T. J. COO.

ATTACHMENT FOR TYPE WRITING MACHINES.

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1,166,438. Patented Jan. 4, 1916.

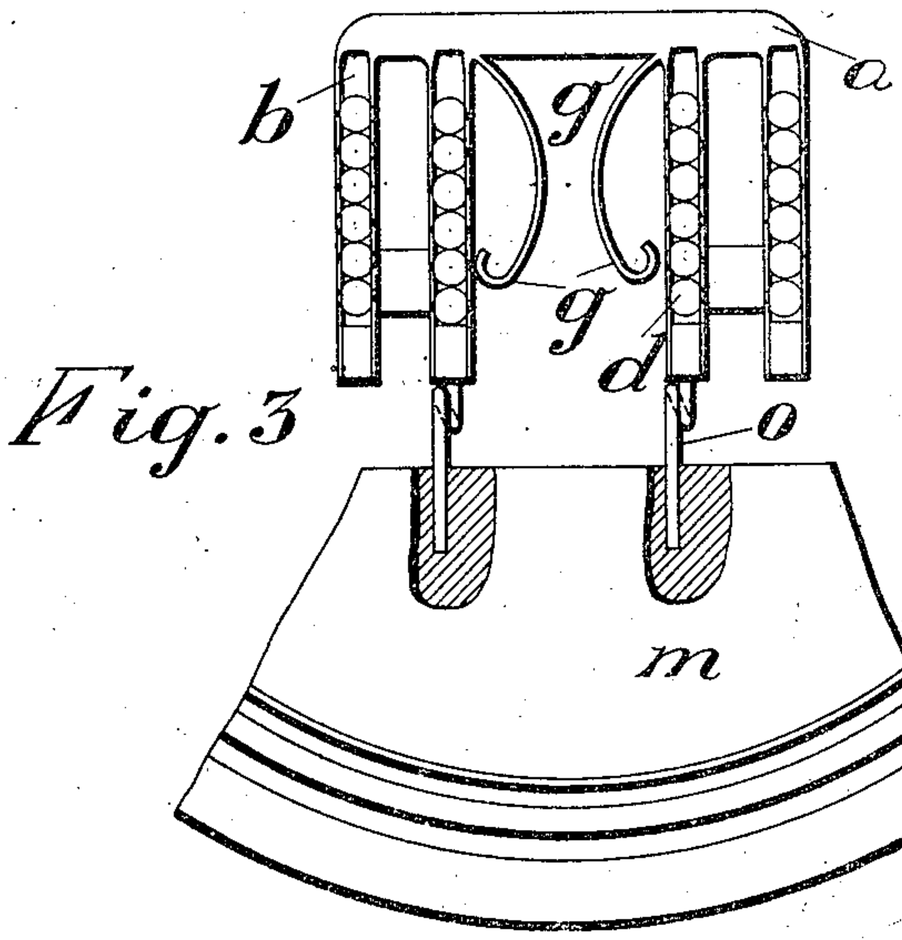


Fig. 3

