

No. 785,709.

PATENTED MAR. 28, 1905.

L. S. BURRIDGE.
TYPE WRITING MACHINE.
APPLICATION FILED AUG. 3, 1901.

2 SHEETS—SHEET 1.

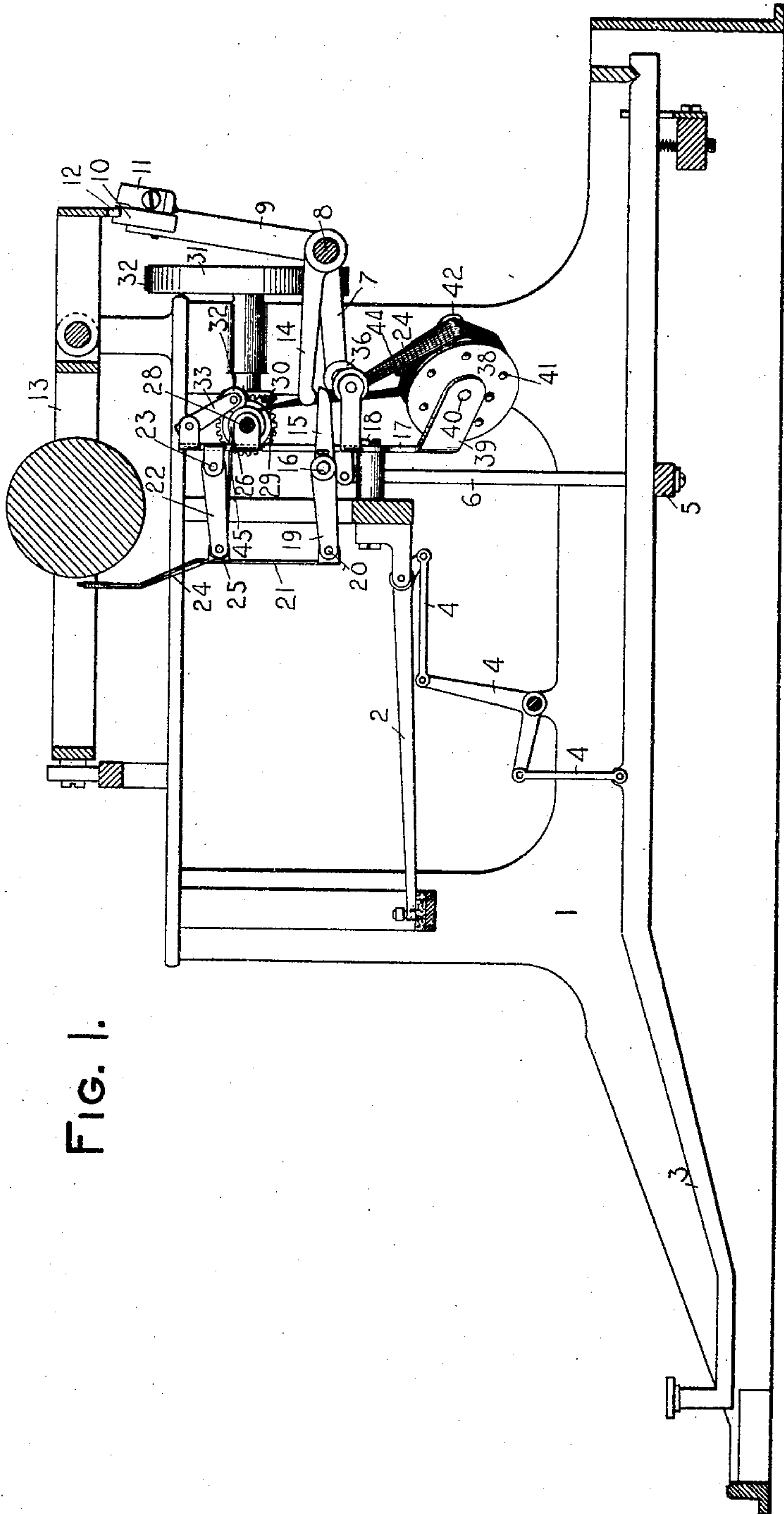


FIG. 1.

WITNESSES.

