

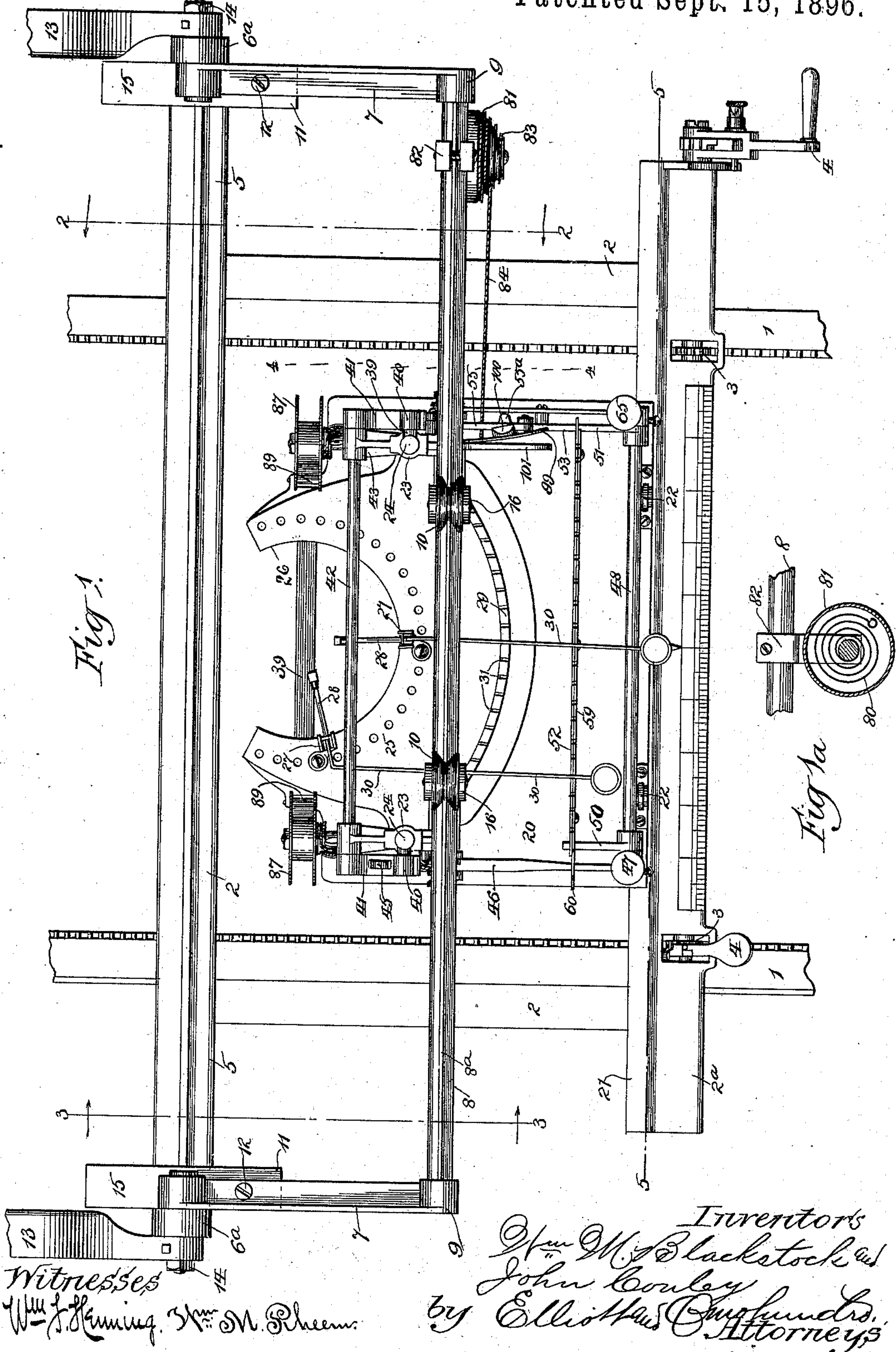
(No Model.)

4 Sheets—Sheet 1.

W. M. BLACKSTOCK & J. CONLEY.
TYPE WRITING MACHINE.

No. 567,937.

Patented Sept. 15, 1896.



(No Model.)