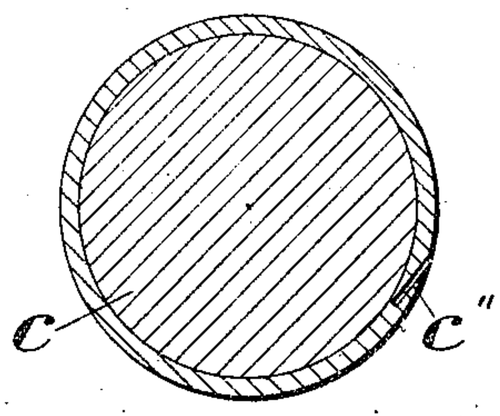


Fig. 4

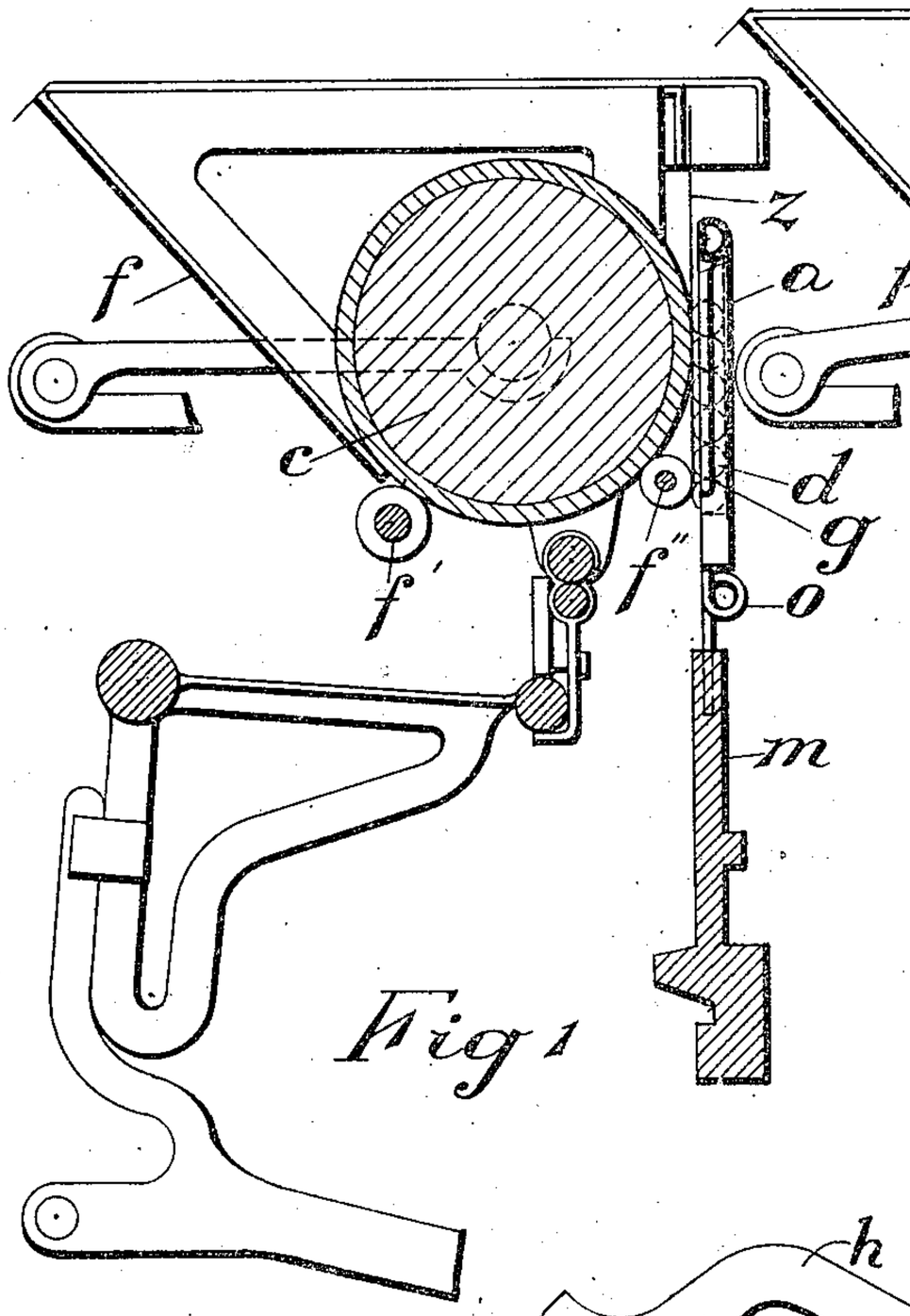


Fig. 1

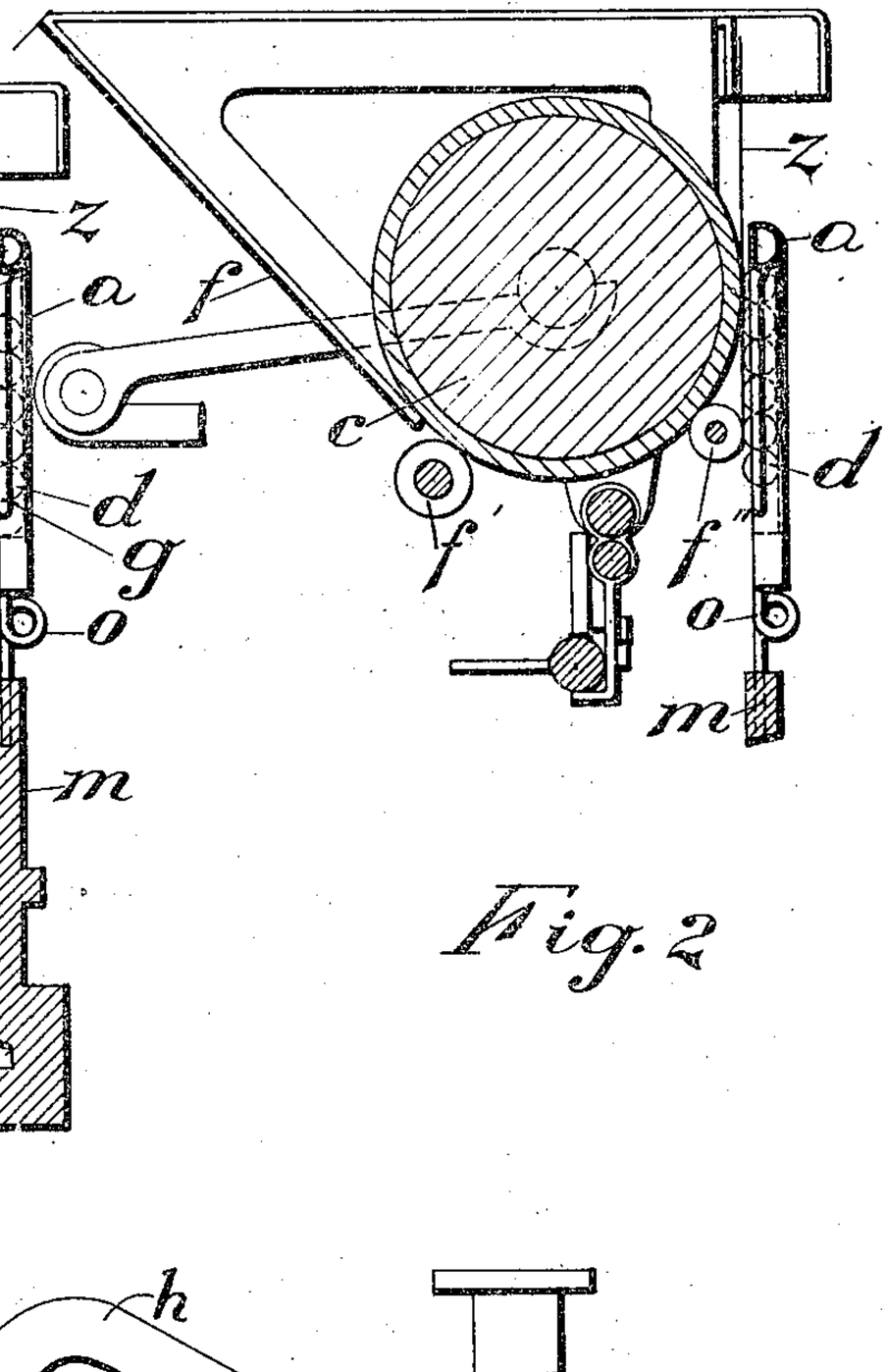
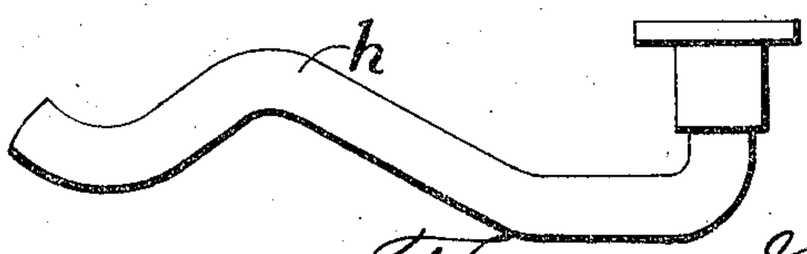


