

928,591.

C. DELVIGNE.
TYPE WRITING MACHINE.
APPLICATION FILED MAY 23, 1908.

Patented July 20, 1909.

3 SHEETS—SHEET 1.

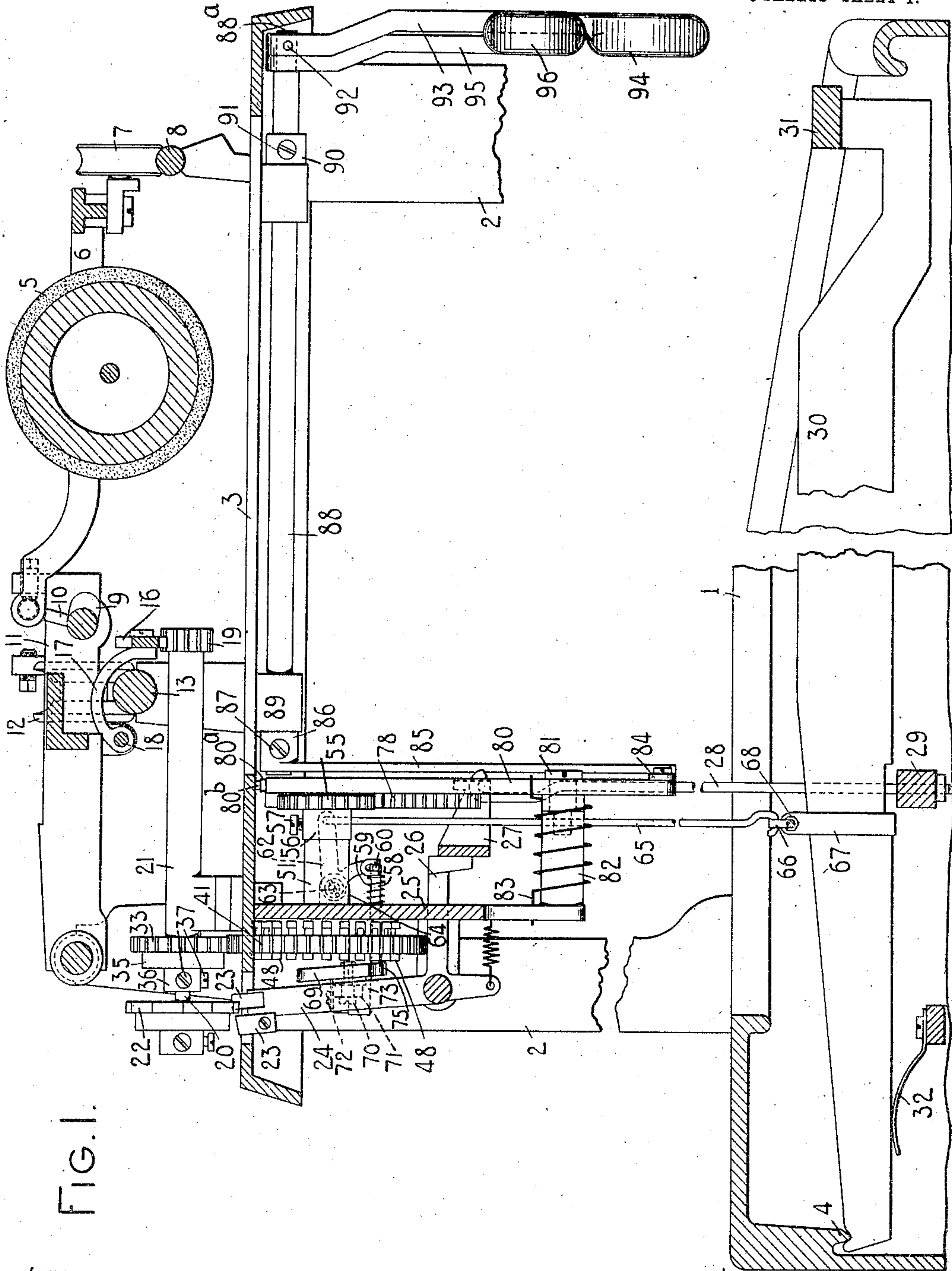


FIG. 1.

WITNESSES:

E. M. Wells.

m. w. Pool

INVENTOR:

Charles Delvigne
By Jacob Feldt
HIS ATTORNEY

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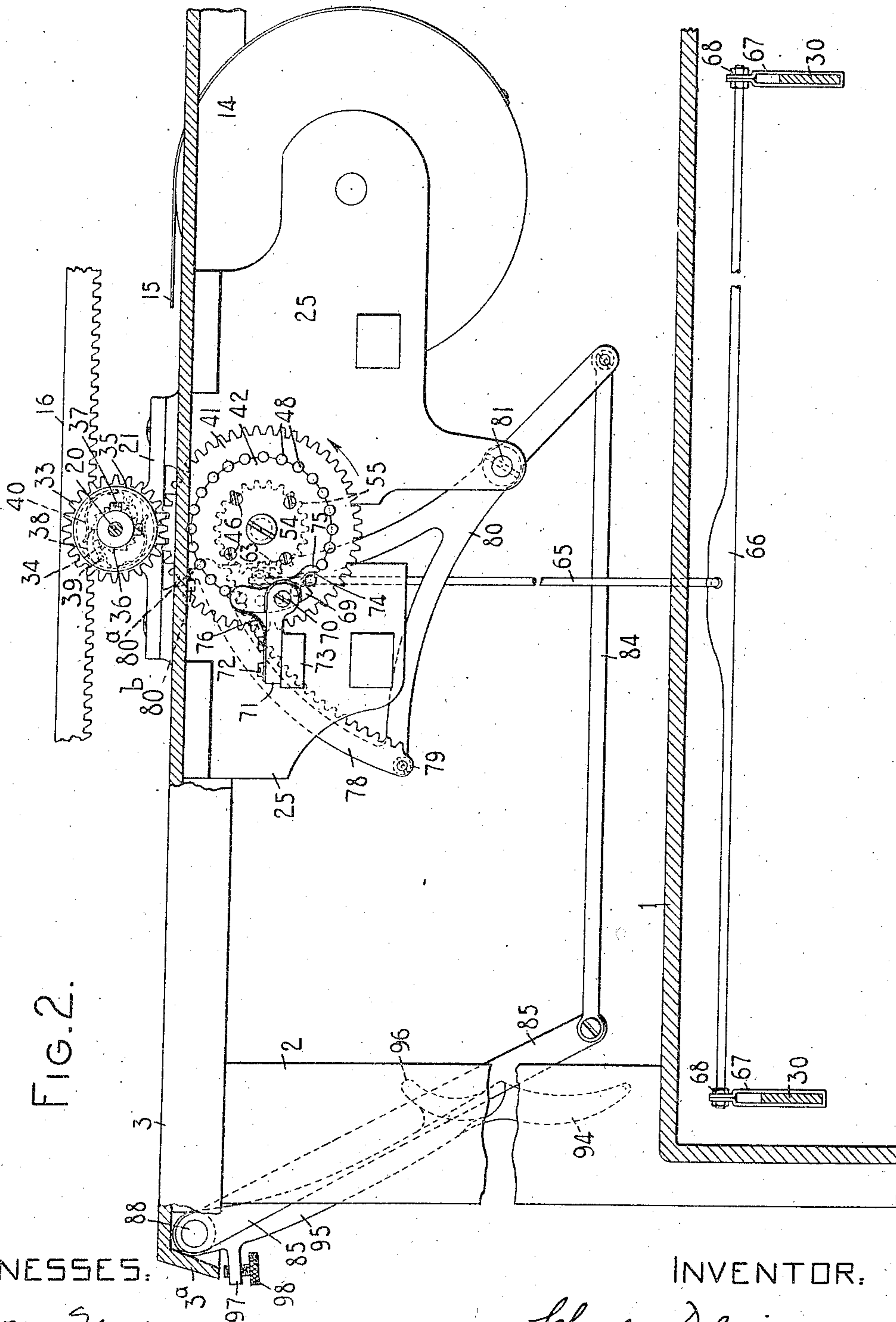


FIG. 2.

