A. G. F. KUROWSKI.

TYPE WRITING MACHINE.

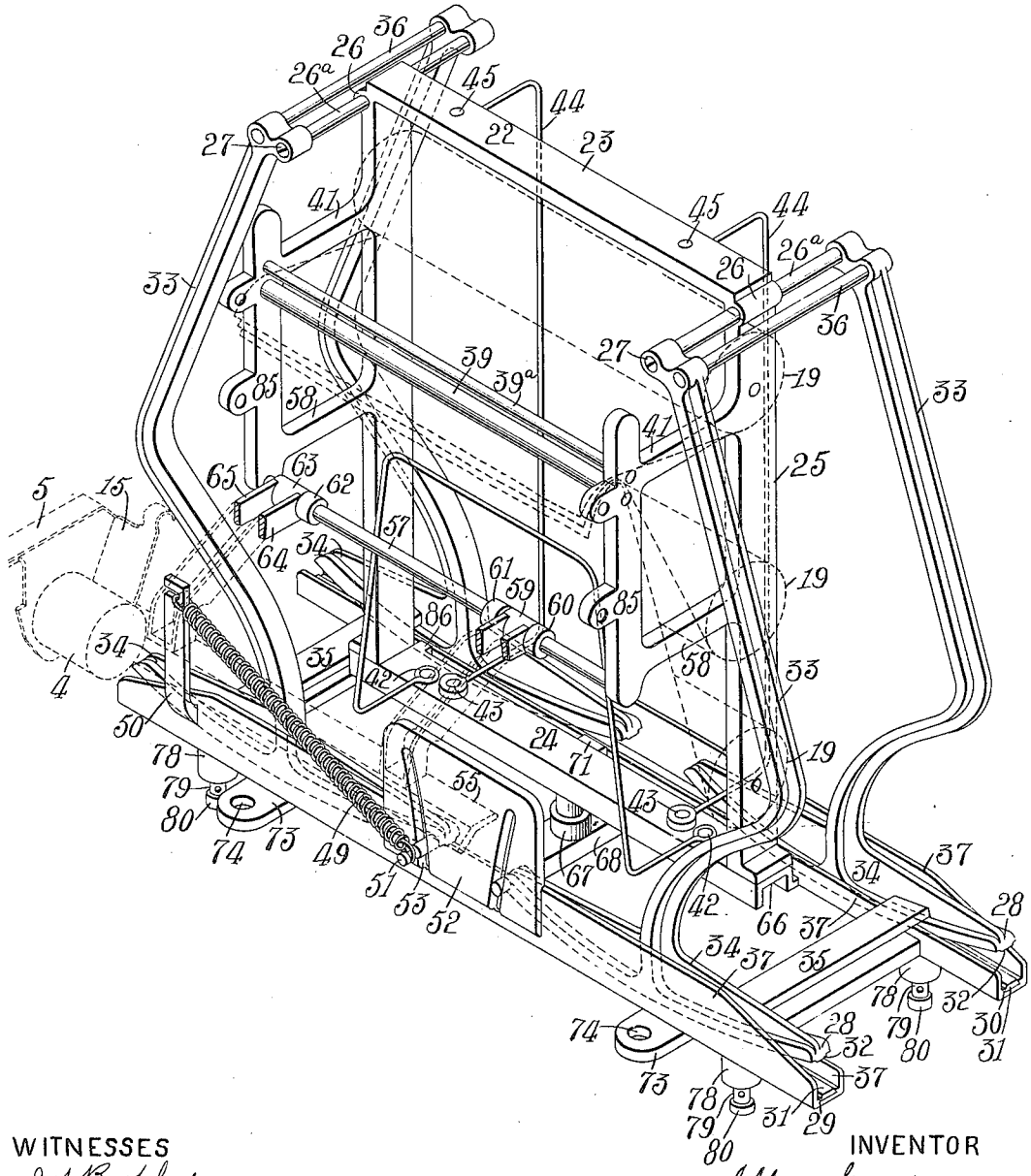
APPLICATION FILED JAN. 15, 1913.

1,196,369.

Patented Aug. 29, 1916.

2 SHEETS—SHEET 1.

FIG. 1



WITNESSES

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2 SHEETS—SHEET 2.