Fig. 2



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ATTACHMENT FOR TYPE-WRITING MACHINES.

1,166,438. Specification of Letters Patent. **Patented Jan. 4, 1916.**

Application filed November 21, 1913. Serial No. 802,250.

To all whom it may concern:

Be it known that I, THOMAS JOHN COO, a subject of the King of Great Britain, and a resident of the city of Toronto, in the county of York and Province of Ontario, Dominion of Canada, have invented certain new and useful Improvements in Attachments for Type-Writing Machines; and I hereby declare that the following is a full, clear, and exact description of the same.

One feature of my invention relates to a card holding attachment, comprising a series of sets of independently rotatable and collectively movable elements to engage the material being written on and maintain its operative relation to the platen as it moves for the lineal and lateral spacing of the written matter, and the change of type face.

The invention provides a device to securely hold a card or other work-piece on a roller platen.

Heretofore, difficulty has been experienced in holding cards or other small work-pieces firmly against the platen at the printing point, and in preventing them from slipping on the platen surface or becoming displaced during the letter-feeding, line-spacing, and case-shifting movements of the platen. Cards and small work-pieces are often rather stiff, and have a tendency to spring away from the platen surface at the printing point, so that the type-impressions thereon are not clear and distinct. Moreover, the usual stationary card-holding device has a tendency to drag or retard the line-feeding movement of the card, so that the card becomes displaced.

The present invention is designed to overcome these difficulties, and provides a card-holder having bodily movable anti-friction balls to bear against the face of the card or work-piece along the printing line with a yielding pressure, so that the card is held firmly against the platen at the printing point, said anti-friction balls having a free rolling engagement with the work-piece, to hold it with force against the platen, but to avoid liability of displacing the work-piece. As the anti-friction devices bear along the printing line, there is no tendency for the work-piece to spring away from the platen at the printing point, even when the edge of the work-piece is at the printing point, so that the printing may be carried to any edge or other portion of the card. The anti-friction devices are arranged to bear against the card or work-piece at a number of points along the printing line on each side of the printing center, so that the work-piece is securely held thereby while carried with the platen in the direction of the writing line, to bring either lateral edge to the printing center.

The card holding attachment may be made in numerous ways within the scope of the appended claims, but the preferred construction consists of an open casing in which is contained a series of sets of anti-friction elements, each anti-friction element of each set being rotatable independently of the others so that it will offer no impediment to the movement of the material being written on during the lineal and lateral spacing of the written matter, and the sets of anti-friction elements being collectively movable during a case-shift or change of type face, the anti-friction elements extending beyond the face of the casing sufficiently to engage the material being written on and hold it in contact with the platen.

The invention further relates to a supporting means for the card holding attachment, which will permit of it being adjusted to the platen, to regulate the pressure of the anti-friction elements against said material.

The invention further relates to the platen cylinder which is peculiarly constructed to permit a card or other work-piece to be introduced at the front of the platen and fed backward into position to be written upon.