WITNESSES:

E. M. Wells.

W. W. Pool

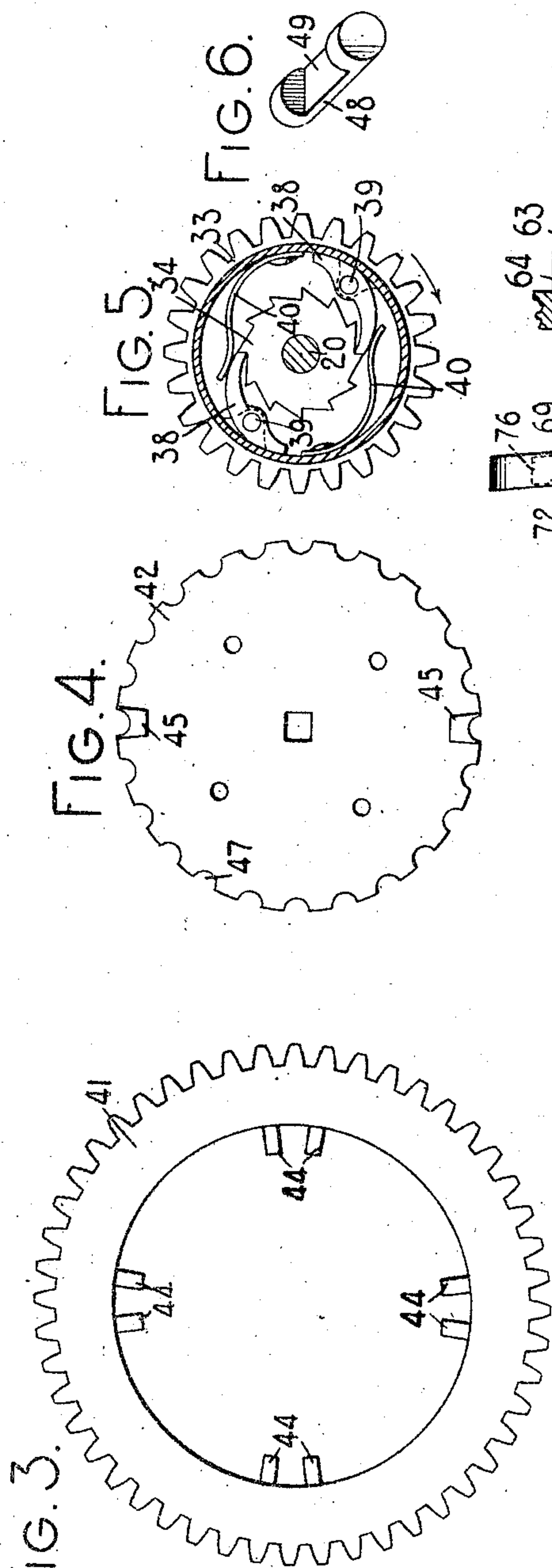
INVENTOR:

Charles Delvigne

By Jacob Felbel

HIS ATTORNEY

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WITNESSES:

E. M. Wells.
Wm. Pool.

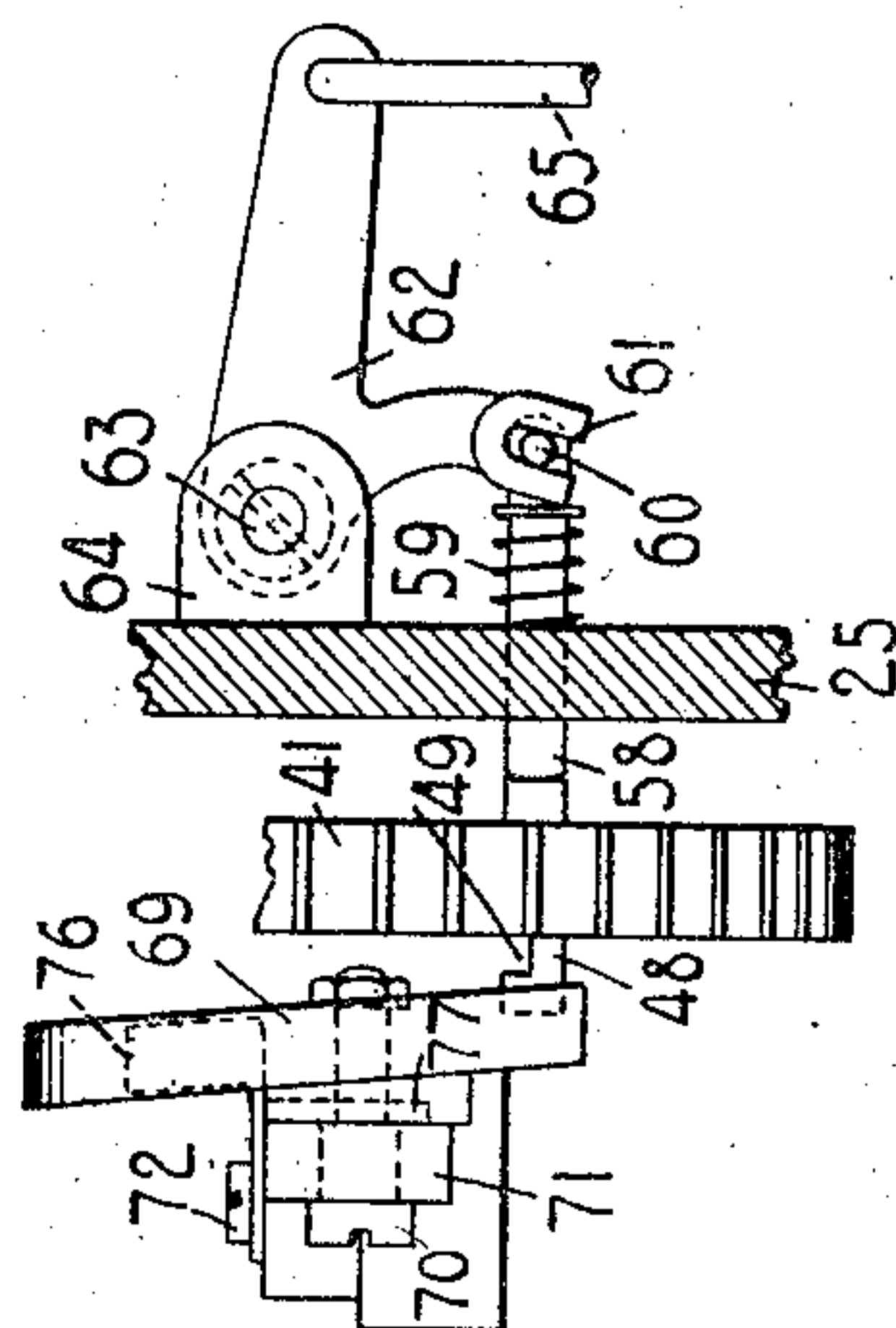


FIG. 7.