4 Sheets—Sheet 2.

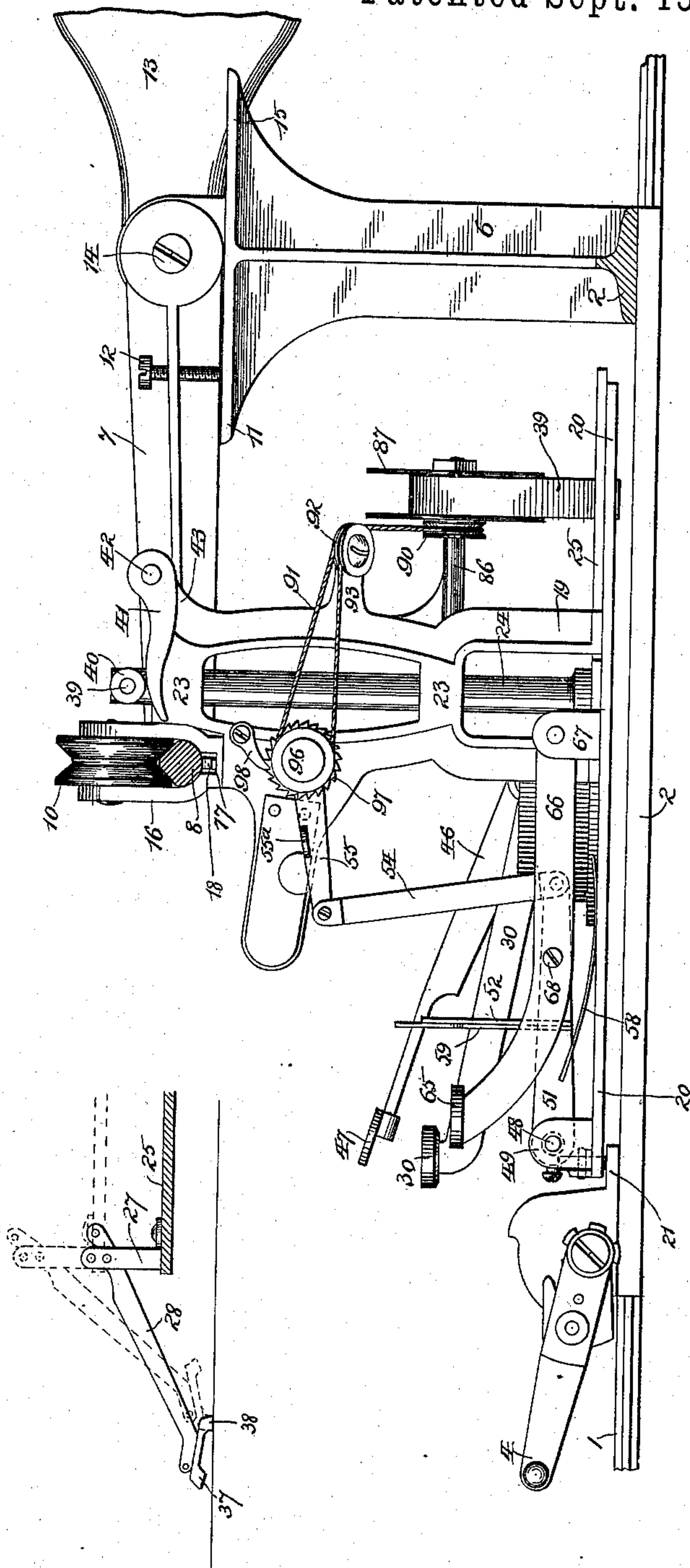
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Fig 2.

Fig 6.



Witnesses
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4 Sheets—Sheet 3.

No. 567,937.

Patented Sept. 15, 1896.



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(No Model.)