The card-holder may be in the form of an attachment adapted to be removably mounted on a suitable part of the machine, as, for example, the type-bar segment, and may comprise a stationary support or casing provided with a number of grooves or raceways extending transversely to the line of writing, in each of which grooves is supported a column of anti-friction rollers preferably in the form of balls, each of which projects a slight distance from the face of the support, to engage the face of a card or other work-piece on the platen. The anti-friction rollers hold the work-piece against the platen along the printing line with sufficient pressure to prevent it from slipping over the face of the platen as the latter moves for letter-spacing, line-spacing, or case-shifting. During the case-shifting movements of the platen, the anti-friction rollers in contact with the work-

piece roll freely thereon, so that they have practically no drag or tendency to slide the work-piece on the platen, but, on the contrary, maintain a frictional pressure between the work-piece and platen, insuring a proper relation of the work-piece to the platen being maintained.

During the letter-feeding movements of the platen, the balls may revolve in their guides, so that the drag of the balls on the card at this time may be inappreciable and unobjectionable. The balls may comprise one or more columns on each side of the printing point, and spaced apart sufficiently to accommodate the usual type-guide, types and ribbon vibrator. Spring-arms on the card-holder extend into this space and serve to prevent the work-pieces from coming in contact with the ribbon as they move across said space. The card-holder is attached to the type-bar segment by strong but somewhat elastic supporting rods, which provide suitable pressure of the rollers against the work-piece, and said rods may be adjusted by bending to adjust the holder relatively to the platen and to regulate the said pressure.

For an understanding of the invention, reference is to be had to the following description, and to the accompanying drawings, which show the invention applied to an Underwood machine, and in which:—

Figure 1, is a cross sectional view of a carriage frame, the platen, the shifting mechanism therefor, the type gar segment, and the card holding attachment, with the platen and its shifting mechanism in their lower case position. Fig. 2 is a cross sectional view of the platen, and the card holding attachment, with the platen in its upper case position. Fig. 3, is an elevation of the card holding attachment and a part of the type bar segment, and Fig. 4, is a cross sectional view of the platen cylinder.

Like characters of reference refer to like parts throughout the specification and drawings.

The card-holding attachment consists of a casing *a* having a series of vertical slots or raceways *b* in the face opposed to the platen *c*. In the slots *b* and projecting slightly beyond the face of the casing is a series of sets of anti-friction elements *d* arranged in vertical columns or groups whose function is to feed the cards or other material being written upon around the platen, for the lineal spacing of the written matter; to hold the material closely against the platen to obtain a perfect imprint of the type; and to permit the material to move with the platen for the lateral spacing of the written matter, and for the change of type face.

The work-pieces or material to be written upon, which may be either sheets of paper, envelops, cards or the like is ordinarily fed along the paper shelf *f* and between the feed rolls *f'*, *f''* and the platen *c*, and passes between the platen *c* and the columns of anti-friction elements *d*, the anti-friction elements *d* individually rotating when the material moves past them so as to offer no impediment to it as it is advanced by the rotation of the platen.

The anti-friction elements *d* hold the material tightly against the platen at the "line of print," that is, at the line opposed to the impact of the type when moved by the action of the keys, and by doing so make it possible for the type to write along any of the edges of the material as perfectly and as clearly as in the middle thereof.

As shown in Fig. 3, the casing *a* is provided with two spring arms *g* located in the space *g'* through which the types move to the platen *c*, said arms projecting downward between the platen and the usual vibrating ribbon guide and ribbon. The purpose of these spring arms *g* is to prevent the work-pieces, and more particularly the edges thereof, coming into contact with the ribbon as they move across the space *g'*.

The usual method of feeding the material to be written on to the platen is to bring it along the paper shelf *f* at the back of the platen, and then between the feed rolls *f'*, *f''* to the front of the platen. But with this card-holding attachment, it is practical to introduce the work-pieces at the front of the platen and work them backward along the paper shelf *f*, thus reversing the motion of the feed, the platen for this purpose being provided with a slot *c''* extending in an inwardly and rearwardly inclined direction from the surface of the platen, and into which the edge of the material is entered to carry it past the feed rolls *f'*, *f''* as the platen is rotated backwardly (see Fig. 4), this being an advantage when correcting typewritten work, also for introducing cards or work-pieces of small dimensions, and for other specific purposes. Heavy cards, which ordinarily could not conveniently pass around the platen, may, as indicated at *z* in Figs. 1 and 2, be fed vertically between the platen and the card-holding attachment, the arrangement permitting the cards to be fed downward until the upper edge of the card is at the printing line. During the downward feed of the cards, the anti-friction elements *d* individually rotate to permit the cards to move freely past them. During the upward feed of the cards, the anti-friction elements *d* hold them tightly in contact with the platen so that the types will make a perfect imprint thereon. During the upward feed of the cards, the anti-friction elements individually rotate and avoid impeding the movement of the cards, so that they will move in harmony with the platen for the correct lateral and lineal spacing of the written matter. The friction between the

platen surface and the work-piece is ample to prevent any slipping of the latter on the platen, the anti-friction balls *d* rolling on the front face of the work-piece having practically no tendency to slide the work-piece on the platen.