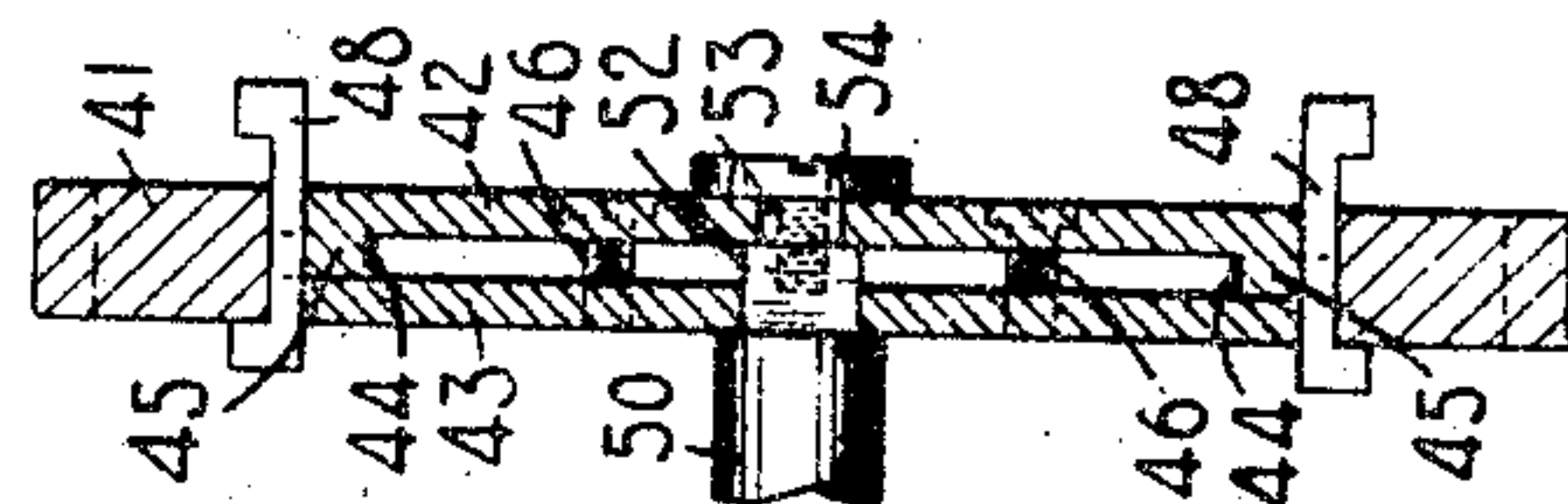


FIG. 8.

FIG. 9.

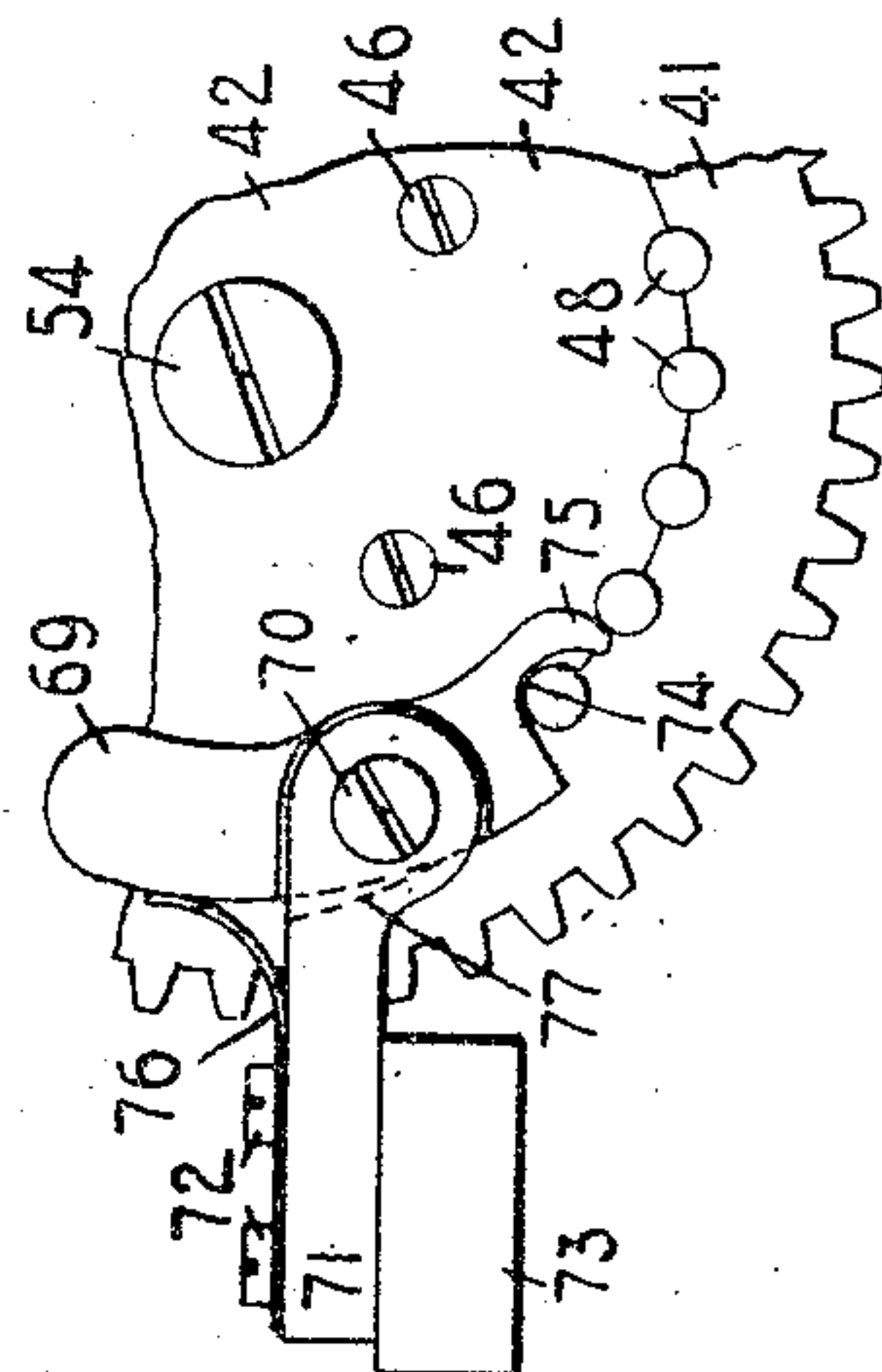
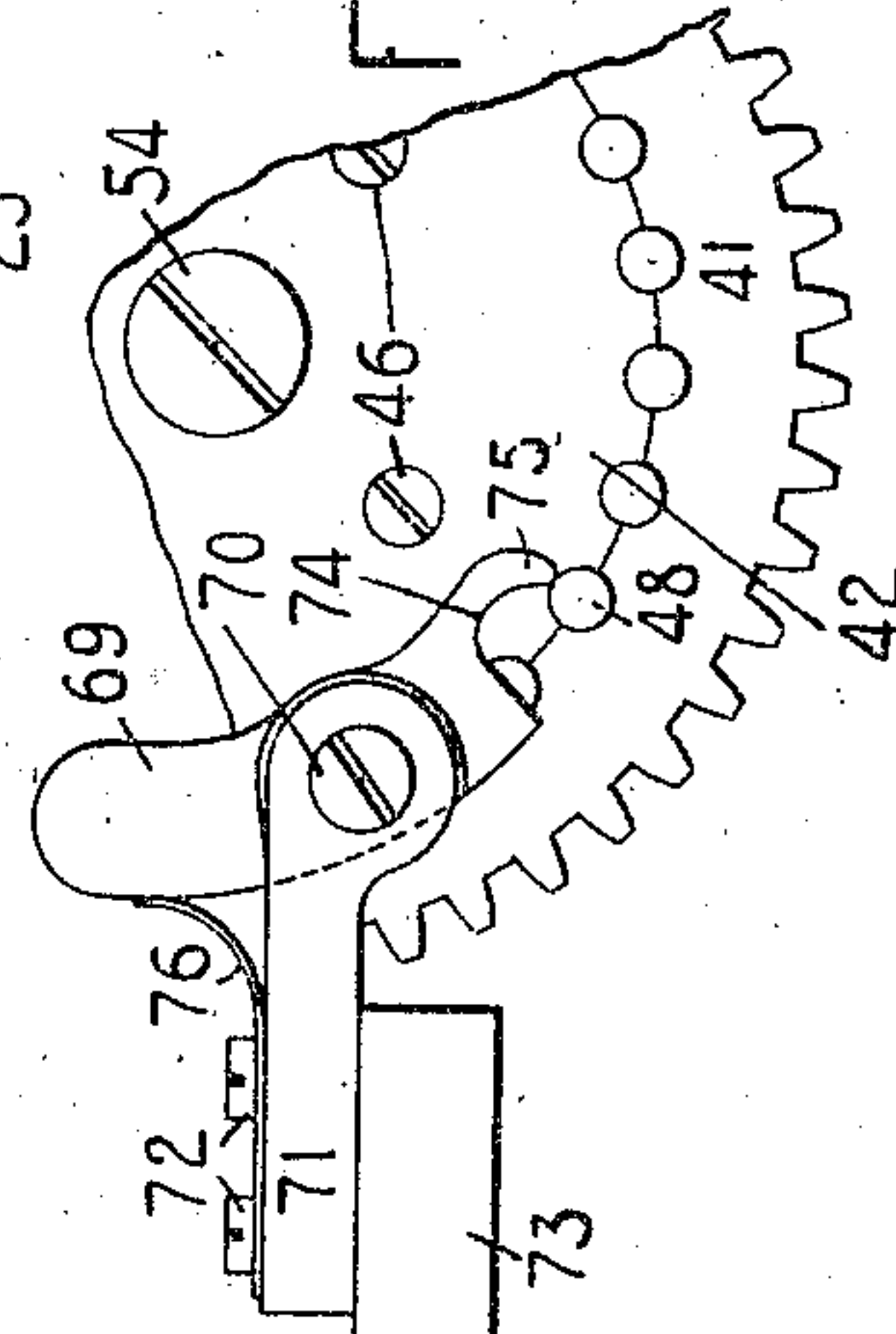


