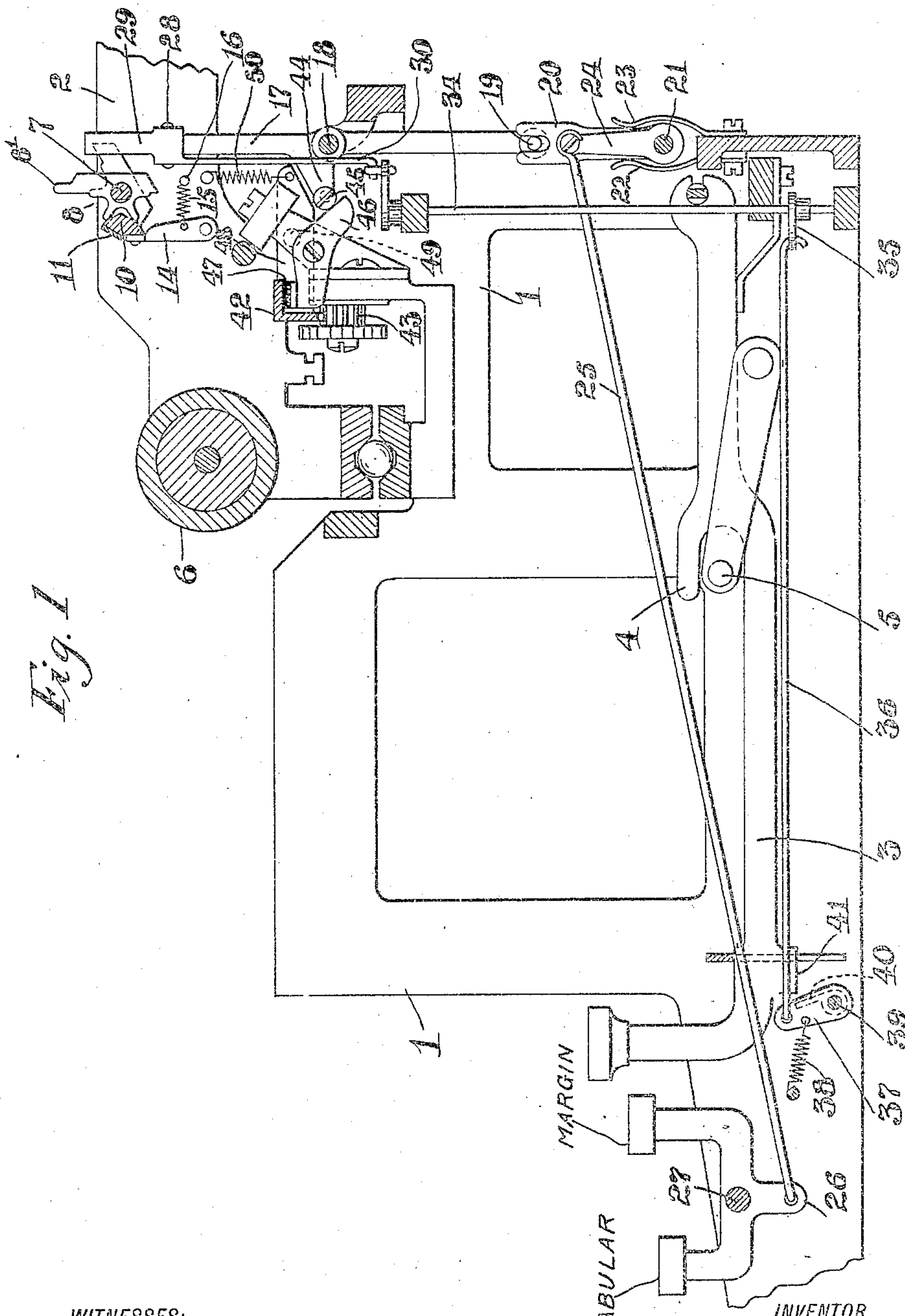


931,305.

Patented Aug. 17, 1909.
 6 SHEETS—SHEET 1.

Fig. 1



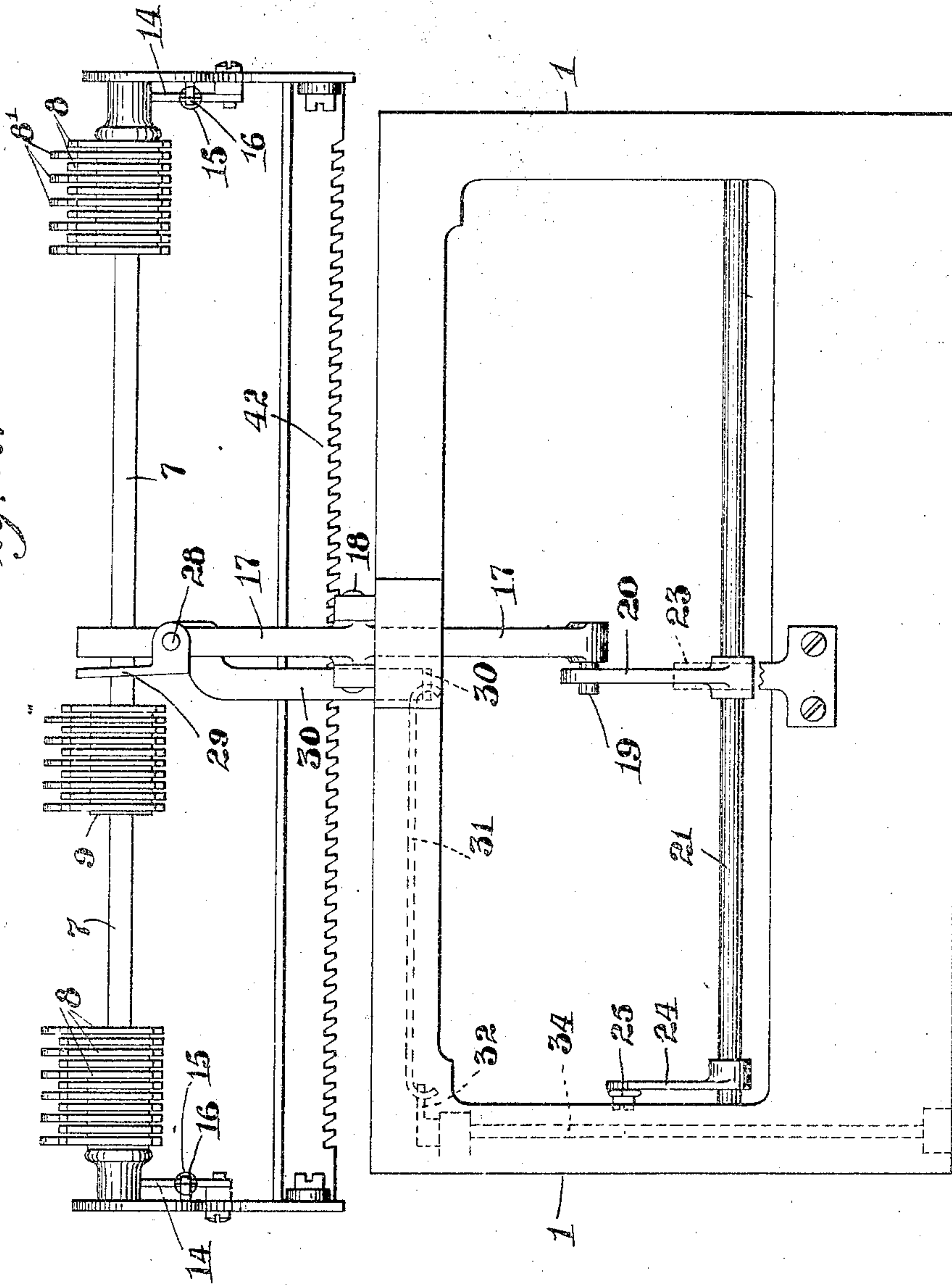
WITNESSES:
L. F. Browning

INVENTOR
 Edward B. Hess
 BY
 Edward C. Davidson
 ATTORNEY

931,305.