When the platen *c* is shifted to upper-case position for a change of type face by means of the usual shift levers *h*, it moves the work-piece with it, and bodily lifts that part of each column of anti-friction elements *d* in contact with the work-piece, or above the lowest point at which the balls *d* bear against the work-piece, so that the proper relation of the platen, work-piece, and anti-friction elements will be maintained for a correct alinement of the printed matter and a perfect imprint of the type, the material after leaving the feed roll *f''* being in contact with substantially the whole of the column of anti-friction elements. The slots *b* of the casing *a* are extended above said anti-friction elements to permit of a limited vertical movement of said elements during the case-shifting movements of the platen, the anti-friction elements in each group collectively moving as the platen is shifted, the individual elements rolling between the work-piece and the platen during the movement of the platen for a change of type face.

The casing and anti-friction elements are held above the type-bar segment *m* by bendable supporting members *o*, which hold the card-holding attachment against the platen with a yielding pressure, and permit it to be accurately adjusted to the platen to provide a suitable pressure on the work-piece for holding it on the platen, so that it will not slip. The ends of the supporting members *o* are adapted to fit in the usual card-holder openings provided in the segment *m*, so that the attachment may be readily attached to or removed from the machine.

It is possible to vary the details of the above described construction within the scope of the appended claims and without departing from the principles of the invention.

The card holding attachment has been shown and described in connection with a stationary type bar segment and a movable platen, but it may be as conveniently used in connection with a stationary platen, and a movable type bar segment and for that reason it is not desired to confine its use to any particular make of typewriting machine.

Having now fully described and ascertained the nature of my said invention and in what manner same is to be performed, I declare that what I claim is:—

1. In a typewriting machine, the combination with a carriage and a platen rotatably mounted thereon, of a card-holder comprising a stationary support and a series of sets of movable anti-friction elements bearing against a work-piece on the platen and preventing the work-piece from slipping on the platen as the platen moves for letter-spacing and line-spacing of the written matter; said anti-friction elements rolling on the work-piece in a direction transversely of the platen.

2. In a typewriting machine, the combination with a platen shiftable to upper and lower case positions, of a card-holder comprising a stationary support and a series of sets of anti-friction elements bearing against a work-piece on the platen and holding the work-piece against slipping on the platen during the case-shifting of the platen; said anti-friction elements being free to move over the surface of the work-piece in the direction of the case-shifting movement of the platen, thereby permitting the work-piece to be frictionally held against the platen by said elements and moved with the platen without being dragged or retarded by the card-holder.

3. In a typewriting machine, the combination with a carriage and a rotatable platen thereon, said platen shiftable to upper and lower case positions, of a card-holder comprising a stationary casing or support and a series of columns of rotatable anti-friction elements mounted on said casing and holding a work-piece against the platen, and preventing slipping of the work-piece on the platen during the letter-feed travel and case-shifting movements of the platen; said columns extending in the direction of the case-shifting movements of the platen, and said elements arranged to permit the work-piece to move freely relatively to the card-holder during both the letter-feeding movements and the case-shifting movements of the platen.

4. In a typewriting machine, the combination of a platen shiftable to different case positions, and a card-holder comprising a casing or support and a series of columns of anti-friction elements rotatably mounted on said support; said elements positioned to bear against a work-piece on the platen and prevent the work-piece from slipping on the platen, said elements free to roll on their support and on the work-piece in the direction of the case-shifting movement of the platen, and thereby permitting the work-piece to have an unrestricted movement with the platen.

5. In a typewriting machine, the combination with a carriage and a platen rotatably mounted thereon and shiftable to upper and lower case positions, of a card-holder comprising a stationary support mounted on the machine frame, a set of anti-friction elements mounted for rotation on said support, and means to cause said ele-

ments to bear with a yielding pressure on a work-piece on the platen, and thereby prevent slipping of the work-piece on the platen during the letter-feeding and line-spacing movements of the platen; said elements free to roll on the work-piece in the direction of the case-shifting movement of the platen.

6. In a typewriting machine, the combination with a platen shiftable to upper and lower case positions, of a work-piece-holder comprising a stationary support, a set of anti-friction elements mounted to move on said support during the case-shifting movements of the platen, and means for holding said elements with a yielding pressure against a work-piece.

7. The combination with a carriage and a platen rotatably mounted thereon and shiftable to upper and lower case positions, of a stationary card-holder comprising a casing and a series of sets of anti-friction balls rotatably mounted thereon and comprising sets located on opposite sides of the printing point in position to bear against a work-piece on the platen, and prevent slipping of the work-piece on the platen during the letter-feed travel and case-shifting movements of the platen.

8. The combination with a carriage and a rotatable platen mounted thereon and shiftable to upper and lower case positions, of a stationary work-piece-holder comprising a casing formed with open grooves or raceways, a set of anti-friction balls in each raceway, said balls protruding beyond the face of the casing, and means to support said casing adjacent the platen and cause the anti-friction balls to bear with a yielding pressure against the work-piece, and thereby maintain an operative relation of the work-piece to the platen as the latter moves for letter-spacing and line-spacing.