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INVENTOR

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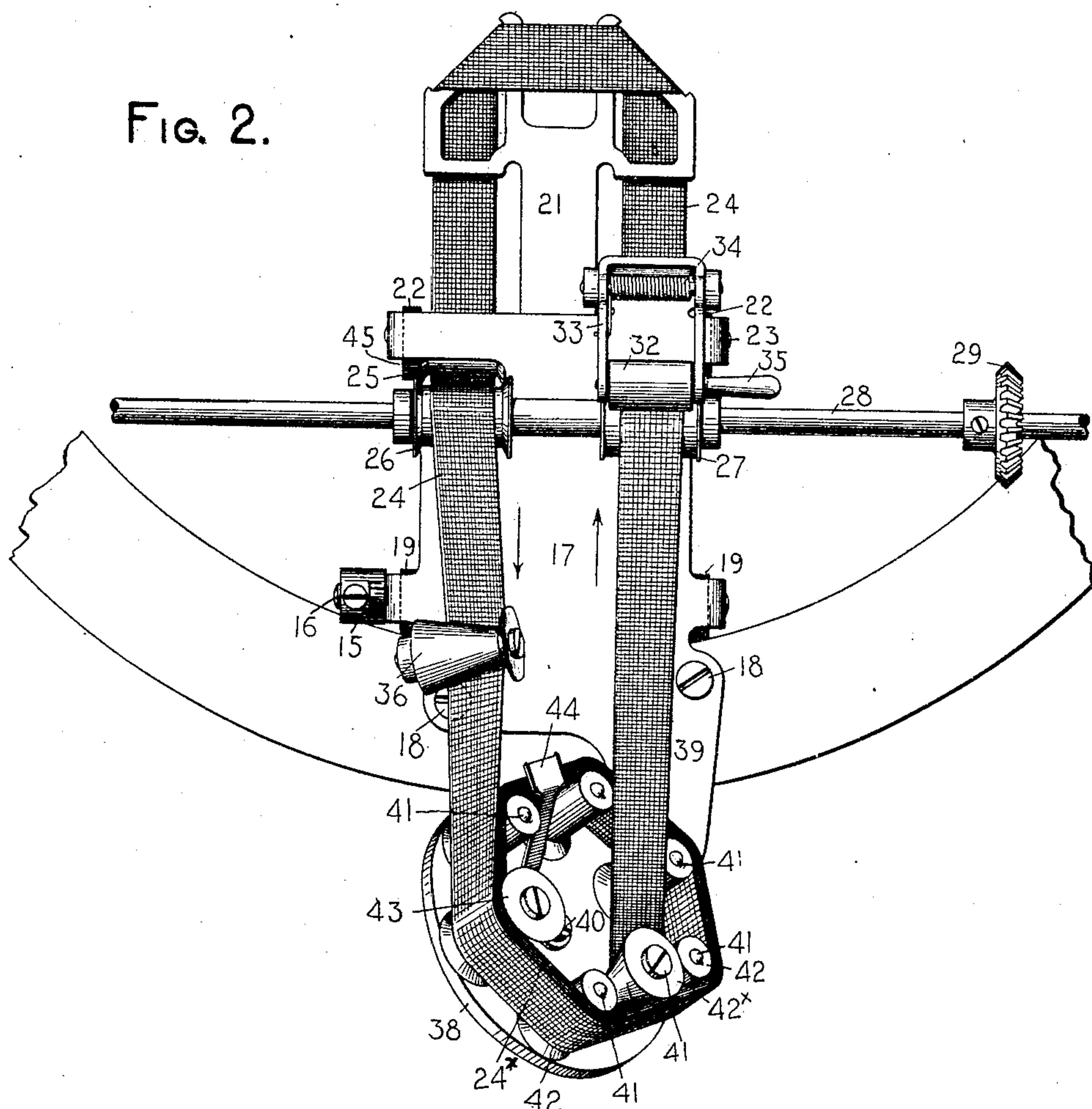
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2 SHEETS—SHEET 2.

FIG. 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

LEE S. BURRIDGE, OF NEW YORK, N. Y., ASSIGNOR TO UNION TYPE-WRITER COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 785,709, dated March 28, 1905.

Application filed August 3, 1901. Serial No. 70,770.

To all whom it may concern:

Be it known that I, LEE S. BURRIDGE, a citizen of the United States, and a resident of the borough of Manhattan, city of New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

My invention relates to ribbon mechanism for type-writing machines; and the object of said invention is to provide a simple, compact, and efficient ribbon mechanism with the aid of which the inking-ribbon can be continuously fed step by step in one direction.