4 Sheets—Sheet 4.

W. M. BLACKSTOCK & J. CONLEY.
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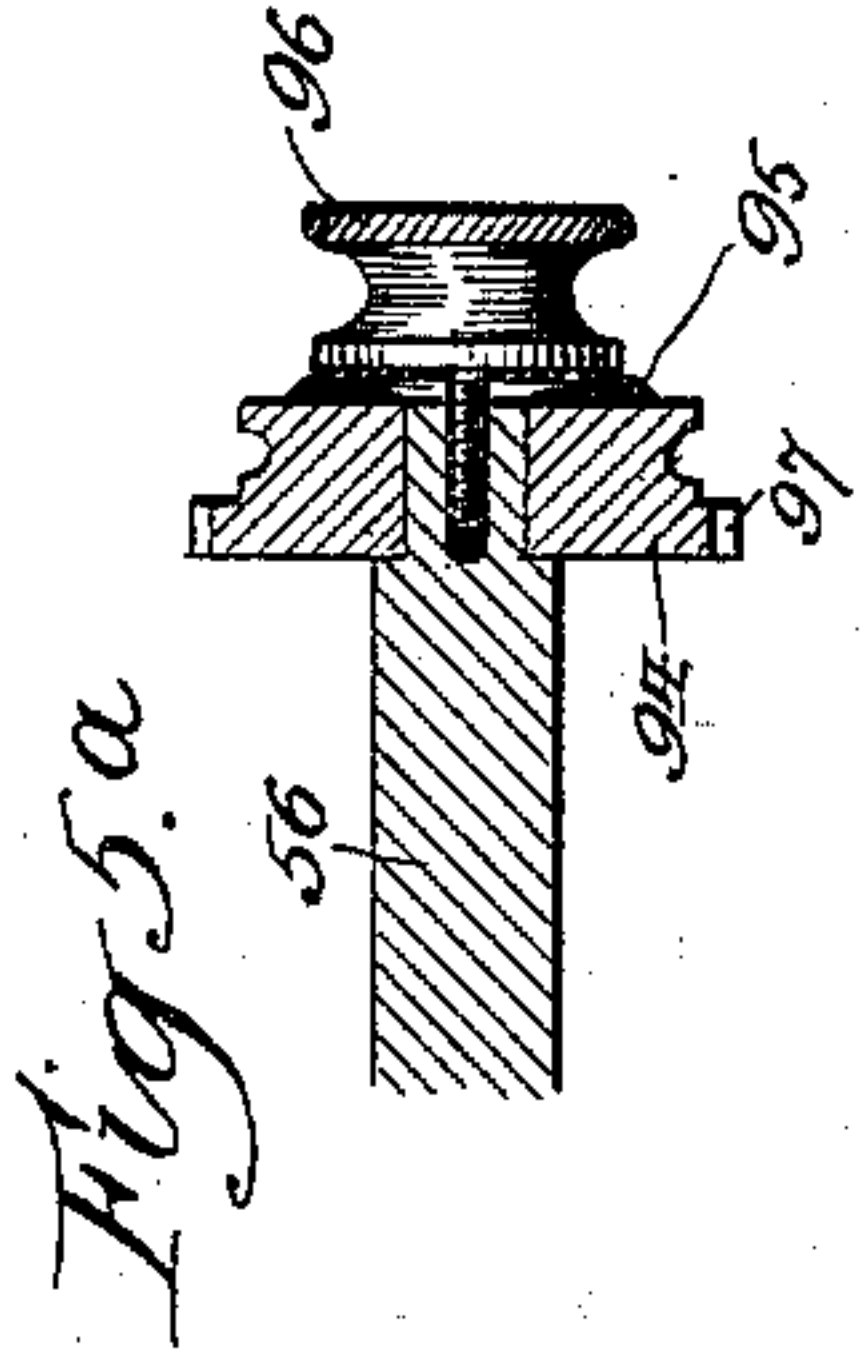
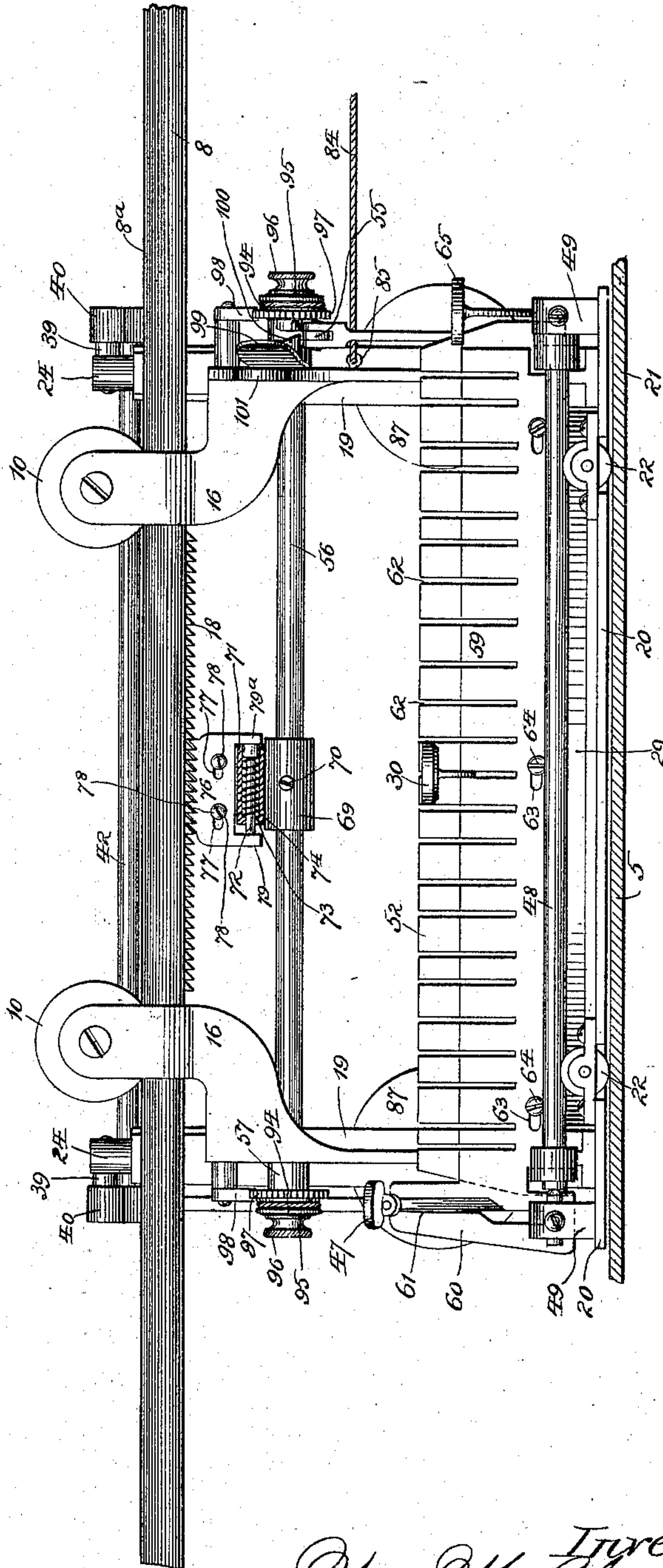


Fig. 5.



Witnesses
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UNITED STATES PATENT OFFICE.

WILLIAM M. BLACKSTOCK, OF SHADELAND, INDIANA, AND JOHN CONLEY,
OF CHICAGO, ILLINOIS, ASSIGNORS, BY MESNE ASSIGNMENTS, TO THE
ELLIOTT & HATCH BOOK TYPEWRITER COMPANY, OF NEW YORK.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 567,937, dated September 15, 1896.

Application filed July 12, 1892. Renewed January 18, 1896. Serial No. 576,046. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM M. BLACKSTOCK, residing at Shadeland, in the county of Tippecanoe and State of Indiana, and JOHN CONLEY, residing at Chicago, in the county of Cook and State of Illinois, citizens of the United States, have invented certain new and useful Improvements in Type-Writers, of which the following is a full, clear, and exact specification.

Our invention relates more particularly to that class of type-writers designed for traveling over and writing upon the pages of open books, or other flat surfaces, which cannot be conveniently fed through or inserted in the ordinary machine. A type-writer of this class is shown and described in our application for United States Letters Patent, Serial No. 398,188, filed July 1, 1891, and also in United States Letters Patent to Elliott, No. 440,307, granted November 11, 1890, to which reference may be had for a better understanding of any features that are common to our present case and such prior devices.