9. A card-holding attachment for a typewriting machine, comprising a support or casing having a flat face and formed with a series of open grooves or raceways in said face, and a set of anti-friction balls in each of said raceways, the balls of each set projecting beyond said face, the projecting faces of said balls all lying in substantially the same plane.

10. In a typewriting machine, the combination with a platen having a case-shifting movement, of a card-holder comprising a casing and a series of columns of independently rotatable anti-friction balls mounted on said casing and projecting from one face of the casing, and means to support the card-holder in position to cause the anti-friction balls to bear against the material being written upon and maintain the latter in operative relation to the platen as the platen moves for letter-spacing or line-spacing of the written matter; the anti-friction balls of each column movable collectively during the case-shifting movement of the platen, to change the position of the column relatively to its support.

11. In a typewriting machine, the combination with a carriage and a platen rotatably mounted thereon, of a work-piece-holder comprising a stationary casing and a series of sets of anti-friction elements mounted thereon and projecting beyond the face of the casing, said casing positioned to cause the anti-friction elements to engage a work-piece on the platen and maintain it in operative relation to the platen during the travel of the carriage and the line-spacing rotation of the platen; the sets of anti-friction elements being arranged in vertically-disposed columns, said columns being separated to provide space to accommodate the types and inking ribbon during the operation of the machine, and means located in the space between said columns to prevent a work-piece entering said space.

12. In a typewriting machine, the combination with a rotatable platen, of a card-holding attachment comprising a casing provided with open grooves or raceways, a set of anti-friction rollers mounted in each raceway and protruding beyond the casing, means for supporting said casing in position to cause the rollers to bear against a work-piece on the platen and prevent slipping of the work-piece during the lineal and line-spacing movements of the platen, each of said sets of anti-friction rollers being arranged in a vertically-disposed column; said casing formed to provide an open space between the columns to accommodate the types and inking ribbon, and arms carried by said casing and located in said space between said columns to prevent the work-piece entering said space.

13. A card-holder for a typewriting machine, comprising a casing having a series of grooves or raceways formed in one face thereof and a set of anti-friction rollers in each of said grooves, said rollers projecting beyond the face of the casing to engage and hold a work-piece on the platen when the said holder is attached to the typewriting machine, said rollers mounted to move or roll along the casing, each of said grooves being of sufficient length to permit a limited movement of all of the rollers of a set along the groove.

14. In a typewriting machine, the combination with a platen and its feeding means, of a card-holding attachment opposed to the platen, comprising rotatable elements to engage the material being written upon and holding said material against the platen, and preventing it from slipping on the platen as the platen moves for the lineal and lateral spacing of the written matter, the platen being moved relatively to said attachment during said spacing.

15. In a typewriting machine, the combination with a traveling platen and its feeding means, of a stationary card-holder comprising rotatable elements to engage the material being written upon and holding said material against the platen with sufficient pressure to prevent it from slipping on the platen as the platen moves for the lineal and lateral spacing of the written matter, and means for adjusting said card-holder to the platen.

16. In a typewriting machine, the combination with a platen, work-piece feeding means, and a type-bar segment, of a card-holder mounted on said segment and comprising rotatable elements to engage the work-piece and maintain its operative relation to the platen as the platen moves for the lineal and lateral spacing of the written matter, said elements being free to roll on the work-piece transversely to the direction of the writing line.

17. In a typewriting machine, the combination with a platen and a type-bar segment, of a card-holder comprising rotatable elements to engage the material being written upon, and adapted to roll thereon transversely to the direction of the writing line as the platen rotates for line-spacing of the written matter, and means for connecting the card-holder to the type-bar segment, said means being flexible to provide for the lateral adjustment of the card-holder to the platen, and to regulate its pressure on said material.

18. In a typewriting machine, the combination with a rotatable platen, of a stationary card-holder mounted on the machine and comprising anti-friction elements movable relatively to the body of the card-holder, said anti-friction elements positioned to engage a card or work-piece and hold it on the platen with sufficient pressure to prevent slipping of the work-piece on the platen surface during the rotation and letter-feed movements of the platen when said work-piece is held on the platen solely by said anti-friction elements, the latter having a rolling connection with their support and being free to roll on the work-piece during the rotation of the platen, permitting a free movement of the work-piece relatively to the card-holder as the platen rotates.

19. In a typewriting machine, the combination with a traveling platen, of a stationary card-holder comprising movable elements bearing against the material being written upon, and holding it against the platen and preventing slippage of said material on the platen during case-shifting movements of the platen, said card-holder being provided with means to permit adjustment of the card-holder to the platen.

20. In a typewriting machine, the combination with a platen, of a card-holder comprising a stationary body or support and elements movable thereon to engage the material being written upon and hold it frictionally against the platen, to maintain its fixed relation to the platen during a case-shifting movement of the platen, said elements being movable in the direction of the case-shifting movement, to permit a free movement of said material with the platen, said card-holder having flexible members whereby it can be adjusted relatively to the platen to regulate its pressure on said material.

21. In a typewriting machine, the combination with a platen, of a card-holder, a stationary support for the holder, said holder comprising rolling elements to engage the material being written upon and maintain its fixed relation to the platen during a case-shifting movement of the platen, said card-holder having flexible members connecting the holder to its support and adjustable by flexing to regulate the pressure of said rolling elements on said material.