FIG. 2

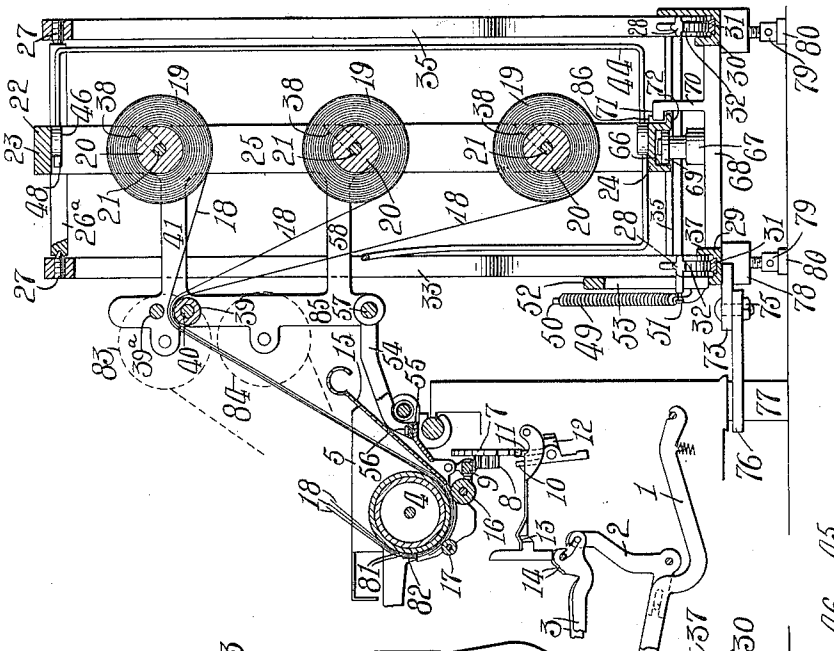


FIG. 4.

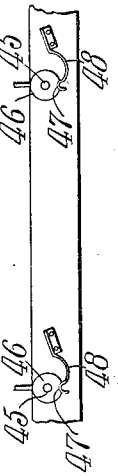


FIG. 3

WITNESSES

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UNITED STATES PATENT OFFICE.

ALFRED G. F. KUROWSKI, OF NEW YORK, N. Y., ASSIGNOR TO UNDERWOOD TYPEWRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

TYPE-WRITING MACHINE.

1,196,369. Specification of Letters Patent. Patented Aug. 29, 1916.

Application filed January 15, 1913. Serial No. 742,096.

To all whom it may concern:

Be it known that I, ALFRED G. F. KUROWSKI, a citizen of the United States, residing in Brooklyn, in the county of Kings, city and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to typewriting machines and particularly to such machines which have a rotatable platen mounted in a traveling carriage and which are arranged to feed a web or webs of considerable length around said platen from a roll-holder.

The invention is herein illustrated in connection with an Underwood typewriting machine of the front-strike type in which the work-sheet is delivered to the platen at the rear of the carriage. When this work-sheet is in the form of a web, according to the present invention, the web is carried in the form of a roll mounted in a roll-holder which may travel at the rear of the typewriter. This roll holder may, if desired, include several separate rolls or spindles on which rolls may be mounted. The roll-holder is preferably carried by rocker bearings, and said roll-holder may be so arranged as to normally tend to travel in the direction in which the letter-feeding motion of the typewriter carriage takes place, thus relieving the driving spring of the typewriter from the load of the roll-holder and its rolls.

For causing the roll-holder to travel with the carriage of the typewriter, there may be a connection between the two, which preferably will include a lost motion device, so that while the roll-holder is always positioned approximately by the typewriter carriage, yet the two may have a slight relative motion with respect to each other in either direction of normal travel. This will permit the roll-holder to be carried along either by its own tendency to move, or by the carriage of the typewriter, in an even motion almost free from the momentary stoppages which are caused by the escapement of the typewriter carriage even in the act of rapid writing. This will largely relieve the escapement dogs of the typewriter carriage from the strain of starting and stopping the roll-holder with its rolls, which may have considerable inertia. If said lost motion is of small extent, the fact that the web does not feed straight from the rolls to the platen at all points, may be practically completely overcome by having the rolls at some distance behind the typewriter carriage.

Other features and advantages will hereinafter appear.

In the accompanying drawings, Figure 1 is a front perspective view of my roll-holder showing parts of the typewriter carriage in dotted lines to disclose the relative positions of the two. Fig. 2 is a sectional side view of the same. Fig. 3 is a rear view. Fig. 4 is a view showing detents for holding the paper guards in position.