To these and other ends, which will hereinafter appear, my invention consists in the novel arrangement and combination of parts and to certain details to be hereinafter described and claimed.

Reference is had to the accompanying drawings, wherein—

Figure 1 is a vertical sectional view of sufficient number of parts of a type-writing machine to illustrate my invention, the section being taken from front to rear of the machine; and Fig. 2 is an enlarged detail rear elevation of a portion of the ribbon mechanism.

While I have shown my invention in its application to a "front-strike" type-writing machine, and it is particularly available in such a machine, it should be understood that the invention is in no sense restricted in its use to any particular character of type-writing machine.

In the drawings, 1 designates the framing of the machine, in which is mounted the usual or any preferred type-carriers 2. For the purpose of clearness I have illustrated but a single type-carrier and its connection, though it should be understood that a plurality of such type-carriers is employed in the particular construction shown and described and that the description of one type-carrier and its connection will suffice for all. The type-carrier 2 is operated by a key-lever 3, in the example shown, by suitable intermediate connections 4, and extending beneath the key-levers 3 is

a universal bar 5, which is connected to the upright rods 6, that in turn are connected to a crank-arm 7. This crank-arm 7 extends from a rock-shaft 8, journaled in the framing of the machine, and a projection 9, extending from this rock-shaft, carries one member of the carriage-feeding mechanism—as, for example, the feed-dogs 10 and 11, which cooperate with a feed-rack 12, that is operatively connected to the carriage 13. The rock-shaft 8 likewise has projecting therefrom an arm 14, which is adapted to bear upon a crank-arm 15, and this crank-arm 15 is connected to a rock-shaft 16, which is journaled in a suitable frame 17, that is removably secured to the framing of the machine by screws 18. Projecting from the rock-shaft 16 are parallel arms 19, that are pivoted, as indicated at 20, to a movable ribbon-guide 21, and this ribbon-guide 21 is likewise pivoted to parallel links 22, which links in turn are pivoted to the frame 17, as indicated at 23. The ribbon-guide 21 may be of any preferred construction, but is preferably of the form illustrated in Fig. 2 of the drawings, so that it is adapted to receive and guide an endless ribbon 24, in the form of a loop at its upper end and with its sides in substantial parallelism, from the points where it cooperates with the guide 21 to the points where it connects with the coil 24^x of ribbon. The movable guide presents the ribbon in the path of the type-carrier in its movement to the printing-point. Thus it will be understood that a depression of a key-lever 3 will cause the universal bar to be depressed, thereby rocking the rock-shaft to effect a feed of the carriage. The same movement depresses the inner end of the arm 14, thereby rocking the shaft 16 and elevating the movable ribbon-guide 21 so as to bring the ribbon into the path of the type on the type-bar or carrier. The ribbon passes from the movable ribbon-guide 21 over guide-rollers 25 and extends toward the rear of the machine over guide-rollers 26 and 27, which may be termed "fixed guides" or "guide-rollers" by reason of the fact that they are carried by a fixed

part of the machine and do not move with the movable guide. From an examination of the drawings it will be seen that the arc in which that portion of the ribbon moves which is carried by the movable ribbon-guide is substantially the same as the arc in which the movable ribbon-guide itself moves, so that no appreciable tightening or slackening of the ribbon occurs during the movement of the movable guide to and from the printing-point.

The so-called "guide-roller" 27 in addition to performing its function as a guide-roller likewise constitutes a feed-roller for the ribbon. Thus the roller 27 is fixed upon the shaft 28, and this shaft 28 has secured thereto a pinion 29, which meshes with a cooperating pinion 30, and this pinion 30 is operatively connected to the spring-drum 31 of the machine. As is usual in many existing machines, this spring-drum may be connected by a band 32 to the carriage; but a pawl and ratchet (not shown) is interposed between the spring-drum and the gear or pinion 30, so that the pinion will only be rotated during the movement of the carriage in the direction of its feed and will not be rotated as the carriage is returned by hand to the initial or starting position. The roller 27 being positively driven in the manner described effects an intermittent movement of the endless ribbon 24 by reason of a suitable spring-pressed roller 32 bearing thereon. The roller 32 in the present instance is carried by a pivoted frame 33, which is normally pressed toward the roller 27 by a coiled spring 34, and in order to facilitate the movement of this spring-pressed feed-roller away from the ribbon it may be provided with an arm or finger-piece 35.