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 6 SHEETS—SHEET 2.

Fig. 2.



WITNESSES:

Comstock
 L. F. Browning.

INVENTOR

Edward B. Hess

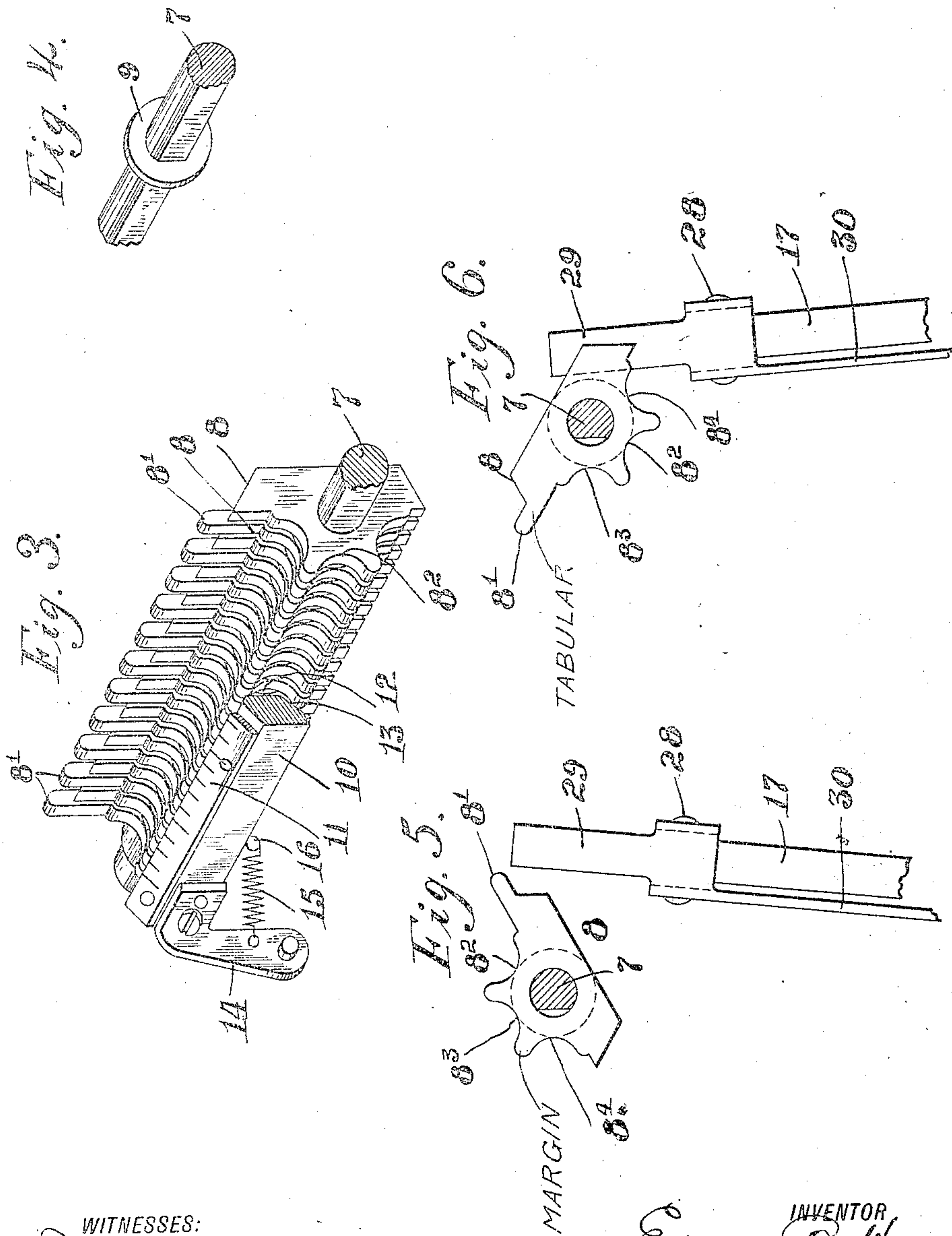
BY

Edward C. Davidson
 ATTORNEY

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 WRITING MACHINE.
 APPLICATION FILED OCT. 8, 1907.

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 6 SHEETS—SHEET 3.



WITNESSES:

Edw. B. Hess
 L. J. Browning

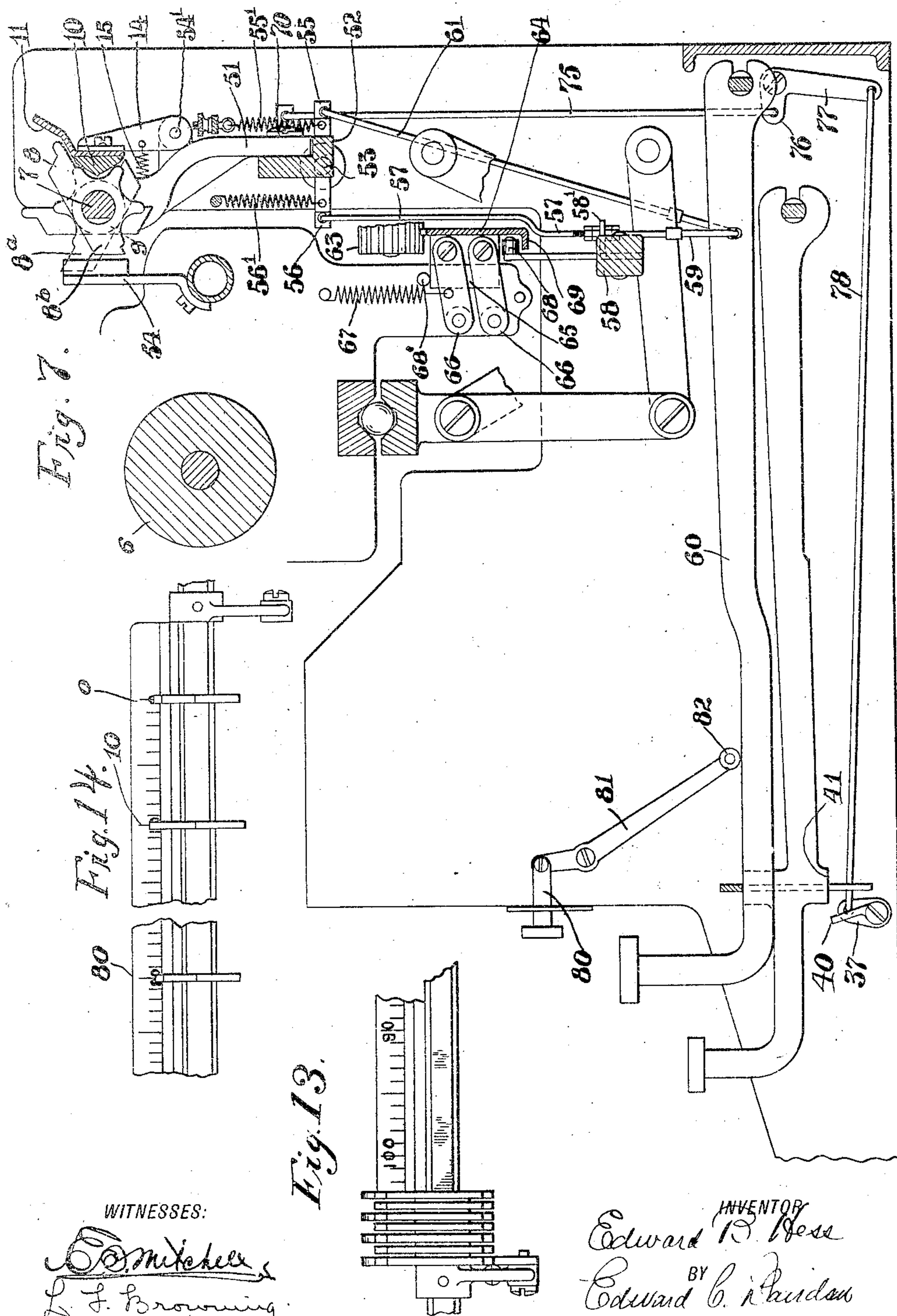
INVENTOR
Edward B. Hess
 BY
Edward C. Davidson
 ATTORNEY

