a running movement, a key and suit-  
able connections for rendering said means operative, col-  
umn stopping devices, a key and suitable connections for 85  
rendering said stopping devices operative, and connections  
between this key and the means for giving the carriage  
a running movement, whereby when the column stopping  
key is operated the carriage is given said running move-  
ment. 90
2. In a typewriter, the combination with a carriage,  
of a driving mechanism by which the carriage may be  
given a running movement, said mechanism being nor-  
mally disconnected from the carriage, key-controlled 95  
means for connecting said mechanism to the carriage,  
key-controlled column stopping devices, and connections  
whereby the column stopping key connects the driving  
mechanism to the carriage.
3. In a typewriter, the combination with a carriage, of  
a constantly running driving mechanism, normally inop- 100  
erative key-controlled connections, key-controlled column  
stopping devices, and means whereby the operation of the  
column stopping key renders the connections between the  
driving mechanism and the carriage operative.
4. In a typewriter, the combination with a carriage, of 105  
power operated key-controlled means whereby the carriage  
may be given a running movement in either direction, key-  
controlled column stopping devices independent of said  
key-controlled means, and connections whereby the opera-  
tion of the column stopping devices causes a continuous 110  
movement of the carriage.
5. In a typewriter, the combination with a carriage, of  
a driving mechanism, normally inoperative key controlled 115  
connections whereby the driver may give the carriage a  
running movement in either direction, key controlled col-  
umn stopping devices, and means whereby the operation of  
the column stopping devices causes the driving mechanism  
to give the carriage a continuous movement.
6. In a typewriter, the combination with a carriage, of 120  
a constantly running driving mechanism, normally inop-  
erative key-controlled connections whereby the driver may  
give the carriage a running movement in either direction,  
key-controlled column stopping devices, and means where-  
by the operation of the column stopping devices causes 125  
the driving mechanism to give the carriage a continuous  
movement.
7. In a typewriter, the combination with a carriage, of  
a driving mechanism, a key and suitable operating con-  
nections for causing the driving mechanism to move the  
carriage in one direction, and a key and suitable operat- 130  
ing connections for causing the driving mechanism to  
move the carriage in the opposite direction, the operating  
connections for one key being independent of the operating  
connections for the other key.
8. In a typewriter, the combination with a carriage, of 135  
a constantly running driving mechanism, a key and suit-  
able operating connections for causing the driving mech-  
anism to move the carriage in one direction, and a key  
and suitable operating connections for causing the driving



mechanism to move the carriage in the opposite direction, the operating connections for one key being independent of the operating connections for the other key.

9. In a typewriter, the combination with a carriage, of a key and suitable connections for giving the carriage a movement in the printing direction, a key and suitable connections for giving the carriage a movement in the opposite direction, a key operated column stopping device, and connections whereby the operation of the key of said device causes the carriage to move in the printing direction.

10. In a typewriter, the combination with a carriage, of suitable driving mechanism, key operated connections whereby the driving mechanism is caused to move the carriage in the printing direction, key operated connections whereby the driving mechanism is caused to move the carriage in the opposite direction, key operated column stopping devices, and means whereby the key of said devices causes the driving mechanism to move the carriage in the printing direction.

11. In a typewriter, the combination with a carriage, of a driving mechanism including a plurality of driving members, a pair of driving members normally disengaged from the driving members, connections whereby one of said driven members drives the carriage in one direction and the other of said driven members drives the carriage in the opposite direction, swinging blocks one for each driven member by the movement of which the driven members are caused to engage the driving members, and keys and suitable connections for operating the blocks.

12. In a typewriter, the combination with a carriage, of a driving mechanism, a pair of keys, means including a line of connections from one of said keys whereby the driving mechanism is caused to drive the carriage in one direction, means including an independent line of connections from the other key whereby the driving mechanism is caused to move the carriage in the opposite direction, key operated column stopping devices, and connections between the keys of said devices and one of the lines of connections.

13. In a typewriter, the combination with a carriage, of a driving mechanism including a plurality of driving members, a pair of corresponding driven members, means whereby one of said driven members drives the carriage in one direction and the other driven member drives the carriage in the opposite direction, a pair of keys, one for each driven member, whereby each of said members is thrown into engagement with its driving member, key operated carriage stopping devices, and connections between the key for said devices and one of the driven members.

14. In a typewriter, the combination with a driving mechanism including a pair of driving members, of a pair of driven members normally disconnected from the driving members, means including swinging blocks, one for each driven member, whereby each driven member is caused to engage with its driving member, keys and suitable connections for swinging the blocks, key operated carriage stopping devices, and connections between the key for said devices and one of the blocks.

15. In a typewriter, the combination with a driving shaft, of a pair of driving wheels mounted thereon, a pair of driven wheels normally disconnected from the driv-

ing wheels, a carriage driving shaft, connections whereby either of the driven wheels may drive said shaft, a pair of key-controlled swinging blocks one for each driven wheel, whereby each driven wheel may be caused to engage its driving wheel, key operated carriage stopping devices, and connections between the key for said devices and one of the blocks.

16. In a typewriter, the combination with a carriage, of a step by step carriage advancing mechanism normally disconnected from the carriage, whereby the carriage is free to move in either direction, and means also normally disconnected from the carriage for giving the carriage a step by step movement in a direction opposite to that in which it is moved by the step by step advancing mechanism.

17. In a typewriter, the combination with a carriage normally free to move in either direction, of means for giving it a step by step advancing movement, means for giving it a running movement in the same direction as the step by step advancing movement, and means for giving it a step by step movement in the reverse direction.

18. In a typewriter, the combination with a carriage, of means for giving the carriage a step by step advancing movement, a motor driven gear wheel, a rack on the carriage with which the gear wheel engages, and means for operating the gear wheel to move the carriage in a direction opposite to that given it by the step by step advancing means.

19. In a typewriter, the combination with a carriage, of means for giving the carriage a step by step advancing movement, a motor driven gear wheel, a rack on the carriage with which the gear wheel engages, and a pawl and ratchet mechanism for operating the gear wheel to move the carriage in a direction opposite to that given it by the step by step advancing means.

20. In a typewriter, the combination with a carriage, of motor operated means including suitable gearing for giving the carriage a running movement in the direction in which it moves when printing, and means cooperating with the gearing for giving the carriage a step by step movement in the opposite direction.

21. In a typewriter, the combination with a carriage, of motor operated means for giving it a step by step advancing movement, key-controlled gearing including a rack and pinion for giving the carriage a running movement in the same direction as the advancing movement, and means cooperating with the gearing for giving the carriage a step by step movement in the reverse direction.

22. In a typewriter, the combination with a carriage, of a feeding mechanism for giving the carriage a step by step movement, said mechanism being normally disconnected from the carriage whereby the carriage is free to move in either direction, and means including gearing and a suitable slide mounted on the machine frame and normally disconnected from the gearing for moving the carriage in the opposite direction.

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

GEORGE C. BLICKENSDECKER.

Witnesses:

A. WHITE,  
J. A. GRAVES.