FIG. 10.



INVENTOR:

Charles Delvigne
By Jacob Feldel

HIS ATTORNEY

UNITED STATES PATENT OFFICE.

CHARLES DELVIGNE, OF BRUSSELS, BELGIUM, ASSIGNOR TO WYCKOFF, SEAMANS & BENEDICT, OF ILION, NEW YORK, A CORPORATION OF NEW YORK.

TYPE-WRITING MACHINE.

No. 928,591.

Specification of Letters Patent.

Patented July 20, 1909.

Application filed May 23, 1908. Serial No. 434,649.

To all whom it may concern:

Be it known that I, CHARLES DELVIGNE, subject of the King of Belgium, and resident of Brussels, Belgium, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to back spacing mechanism for the carriages of typewriting machines, and its object, generally stated, is to provide improved devices of the class specified, although it will be understood that various features of the invention may be used in connection with devices of different character.

To the above and other ends, the invention consists in the features of construction, combinations of devices and arrangements of parts hereinafter described and particularly pointed out in the claims.

As heretofore constructed, back spacing devices have usually been operated to space the carriage backward step-by-step a single letter space distance at a time. By my improved devices the operator is enabled to move the carriage backward either a single letter space distance or a plurality of letter space distances at one operation, the plurality of letter space distances being variable and depending on the number of letters in the word just written. In other words, if in the course of the writing it is desired to return to the beginning or initial letter of the last written word, as, for example, when it is desired to underscore the word, my improvements enable this to be done by a single operation whatever the number of letter spaces to be covered by this continuous return movement may be, within certain limits.

In carrying out my invention in the present instance I have provided back spacing or feeding mechanism and, associated therewith, certain stop devices which can be set by operating a certain key when the carriage is at any letter space position in the line of writing. The writing may then be continued and when it is desired to bring the carriage back to underscore the matter beginning with the point at which said key was operated, the carriage is moved backward by the back feeding mechanism and is arrested by said stop devices either at the letter space position at which said key was operated or at another letter space position bearing a pre-

determined relation thereto. A special key may be provided to set the stop devices, but in the present instance I have shown said devices connected with the usual space key of the machine and said stop devices are so constructed that when the carriage is set back it will be arrested at the next letter space position in advance of that at which the space key was operated; that is to say, it will be arrested at the letter space position occupied by the first letter of the word. As stated, the back spacing mechanism may also be operated to feed the carriage backward step-by-step a letter space distance at a time.

In carrying out my invention in the present case I have applied it to a Remington typewriting machine, but the character of the invention is such that it may be readily applied to other styles of writing machines.

In the accompanying drawings, Figure 1 is a vertical front to rear sectional view of a Remington typewriter showing my invention applied thereto, parts of the machine being omitted and parts broken away. Fig. 2 is a fragmentary rear elevation of the machine partly in section. Figs. 3 to 7 inclusive are detailed views of various parts of my improvements to be hereinafter described more specifically. Fig. 8 is a fragmentary side elevation, partly in section, showing some of the mechanism for controlling a part hereinafter referred to as the back spacing wheel or element. Fig. 9 is a fragmentary rear elevation of certain of the parts shown in Fig. 8. Fig. 10 is a view corresponding to Fig. 9 but showing various of the parts in different relations from those in which they appear in said Fig. 9.