22. In a typewriting machine, the combination with a platen shiftable to upper and lower case positions, and a type-bar segment, of a card-holder comprising a stationary support and movable elements to engage the material being written upon and hold it against the platen, to maintain its fixed relation to the platen during a case-shifting movement of the platen, said elements being freely movable with said material and relatively to their support during said shifting of the platen, and means for connecting the card-holder to the type-bar segment.

23. In a typewriting machine, the combination with a platen having a case-shifting movement, and a type-bar segment, of a card-holder comprising rolling elements to engage the material being written upon and maintain its fixed relation to the platen during a case-shifting movement, said elements being freely movable with said material in the direction of movement of the platen, and means for connecting the card-holder to the type-bar segment, said means being bendable to provide for the lateral adjustment of the card-holder to the platen and regulate its pressure on said material.

24. In a typewriting machine, the combination with a carriage and a revoluble platen mounted thereon, of a card-holder mounted on the machine frame and projecting across the printing line on the platen, said holder comprising a casing or support and a set of anti-friction balls mounted on said support to project beyond the surface thereof into contact with the platen or a work-piece thereon along the printing line, to hold said work-piece in contact with the platen at the printing point during the let-

ter-space movements of the carriage, and to maintain an operative relation of the work-piece to the platen when the latter is rotated for line-spacing.

25. In a typewriting machine, the combination with a carriage and a revoluble platen mounted thereon, of a card-holder mounted on the machine frame and projecting upwardly across the printing line on the platen, said holder comprising a support having grooves or raceways and a set of anti-friction balls mounted in each groove to project beyond the face of the support into contact with the platen or a work-piece thereon, to hold said work-piece in contact with the platen along the printing line during letter-space movements of the carriage, and to feed the work-piece when the platen is rotated for line-spacing, and means forming a flexible elastic connection between the card-holder and the machine frame and adjustable to position the card-holder relatively to the platen and to regulate the pressure with which the anti friction balls bear on the work-piece.

26. In a typewriting machine, the combination with a carriage and a revoluble platen mounted thereon, of a type-bar segment, a card-holder comprising a casing and a series of sets of anti-friction balls carried by said casing and projecting beyond the face of the casing to hold a work-piece in contact with the platen during letter-space movements of the platen, and to cause the work-piece to move with the platen when the platen is rotated for line-spacing, and means for connecting the card-holder to the type-bar segment; said connecting means being adjustable to permit the card-holder to be adjusted to the platen and to regulate the pressure of the anti-friction balls on the work-piece.

27. In a typewriting machine, the combination with a carriage and a revoluble platen mounted thereon, said platen being shiftable to upper and lower case positions, of a card-holder comprising an open casing and a series of sets of anti-friction balls mounted thereon and projecting beyond the surface of the casing into contact with the platen or a work-piece thereon, to hold said work-piece in contact with the platen during the letter-space movements of the carriage and during the case-shifting movements of the platen, and to feed the work-piece when the platen is rotated for line-spacing; said anti-friction balls being collectively movable relatively to their support or casing, and also to the work-piece during the case-shifting movement of the platen, to permit the work-piece to move freely with the platen and relatively to the card-holder during said case-shifting movement.

28. In a typewriting machine, the combination with a carriage and a revoluble platen mounted thereon, said platen being shiftable to upper and lower case positions, of a card-holder comprising an open casing and a series of sets of anti-friction balls mounted thereon and projecting beyond the surface of the casing into contact with the platen or a work-piece thereon, to hold said work-piece in contact with the platen during the letter-space movements of the carriage and during the case-shifting movements of the platen, and to feed the work-piece when the platen is rotated for line-spacing; said anti-friction balls being collectively movable relatively to their support or casing, and also to the work-piece during the case-shifting movement of the platen, to permit the work-piece to move freely with the platen and relatively to the card-holder during said case-shifting movement, and means forming an elastic connection between the card-holder and the machine frame, said connection being adjustable to position the card-holder relatively to the platen, and also to regulate the pressure of the anti-friction balls on the work-piece.

29. In a typewriting machine, the combination with a carriage and a revoluble platen mounted thereon and shiftable to upper and lower case positions, of a card-holder comprising a casing or support having a vertical face opposite the platen at the printing line and a series of columns of anti-friction balls mounted on said support and projecting beyond said face to engage a work-piece on the platen and hold said work-piece against the platen during the letter-space movements of the carriage, and to feed the work-piece when the platen is rotated for line-spacing, and also to allow the work-piece to move up and down with the platen during the case-shifting movements of the latter, said anti-friction balls mounted to have a limited vertical bodily movement on their support, so that said balls may move collectively as the platen is shifted up and down.