E. B. HESS.
 WRITING MACHINE.
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Patented Aug. 17, 1909.

6 SHEETS—SHEET 4.



WITNESSES:
E. Mitchell
L. J. Browning

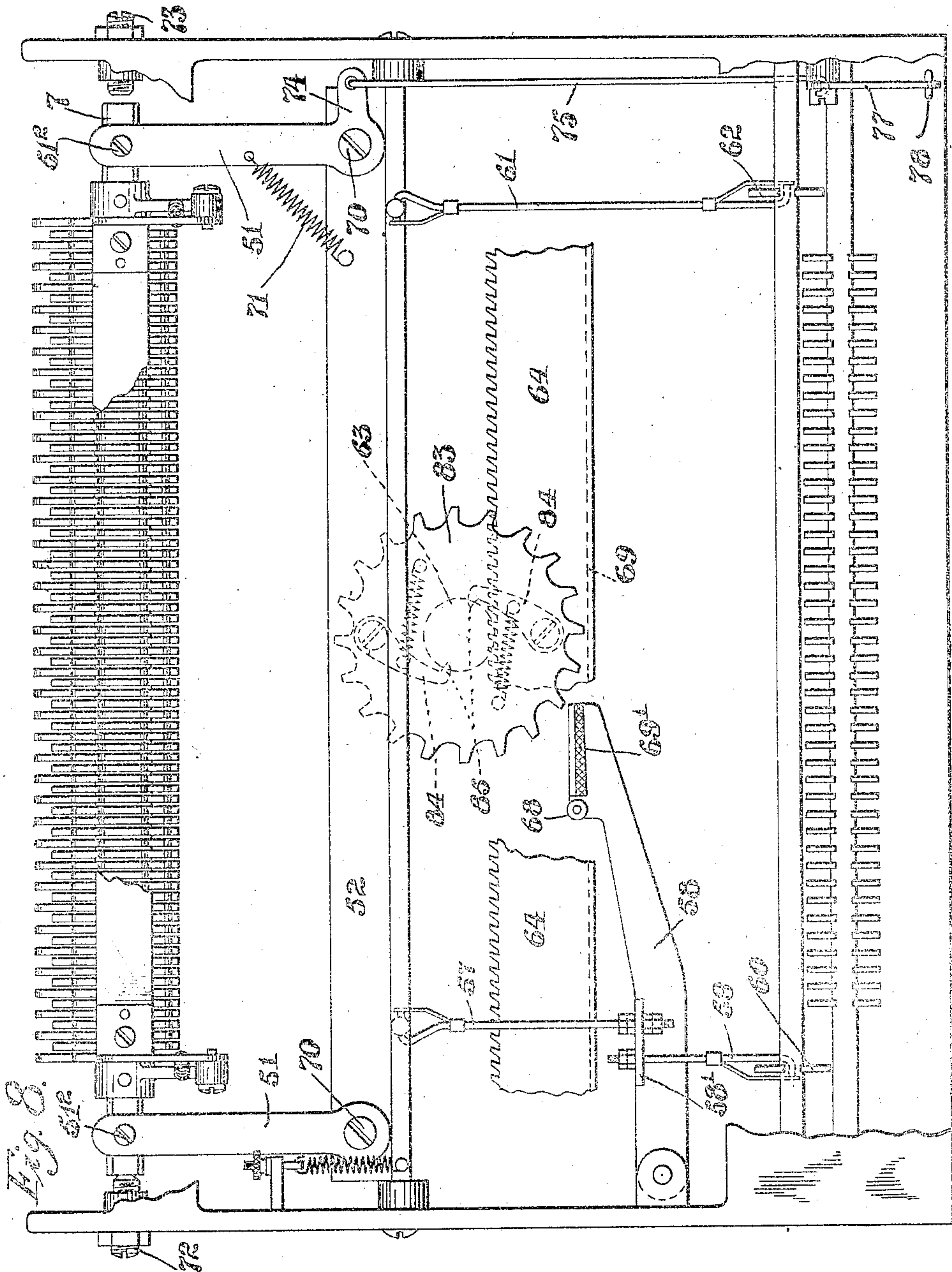
INVENTOR
Edward B. Hess
 BY
Edward C. Parison
 ATTORNEY