Our present invention is designed as an improvement on said prior machines; and the improvements relate more particularly to the means for shifting the type-bars from "upper" to "lower" case, to the means for feeding and supporting the carriage, and to the means for feeding the inking-ribbon. Our improvements also relate to certain other features of minor importance hereinafter described.

One of the important objects of our invention is to provide improved means for shifting the fulcrums or pivotal points of the type-bars whereby the change of the type from lower to upper case is effected.

Another important object of our invention is to provide the carriage with a shiftable way or track and to balance the carriage thereon in such a manner that the way or track may be shifted together with the carriage for uncovering or disclosing the writing-surface, but without destroying the equilibrium of the carriage.

With these ends in view our invention consists in certain features of novelty in the con-

struction, combination, and arrangement of parts by which the said objects and certain other objects hereinafter described are accomplished, as fully explained with reference to the accompanying drawings, and more particularly pointed out in the claims.

In the drawings, Figure 1 is a plan view of our improved type-writer, portions being broken away and many of the keys and type-bars being omitted for the sake of clearness. Figure 1^a is a detail view. Fig. 2 is an end view of the machine, looking from the right, certain portions of the frame, &c., being shown in section on the line 2 2, Fig. 1. Fig. 3 is an end elevation of the same, looking from the left, portions of the frame, &c., being shown in section on the line 3 3, Fig. 1. Fig. 4 is a vertical transverse section taken on the line 4 4, Fig. 1. Fig. 5 is a detail front view of the carriage and a portion of its supporting way or track, a portion of the frame being shown in section on the line 5 5, Fig. 1. Fig. 5^a is a detail sectional view hereinafter described. Fig. 6 is a detail view hereinafter described.

Like signs of reference indicate like parts throughout the several views.

In carrying out our invention we employ parallel rack-bars 1, which rest upon the book or writing-surface and serve as a support or track over which the base-frame 2, carrying the type-writer proper, may be caused to travel by means of pinions 3, mounted in the cross-bar 2^a and provided with suitable operating-levers 4 for producing the desired space between the lines, all of which may be of the usual or of any suitable construction.

Mounted upon the rigid portion of the movable base-frame 2, preferably upon the outer ends of extensions 5, are two standards or uprights 6, to the upper ends of which are respectively pivoted two crank-arms 7. The free ends of these crank-arms 7 are connected together by a rail or rod 8, which serves as a track or way for the support and guidance of the type or printing carriage, the ends of the crank-arms 7 being provided with journal-bearings 9, in which the ends of the rail 8 are journaled. The carriage is supported on this rail 8 by means of rollers or antifriction-

tion-wheels 10, whose peripheries are provided with V-shaped or beveled-edge grooves, which fit the correspondingly-beveled edge 8^a on the upper side of the rail. Thus it will
 5 be seen that when it is desired to inspect the writing or remove the carriage from the writing-surface for any other purpose the crank-arms 7 may be turned backward, carrying the carriage upward and backward with them,
 10 but without destroying the equilibrium of the latter, as it is balanced on the rail 8, and such bar is journaled in the arms 7.

In order that the carriage may be held at the proper distance from the writing-surface,
 15 the standards 6 are provided at or near their upper ends with flanges or extensions 11, arranged under the arms 7, and upon which said arms come to rest. If desired, each of the arms 7 may be provided with an adjust-
 20 able stop in the form of a set-screw 12, passing through a portion of the arm and adapted to impinge the flanges 11 for holding the free ends of the arms at the proper elevation.

In order to overcome a great portion of the
 25 weight of the carriage and render the same easier of manipulation, we provide the arms 7 with suitable counterbalances. These may consist of weights 13, secured in any suitable manner to the rear ends of the arms. As
 30 shown in the drawings, the standards 6 are provided with journal-bearings 6^a, through which short shafts or pins 14 pass, which are secured at their inner and outer ends, respectively, to the arms 7 and weights 13.
 35 These details of construction, however, are immaterial, and it is of course seen that ordinary springs might be substituted for the weights.

The backward movement of the arms 7 may
 40 be arrested, if desired, by means of flanges or projections 15, formed on the standard 6 and being similar to the flanges 11, the weights 13 being mounted to one side of the flanges 15, so as to avoid striking the same.

The grooved wheels 10 are journaled in suitable brackets or hangers 16, which surround and fit the under side of the rail or way 8, so as to prevent lost motion between such rail and the wheels, the hangers being provided
 50 with notches or recesses 17 for the passage of the teeth of the rack 18, formed on the under side of the rail, as usual. These hangers 16 are formed upon or otherwise secured to up-
 55 rights or standards 19, to the lower ends of which the base-plate or bottom 20 of the carriage is secured. The disposition of the hangers 16 is such that they will be directly over the center of gravity of the carriage and all parts supported thereon, so that the carriage
 60 will be equally balanced and will maintain a position parallel to the paper or writing-surface without the aid of additional supports. In order, however, that the pressure brought to bear upon the type-keys may not
 65 depress the front or forward side of the carriage or produce undue oscillation of the car-

riage upon its track or way, we provide such forward edge of the carriage with a support 21, which may consist of a plain flat flange formed along the inner edge of the bar 2^a 70 and projecting under the outer or forward edge of the plate 20, such plate, if desired, being provided with antifriction-rollers 22 to lessen the friction between it and the flange.

Mounted in suitable bearings or guides 23, 75 preferably formed on the standards 19, are two vertically-reciprocating rods or guide-stems 24, whose lower ends are secured, respectively, to the sides of a plate 25, upon which the type-bars and key-levers are sup- 80 ported and fulcrumed.