Referring first more especially to Figs. 1 and 2, the main frame of the machine comprises a base 1, corner posts 2 and a top plate 3. Key levers (not shown) are fulcrumed at 4 in the rear of the base and are connected in the usual way to type bars (not shown) circularly arranged on the top plate, said type bars cooperating with a platen 5 mounted in a platen frame or carrier 6, said platen carrier being provided with a roller 7 which runs on a shift rail 8. The platen carrier is pivotally connected by means comprising a rock shaft 9 and arms 10 with a carriage truck 11 in which are mounted rollers 12, the latter cooperating with a track-way 13 fixed above the top plate. The platen carrier and carriage

truck compose the carriage of the machine, the carriage being constantly urged leftward across the top plate by a spring drum 14 which is connected with the carriage truck by a band or strap 15. A feed rack 16 is supported on arms 17 pivoted at 18 on the carriage truck, said feed rack normally meshing with a feed pinion 19 fixed at the forward end of a horizontally disposed shaft 20, said shaft being mounted on a bearing bracket 21 fixed to the top plate. A toothed escapement wheel 22 is mounted on the rear end of the shaft 20 and is connected therewith in the usual way. Feed dogs 23 cooperate with the escapement wheel, said dogs being mounted at the top of a dog carrier or rocker 24, said dog carrier being pivoted on a supporting bracket 25 depending from the top plate, said bracket 25 also providing a bearing for the spring drum 14 as well as for various parts of my improvements. Fixed to the horizontally disposed arm 26 of the dog carrier is an extension 27 provided at its ends with notches which are engaged by the hook-like upper ends of arms or links 28, said arms depending from the extension 27 and carrying at their lower ends a universal bar 29. The universal bar underlies the set of key levers and the usual spacing frame, the latter comprising spacing levers 30, one at each side of the base and fulcrumed at 4 and also comprising a space bar or key 31 connecting the spacing levers at their forward ends and located in front of and below the usual set of printing keys. The spacing frame is provided with the usual restoring springs 32, one of which only is shown. It will be understood that when the space bar 31 or any one of the printing keys is suitably depressed, it acts on the universal bar 29, causing the escapement devices to cooperate in the usual manner to permit a letter space movement of the carriage in printing or leftward direction under the pull of the spring drum 14. The parts thus far described are or may be of the usual construction and a more extended description is therefore not considered necessary.

My improved back spacing devices comprise a gear wheel 33, (Figs. 1, 2 and 5) loosely mounted on the shaft 20 contiguous to the rear face of the bracket 21. Fixed to the rear face of the gear wheel is a ratchet wheel 34, the ratchet wheel being covered by a housing 35 provided with a hub 36 which receives set screws 37, the latter engaging the shaft 20 and maintaining the housing in a fixed relation therewith. Within the housing are pawls 38 pivoted on said housing at 39 and constantly pressed into engagement with the teeth of the ratchet wheel 34 by springs 40. The construction of the ratchet wheel, housing and spring-pressed pawls just described is well known and is the same as that employed in connec-

tion with the escapement wheel 22 both in construction and action. The arrangement is such that when the carriage feeds in letter space direction the shaft 20 turns in the direction of the arrow in Fig. 5, causing the housing 35, which is fixed to said shaft, to turn therewith. As the housing turns, the pawls 38 carried thereby cooperate with the ratchet wheel 34 to cause it and the gear wheel 33 to turn also. When the carriage is drawn backward or in return direction independently of the back-spacing device, however, the ratchet wheel and pawls cooperate to permit rotary movements of the shaft 20 without affecting the gear wheel 33.

The gear wheel 33 cooperates with a rotary element or stop wheel, the details whereof are most clearly shown in Figs. 3 to 7 inclusive. This rotary element or stop wheel comprises an annulus 41 (Figs. 3 and 7), the periphery of which is toothed to mesh with the gear wheel 33. Fitted in the central opening of the annulus 41 are two disks 42 and 43 (Figs. 4 and 7). Radial lugs 44 projecting inwardly from the annulus 41 maintain the disks 42 and 43 separated or apart as shown in Fig. 7, and lugs 45 diametrically disposed, two on each disk, are adapted to fit between the pairs of radial lugs 44 on the annulus 41 so as to prevent relative rotary movement between the disks and the annulus. Screws 46 connect the disks, the construction being such that when said screws are tight the annulus and the two disks are maintained in a fixed relation and operate as a single piece or member. The peripheries of the disks 42 and 43 are formed with rounded notches or cut-aways 47, these being arranged at regular intervals and the notches of one disk registering with those of the other, there being in the present instance 24 notches in each disk. Seated movably in the opening formed by each pair of notches and the annulus is a stop device or pin 48 shown detached in Fig. 6. This pin or member is cut away as indicated at 49 to fit in its associate bearing opening. The cut-away 49 of each pin leaves a head at each end thereof, the length of the cut-away being greater than the width of the annulus 41 as will be understood from an inspection of Figs. 7 and 1. The pins 48 are frictionally held in the bearing openings in the stop wheel and are capable of being moved lengthwise in said wheel, the extent of such movement being limited by the heads of the pins. Rotary or turning movement of said pins is prevented by the flattened portions of the cut-aways which contact with the inner surface of the annulus 41.

The stop wheel carrying the spacing pins 48 is fixed to the rear end of a shaft 50 which bears in a boss or hub 51 (Fig. 1) integral with and projecting horizontally forward from the front face of the supporting bracket

25. The rear end portion of the shaft 50 is stepped down and squared as indicated at 52 and 53 (Fig. 7). The squared portions 52 and 53 cooperate with corresponding squared openings formed respectively in the disks 43 and 42. A headed screw 54 serves to secure the stop wheel to the shaft 50. Mounted on the forward end of said shaft is a gear wheel 55 (Figs. 1 and 2) having a hub 56 which receives a set screw 57, said set screw abutting against the shaft 50 and maintaining the gear wheel 55 in a fixed relation therewith.

It will be understood that when the carriage is fed in letter space direction the gear wheel 33 will operate to turn the stop wheel in the direction of the arrow in Fig. 2. The parts are so proportioned that the distance that the stop wheel is fed at each letter space movement of the carriage corresponds to the distance between the centers of any two of the spacing pins 48, said pins of course being equally spaced apart. In other words, at the end of each letter space movement each spacing pin will occupy the same position that the pin immediately in advance of it occupied just prior to said movement.

Normally the spacing pins 48 are arranged as shown in Fig. 1 with their rear heads in contact with the rear face of the annulus 41. Each of these pins, when pushed rearward to the position illustrated in Fig. 8, is adapted to control the extent of back spacing movement of the carriage, as will be hereinafter explained. In the present instance the means for pushing the spacing pins from normal to rearmost position are connected with the spacing key and comprise a cylindrical pin or plunger 58 (Figs. 1 and 8), which bears in an opening in the bracket 25 and is normally maintained in the position shown in Fig. 1 by a coiled spring 59. Projecting laterally from the forward end of the plunger 58 is a lug 60 which cooperates with an open slot 61 formed in the downwardly extending arm of a bell crank lever 62 pivoted at 63 on an ear 64 on the bracket 25. The forwardly extending arm of the bell crank lever 62 is connected by a link 65 with the middle portion of a cross bar 66 (Figs. 1 and 2), said cross bar extending from side to side of the machine above the key levers and being connected by straps 67 with the spacing levers 30. Each spacing lever is embraced by a strap 67, the straps being clamped or locked by nuts 68 on the end portions of the cross bar 66. The construction is such that the plunger or projecting device 58 is always in line or register with one of the spacing pins 48. When the spacing bar 31 is depressed to space between words or for any other purpose the link 65 is pulled downward, rocking the bell crank lever 62 and forcing the plunger 58 rearward, causing said plunger to move the spacing pin or stop 48 with which

it is in register, longitudinally rearward to the position illustrated in Fig. 8, the movement of said pin 48 being arrested when its forward head contacts with the front face of the stop wheel.