In the Underwood typewriting machine, keys (not shown herein) depress levers 1 to cause bell cranks 2 to swing type bars 3 upwardly and rearwardly against a platen 4, so that the type (not shown) on said type bars are caused to write on said platen. The platen 4 is rotatably mounted in a traveling carriage 5, which is drawn forwardly in a leter-feeding direction by means of a spring barrel 6 (see Fig. 3) and is controlled in said letter feeding direction by means of an escapement wheel 7 carrying a pinion 8, which pinion works in a rack 9 pivoted in the usual manner on the carriage of the typewriter. The escapement wheel 7 is controlled by dogs 10 and 11 on a rocker frame 12, said rocker frame forming part of a universal member 13, which is operated with every type stroke by means of heels 14 on the type bars.

The typewriter carriage 5 comprises a platen frame on which the platen 4 is mounted, said platen frame also including paper table 15 and rolls 16 and 17, which serve to guide the work-sheets 18 around the platen. Said platen may be rotated in the usual manner, as by line-space mechanism (not shown herein).

The work-sheets 18, of which three are shown herein, are, in the present case, in the form of webs, which are drawn from rolls 19 on spools 20, said spools being carried on spindles 21 in a spool-holder 22. The spool-holder comprises a top bar 23, a bottom bar 24, and side bars 25, forming a rectangular frame, which is carried by rods 26[a] fast in ears 26 at the top of each side bar. Against depressions in the ends of said rods bear pintles 27, each pintle forming a pivot for a rocker bearing, said bearings comprising arcuate treads 28, which are struck from the

pintles 27 as a center. The treads 28 ride in front channels 29 and rear channels 30 in a fixed part of the mechanism fast to the type-writer frame. The channels comprise hardened steel bearing surfaces 31, dovetailed into the bottom of the channels, and on said surfaces 31 bear corresponding raised surfaces 32 formed on the arcuate treads 28. There is a rocker bearing for each end of the roll-holder and the roll-holder is, as above described, suspended at its top between said bearings.

Each pintle 27 forms part of a frame of which the arcuate treads also form parts, said frame including elbow-shaped T-bars 33 extending from the pintles 27 down to the treads 28, where the webs of the T-bars are spread out forming webs 34 which strengthen said treads, said webs 34 being connected by cross bars 35, and said T-bars, at their upper ends adjacent the pintles 27, being connected by cross rods 36.

The alinement of the rocker bearings is preserved by the sides 37 of the channels 29 in which the arcuate treads rock. Thus the rocker bearings hold the roll-holder frame 22 parallel with the carriage of the typewriter. The spindles 21 on which the spools 20 of the rolls 19 are mounted extend across the roll holder 22, and at each end enter slots 38 in the side bars 25, which slots incline rearwardly and upwardly to the rear side of said side bars, as best seen in Figs. 2 and 3, while the bottoms of said slots form journals on which the spindles turn.

The webs from the spools are led upward over a roll 39 loose on a cross bar 40 extending lengthwise of the roll-holder and fixed at its ends in extensions 41 of the side bars 25, which extensions reach forward almost to the rear of the typewriter and considerably above the paper table. Just above the roll 39 is a rod 39[a] which holds the work-sheets 18 close to said roll. From the roll 39 the webs extend downwardly around the platen, around which they may be fed in any usual manner. The bight of the paper which unwinds is kept from flying loose by means of paper guards both in front and behind. The front guard, as best seen in Fig. 1, is a wire which is riveted to the bottom plate 24 of the roll-holder 22 at its ends 42, and it is carried forward parallel to the bottom of the roll-holder, and then upwardly toward the roll 39 till of sufficient height to hold the paper which might unwind from the rolls 19, and not only confines the paper so that it cannot become entangled with the typewriter mechanism, but also by bearing against the bight tends to act as a brake for the roll in unwinding. At the back of the roll-holder there are two paper guards 44, each of which comprises a wire pivoted on the bottom plate 24 of the roll-holder 22, from said pivot the guard extends rearwardly some distance behind the roll 19, then it is bent upward, and rises to a point level with the bottom of the top plate 23 of the roll-holder, and then it is bent forwardly to the roll holder where it engages with a pivot 45. Each wire forming a guard 44 engages its pivot 45 by means of a hub 46 fixed to the wire and comprising a notch 47 into which a spring 48 is normally pressed, thus serving as a detent to hold said guard in its normal position behind its rolls 19. When it is desired to have access to the rolls or place a new roll in position, the rear paper guards 44 may be swung on their pivots to one side and beyond the ends of the rolls, so as to be completely out of the way.