The ribbon after passing from the guide-rollers may cooperate with one or more additional conoidal guide-rollers, as indicated at 36, for instance, and the ribbon is conducted from the various guide-rollers to a ribbon-supporting device. In the present instance this ribbon-supporting device comprises a supporting-plate 38, which is removably secured to its bracket or support 39 by a screw 40 or otherwise. Projecting from one face of the plate 38 is a series of pintles 41, and on each of these pintles is movably secured a ribbon-supporting roller 42. Certain of the rollers in question may be provided with an outer flange, as indicated at 43, for instance, to prevent a lateral displacement of the ribbon therefrom, and as an additional precaution a fixed guide 44 may be employed to bear upon the edge of the coil of ribbon 24^x to prevent its lateral displacement. It will be observed that in the specific construction shown and described the ribbon-bearing rollers 42 are arranged in a cycle and that the ribbon is maintained thereon in the form of a coil or a series of superposed layers. The ribbon as it is fed in the direction of its length passes to the supporting device on the outside of the

so-called "coil" and is withdrawn from the supporting device from the inner portion of the coil over the conoidal roller 42^x, though obviously the operation might be reversed without in any sense changing or modifying the construction except in so far as may be necessary to change the direction of feed of the ribbon. I prefer, however, to withdraw the ribbon from the inside of the coil, for the reason that in this event the tension exerted upon the ribbon to draw it from the coil does not press upon various layers of ribbon forming the coil, as would be the case where the ribbon is unwound or withdrawn from the outside of the coil. In order that this winding and unwinding of the coil of ribbon may be efficiently accomplished without distorting or creasing the ribbon, the plane of the coil is maintained at an angle to the plane of the ribbon where it cooperates with the guides 26 and 27. In other words, the plate 38 is secured to its support at an angle to the plane of the frame 17, thereby permitting the coil to assume a position where the ribbon can be readily withdrawn from the inner portion of the coil and fed to the outer side thereof with facility, as is clearly illustrated in the drawings.

While I have shown and described with considerable detail one form of mechanism embodying my invention, I desire to have it understood that various changes may be made without departing from the spirit of my invention. For instance, the so-called "supporting" device for the ribbon may be of any desired construction if it is capable of taking up an endless band of ribbon at the same rate of speed or substantially the same rate of speed that it is fed forward and at the same time maintain the various layers of ribbon in the same relation one to another. It is obvious, furthermore, that the arrangement of the ribbon-supporting rollers may be otherwise than shown and described, though I consider such an arrangement preferable, as it provides a simple, compact, and efficient structure wherein the supporting device as a whole can be readily removed.

From an inspection of the drawings it will be observed that the structure enables an endless ribbon to be readily threaded in the machine without dismounting any part of the ribbon-guiding structure. Thus the ribbon is first placed, in the manner shown, over the movable ribbon-guide 21, and from thence it is fed over the guide-rollers 25, and the open-mouthed bearings 45 permit the ribbon to be inserted laterally and placed in position upon the rollers 26 and 27. The ribbon is then placed under the guide-roller 36, and from thence it passes to the ribbon-supporting device. It is preferred that the ribbon be maintained upon the supporting device in the manner shown, and in order to substitute one ribbon for another it is merely necessary to

remove the screw 40, thereby permitting the removal of the supporting device as a whole with the ribbon on it, and a new ribbon may be placed on the supporting device, or a second supporting device provided with a new ribbon may be placed in position and the machine threaded, as hereinbefore described. In practice it would be preferable to prepare the ribbon-supporting device, which may be regarded in the nature of a ribbon-spool, as an article of manufacture or commerce with the ribbons properly wound thereon, so that it is merely necessary to substitute one ribbon support or spool for another and thread the machine as described when it is necessary to replace an exhausted ribbon with a new one. This is desirable, because an ordinary endless ribbon could not be employed in the structure shown and described. Thus, for instance, if a single strip or straight length of the ribbon is threaded in the machine and one end of said ribbon is carried, we will say, fourteen times around the ribbon-support to form the coil in the manner described and the free ends of the ribbon are then secured together we will have an endless band with fourteen twists in its length. These twists are produced naturally in reeving or winding the ribbon on the support. If, however, a ribbon is employed which has its ends connected before the ribbon is placed on the support, then the endless band must have a number of inherent twists in its length which corresponds to the cycles or turns of ribbon on the support. It will be observed that by removing the screws 18 the entire ribbon mechanism can be readily withdrawn from the machine.