When the spacing pins are in their projected or rearmost positions they are adapted for reasons hereinafter explained to cooperate with a combined stop or abutment and cam member, said combined abutment and cam member in the present instance being in the form of a lever 69 pivoted on a shouldered screw 70, the latter being supported on a block 71 secured by screws 72 to a lug 73 extending rearward from the bracket 25 (Figs. 2 and 8). Viewed from the side (Figs. 1 and 8) the lever 69 is arranged at an angle to the rear face of the stop wheel, so that the adjacent face of said lever may act as a cam to cooperate with the pins 48 during the rotary movements of the spacing wheel, with the result that during their passage downward behind the lever 69 from the top to the bottom thereof any of such pins which may have been projected previously by the plunger 58 will be restored automatically to normal position. The lower end portion of the member or lever 69 is cut-away as indicated at 74 to provide an opening through which the pins 48 as they are brought opposite to or in register with the plunger 58 may be projected by said plunger when the space key 31 is operated. Below the opening 74 the lever terminates in a nose or stop lug 75. A leaf spring 76, held by the screws 72, cooperates with the upper arm of the lever 69 to maintain it normally in the position shown in Figs. 2 and 9, in which position said lever is arrested by a shoulder or ledge 77 formed by cutting away or depressing the front face of the block 71 adjacent to the screw 70 to form a seat for said lever 69. When the plunger 58 operates to project one of the pins 48 said pin will be pressed rearward in or through the opening 74 in the lever 69. At the first letter space movement of the carriage thereafter, the rear head of the projected pin will act against the nose 75 and turn the lever 69 on its pivot against the tension of the spring 76 (Fig. 10). Toward the end of this letter space movement the projected pin moves away from the nose 75 and permits the lever 69 to return to normal position with the next following pin in register with the opening 74 and so that the nose or stop lug 75 will be in position to contact with the head of the projected pin and arrest the back spacing wheel should the latter be moved in reverse direction by any backward spacing movement which may be communicated to the carriage by the wheel.

In order to space the carriage backward or in reverse direction, devices are provided comprising an internally toothed gear segment 78 (Figs. 1 and 2), said gear segment

being adapted to cooperate with the gear wheel 55 at the top thereof, but being normally disengaged therefrom. The gear segment 78 is secured by screws 79 to the upper 5 triangularly shaped arm of a lever 80, said lever being pivoted on a shouldered screw 81 received in a boss or lug 82 projecting forward from the supporting bracket 25. A wire spring 83 is coiled around the boss 82 10 and tends constantly to press the upper arm of the lever 80 toward the left as viewed from the rear and to move the gear segment 78 leftward over the top of the gear wheel 55, maintaining a projection 80^a on said lever 15 normally in contact with a lug 80^b depending from the top plate.

It will be understood that when the gear segment 78 is moved rightward as viewed from the rear, it will engage with the gear 20 wheel 55, turning the latter and through it the stop wheel, causing the teeth of the annulus 41 to cooperate with the gear wheel 33 to turn the latter backward so that the teeth or the ratchet wheel 34, acting against the 25 pawls 38, will turn the housing 35 backward and, through it and the shaft 20, pinion 19 and rack 16, move the carriage backward or in reverse direction. The means for moving the gear segment 78 in the manner just de- 30 scribed are illustrated in Figs. 1 and 2 and comprise a link 84 pivotally connected at one end with the lower arm of the lever 80 and at the opposite end with the lower end of a crank arm 85, said crank arm at its upper end 35 being provided with a hub 86 which receives a set screw 87, said set screw securing the crank arm to the rear end portion of a rock shaft 88. The rock shaft extends forward 40 beneath the top plate and is journaled in lugs 89 depending therefrom. Longitudinal movement of the shaft 88 in one direction is prevented by the cooperation of the hub 86 with the rear lug 89 and in the opposite direc- 45 tion by the cooperation of the forward lug 89 with a collar 90 fixed to the shaft by a set screw 91. The forward end of the rock shaft is slightly reduced in diameter, as indicated at 88^a, and terminates just in rear of the de- 50 pending lip 3^a of the top plate 3. Fixed to the reduced end of the rock shaft by a pin 92 is a crank arm or handle 93 which extends downward in front of the right-hand front corner post and terminates in a finger piece 94 a short distance above the base of the ma- 55 chine. Loosely mounted on the reduced end portion of the rock shaft 88, behind the crank arm 93, is a shorter arm or stop member 95, said arm or member being confined between the crank arm 93 and the shoulder formed 60 between the body of the rock shaft and the reduced end 88^a thereof. The lower end of the arm 95 terminates in a finger portion 96 which overlies the crank arm 93 above the finger portion 94 thereon. A lug 97 projects

laterally from the arm 95 near the upper end 65 thereof and receives an adjustable thumb screw 98 which underlies the lip 3^a of the top plate, the point of said screw being adapted to contact with the lower edge of said lip and serving as a stop to arrest the arm 95. 70

Certain features of the operation of my invention not hereinbefore explained may now be referred to. It will be understood that when the printing keys are operated, the as- 75 sociate type bars will be caused to print and the carriage will be moved step-by-step in printing or letter feeding direction; that is, toward the left viewed from the front of the machine. During this movement, the stop 80 wheel and connected parts will turn in the direction of the arrow (Fig. 2) while the hand-operated devices for controlling said spacing wheel (said hand-operated devices compris- 85 ing the gear segment 78, the lever 80, link 84, crank arm 85, rock shaft 88 and arms 93 and 95) will remain motionless. If at any time it is desired to space the carriage backward a single letter space the operator presses the 90 finger piece 96 toward the right, (viewed from the front of the machine) causing the arm 95 to turn until the screw 98 contacts with the lip 3^a of the top plate. Because of the finger portion 96 overlapping the crank 95 arm 93, said crank arm will participate in this movement of the arm 95 and will rock the shaft 88 and through the above de- scribed connections will swing the gear seg- 100 ment 78 into engagement with the gear wheel 55, turning the latter and the spacing wheel and causing a backward spacing movement of the carriage. The extent of this move- 105 ment will depend on the point at which the screw or stop 98 contacts with the top plate, and is preferably limited to a single letter space distance.

It will be understood that each time the 110 space bar or key 31 is operated to space between words or for any other purpose, one of the spacing or stop pins 48 will be projected and that during subsequent letter feeding 115 movements of the carriage said projected pin will travel with the spacing wheel in the direction of the arrow in Fig. 2 until said pin has completed nearly a full revolution and engages with the inclined or cam face of 120 the cam member or lever 69 which automatically pushes the pin forward and restores it to normal position. If, however, subsequent to the projection of said pin and during the 125 course of the printing of the following word it is desired to backspace the carriage until the first letter of said word is opposite the printing point, the finger piece 94 is pressed rightward (viewed from the front of the machine), causing the gear segment 78 to cooperate 130 with the gear wheel 55 and turn the spacing wheel or element backward in a direction opposite to the arrow in Fig. 2. The extent

of this backward rotation of the spacing wheel and consequently the extent of back spacing of the carriage will depend on the number of steps the projected pin 48 has moved from the nose or stop 75. As has been stated, each letter space movement of the carriage causes the spacing pins 48 to move a distance corresponding to the distance between the centers of adjacent spacing pins. It will be evident therefore that the continuous backward movement of the spacing wheel and carriage imparted by the arm 93 will correspond to the number of letters printed in the word and will equal the letter space feed movements imparted to the carriage in writing said letters. When the crank arm 93 is operated by the finger piece 94, the arm 95 and the stop 98 thereon do not cooperate with the crank arm 93 to arrest it, but permit the crank arm 93 to be moved away from the arm 95 until said crank arm is arrested by the projected stop pin 48. After any back spacing movement the gear segment 78 and connected parts will be restored to normal position by the operation of the spring 83.