It will be seen from Fig. 3 that the left hand edge of the arcuate tread, as seen in said figure, lies to the left of the pintles 27, so that the weight of the raised portion of said treads would tend to swing the roll holder to the left around the pintle on the which the treads are pivoted, as viewed in said figure, that is, in the direction opposite to the letter-feed movement of the carriage. This figure shows the parts as viewed from behind at the end of a line of writing, but at the beginning of the line the parts are in such position that the other ends of the arcuate treads are lifted and tend to start the roll-holder, so as to travel in the letter-feeding direction of the carriage. The weight of said treads, however, will have comparatively little influence as said roll-holder approaches the center of the travel where the weights of the two ends of the treads almost balance each other.

In order to make the roll-holder continually tend to move to the left, as viewed from in front, the roll-holder is drawn in said direction by means of a spring 49 anchored to the top of a fixed post 50 rising from the bottom of the fixed framework. From said post said spring extends to a pin 51 on the end of one of the arcuate treads so that it tends to draw said tread to the left, as seen in Fig. 1. Said tread, however, is prevented from sliding by means of a plate 52 comprising a slot 53, in which the pin 51 travels, which slot is so curved that as the tread 28 rolls along, said pin 51 will ride idly in said slot 53. As the tread rolls along it will be seen that the pin 51 will rise in said slot and so give the spring 49 a more direct pull and so tend to rotate the tread 28. Thus said pull tends to increase as the weight of the treads 28 tends to decrease in driving the roll-holder. In this way, an almost uniform pull on the roll-holder is obtained decidedly weaker than the pull of the spring on the typewriter carriage. Said slot 53, it will be noted is the arc of a cycloid.

In order to control the roll-holder from the typewriter carriage, a bar 54 fast to the typewriter carriage, by means of an offset

portion 55, engaging said carriage by screws 56, stretches rearwardly to where it embraces a rod 57 on the roll-holder, said rod fast to projections 58 extending forward from the side plates 25. The bar 54 engages said rod 57 by means of a hub 59 which embraces the bar and lies between collars 60 and 61 fast on said bar. Said hub 59 is shorter than the distance between the insides of the two collars 60 and 61 by not more than the distance of a letter-space or two of the typewriter.

The roll-holder, as seen in Fig. 1, normally stands so that the collar 60 bears against the hub 59, owing to the tendency of the roll-holder to be drawn in letter-feeding direction. As soon as a type key is operated, the typewriter carriage will move the hub 59 to the left, and the roll-holder will at once tend to follow it, owing to the tension of the spring 49. If the lost motion between the hub 59 and the collar 61 is a little less than a letter-space, the typewriter carriage may move fast enough, so that the hub 59 will just strike the collar 61, and thereby positively move the roll-holder with the typewriter carriage slightly. In any event, if another type key is depressed quickly, the roll-holder will move substantially free from the intermittent movement of the typewriter carriage in its letter-space travel.

The cross bar 57 which carries the collars 60 and 61, also carries a third collar 62 fast on it, and at the left of said collar 62 is a second hub 63 like the hub 59 which is carried by an arm 64 precisely like the arm 54 fast to the typewriter carriage. This arm 64, it will be observed, like the arm 54, may be made double, having a second parallel piece 65 which engages the hub 63 at some distance from the arm 64, thus giving greater rigidity of structure. The arm 64 helps the arm 54 to return the roll-holder with the typewriter carriage.

The roll-holder frame 22 is prevented from swinging by means of a groove 66 formed in the bottom of the bottom bar 24 of said frame, into which groove rises a vertical post 67 fast on a cross bar 68 of the frame, said post carrying at its upper end an idle roller 69 which forms a roller bearing guide for the roll frame 22.

Fast on the cross bar 68 is a post 70 comprising a lip 71 which overhangs a flange 72 extending outwardly from the bottom bar 24 of the roll frame, so as to prevent said roll frame from being lifted from its bearings.

The frame, of which the channel bars 29 form a part, comprises ears 73 which extend forwardly from said bars, and said ears are drilled at 74 to accommodate bolts 75, which bolts seize plates 76 fast to the posts 77 of the typewriting machine. The frame, of which the channel bars 29 form a part, also includes lugs 78 extending beneath said bars, in which are threaded bearing posts 79 comprising heads 80 which may rest on the table supporting the typewriting machine. By screwing the posts 79 in or out, the adjustment of the roller frame may be made to suit the exact setting of the typewriting machine, and said roll-holder is preferably so set, that the channels on which it runs have a downward inclination of approximately one-eighth of an inch in the ordinary travel of a standard typewriter carriage.