E. B. HESS.
 WRITING MACHINE.
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Patented Aug. 17, 1909.

6 SHEETS—SHEET 5.



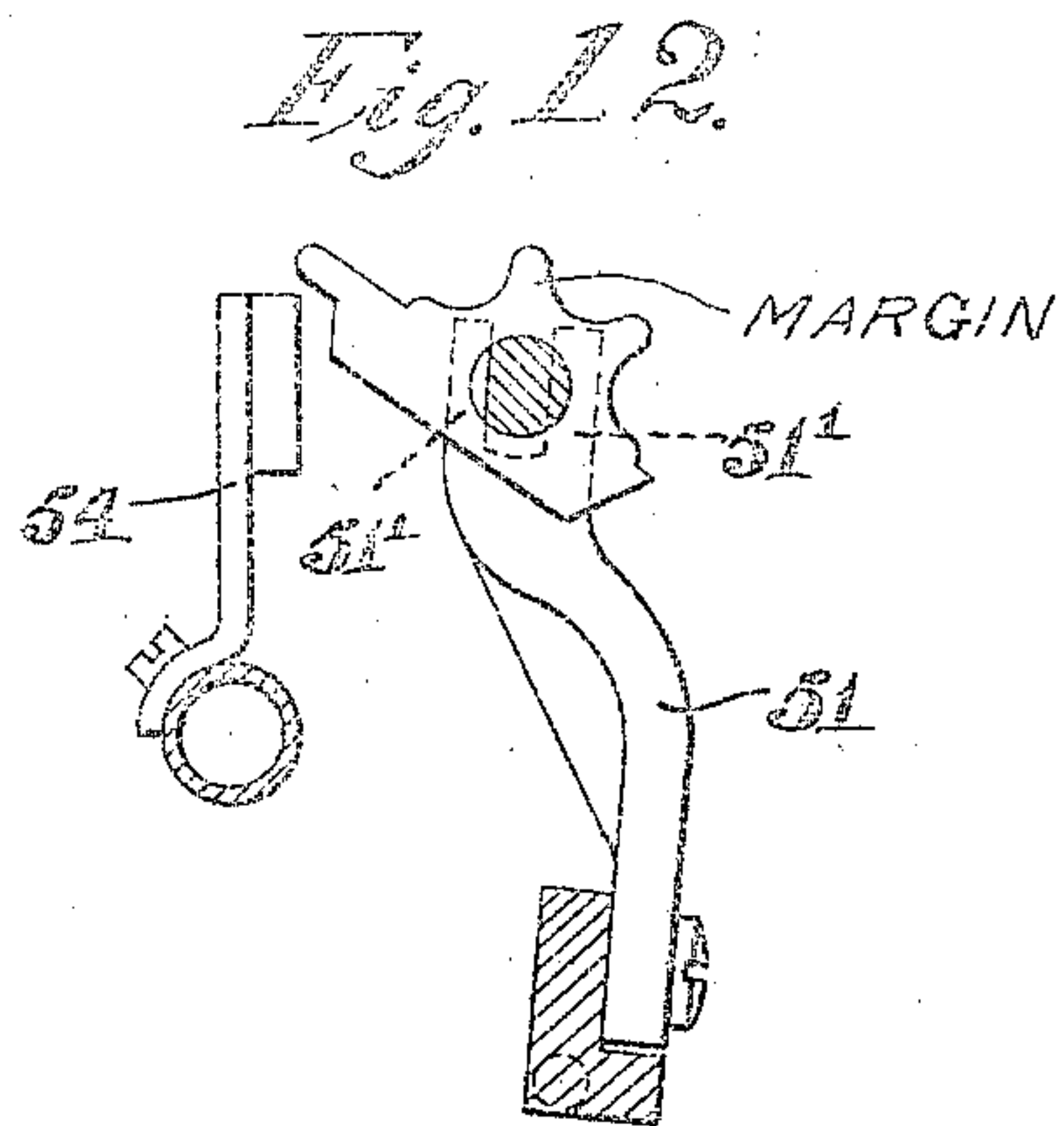
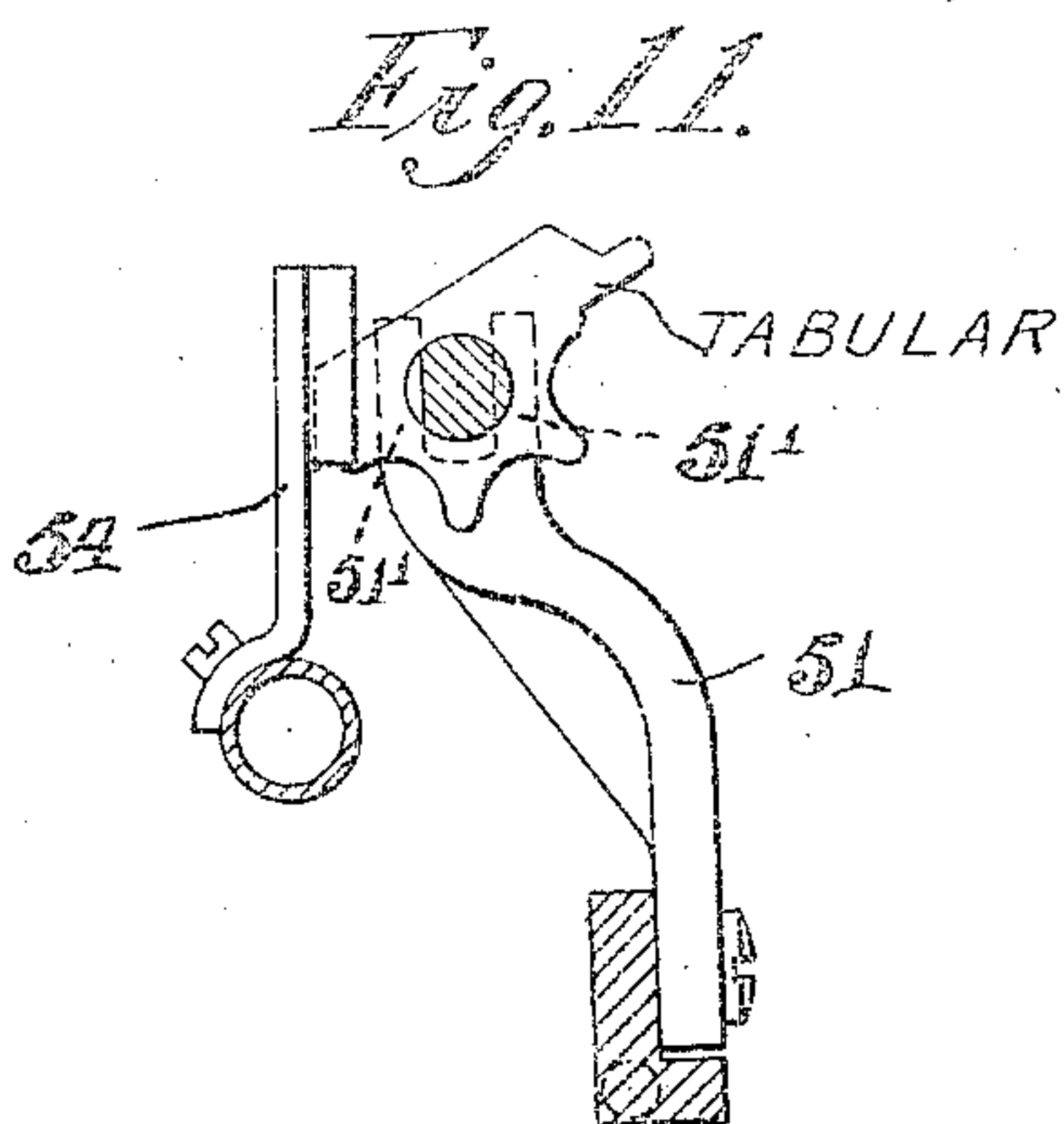
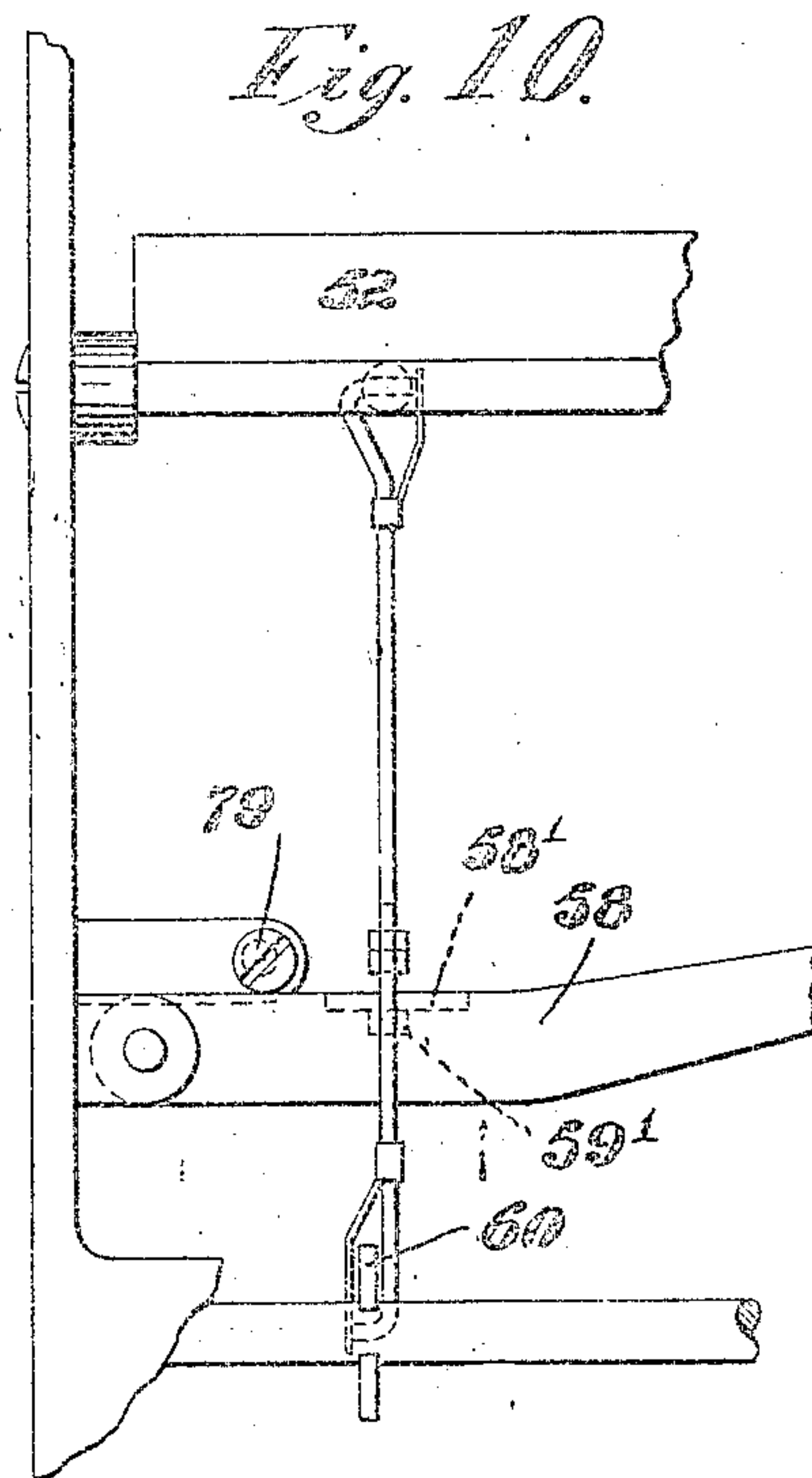
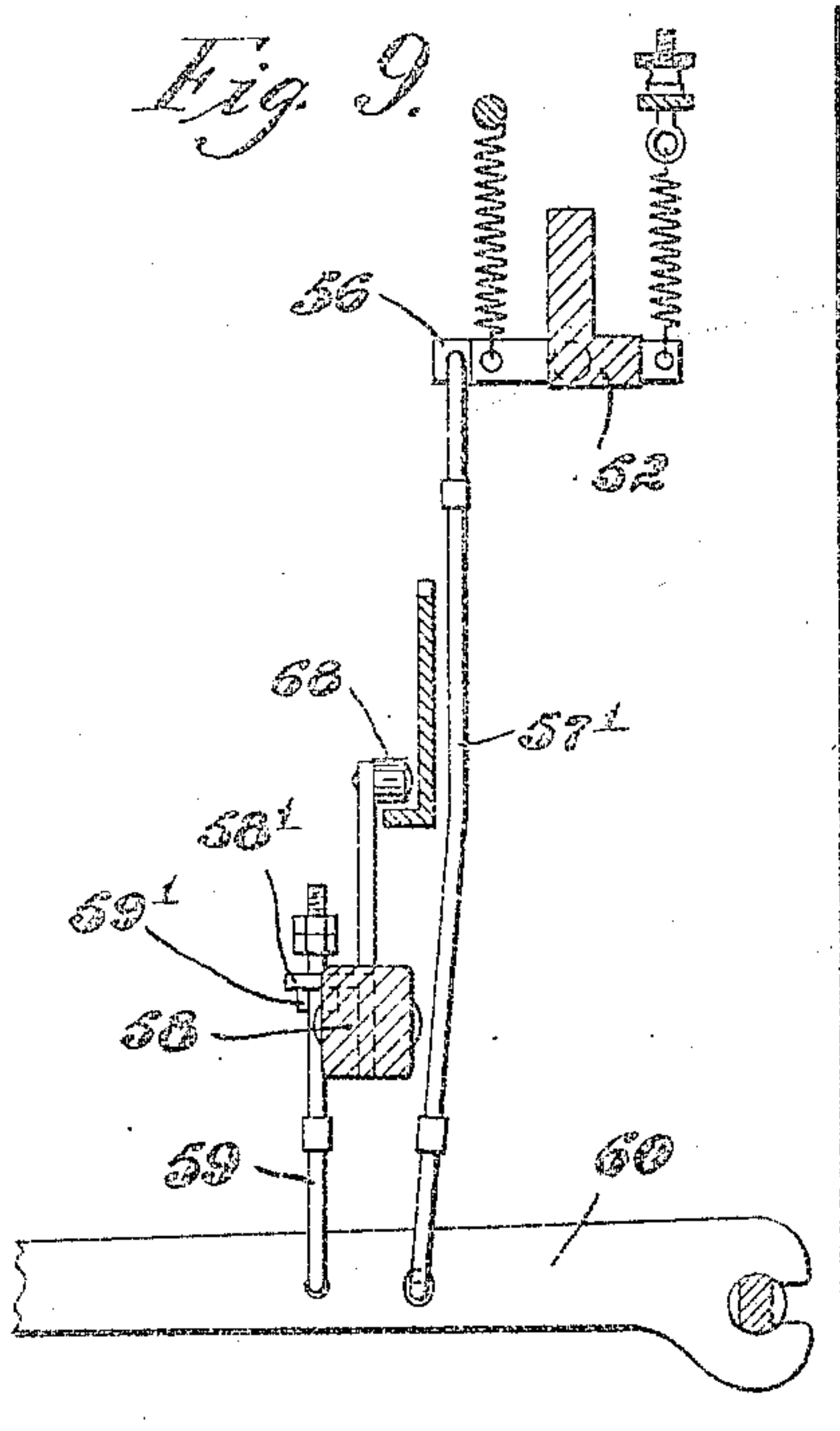
WITNESSES:
L. F. Browning