What I claim as new and desire to secure by Letters Patent, is:—

1. In a typewriting machine, the combination of a carriage, means for feeding the carriage step-by-step in printing direction, and a key operated back spacing mechanism including means for feeding the carriage backward and means for arresting said carriage after it has been fed backward a variable distance and prior to its reaching the beginning of the line of writing; a single key being operative to feed the carriage backward varying extents prior to its arrest.

2. In a typewriting machine, the combination of a carriage, means for feeding the carriage step-by-step in printing direction, and a back spacing mechanism including means for feeding the carriage backward by a continuous motion until the first letter of the last word printed has been brought opposite the printing point and then positively arresting the carriage.

3. In a typewriting machine, the combination of a carriage, means for feeding the carriage step-by-step in printing direction, and a back spacing mechanism including means for feeding the carriage backward and means for arresting said carriage after it has been so fed a single letter space and also after it has been so fed a variable number of letter spaces, either extent of back feeding being selected at will.

4. In a typewriting machine, the combination of a carriage, means for feeding the carriage step-by-step in printing direction, and a back spacing mechanism including means for feeding the carriage backward and means for arresting said carriage after it has been so

fed a single letter space and also after it has been so fed a variable number of letter spaces depending on the number of letters in the word last printed.

5. In a typewriting machine, the combination of a carriage, means for feeding the carriage step-by-step in printing direction, and back spacing mechanism including a rotary back spacing element connected with the carriage so as to rotate as the carriage is fed step-by-step in printing direction, said rotary element being rotatable in the opposite or back spacing direction by hand, and means for varying the extent of back spacing rotation of said rotary element independently of the marginal position of arrest of the carriage and of said rotary element.

6. In a typewriting machine, the combination of a carriage, means for feeding the carriage step-by-step in printing direction, and a back spacing mechanism including a rotary back spacing element connected with the carriage so as to rotate as the carriage is fed step-by-step in printing direction, said rotary element being rotatable in the opposite or back spacing direction by hand, and means operating automatically to variably control the extent of back spacing rotation of said rotary element whereby the carriage may by continuous movement be moved to the beginning of the word last written.

7. In a typewriting machine, the combination of a carriage, means for feeding the carriage step-by-step in printing direction, back spacing mechanism including a rotary back spacing element connected with the carriage so as to rotate as the carriage is fed step-by-step in printing direction, said rotary element being rotatable in the opposite or back spacing direction by hand, and a stop on said element adjustable to limit its movement in back spacing direction.

8. In a typewriting machine, the combination of a carriage, means for feeding the carriage step-by-step in printing direction, back spacing mechanism including a rotary back spacing element connected with the carriage so as to rotate as the carriage is fed step-by-step in printing direction, said rotary element being rotatable in the opposite or back spacing direction by hand, and a plurality of stops on said element, said stops being independently adjustable to vary the extent of movement of said element in back spacing direction.

9. In a typewriting machine, the combination with a carriage, means for feeding the carriage step-by-step in printing direction, and a space key connected with said means, of back spacing devices certain of which are controllable by said space key.

10. In a typewriting machine, the combination with a carriage and means for feeding said carriage in printing direction, of a key,

a stop device controlled by said key and moving with the carriage, means for moving the carriage backward, and a stop device co-operating with the first recited stop device to arrest such backward rotation of the carriage.

11. In a typewriting machine, the combination with a carriage and means for feeding said carriage in printing direction, of a key which may be operated in the course of the printing, a stop device set by said key, means for moving the carriage backward, and means coöperating with said stop device for arresting the backward motion of said carriage at a letter space position bearing a predetermined relation to that at which said key was operated.

12. In a typewriting machine, the combination with a carriage and means for feeding said carriage in printing direction, of a key that can be operated when the carriage is in letter space position, means for feeding the carriage backward, and a stop device controlled by said key for arresting the backward feed of the carriage at a letter space position bearing a predetermined relation to that at which said key was operated.

13. In a typewriting machine, the combination with a carriage, means for feeding the carriage step-by-step in printing direction and a space key connected with said means, of back spacing mechanism for said carriage, and means set by said space key for limiting the extent of motion of said back spacing mechanism.

14. In a typewriting machine, the combination with a carriage, means for feeding the carriage step-by-step in printing direction and a space key connected with said means, of back spacing mechanism including a rotary element, hand controlled means for rotating said element in back spacing direction, and means set by said space key for limiting the extent of such rotation.

15. In a typewriting machine, the combination with a carriage, means for feeding the carriage step-by-step in printing direction and a space key connected with said means, of back spacing mechanism including a rotary element, hand controlled means for rotating said element in back spacing direction, and means on said element for varying the extent of its backward rotation, said last named means being set by said space key.

16. In a typewriting machine, the combination with a carriage, means for feeding the carriage step-by-step in printing direction and a space key connected with said means, of back spacing mechanism including a rotary element, hand controlled means for rotating said element in back spacing direction, a plurality of stops adapted to limit the extent of back spacing rotation of said element, said stops being normally in inoperative position, and means operative by said space

key for moving said stops to operative position.

17. In a typewriting machine, the combination with a carriage, means for feeding the carriage step-by-step in printing direction, and a space key connected with said means, of back spacing mechanism including a rotary element, hand controlled means for rotating said element in back spacing direction, a plurality of stops on said element, said stops being normally in inoperative position, and means operative by said space key for moving said stops one at a time to operative position.

18. In a typewriting machine, the combination of a carriage, back spacing mechanism therefor including a rotary back spacing element, and connections between said carriage and said element, said connections comprising a shaft, a gear wheel and a pawl and ratchet connecting said gear wheel and said shaft.

19. In a typewriting machine, the combination with a power driven carriage and escapement devices therefor including an escapement wheel and an escapement wheel shaft, of back spacing devices comprising a rotary back spacing element and a pawl and ratchet connection between said element and said escapement wheel shaft.

20. In a typewriting machine, the combination with a power driven carriage and escapement devices therefor including an escapement wheel and an escapement wheel shaft, of a back spacing element provided with a gear and connections between said back spacing element and said escapement wheel shaft including a gear wheel meshing with said gear, a ratchet rigidly connected with said gear, and a pawl engaging with said ratchet and mounted to turn bodily with said escapement wheel shaft.

21. In a typewriting machine, the combination with a carriage and means for feeding the carriage step-by-step in printing direction, of back spacing mechanism comprising a back spacing element, a set of stop devices movably mounted thereon at letter space distances apart, said devices being normally in inoperative position, and means for moving said stop devices one at a time relatively to said element to operative position.