The roll-holder is preferably used in connection with the ribbon feeding mechanism shown in my co-pending application No. 746,258, filed February 5, 1913. The ribbon of said application is herein shown at the front of the platen at 81 between two of the web sheets 18, while in front of the front web sheet there is preferably the ordinary ribbon 82. The ribbon 81, lying between the sheets, may be fed from ribbon spools 83 and 84 carried on a vertical upright post 85 of the roll-holder, connecting the cross bars 41 and 58, at one side of the machine.

As is best seen in Fig. 1, the elbows of the T-bars 33 are so arranged, that the bottom roll at its extreme right-hand or left-hand point will lie above the nearly horizontal arm of said elbow bars, and thus the rocker bearing will carry itself clear of the webs 18 as they are drawn from the rolls 19. The T-bars and all the rest of the rocker frame and its supports are preferably made of aluminum, except at bearing points. The reach of the webs from the roll 39 to the platen is sufficient to prevent the twisting of the webs during the movement of the platen and holder. To reduce the effect of possible twisting, the roll 39 may be highly polished and the spools 20 turn easily on the spindles 21.

The roll holder may have its travel limited by means of a lug 86 on the bottom bar 24 of the roll holder, which lug at the end of travel of the roll holder is intercepted by the lip 71 overhanging said bar.

Variations may be resorted to within the scope of the invention, and portions of the improvements may be used without others.

Having thus described my invention, I claim:

1. In a typewriting machine, the combination with a traveling carriage, of a letter feeding device for said carriage, a roll holder, means tending to move said holder in the letter feeding direction of said carriage, and a lost motion device connecting said holder and carriage for causing said holder to travel with said carriage, and permitting relative movement of the holder and carriage in either direction through a short distance only.

2. In a typewriting machine, the combination with a traveling carriage, of a letter feeding device for said carriage, a roll

holder behind said carriage, a guard on said roll holder between the rolls thereon and the typewriter, and a guard behind the roll holder, said second guard hinged to be swung about a vertical axis to a position beyond the end of the roll space and thereby leave a clear space for inserting a roll in said holder.

3. In a typewriting machine, the combination with a roll-holder, of a bar on which said roll-holder travels, gravity means tending to start said roll-holder, and a spring exerting a varying pull on said roll-holder to maintain a substantially uniform tendency to move said roll-holder.

4. In a typewriting machine having a traveling carriage, the combination with a roll-holder, of means tending to move said roll-holder in a letter-feeding direction of the typewriter carriage, and a connection extending from said typewriter carriage to said roll-holder and permitting an independent movement of said roll holder a distance of substantially a letter space movement of said typewriter carriage.

5. In a typewriting machine, the combination of a traveling carriage and an arm fast on said carriage, of a traveling roll-holder, abutments on said roll-holder between which said arm has a limited movement only, and by which the roll-holder may be positively driven in either direction, and means tending to move said roll-holder independently of said typewriter carriage.

6. In a typewriting machine, the combination with a traveling carriage and a traveling roll-holder, of arcuate treads carrying said roll-holder, channels in which said treads ride, hardened bearings in said channels, side plates for confining said treads in said channels, a pin on a tread, and a plate having a slot in which said pin travels to prevent said treads from slipping in their channels.

7. In a typewriting machine, the combination with a traveling carriage and a roll-holder, of a rocker bearing at each side of the roll-holder from which bearings said roll-holder is suspended, and a roller bearing at the bottom of the roll-holder for preventing said roll-holder from oscillating.

8. In a typewriting machine, the combination with a traveling carriage having a letter-feeding movement, and a roll-holder, of a cross bar on said roll-holder, an arm on said carriage, collars on said cross bar, and a hub on said arm between said collars but shorter than the distance between said collars.

9. In a typewriting machine, the combination with a frame, of a roll-holder, ears on said roll-holder by which it may have lateral swinging attachment to said frame, and independently adjustable posts by which said frame may be leveled.

10. In a typewriting machine, the combination with a roll-holder frame, provided with slots extending forward from the rear side of the frame, of spindles insertible into said slots from the rear, guards pivoted on said frame, and detents for holding said guards in their normally effective position at the rear of said frame.