The plate 25 is provided with a circular edge 26, as usual, around which the fulcrums 27 of the type-bars 28 are secured in any suitable manner, and such plate is also provided 85 at or near its forward edge with a flange or ridge 29, which serves as a fulcrum for the key-levers 30. The key-levers 30 may be secured to this flange 29 in any convenient way, but we preferably provide such flange with 90 slits or notches 31, in which the key-levers are inserted, the levers themselves being provided with notches 32, which receive the flange 29 and thus prevent their endwise or longitudinal movement, their inner ends being 95 connected to the type-bars by a pin-and-slot connection 33, or by any other suitable or well-known means, and both the key-levers and type-bars being returned to their re- 100 tracted or normal position by means of suitable springs 34, whose upper ends 35 pass through perforations in the key-levers, while their lower ends 36 are seated in longitudinal perforations formed in the base of the flange 29. The type-bars 28, two of which only are 105 shown in the drawings, are each provided, as usual, with two characters or types 37 38. The inner types or characters 38 are centered to strike the ribbon 39, which runs under the plate 20 at the same point, and the faces of 110 the characters on each type-bar are set at such an angle that but one character on each bar can come in contact with the paper at the same time.

Thus it will be seen from Fig. 6 that when 115 the fulcrum-plate 25 is in its lower position the inner characters 38 only will come in contact with the writing-surface; but should this plate be elevated, as shown in dotted lines, carrying the fulcrum of the type-bar upward 120 to a point immediately over the position it occupies when lowered, thus placing it farther from the paper or writing-surface, it will be seen that the forward character or type, 37, will be brought against the paper, 125 while the other character, 38, will be carried upward and held aloof therefrom until the fulcrum or supporting-plate 25 is again lowered. This upward movement of the plate 25 is so proportioned with relation to the dis- 130 tance between the characters 37 38 that the character 37, when the plate is raised, will

strike on the line in which the character 38 prints when the plate is down, and the faces of the characters 37 38 are set at an angle to each other, as shown, so as to strike squarely against the writing-surface.

As a means of imparting an upward movement to the type-supporting plate 25, we provide the rods 24 with lugs or projections 39, having antifriction-rollers 40, under which engage crank-arms 41, secured to a shaft 42, journaled in suitable projections 43, formed on or secured to the uprights 19. The upper edges of the arms 41 may be rounded or so formed as to readily elevate the bars 24 when an upward movement is imparted to such arms, and the shaft 42 is rigidly secured to both arms, so that the movement of one will be conveyed to the other without the necessity of applying the power to both directly. One of the arms 41 is attached or pivoted at 44 to an upwardly-projecting link 45, whose lower end is pivoted to the short arm of the shifting-lever 46, pivoted in any suitable manner to the base-plate 20. Thus by applying pressure to the key 47 of such shifting-lever both arms 41 will be caused to engage under the rollers 40 and elevate the plate 25 bodily, with the keys and type-levers thereon, to the position shown in dotted lines in Fig. 6, and it will there remain until the pressure on the key 47 is released, whereupon the parts will return to their normal position through the influence of gravity. By this arrangement the fulcrum plate or support is elevated without changing its plane with reference to the horizontal; that is to say, if the plate is normally horizontal it will remain so throughout its movement, and hence the movement of the fulcrums will be uniform.

Mounted upon the forward edge of the plate 20 is a crank-shaft 48, provided at each end, if desired, with ordinary cone or other suitable bearings 49. This crank-shaft 48 is provided with two inwardly-projecting crank-arms 50 51, which are rigidly attached thereto and carry at their inner ends a spacing-bar 52.

The crank-arm 51 is provided with an extension 53, to which is pivoted the lower end of a link 54, whose upper end is pivoted to the end of a crank-arm 55, suitably secured to a rocker-shaft 56. This rocker-shaft 56 is journaled in any suitable bearings 57 on the standards 19 and carries the spacing-dog, which engages with the rack 18 on the under side of the rail or track 8. The spacing-bar 52 is arranged across the machine under the type-levers 30, in a position to be impinged by such levers when the latter are depressed in the act of producing impressions or printing on the writing-surface, and thus it will be seen that at each depression of the type-levers or of any one of them the spacing-bar will force the crank-arm 51 downward against the influence of the spring 58, whose duty is to hold the spacing-bar normally elevated, and

will consequently rock the shaft 56 and cause the spacing-dog to release the rack 18 and thereby permit the feeding-spring herein-after described to feed the carriage forward one space.

When the plate 25 is elevated, the key-levers will of course be too far above the spacing-bar 52 to touch said bar when depressed, and in order that the movement of the keys may be imparted to the spacing-dog, through the connections already described, when the plate 25 is in its upper position, we provide a second spacing-bar 59. The first spacing-bar 52 is permanently or immovably attached to the arms 50 51, Fig. 1, but the second spacing-bar 59 is capable of lateral or longitudinal adjustment with relation to the bar 52, and it is adapted to be shifted with relation to such bar automatically with the movement of the rising-and-falling plate 25. In order to accomplish this automatic movement of the bar 59, Fig. 5, the end of the latter is provided with an extension 60, in which is formed a cam-groove 61, through which passes the outer end of the shifting-lever 46.