22. In a typewriting machine, the combination with a carriage and means for feeding the carriage step-by-step in printing direction, of back spacing mechanism including a back spacing wheel, a set of stop pins circularly arranged thereon at letter space intervals, said pins being normally in inoperative position, and means for moving said pins one at a time relatively to said wheel to operative position.

23. In a typewriting machine, the combination with a carriage and means for feeding

the carriage step-by-step in printing direction, of back spacing mechanism including a rotary element, hand controlled means for rotating said element in back spacing direction, a plurality of stops normally in inoperative position but adapted to limit the extent of back spacing rotation of said element, key controlled means for moving said stops relatively to said element into operative position, and automatic means for restoring said stops to normal position.

24. In a typewriting machine, the combination with a carriage, means for feeding the carriage step-by-step in printing direction, and a space key connected with said means, of back spacing mechanism including a rotary element, hand controlled means for rotating said element in back spacing direction, a set of stops adapted to limit the extent of back spacing rotation of said element, said stops being normally in inoperative position, means operated by said space key for moving said stops to operative position, and means operating automatically to restore said stops to normal or inoperative position during rotary movements of said element.

25. In a typewriting machine, the combination with a carriage and means for feeding said carriage step-by-step in printing direction, of back spacing mechanism including a back spacing element connected with said carriage and carrying relatively movable stop devices, means for moving said devices from normal position one at a time and relatively to said element, and means operating automatically during the movements of said element to move said devices back to normal position.

26. In a typewriting machine, the combination with a carriage and means for feeding said carriage step-by-step in printing direction, of back spacing mechanism including a back spacing element connected with said carriage and carrying relatively movable stop devices, means for moving said devices from normal position one at a time and relatively to said element, and a cam operating automatically to move said devices back to normal position.

27. In a typewriting machine, the combination with a carriage and means for feeding said carriage step-by-step in printing direction, of back spacing mechanism including a back spacing element connected with said carriage and carrying relatively movable stop devices, means for moving said devices from normal position one at a time and relatively to said element, and a stop cooperative with said devices to arrest said element.

28. In a typewriting machine, the combination with a carriage and means for feeding said carriage step-by-step in printing direction, of back spacing mechanism including a back spacing element connected with said

carriage and carrying relatively movable stop devices, means for moving said devices from normal position one at a time and relatively to said element, and a member cooperative with said devices when said element is moved in one direction to arrest said element and operating when said element is moved in the opposite direction to automatically move said devices back to normal position.

29. In a typewriting machine, the combination with a carriage and means for feeding said carriage step-by-step in printing direction, of back spacing mechanism including a back spacing element connected with said carriage and carrying relatively movable stop devices, means for moving said devices from normal position one at a time and relatively to said element, and a combined cam and stop operative at one time to cooperate with said devices to arrest said element and at another time to cam said devices back to normal position.

30. In a typewriting machine, the combination with a carriage and means for feeding said carriage step-by-step in printing direction, of back spacing mechanism including a back spacing element connected with said carriage and carrying relatively movable stop devices, means for moving said devices from normal position one at a time and relatively to said element, and a spring pressed lever pivotally mounted on the machine frame and cooperating with said devices to arrest said element and also cooperating with said devices to move them relatively to said element back to normal position.

31. In a typewriting machine, the combination with a carriage and means for feeding the carriage step-by-step in printing direction, of back spacing mechanism including a rotary back spacing element connected to turn with the carriage as the carriage is fed in printing direction, and hand controlled means for turning said element in the opposite direction, said hand controlled means including a gear wheel rigid with said element, a gear segment adapted to mesh with said gear wheel, a rock shaft, a link connecting said gear segment with said rock shaft, and a crank arm rigid with said rock shaft and provided with a finger piece.

32. In a typewriting machine, the combination with a carriage and means for feeding the carriage step-by-step in printing direction, of back spacing mechanism including a rotary back spacing element connected to turn with the carriage as the carriage is fed in printing direction, and hand controlled means for turning said element in the opposite direction, said hand controlled means including a rock shaft, a crank arm rigid thereon, and a stop arm loosely mounted on said rock shaft and adapted to control said crank arm.

33. In a typewriting machine, the combination with a carriage and means for feeding the carriage step-by-step in printing direction, of back spacing mechanism including a rotary back spacing element connected to turn with the carriage as the carriage is fed in printing direction and hand controlled means for turning said element in the opposite direction, said hand controlled means including a rock shaft, a crank arm rigid with said rock shaft, a stop arm loose on said rock shaft and overlying said crank arm, said crank arm being adapted to be moved by said stop arm a predetermined extent and being adapted to be moved independently of said stop arm variable extents.

34. In a typewriting machine, the combination with a carriage, means for feeding the carriage step-by-step in printing direction and a space key connected with said means, of back spacing mechanism including a movable back spacing element connected with the carriage, stop devices on said element, and a device operated by said space key for moving said stop devices one at a time relatively to said element.

35. In a typewriting machine, the combination with a carriage, means for feeding the carriage step-by-step in printing direction and a space key connected with said means, of a rotary back spacing element, a set of stop pins mounted on said element and movable relatively thereto into and out of operative position, said pins being normally inoperative, and a plunger connected with said space key and operated thereby to move said stop pins one at a time to operative position.

36. In a typewriting machine, the combination of a frame; a carriage movable across said frame for letter spacing; a row of settable stops and a setting device for said stops, one of the last recited parts being connected to move past the other as the carriage moves across the frame; a key connected with said setting device to set the stop that happens to be in register with said setting device when the key is operated; and a stop cooperative with said settable stops.

37. In a typewriting machine, the combination of a frame, a carriage mounted for letter space motion across said frame, a device connected with said carriage and carry-

ing a series of settable stops, a setting device mounted on the frame, a key for operating said setting device to set to operative position whichever settable stop happens to be in register with said setting device when the key is operated, and a stop cooperative with said settable stops.

38. In a typewriting machine, the combination with a carriage, a wheel geared to said carriage, a series of settable stops mounted on said wheel, a setting device for said stops, a key connected with said setting device for setting to operative position whichever one of said settable stops happens to be in register with said setting device when the key is operated, and a stop cooperative with said settable stops.

39. In a typewriting machine, the combination with a traveling carriage, of stop devices, means for setting one or another of said stop devices when the carriage is in any letter space position in its travel across the machine, means for moving said carriage backward, and a stop cooperative with the set stop device to arrest the carriage in its backward motion at a letter space position in advance of that at which said stop device was set differing from but bearing a predetermined relation to that at which said stop device was set.

40. In a typewriting machine, the combination of a carriage, a series of settable stops connected to move with the carriage, a key operated setting device for setting in operative position that stop which happens to be in register with said setting device when its key is operated, a movably mounted cooperating stop arranged to move when the carriage feeds forward after the operation of said key and to drop in behind the set stop, and means for moving the carriage backward, the arrangement being such that said cooperating stop will arrest the set stop at a letter space position in advance of that at which it was set.

Signed at Brussels, Belgium, this 8th day of May A. D. 1908.

CHARLES DELVIGNE.

Witnesses:

GREGORY PHELAN,
JAMES M. G. FAY.