11. In a typewriting machine, the combination with a carriage and a letter-feeding device therefor, of a spring for propelling said carriage, a roll-holder, a spring weaker than said carriage-propelling spring tending to move said roll-holder, and a lost-motion connection between said carriage and said roll-holder, permitting the latter to be moved by its spring to take up said lost motion, and serving to positively limit the relative movement of the roll-holder and carriage in both directions, whereby the roll-holder may be driven by the carriage in either direction.

12. In a typewriting machine, the combination with a traveling carriage, of a roll-holder traveling with said carriage, a rocker frame from which said roll-holder is suspended, a roller bearing for preventing said roll-holder from swinging, rockers on said rocker frame, and tracks beneath said roll-holder on which said rockers roll, said rocker frame comprising elbow bars free of the rolls in said holder and supported on said rockers.

13. In a typewriting machine, the combination with a rocker bearing adapted to form a carrier for a roll holder, of a pin on a member of said bearing, and a guide member provided with a cycloidal slot in which said pin moves, to limit the rocker bearing to a rocking movement.

14. In a typewriting machine, the combination with a roll-holder, of rocker bearings with which said holder travels, tracks on which said rocker bearings are supported, said tracks and bearings having smooth cooperating bearing surfaces, a stationary guide, means carried by a rocker bearing and moving along said guide in a direction transverse to that of the tracks as the bearing rocks for preventing said rocker bearings from slipping on said tracks, and a spring coöperating with said rocker bearings and tending to cause said roll-holder to travel.

15. In an attachment for typewriting machines, the combination with a roll-holder, of roller bearings to which the holder is pivoted, said bearings having arc-shaped treads with their centers of curvature in the pivots connecting said holder and bearings, tracks on which said treads rock, a guide pin carried by one of said treads, and a stationary guide along which said pin moves as the treads rock, whereby the treads are prevented from slipping along the tracks.

16. In an attachment for typewriting ma-

chines, the combination with a roll-holder, of roller bearings to which the holder is pivoted, said bearings having arc-shaped treads with their centers of curvature in the pivots connecting said holder and bearings, tracks for said treads, the roll-holder being carried by said bearings and moved thereby in a direction parallel with the tracks as the treads rock on the tracks, and means for retaining said bearings on the tracks, said means comprising a guide having a fixed relation to the tracks and overhanging a guiding surface formed on the roll-holder, whereby the said holder and bearings are held against movement away from the tracks.

17. In a typewriting machine, the combination with a roll-holder having a vertically rocking frame of aluminum, of a steel bearing for said frame in its travel.

18. In a typewriting machine, the combination with a traveling carriage and a roll-holder traveling substantially with said carriage, of guards for confining paper from the rolls within said roll-holder, vertical pivots on which said guards swing, so that they may be swung beyond the roll ends, to give clear access to said rolls, and detents for holding said guards in effective position.

19. In a typewriting machine, the combination with a traveling carriage and a traveling roll-holder, of an idle roll at one side of the roll-holder over which webs may be drawn from said roll-holder, and a guard pivoted for movement about a vertical axis into and out of position for confining webs from said roll-holder at the opposite side of said roll-holder, to thereby maintain suitable web delivering relationship between said roll-holder and idle roll.

20. In a typewriting machine having a traveling carriage, a letter-feeding device for said carriage, a roll-holder, lost motion means providing independent movement for said roll-holder in the direction of travel of said carriage, and means to positively limit the extent of relative movement in both directions between said carriage and roll-holder, and thereby positively prevent the web from being moved out of substantial alinement with the platen.

21. In a typewriting machine, the combination with a vertically rocking roll-holder composed of aluminum, of travel channels therefor with bearing surfaces of hardened steel.

22. In a typewriting machine, the combination with a traveling carriage and a traveling roll-holder, said carriage and roll-holder having relative motion in the direction of the letter-feeding movement of the carriage, of bearing tracks, supporting means for said roll-holder adapted to travel partially under the influence of gravity upon said bearing tracks, and means for independently adjusting the elevation of said bearing tracks at their respective ends to level said tracks.

23. In a typewriting machine, the combination of a traveling carriage, a traveling roll-holder behind said carriage, side bars in said roll-holder having inclined slots, spindles on which rolls are mounted lying in said slots, and pivoted guards extending vertically behind said rolls for confining webs in said roll-holder, said guards being capable of swinging laterally out of their operative position to provide a clearance of the rear of the roll-holder for the insertion and removal of rolls.