INVENTOR
Edward B. Hess
 BY
Edward C. Davidson
 ATTORNEY

E. B. HESS.
 WRITING MACHINE.
 APPLICATION FILED OCT. 8, 1907.

831,305.

Patented Aug. 17, 1909.
 6 SHEETS—SHEET 6.



WITNESSES:
E. Mitchell
P. J. Browning

INVENTOR
Edward B. Hess
 BY
Edward C. Davidson
 ATTORNEY

UNITED STATES PATENT OFFICE.

EDWARD B. HESS, OF NEW YORK, N. Y., ASSIGNOR TO ROYAL TYPEWRITER COMPANY, OF HOBOKEN, NEW JERSEY, A CORPORATION OF NEW JERSEY.

WRITING-MACHINE.

No. 931,305.

Specification of Letters Patent.

Patented Aug. 17, 1909.

Application filed October 8, 1907. Serial No. 396,396.

To all whom it may concern:

Be it known that I, EDWARD B. HESS, a citizen of the United States of America, residing in the borough of Brooklyn, city and State of New York, have invented certain new and useful Improvements in Writing-Machines, of which the following is a specification.

This invention comprises an organization wherein are employed stops adapted to act either as margin stops or as tabular stops according to their adjustment. Coöperating with them is another stop which may be located upon the main frame of the machine when the combined tabular and marginal stops are carried upon the carriage or upon the carriage when the combined margin or tabular stops are carried upon the frame. As usual, the margin stop has coöperating with it line-lock devices.

In the machine disclosed in this application, the line-lock devices are thrown into operation whenever the carriage is arrested either for tabulation or for margin. The combined stops are, in the construction shown herein, mounted to be turned about a center of motion. When turned to one position their projection is such that they serve as margin stops and when turned to another position their projection is such that they serve as tabular stops. In addition to these general features there may be provided one such combined margin and tabular stop for each letter space of the machine and associated with them for the guidance of the operator is a scale bar which may also serve as the locking device by which the stops are held in their normal position or in the positions to which they are adjusted. Each combined margin and tabular stop is adjusted by hand, the adjustment consisting in its partial rotation merely—adjustment of the stops longitudinally of the carriage not being required. Of course special adjustable margin stops of suitable character (many styles of which are well known) may be employed, and the stops above referred to be used as tabular stops only. They are fixed with reference to their corresponding letter-spaces and their number may be whatever is desired, either one for each letter-space, or any less number—preferably equally spaced.

They are independently operated directly by the hand of the operator and when set or adjusted so remain until returned to normal inactive position by the hand of the operator.