The bars 52 59 are provided with vertical slots 62, in which the key-levers work, and which serve as guides for such levers and prevent lateral play or vibration thereof. As shown in Fig. 5, these slots 62 are coincident when the plate 25 is in its lower position; and they are also of equal depth in both of the spacing-bars. The extent of the slots in the bar 52 is such that the key-levers will strike or come to rest on such bar in time to shift the feeding-dog to one side before the types strike the printing-surface, and the upper edge of the bar 59 is located at such height as to be struck by the levers in time to shift the feeding-dog to one side before the types strike the printing-surface when the plate 25 is in its elevated position.

The formation of the cam-groove 61 is such that when this shifting-lever 46 is depressed the spacing-bar 59 is moved to one side, causing the slots in the two bars to become non-coincident and ranging the upper edge of the bar 59 in a position to be struck by the key-levers before reaching the lower ends of the slots in the bar 52, thus causing the spacing-dog to release the carriage when the keys are depressed while the plate 25 is in its elevated position. The upper portion of the cam-groove 61 is such that when the shifting-lever 46 returns to its elevated position the shiftable spacing-bar 59 will be returned to its normal position with the slots therein coincident with the slots in the bar 52.

The bar 59 may be held in position on the arms 50 51 in any convenient manner. As shown in the drawings, this bar 59 is provided at its lower edges with a number of longitudinally - arranged slots 63, through which pass headed studs 64, secured to the fixed bar 52, thus holding the bar 59 upright

against the side of the bar 52, with capability of adjustment as described.

Preferably at the opposite side of the machine to the shifting-lever 46 is arranged the
5 spacing-key 65, mounted upon the end of a suitable lever 66, as usual, which is fulcrumed at 67 to the base-plate 20 and pivoted at 68 to the extension 53 of the crank-arm 51, thus rendering it possible to feed the carriage forward without manipulating the type-keys, as
10 will be understood.

The feeding-dog above referred to preferably consists of a collar 69, having a set-screw 70, by means of which the same may be adjust-
15 ably secured to the rocker-shaft 56. As shown more clearly in Fig. 5, the upper side of the collar 69 is provided with a box 71, through which passes a pin 72, having a large and small end, as shown, and arranged
20 on the small end of this pin, behind a shoulder 73, is a suitable spring 74, which normally imparts to the pin a tendency to move toward the feeding-spring 80. Projecting above the box 71, and being rigidly secured
25 to or formed upon the collar 69, is a dog 75, having a number of teeth complementary in shape to the spaces between the teeth of the rack 18, and adjustably secured to the face of the dog 75 is a second dog 76, provided with
30 a number of teeth, and being, if desired, identically like the dog 75, excepting that it is capable of slight longitudinal movement independently of the collar 69.

The dog 76 may be provided with longitudinal slots 77, through which pass headed
35 studs or screws 78, fixed in the dog 75 or some other fixed part of the collar 70, as a means for adjustably holding such dog 76 in position. The dog 76 is provided at its ends with
40 downwardly-projecting fingers or lugs 79 79^a, respectively, which engage with the ends of the pin 72, whereby the movement of such pin beyond the ends of the box 71 will be imparted to the dog, the pin being slightly
45 greater in length than such box. Thus it will be seen that when the rocker-shaft 56 is rocked in one direction the teeth of the dog 76 will be disengaged from the rack 18, and consequently the spring 74 will shift the dog
50 76 a short distance forward or toward the feeding-spring 80, this distance of course being equal to the distance between the teeth of the rack 18. When in this position, the dog 76 will of course be in engagement with the
55 rack 18 and hold the carriage against movement, but when the pressure on the key is released, permitting the spring 58 to rock the shaft 56 and force the teeth of the dog 76 between the teeth of the rack 18, the feeding-spring 80, by virtue of its preponderance of
60 power over the spring 74, will draw the carriage forward against the inertia of such spring 74 until the end of the box 71 strikes the depending lug 79^a, thus shifting the carriage one space, or the distance required between two letters of a word.

The feeding-spring 80 above referred to is coiled within a box or barrel 81, provided with a clamp 82 or other suitable device, by means of which it may be secured to the rail
70 or track 8. The barrel 81 is preferably pivoted or journaled on a depending portion of the clamp 82, and one end of the barrel is provided with a drum 83, around which is wound a cord or cable 84, connected to a lug
75 85 on one of the standards 19, or to any other suitable and convenient portion of the carriage. The drum 83 is preferably of spiral form, as shown in Fig. 1, in order that the tension of the spring 80, as exerted on the car-
80 riage, will be uniform throughout the travel of the carriage, as will be understood.

With a carriage constructed and arranged, as described, on the journaled rail or way 8, it will be understood that when the carriage
85 is thrown backward from over the writing-surface its weight will hold its base 20 substantially parallel with the writing-surface, the standards 19 of course remaining vertical at all times, and as the rail cannot turn inde-
90 pendently of the grooved supporting-rollers the position of the rail cannot change with relation to the spacing or feeding dog, which will remain normally in line with the rack 18. So also will the feed-spring mechanism main-
95 tain an unchanging position with relation to the carriage.

Mounted on suitable journals 86, preferably projecting from the standards 19, are the ribbon drums or spools 87, upon which is wound
100 the ribbon 39, passing under suitable anti-friction-rollers 89, mounted in the edges of the plate 20. Each of these spools is provided with a pulley 90, around each of which passes a belt 91. The two laps or folds of each of
105 the belts 91 are guided upward over a pair of idlers 92, journaled in projections 93, formed, if desired, on the rear sides of the standards 19, and from the idlers 92 each of the belts 91 passes around a pulley 94, having frictional
110 connection with the ends of the rocker-shaft 56. This frictional connection between the rocker-shaft 56 and the pulleys 94 may consist of a spring-washer 95, bearing at its perimeter or edge upon the face of the pulley
115 94, and being held in place by means of a set or tension screw 96, whose end passes through such washer 95 and is threaded in the reduced end of the shaft 56.