30. In a typewriting machine, the combination with a carriage and a revoluble platen mounted thereon and shiftable to upper and lower case positions, of a card-holder comprising a casing or support having a vertical face opposite the platen at the printing line and a series of columns of anti-friction balls mounted on said support and projecting beyond said face to engage a work-piece on the platen and hold said work-piece against the platen during the letter-space movements of the carriage, and to feed the work-piece when the platen is rotated for line-spacing, and also to allow the work-piece to move up and down with the platen during the case-shifting movements of the latter, said anti-friction balls mounted to have a limited vertical bodily movement on their support, so that said

balls may move collectively as the platen is shifted up and down, and means for attaching the card-holder to a support; said means being bendable to provide for adjustment of the card-holder in a forward or rearward direction, and to regulate the pressure of the anti-friction balls on the work-piece.

31. In a typewriting machine, the combination with a carriage and a rotatable platen thereon, of a work-piece-holder comprising a stationary support and anti-friction means carried by said support to bear against the front face of the platen or a work-piece on the platen, said anti-friction means free to roll relatively to their support and also relatively to the work-piece in the direction of the line-spacing movement of the work-piece; the platen being provided with a slot extending longitudinally of the platen and inclined inwardly and rearwardly with respect to the direction of forward rotation of the platen, and serving to receive the lower edge of a card or other work-piece and permit the latter to be fed into writing position between the platen and work-piece-holder by a backward rotation of the platen.

32. In a typewriting machine, the combination with a traveling roller platen, of a stationary card-holder for holding a card on the platen, said card-holder comprising a raceway and anti-friction means therein to roll along the raceway and also to roll on the face of the card at a plurality of points along the printing line on each side of the printing point and permitting the platen and card thereon to move relatively to the card-holder in a letter-feed direction or a reverse direction, to allow the printing to be extended to either lateral edge of the card while the latter is held against the platen by the card-holder at different points along the printing line, said card-holder comprising means to apply sufficient pressure on the card to prevent the card from slipping on the platen, said anti-friction means permitting the card to move freely relatively to the card-holder and thereby prevent dragging of the card over the platen.

33. In a typewriting machine, the combination with a roller platen having a letter-feed movement in the direction of its axis, of a card-holder stationary during the letter-feed movement of the platen and comprising anti-friction means to bear against the face of the card at a plurality of points on opposite sides of the printing center, said bearing points being at different distances from the printing center as measured in the direction of the printing line, to cause the card to be continuously held at a number of different points while it is moved with the platen to bring the edge of the card to the printing center.

34. The combination with a traveling roller platen, of a stationary card-holder comprising anti-friction bearing devices positioned to bear on the face of a card at a number of points along the printing line on each side of the printing point.

35. The combination with a platen shiftable to upper and lower case positions, of a card-holder comprising a stationary support and anti-friction means thereon to bear against the face of a card or other work-piece on the platen and cause the work-piece to be moved with the platen as the latter is shifted, said anti-friction means rolling between the work-piece and said support during said shifting movement, and thus providing a free movement of the work-piece relatively to the card-holder as the work-piece moves with the platen.

36. In a typewriting machine, the combination with a traveling roller platen, of a stationary card-holder for holding a card against the platen, said holder comprising a plurality of series of anti-friction balls, said series extending across the printing line, to bear against the card along the printing line at a number of points on each side of the printing center.

37. In a typewriting machine, the combination with a traveling roller platen shiftable to upper and lower case positions, of a stationary card-holder comprising a support and anti-friction means interposed between the support and a card on the platen, and bearing against the card along the printing line, to hold the card firmly against the platen at the printing point, said anti-friction means being free to roll between the card and said support in the direction of the platen shift during the shifting of the platen.

38. The combination with a traveling roller platen shiftable to upper and lower case positions, of a stationary card-holder comprising a support and anti-friction rollers mounted on said support in position to bear against a card on the platen, said rollers bearing against the card along the printing line and being free to roll over the card in case-shifting direction as the card is carried with the platen during the case-shifting movement of the platen.

39. In a typewriting machine, the combination with a traveling roller platen shiftable to upper and lower case positions, of a stationary card-holder comprising a support and anti-friction balls mounted in said support to bear against a card on the platen, said card-holder comprising means to cause said balls to bear with a yielding pressure against the card along the printing line, said balls being free to roll over the card in case-shifting direction during the case-shifting of the platen, said balls being arranged to maintain a pressure on the card substan-

tially along the printing line during the shifting of the platen.

40. In a typewriting machine, the combination with a traveling roller platen, of a stationary card-holder comprising anti-friction means for holding a card or other work-piece against the platen along the printing line with sufficient pressure to prevent slipping, while permitting a free movement of the card either in the direction of the printing line or in a direction transverse to the printing line, thereby preventing the card from being moved out of position on the platen.

41. The combination with a traveling roller platen and a stationary card-holder comprising a support and anti-friction balls thereon to bear against the face of a card or other work-piece and arranged to hold the work-piece against the platen with a yielding pressure sufficient to prevent slipping of the work-piece on the platen surface, said pressure applied to the platen along the printing line, said anti-friction balls being free to roll on the work-piece and the holder in a direction transverse to the printing line, thereby preventing the work-piece from being dragged out of position on the platen surface by the card-holder as the platen is moved relatively to the holder.

Toronto, November 18th, 1913.

THOMAS J. COO.

Signed in the presence of—

CHAS. H. RICHES,

F. F. BOOTHBY.