In the accompanying drawings: Figure 1 is a vertical longitudinal section showing the combined margin and tabular stops mounted upon the carriage: Fig. 2, a rear view thereof part of the combined margin and tabular stops being omitted to avoid mere duplication thereof: Fig. 3, a detail perspective view showing the scale bar, combined margin and tabular stops and the bar by which they are carried and about which they may be turned: Fig. 4, a detail perspective view showing the bar that carries the margin tabular stops and a spacing washer thereon: Fig. 5, a detail view indicating a combined margin and tabular stop in the margin stop position and a coöperating stop that has been moved out of engagement with it: Fig. 6 shows a combined margin and tabular stop in tabular position and a coöperating stop in engagement therewith: Fig. 7 is a vertical longitudinal section showing the combined margin and tabular stops mounted on the main frame of the machine and the coöperating stop upon the carriage: Fig. 8, a rear elevation thereof: Fig. 9, a detail sectional view showing a manner in which the rack is released when the tabular key is operated, the construction being a modification of that shown in Fig. 7: Fig. 10 is a side elevation of the parts shown in Fig. 9: Fig. 11 is a detail view showing a combined tabular and margin stop mounted on the main frame, in tabulating position and engaged by the coöperating stop on the carriage: Fig. 12, a similar view showing the combined stop in margin position and moved out of engagement with the coöperating stop on the carriage: Fig. 13 is a detail front elevation showing a part of the series of combined margin and tabular stops, their supporting bar and the scale bar: Fig. 14 is a front elevation showing a scale, the bar upon which the margin and tabular stops are carried and three of the combined stops, two set for the margin stop position at zero and 30 respectively and the third in tabular position at 10.

What I have termed the coöperating stop

acting in connection with the series of combined stops would ordinarily be located in the center of the machine when mounted on the main frame and at the right hand side of the carriage when mounted on the carriage. It will, for convenience, be called the center stop and when so designated in claims generic to both arrangements, the term is intended to refer to the stop whether mounted on the main frame, centrally or otherwise; or upon the carriage at the appropriate place for it.

1 is the main frame; 2 the carriage which may shift as usual for upper and lower case printing. The printing key levers 3 may be of ordinary character or shape, or as shown in Fig. 1, they may have projection 4 at the top which overlies and operates upon the universal bar 5. 6 is the platen.

Referring to Figs. 1 to 7--between the side plates of the carriage there extends a rod 7 which is by preference circular except at one side where it is flat. Fitted to turn upon this bar are combined margin and tabular stops 6. The only distinction between them is that the alternate ones have projections 8' at their upper ends that, when the stops are in normal inoperative position, extend beyond the upper ends of the adjacent stops. Of course, the stops may all be of the same shape. Such projections on some of them are provided merely because the stops may be more readily selected and manipulated by the operator. The several stops are spaced by interposed washers 9 having openings corresponding with the cross section of bar 7, so as not to turn. In their front edges, the stops are formed with uniform curved recesses radial to their axes and of equal radius. When in normal or operative position, the central recess 8² of each stop is turned to the front and is occupied by a spring pressed bar 10 carrying upon its upper face a scale 11. The face of this bar in contact with the series of stops is preferably formed with converging faces 12 and 13. The bar is mounted in the ends of rocking arm 14 drawn against the series of stops by coiled springs 15 that may be attached to pins 16 in the side plates of the carriage. The spring pressure of the bar is such as to aline or bring into symmetrical order the entire series of stops and the scale is so adjusted with reference to the stops that each division thereon indicating a letter space is opposite one of the adjustable stops. If one of the stops is to be used for tabulating, it is moved into the position shown in Fig. 6, its lower end (which is of less radius than the upper end) being projected. During its movement, it will force back the bar 10 which will return to normal position under the stress of its spring being pressed into the recesses 8² of the remainder of the stops and into the recess 8³ of the adjusted stop.

Similarly, if the stop is to be used for margin, it is thrown into the position indicated in Fig. 5 its upper end of greater radius being projected. The pressure bar will occupy the recess 8¹ of that stop and hold it in position. This series of stops may extend entirely across the carriage and, if desired, one stop provided for each letter space.

Mounted upon the main frame in rear of the bar 7 is a cooperating or central stop 17 pivoted at 18 upon an axis parallel with that of the platen and having in its lower end a cross pin 19 occupying the bifurcated end of an arm 20 on a rock shaft 21 and held in normal or vertical position by oppositely acting plate springs 22, 23 bolted to the frame. At the right hand end of this rack shaft there is an upright radial arm 24 from which extends a link 25 to a central downward projection 26 on a horizontally disposed lever 27 pivoted intermediate its ends which are upturned and equipped with finger pieces, one marked "Margin" for margin release and the other "Tabulator" for tabulating.

On the side of the upper end of the central stop or lever 17 is pivoted, upon an axis 28 at right angles to axis 18, a plate 29 having a downwardly extending arm 30 connected to which is connected a link 31 extending to the side of the machine and applied to a crank arm 32 on a vertical shaft 34 having a crank 35 at its lower end to which is attached a forwardly extending link 36 connected to an upwardly extending radial arm 37 (normally drawn to the front by coiled spring 38) upon a rock shaft 39 that carries a line lock plate 40 adapted to pass under projections 41 on the lower edges of all of the printing key levers when arm 37 is drawn rearwardly. In this way when the pivoted plate 29 comes in contact with a margin or tabular stop it rocks about its axis until arrested by the upper end of lever 17 and during its movements the line-lock plate 40 is drawn under all of the printing key levers. This operation will occur whenever the carriage is arrested by a margin or tabular stop.

The general arrangement comprising the printing keys and 37, 40, 36, 34 and 29; and the general arrangement of stop lever 17; and also the general arrangement of a centrally disposed stop lever 17 and cooperating parts 20, 22, 23 and 24, link 25 and rocking lever 27 all in connection with a tabulating system are shown in my application filed May 15, 1907, No. 373,849.

In order that the rack 42 may be thrown out of engagement with the escapement wheel pinion 43 when the carriage is to be jumped for tabulation there is formed on lever 17 a forward projection 44 carrying an adjustable eccentric piece 45 that works upon an inclined face of a pivoted lever 46 carrying in its other end a pad 47 that works

against the under side of a horizontal flange formed with the rack. The rack is carried in arms 48 pivoted at 49 and having applied to them springs 50. When, therefore, the carriage is to be jumped for tabulation by depression of the tabular key a rearward thrust is imparted to the rod 25 which operates to carry the upper end of the lever 17 inwardly to engage the tabular stops and during the latter part of this movement the part 45 acting upon lever 46 lifts the rack out of engagement with its pinion and permits the jump of the carriage. When the carriage is arrested by a margin stop, it may be released by depression of the margin finger piece the arrangement being such that when that key is fully depressed the rearward movement of lever 17 will be sufficient to carry it out of engagement with the margin stop which has a greater rearward projection from shaft 7 than has a tabular stop.

So far as I am aware, it is new to provide a combined stop for both margin and tabular use and a cooperating or center stop. It is also novel so far as I am aware to provide a series of stops that may be or are capable of use only as tabulator stops there being one such stop for each of a series of line spaces: and by making such stops serve also as margin stops, the utmost range of adjustment of printed matter upon the sheet is feasible.

Figs. 8 to 13 inclusive show an organization of this invention in which the adjustable combined stops are mounted upon the main frame the cooperating stop or so-called center stop being carried by the carriage. The arrangement of bar 7 of the combined stops 8 and spacing washers 9 upon the bar are the same as before described. The bar however is carried by vertically disposed arms 51, 51, pivoted to rock transversely of the machine in a plate 52 shown as L-shape in cross section and arranged transversely of the machine and adapted to rock about an axis 53. The cooperating stop or so-called center stop in this construction is marked 54 and is rigidly mounted upon one of the cross rails of the carriage. The scale 11 and its bar 10 is now placed in rear of the series or combined stops being mounted as before in arms 14 pivoted, in this case however, at 54' in the side plates of the main frame and drawn forwardly by spiral springs 15. It now becomes necessary, however, to move the series of stops into and out of position to engage the cooperating stop. This may be conveniently accomplished as follows: Projecting front and back from the transverse plate 52 are arms 55, 56, to which are applied coiled springs 56', 55', that tend to hold the parts in normal central position. A link 57 extends downwardly from the forwardly extending part 56 to a pivoted arm, 58 from

which there extends, downwardly, a link 59 to the tabulator key 60. From the rearwardly extending part 55 of the rocking transverse frame extends downwardly a link 61 to a margin release lever 62, seen in the rear view Fig. 8, and lying behind or beyond the tabular key 60 shown in side elevation, Fig. 7. The escapement pinion is marked 63. It is engaged at the bottom by the rack 64 which at each end is formed with a forwardly extending right angle flange 65 to which are pivoted the rear ends of a pair of parallel links 66, 66. These pairs of arms are pivoted upon downward extensions from the side plates of the carriage and are drawn upwardly by springs 67 until the side flanges 65 abut against stop pins 68'. These springs therefore serve to hold the rack in engagement with the pinion.