Each of the pulleys 94 is provided on one
120 side with ratchet-teeth 97, with which engages a pawl 98, pivotally fixed to the standard 19 or other suitable portion of the carriage. The arrangement of the teeth 97 and pawl 98 is such that the pulleys 94 are free to rotate
125 with the shaft 56 in one direction, but when such shaft returns in the opposite direction the pawls 98 will engage the teeth 97 and overcome the frictional resistance of the spring-washers 95, holding the pulleys 94 against a
130 retrograde movement while the shaft 56 returns. This step-by-step rotation of the pul-

leys 94 will of course be imparted, through the intermediary of the belts 91, to the spools 87, and consequently to the ribbon itself.

In order that both of the feeding-dogs 75 76 may be simultaneously disengaged from the rack 18, we provide a spring-key 99, upon which is mounted a stop 100, which latter is normally held over the crank-arm 55, so as to prevent the spring 58 from forcing such arm upward sufficiently far to disengage both feeding-dogs from the rack 18, but when such stop 100 is withdrawn the arm 55 will be free to move upward under the influence of the spring 58 and both dogs will be consequently thrown to the rear of the rack 18, and the carriage may be quickly and conveniently adjusted to any desired point throughout the alinement. The crank-arm 55 is provided with a key or button 55^a for convenience in depressing such arm when it is desired to force it below the stop 100 and cause the dogs to again engage the rack 18, the upper side of the stop 100 being beveled to permit the arm 55 to readily pass it when forced downward. One of the standards 19, or any other desired portion of the carriage, may be provided with a rigid thumb-piece 101, to which the spring-key 99 is secured, and which serves as a brace or handle for the thumb in releasing the stop 100 and forcing the carriage to the desired adjustment.

Having thus described our invention, what we claim as new therein, and desire to secure by Letters Patent, is—

1. In a type-writing machine, the combination with the main frame embodying the standards 6 provided with flanges 11, of the carriage hinged as described and adapted to rest upon said flanges, and the adjusting-screw 12, arranged upon the carriage and adapted to bear upon the said flanges 11, substantially as set forth and described.

2. In a type-writer, the combination of the carriage, the type-bars and key-levers, a rising-and-falling support therefor, a spacing or feeding mechanism for said carriage having a depressible spacing-bar arranged to be impinged by the key-levers and a shiftable spacing-bar, and means for simultaneously throwing said spacing-bar into action under the key-levers and raising said support, substantially as set forth.

3. In a type-writer, the combination of the carriage, the type-bars and key-levers, a rising-and-falling support therefor, a spacing or feeding mechanism for said carriage having a slotted depressible spacing-bar into which slots said levers project, a shiftable spacing-bar adapted to bridge or obstruct said slots, and means for simultaneously shifting said shiftable spacing-bar and raising said support, substantially as set forth.

4. In a type-writer, the combination of the carriage, the type-bars and key-levers, a rising-and-falling support therefor, a spacing or feeding mechanism for said carriage having

a slotted depressible spacing-bar into the slots of which said levers project, and a shiftable spacing-bar having slots adapted to register with said first slots, and means for simultaneously shifting said shiftable bar and elevating said rising-and-falling support, substantially as set forth.

5. In a type-writer, the combination of the carriage, the type-bars and key-levers, a rising-and-falling support therefor, a spacing or feeding mechanism for said carriage having a depressible spacing-bar arranged to be impinged by the key-levers, and a shiftable spacing-bar normally out of reach of said levers, a cam for actuating said shiftable bar, and a lever engaging said cam and having connection with said rising-and-falling support for simultaneously elevating said support and shifting said shiftable bar within reach of the key-levers, substantially as set forth.

6. In a type-writer, the combination of the carriage, the type-bars and key-levers, a rising-and-falling support therefor, a spacing or feeding mechanism for said carriage having a depressible spacing-bar arranged to be impinged by the key-levers and a shiftable spacing-bar normally out of reach of said levers, provided with a cam-groove, and a lever projecting through said cam-groove and connected with said rising-and-falling support for simultaneously elevating said support and shifting said shiftable bar within reach of the key-levers, substantially as set forth.

7. In a type-writer, the combination of the carriage, the type-bars and key-levers, a rising-and-falling support therefor, a spacing or feeding mechanism for said carriage having a slotted depressible spacing-bar into the slots of which the key-levers descend, and a second spacing-bar of less height than the first bar, having slots adapted to register with the aforesaid slots and being shiftable lengthwise of the said first bar, a cam for shifting the second bar and a lever arranged to engage said cam and being connected with said rising-and-falling support, substantially as set forth.

8. In a type-writer, the combination with the carriage and a track or rail therefor having a rack thereon, of a feeding-dog engaging said rack, a spring-actuated crank-arm for throwing said dog into and out of engagement with said rack, a key having the lug, 100, adapted to engage said crank-arm for holding said dog in engagement with said rack, and a thumb-piece 101, secured to the carriage adjacent to said key, substantially as set forth.

9. In a type-writer, the combination with the carriage having a support or track and a rack-bar, of a crank-shaft having a dog adapted to engage said rack-bar, a spacing-bar connected with and adapted to oscillate said crank-shaft, the ribbon-spools, a pulley on said crank-shaft adapted to rotate in one direction therewith for actuating said spools, and means for preventing a reverse or retrograde

movement of said pulley, substantially as set forth.