24. In a typewriting machine, the combination with a traveling carriage, of a traveling roll-holder behind the carriage, said holder comprising side bars provided with recesses on their inner faces extending forwardly and downwardly, the depth of said recesses being of less degree than the thickness of said side bars, to provide end bearings, and a spindle adapted to receive a roll mounted in said recesses, the ends of said spindle being confined by said end bearings to prevent lateral displacement of said spindle.

25. The combination with a paper carriage, means to advance the carriage, and letter-feed mechanism controlling the advance of the carriage, of a support for a web or webs of paper arranged to be fed from the support of the paper carriage, means on which said support is mounted separately from the carriage to travel in a direction parallel with the direction of the carriage travel, motive means tending to advance said support, and means providing a lost motion connection between the carriage and said support permitting a limited movement of the support relative to the carriage in the direction of the carriage travel, whereby the carriage during its letter-feed movements is free from the weight and inertia of said support and the latter advanced by its own motive means, said connection between the support and carriage operable positively to return the support with the carriage and also to prevent relative movement of the carriage and said support in either direction through a sufficient distance to move said webs out of operative adjustment relative to the paper carriage.

26. The combination with a paper carriage, means to advance the carriage, and letter-feed mechanism to control said advance, of a supporting frame for a web or webs of paper to be fed from said frame to the paper carriage, a stationary support, means by which said frame is mounted on the support to travel in a direction parallel with the direction of the carriage travel, means for driving said frame in the direction of the carriage travel, and means forming a lost motion connection between the

carriage and said frame to permit a limited movement only of the frame relative to the carriage in either direction, whereby the inertia of the supporting frame is overcome by its own driving means and said frame advanced along with the carriage during the letter-feed travel of the latter, said lost motion connection operable positively to prevent said frame from lagging behind the carriage in its forward travel and to return said frame when the carriage is returned.

27. In a typewriting machine, the combination with a carriage, a platen thereon, means to advance the carriage, and letter-feed mechanism controlling the advance of the carriage, of a roll-supporting frame on which is mounted a roll or rolls parallel with the platen and from which a web or webs may be fed to the platen, a support on the machine frame and on which said roll-supporting frame is mounted and guided for movement in a direction parallel with the direction of the carriage travel, means tending to effect said movement of the supporting frame, and means forming a positive driving connection between the carriage and roll-supporting frame, said connection having lost motion permitting the carriage to advance through a letter-space distance relative to said frame, whereby the carriage in its letter-feed movements is free from the weight and inertia of said supporting frame, said connection between the roll-supporting frame and the carriage being operable positively to return said frame with the carriage.

28. In a typewriting machine, the combination with a carriage, a platen thereon, means to drive the carriage, and letter-feed mechanism controlling the advance of the carriage, of a roll-holder comprising a frame to support a roll or rolls from which a web or webs may be fed to the platen, rocker bearings to which said frame is pivoted, said rocker bearings carrying said frame and having arc-shaped treads concentric with the pivots, tracks on which said treads are supported to rock, said parts arranged to permit the frame to move in a direction parallel with the direction of the carriage travel, driving means tending to move said frame in the direction of the carriage travel, and means forming a lost motion connection between said frame and the carriage permitting the said frame to be advanced by the power of its own driving means while the carriage is advanced in its letter-feed movements by its driving means, said connection operable positively to return said frame when the carriage is returned.

29. The combination with a typewriting machine having a platen-carriage and a roll-carriage, of power-supply means to drive the platen-carriage, means providing a lost-motion connection between the platen-carriage and the roll-carriage, permitting letter-feed movements of the platen-carriage in advance of those of the roll-carriage, and a spring to drive the roll-carriage and take up said lost motion, said connecting means providing a stop for the roll-carriage, causing the tension of said spring to be applied to the platen-carriage while the latter is at rest.

30. The combination with a typewriting machine having a platen-carriage and a roll-carriage, of power-supply means to drive the platen-carriage, means providing a lost-motion connection between the platen-carriage and the roll-carriage, permitting letter-feed movements of the platen-carriage in advance of those of the roll-carriage, and a spring to drive the roll-carriage and take up said lost motion, said connecting means permitting a relative movement of said carriages through about a letter-space distance only in either direction, whereby a roll on the roll-carriage is positively retained in register with the platen-carriage.

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Witnesses:
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