In Fig. 7 one of the adjustable stops 85 marked 8^a is shown as adjusted for margin arrest and as standing in the path of the cooperating stop 54 carried by the carriage. To release the carriage from such a margin stop, the margin release key is depressed, drawing link 61 downwardly and rocking the transverse frame 52 about its axis 53 in a direction to carry the vertically disposed arms 51 rearwardly to move the margin stop 8^a out of the path of the cooperating stop and permit the printing of additional characters.

In Fig. 7, one of the combined adjustable stops marked 8^b is set for tabulation and when so set stands normally out of the path of the cooperating or center stop 54. When the carriage is to be jumped for tabulation, key 60 is depressed, the effect being to draw down link 57 and rock the vertically disposed arms 51 forward to bring the tabulator stop 8^b into the path of the carriage stop 54 to arrest the carriage at the required printing space. Release of the escapement required for this operation may be accomplished as follows: When a tabular key 60 (Figs. 7 and 8) is moved downward, link 59 carries down the pivoted arm 58 which in turn draws down link 57. In the downward movement of arm 58 a roller 68 carried by the horizontally disposed upper end thereof, engages the horizontal forwardly projecting flange 69 at the bottom of rack 64 and draws the rack downwardly against the tension of springs 67. The arc described by the end of arm 58 brings into contact with the upper face of flange 69 a friction pad 69' attached to the under face of a laterally projecting horizontally disposed flange at the upper end of the arm 58 which pad acts as a brake to sufficiently retard the run or jump of the carriage when released from the escapement device. The vertically disposed arms 51 carrying the shaft 7 are pivoted at the side of the rocking transverse angle plate 52 upon axes at right angles to the

axis of shaft 7. A coiled spring 71 applied to one of these arms tends by its reaction to hold the shaft 7 against an adjustable stop 72 mounted in the right hand side plate 5 of the main frame.

When one of the adjustable stops is engaged by the carriage stop, the action that occurs is analogous to that which happens when the pivoted plate 29 is struck by one 10 of the stops illustrated in Fig. 1,—that is to say, the vertically disposed arms 51 rock slightly carrying shaft 7 toward the left hand side of the machine until arrested by an adjustable stop 73 mounted in the left 15 hand side plate of the main frame. Arm 51 attached to shaft 7 at its left hand end has at its bottom a horizontal crank projection 74 to which is attached a downwardly extending link 75 connected at its lower end 20 to the short horizontally disposed end 76 of a bell crank lever the downwardly extending arm 77 of which has attached to it a forwardly extending link 78 that is connected with one of the rocker arms 37 so 25 that the line-lock plate 40 is carried under the projections 41 on the under edges of the printing levers whenever the cooperating stop 54 contacts with any one of the carriage stops.

Of course, the arms 51 are pivotally connected with the shaft 7. The construction that is preferred as to this detail is that indicated in Figs. 11 and 12 in which the upper ends of the arms 51 are bifurcated as at 35 51', 51', the pivotal connection being afforded by screw pivot bolt 51² seen in Fig. 8 but omitted in Figs. 11 and 12 for clearness of illustration of the parts shown in those figures.

In the construction shown in Figs. 9 and 40 10 there is a link 57' running directly from the extension 56 of the rocking frame 52 to the tabulator key 60 and a link 59 extending upwardly from that key to the rocking arm 45 58. The operation, however, is the same as that already described in respect to the disengagement of the rack from the escapement pinion.

In the construction shown in Figs. 7 and 50 8, the link 57 is threaded at its lower end and passes through an aperture in a lateral plate 58' on the side of the arm 58. Adjusting nuts are applied to the threaded end of the link above and below this plate.

In the construction shown in Figs. 8 and 55 9, the link 59 has a threaded end which passes upwardly through an aperture in the plate or flange 58' and has applied to its upper end suitable nuts; but in the construction shown in Figs. 9 and 10 there is also a 60 nut or collar 59' applied to the threaded end of the link below the plate 58' in order to maintain in normal elevated position the rocking arm 58. If desired, and as shown 65 in Fig. 10, the normal upper position of arm

58 may be determined by an adjustable eccentric stop 79 mounted in the end of an arm projecting inwardly from the side plate of the frame.

In the construction shown in Fig. 7, provision is made as usual for shifting the carriage. When, however, the carriage is elevated, roller 68, mounted on the arm 58, prevents the teeth of the rack from bottoming in the grooves between the teeth of the 75 escape wheel, and the adjustment of parts is preferably such that the relation of the rock teeth to the teeth of the escape pinion shall be the same whether the carriage is in normal or in elevated position. 80

Above the key board and in line above the tabulator key 60 is a horizontally disposed key or push pin 80 connected at its inner end with a lever 81 pivoted intermediate its ends and carrying at its lower free end a 85 roller 82 adapted to bear upon and depress the tabulator key 60. Referring to Fig. 14, by way of illustration, two margin stops are shown,—one, set at "0," the other at "80;" and intermediate them, set at 10, is a tabular 90 stop to be used for paragraphing. By operating the paragraphing key 80, the tabular key may be depressed to such extent as not to disengage the rack from the escapement pinion but sufficiently to bring the tabulator 95 stop set at 10 into position to be engaged by the center stop 54. By using the ordinary space lever, the carriage may be run step by step (so long as the finger of the operator is held on the paragraph key) until arrested 100 by the tabulator stop at 10, that being the position selected for commencing the paragraph. When the cooperating or center stop is moved with the carriage and the adjustable combined stops are mounted on the 105 main frame, the scale as indicated in Fig. 13 should read from right to left.

As shown in Fig. 8, the escape wheel 83 is connected to turn in one direction with the pinion 63 and the pinion is free to revolve 110 in the other direction without movement of the escapement wheel. This is an operation common in typewriting machines. In the present instance, however, the pinion 63 is locked to escape wheel in one direction of 115 movement by pivoted spring controlled dogs 84 having teeth 85 that are drawn into the spaces between the teeth of the pinion, the teeth 85 being rounded or beveled upon one face and flat upon the other. This construction is believed to be more positive in action and more substantial in construction than the devices that have heretofore been used for this purpose. 120

While there has been described a series of 125 stops one for each letter space, or one for each of a series of consecutive letter spaces, it is, of course, obvious that there might be a stop for every other or alternate letter space; or one for every third letter space; 130

and that these stops may be mounted in fixed relation to their corresponding letter spaces. Such an arrangement would afford a suitable range for tabular work and also for margin arrest of the carriage. In the special form of the invention shown in the drawings, the rotatable stops may each readily be mounted upon the shaft 7 so as to rotate thereon but be prevented from moving endwise.

While rotary stops having each parts of different radius or elevation one to act as a tabular stop and the other as a margin stop are preferred on account of the simplicity of construction and facility of adjustment and are therefore deemed most practicable, the invention is not in its broader aspects limited to rotatable stops.