10. In a type-writer, the combination with the carriage and a support or way therefor
5 having a rack, of a rock-shaft having a dog adapted to engage said rack, and means for oscillating said rock-shaft by the movement of the key-levers, pulleys having frictional connection with said rock-shaft, the ribbon-
10 spools connected with said pulleys, and means for restricting the movement of said pulleys to one direction, substantially as set forth.

11. In a type-writer, the combination with the carriage having a support or way and a
15 rack thereon, of a rock-shaft provided with a dog adapted to engage said rack, a spacing-bar for oscillating said shaft, pulleys provided with teeth having frictional connection with said shaft and adapted to rotate in one
20 direction therewith, pawls engaging the teeth of said pulleys, and the ribbon-spools connected with said pulleys, substantially as set forth.

12. In a type-writer, the combination with
25 the carriage and the rail or track therefor having a rack thereon, of an oscillating spacing-dog adapted to engage said rack, consisting of a toothed dog fixed against longitudinal movement, a second dog shiftable
30 with relation to the first dog and having projecting fingers or lugs, a pin arranged between said lugs and a spring for shifting said second dog with relation to the first through the medium of said pin, substantially as set
35 forth.

13. In a type-writer, the combination with the carriage and the track or rail therefor having a rack thereon, of a spacing or feeding dog adapted to engage said rack, con-
40 sisting of a collar fixed against longitudinal movement with relation to the carriage, and provided with a toothed dog and box, 71, a second dog adapted to slide on said collar and having projecting fingers or lugs, a pin
45 arranged in said box between said fingers or lugs, a spring forcing said pin outward and means for oscillating said collar, substantially as set forth.

14. In a type-writer, the combination with
50 the carriage having standards mounted thereon and type-bars and key-levers, of a plate upon which said type-bars are fulcrumed, lifting-stems working in said standards and having antifriction-rollers secured thereto, a
55 crank-shaft journaled in said standards and having rigid crank-arms engaging under said rollers, a lever fulcrumed on said carriage and a link connecting said lever with one of said crank-arms, substantially as set forth.

60 15. In a type-writer, the combination with the carriage of a rising-and-falling plate supported on said carriage, the type-bars fulcrumed and supported on said plate, the key-levers also fulcrumed on said plate, a spacing
65 mechanism having independent spacing-bars

adapted to be impinged by said levers when the latter are in their upper and lower positions respectively, and a lever for elevating said plate, substantially as set forth.

16. In a type-writer, the combination with
70 the carriage and the type-bars having a plurality of type-faces of a rising-and-falling plate supported on said carriage and upon which said type-bars are fulcrumed, a slotted flange on said plate, the key-levers fitting in
75 said slots and having notches to receive the said flange, and a lever for lifting said plate bodily, substantially as set forth.

17. In a type-writer, the combination with the carriage and the type-bars, of a pair of
80 types or characters secured to or formed on each of said bars, and having their printing-faces arranged at an angle to each other, a rising-and-falling support for said type-bars and means for raising said support without
85 changing its plane with reference to the horizontal, substantially as set forth.

18. In a type-writer, the combination with the carriage and the frame, of a shiftable, pivoted way or track, rollers running on said
90 track and being secured to said carriage over the center of gravity thereof, substantially as set forth.

19. In a type-writer, the combination with the carriage and the frame, of a pair of crank-
95 arms, a rail journaled in said arms and upon which said carriage is supported, substantially as set forth.

20. In a type-writer, the combination with the carriage and the frame, of a pair of crank-
100 arms, a beveled rail journaled in said arms, and having the rack formed thereon, and grooved rollers running on said rail and suspending said carriage therefrom, substantially as set forth. 105

21. In a type-writer, the combination with the carriage and the frame, of a pair of ad-
justable crank-arms, a beveled rail journaled in said crank-arms and grooved supports connecting said carriage with said rail, substan-
110 tially as set forth.

22. In a type-writer, the combination with the frame and the carriage of a pair of crank-
arms pivoted to said frame, a rail journaled in said crank-arms and supporting said car-
115 riage, and a supplementary support arranged under the forward edge of the carriage, substantially as set forth.

23. In a type-writer, the combination with the carriage and the frame, of crank-arms, a
120 rail journaled in said crank-arms and supporting said carriage, the flange 21 arranged under the forward edge of said carriage and antifriction-rollers journaled in said carriage and running on said flange, substantially as
125 set forth.

24. In a type-writer, the combination with the carriage and the frame, of standards ar-
ranged on said frame, crank-arms pivoted to said standards, a rail journaled in said arms
130

and supporting the carriage, and counterbalances secured to said arms, substantially as set forth.

- 5 25. In a type-writer, the combination with the carriage and frame, of standards on said frame, crank-arms pivoted to said standards, a rail journaled in said arms and supporting said carriage, and counterbalance-weights secured to said arms, substantially as set forth.
- 10 26. In a type-writer, the combination with the carriage and frame, of standards on said frame, having the projections or flanges 11, 15, crank-arms pivoted above said flanges

and adapted to come to rest thereon, and a rail journaled in said arms and supporting said carriage, substantially as set forth.

WILLIAM M. BLACKSTOCK.

JOHN CONLEY.

Witnesses to the signature of William M. Blackstock:

ANDREW KRENLY,

GEO. C. ZIEBOLD.

Witnesses to the signature of John Conley:

F. A. HOPKINS,

W. R. OMOHUNDRO.