So far as I am aware, I am the first to provide a stop capable of different degrees of projection from a normal position of inaction, so as to serve in one position or extent of projection as a tabular stop and in another position or extent of projection as a margin stop. Thus broadly considered the invention is not limited to the special style and mounting of stops herein disclosed. Also, so far as I am aware, I am the first to provide a plurality of stops occupying fixed positions with respect to corresponding letter spaces of the machine and capable of use as tabular stops, irrespective of their use as margin stops and whether or not such plurality or series of stops contains one stop for each letter space, or stops corresponding with consecutive letter spaces. Under practical condition of working it is feasible to dispense with some of the tabular stops at each end of the series,—that is to say, with respect both to the beginning and end of the line of print.

I claim:

1. A carriage stop device having two stop surfaces and adapted to occupy two positions in one of which one of said surfaces serves as a tabular stop and in the other of which the other surface serves as a margin stop.

2. A carriage stop device adapted to occupy two positions in one of which it serves as a tabular stop and in the other as a margin stop and a cooperating center stop.

3. An adjustable rotatable carriage stop device adapted to occupy two positions, in one of which it serves as a tabular stop and in the other as a margin stop and a cooperating center stop.

4. A carriage stop device consisting of an adjustable rotatable member having parts of different radius one serving as a tabular stop and the other as a margin stop and a cooperating center stop.

5. A series of adjustable stops each capable of adjustment to one position to act as

a tabular stop and to another position to act as a margin stop said series containing a stop for each of a consecutive series of letter spaces and a cooperating stop.

6. A series of adjustable stops each capable of adjustment to one position to act as a tabular stop and to another position to act as a margin stop said series containing a stop for each of a consecutive series of letter spaces and being mounted in fixed relation to such letter spaces and a cooperating stop.

7. A series of adjustable stops, a bar upon which they are mounted to rotate, each stop capable of adjustment to two positions in one of which it acts as a tabular stop and in the other as a margin stop and non-rotary space pieces mounted upon the bar between adjacent stops and a cooperating stop.

8. A series of tabular stops, a bar upon which they are mounted to rotate, the several stops having each corresponding positioning surfaces, a spring pressed positioning bar bearing upon corresponding surfaces of the stops in normal inactive position and acting to correspondingly hold some of the stops, when adjusted, to tabular position and a cooperating center stop.

9. A series of combined tabular and margin stops, a bar upon which they are mounted to rotate, the several stops having three corresponding positioning surfaces and a spring pressed positioning bar acting to hold in position those stops that are in normal position and also such of the stops as may be adjusted to tabular position and such as may be adjusted to margin position and a cooperating center stop.

10. A carriage stop device adapted to occupy two positions in one of which it serves as a tabular stop and in the other as a margin stop, a cooperating center stop and line-lock devices thrown into operation whenever such center stop engages a tabular or margin stop.

11. An adjustable rotatable carriage stop device adapted to occupy two positions, in one of which it serves as a tabular stop and in the other as a margin stop, a cooperating center stop and line-lock device thrown into operation whenever such center stop engages a tabular or margin stop.

12. A carriage stop device consisting of an adjustable rotatable member having parts of different radius one serving as a tabular stop and the other as a margin stop, a cooperating center stop and line-lock devices thrown into operation whenever such center stop engages a tabular or margin stop.

13. A series of adjustable stops each capable of adjustment to one position to act as a tabular stop and to another position to act as a margin stop said series containing a stop for each of a consecutive series of letter spaces, a cooperating center stop and

line lock devices thrown into operation whenever such center stop engages a tabular or margin stop.

14. A series of adjustable stops each capable of adjustment to one position to act as a tabular stop and to another position to act as a margin stop said series containing a stop for each of a consecutive series of letter spaces and being mounted in fixed relation to such letter spaces, a cooperating center stop and line lock devices thrown into operation whenever such center stop engages a tabular or margin stop.

15. A series of tabular stops, a bar upon which they are mounted to rotate for adjustment and non-rotary space pieces interposed between adjacent stops, a cooperating center stop and line lock devices thrown into operation whenever such center stop engages a tabular stop.

16. A series of adjustable stops, a bar upon which they are mounted to rotate, each stop capable of adjustment to two positions in one of which it acts as a tabular stop and in the other as a margin stop and non-rotary space pieces mounted upon the bar between adjacent stops, a cooperating center stop and line lock devices thrown into operation whenever such center stop engages a tabular or margin stop.

17. A series of tabular stops, a bar upon which they are mounted to rotate, the several stops having each corresponding positioning surfaces, a spring pressed positioning bar bearing upon corresponding surfaces of the stops in normal inactive position and acting to correspondingly hold some of the stops, when adjusted, to tabular position, a cooperating center stop and line lock devices thrown into operation whenever such center stop engages a tabular or margin stop.

18. A series of adjustable combined stops each adapted when adjusted to one position to serve as a tabular stop and when adjusted to another position to serve as a margin stop such series of stops being mounted in fixed relation to corresponding letter spaces, a cooperating center stop and cooperating line lock devices.

19. A series of adjustable combined stops each adapted when adjusted to one position to serve as a tabular stop and when adjusted to another position to serve as a margin stop such series of stops being mounted in fixed relation to corresponding letter spaces and means common to all the stops for holding the series of stops in the positions which the several stops of the series may occupy.

20. A writing machine comprising a shiftable carriage, adjustable tabulator stops mounted on the main frame, a cooperating stop mounted on the carriage, a rocking frame on which the tabular stops are car-

ried, springs acting to maintain said frame in normal position, means for rocking the frame to bring a tabulator stop carried thereby into position to be engaged by the cooperating stop on the carriage, a rack and escapement pinion, means for disengaging them during the rocking of said frame and means for maintaining uniform engagement of the rack and pinion irrespective of the shifting of the carriage.

21. A writing machine comprising a shiftable carriage, tabulator devices, a rack pivotally mounted on the carriage, means for withdrawing the rack from the pinion when the carriage is jumped for tabulation, said means serving also when the carriage is shifted to preserve the normal relation of the rack and pinion.

22. A writing machine comprising tabulating devices operated by a tabular key, means acting on depression of the key to disengage the rack from the escapement pinion and permit jump of the carriage for tabulation, and a paragraphing key acting upon the tabular key to partially depress it to such extent as to cause engagement of the tabulating stops but not sufficiently to disengage the rack and pinion whereby a paragraph position may be reached by the operation of the ordinary space key.

23. In a typewriting machine having tabulating devices and a shifting carriage, spring supported parallel links pivoted to the carriage and carrying the rack, and means for withdrawing the rack from the pinion to permit jump of the carriage in tabulating, said means acting as a stop to prevent deeper entrance of the rack into the spaces of the escape wheel when the carriage is shifted from normal position.

24. In a writing machine a series of tabulating stops carried by the main frame and mounted to move transversely of the machine, a cooperating stop carried by the carriage and adapted to engage the tabular stops to arrest the carriage and move the series of stops transversely of the machine and line lock devices thrown into operation by such transverse movement of the series of tabular stops.

25. A series of adjustable tabular stops mounted in fixed relation to a series of corresponding letter spaces, the stops being adapted to be independently moved, from inactive to active position and vice versa directly by the hand of the operator, a cooperating stop, and line lock devices thrown into operation whenever the cooperating stop and any one of the tabular stops are engaged.

26. A series of combined tabular and margin stops, a bar upon which they are mounted to rotate, the several stops having three corresponding positioning surfaces and a spring pressed positioning bar acting to hold in

position those stops that are in normal position and also such of the stops as may be adjusted to tabular position and such as may be adjusted to margin position, a cooperating center stop and line lock devices thrown
5 into operation whenever such center stop engages a tabular or margin stop.

In testimony whereof, I have hereunto subscribed my name.

EDWARD B. HESS.

Witnesses:

JOHN M. LEE,
L. F. BROWNING.