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

1. In a type-writing machine, the combination of an endless inking-ribbon, means for effecting an intermittent feed of said ribbon continuously in one direction and at all points throughout the length thereof to the same extent, and supporting means for the ribbon, which supporting means maintains the ribbon taut at all points throughout and maintains a portion of the ribbon in a coil.

2. In a type-writing machine, the combination of a carriage, an endless inking-ribbon, a supporting device upon which said ribbon is wound, and means controlled by the feed movement of the carriage for feeding the ribbon, whereby one layer of ribbon is being wound upon said supporting device as another layer is being unwound therefrom.

3. In a type-writing machine, the combination of printing instrumentalities, an endless inking-ribbon, means for supporting a portion of said ribbon in a coil or a plurality of convolutions, and for affording a simultaneous feed of every portion of said ribbon in the direction of its length, and for conveying the ribbon to one side of said coil while it is being withdrawn

from the other, and means operable at each operation of a printing instrumentality for feeding said ribbon.

4. In a type-writing machine, the combination of printing instrumentalities, an endless inking-ribbon, a supporting device cooperating with said ribbon and supporting a plurality of layers or a coil of said ribbon, means for feeding said ribbon in the direction of its length at each operation of a printing instrumentality, and means for guiding the ribbon to the outside of the coil as ribbon is delivered from the inside thereof.

5. In a type-writing machine, the combination of a carriage, an endless inking-ribbon, a portion of which is maintained in a coil or a plurality of superposed layers, and means for delivering ribbon to one portion of the coil at the same rate of speed that it is delivered from another portion thereof, and means controlled by said carriage for simultaneously moving said coil.

6. In a type-writing machine, the combination of printing instrumentalities, an endless inking-ribbon, means for guiding the ribbon in its movement, means for supporting a portion of the endless ribbon in the form of a coil, the plane of said coil being disposed at an angle to the plane of the ribbon where it cooperates with the guides, and means for intermittently feeding said ribbon in the direction of its length at each operation of a printing instrumentality.

7. In a type-writing machine, the combination of an endless inking-ribbon, means for supporting a portion of the endless ribbon in the form of a coil, means for delivering ribbon to one portion of the coil as ribbon is withdrawn from another portion thereof, means for guiding the ribbon as it is being fed to and from the coil, and means for supporting the coil in a plane that is disposed at an angle to the line of the effective faces of the ribbon-guiding means.

8. In a type-writing machine, the combination of an endless inking-ribbon which is taut throughout its length and a portion of which forms a plurality of superposed convolutions or layers, an automatically-operating feed-roller, a second loosely-mounted feed-roller which cooperates with the first-mentioned roller, and means for maintaining a pressure of one of said rollers upon the other in order to feed the interposed ribbon.

9. In a type-writing machine, the combination of an endless inking-ribbon, a supporting device upon which a portion of said inking-ribbon is wound or coiled, and a movable ribbon-guide through which the ribbon is threaded.

10. In a type-writing machine, the combination of an endless inking-ribbon, a supporting device upon which a portion of said inking-ribbon is wound or coiled, and a movable ribbon-guide through which the ribbon is thread-

ed, the relation of the parts being such that the ribbon is free from strain or from being slackened when the movable ribbon-guide is operated.

5 11. In a type-writing machine, the combination of a movable ribbon-guide, and suitable fixed ribbon-guides coöperating therewith, the arc in which that portion of the ribbon moves which swings with the movable guide and
10 around the fixed guides being substantially the same as the arc in which the movable guide moves, whereby no appreciable tightening or slackening of the ribbon is produced through the movement of the movable ribbon-guide.

15 12. In a type-writing machine, the combination of printing instrumentalities, a platen, an endless inking-ribbon, a ribbon-guide that positions the ribbon between the printing instrumentalities and platen, a plurality of rollers upon which a portion of the ribbon is
20 coiled, means for conducting the ribbon to and from the coil, the ribbon passing in one direction to or from the inside of the coil while it is passing from or to the outside of the coil in
25 an opposite direction.

13. In a type-writing machine, the combination of a carriage, an endless inking-ribbon, a plurality of ribbon-rollers supported upon but one side and arranged to support the ribbon, means for conducting the ribbon to said
30 supporting-rollers in one direction as the ribbon is being withdrawn therefrom in another direction, and means controlled by said carriage for feeding the ribbon in the direction of the length thereof.
35

14. In a type-writing machine, the combination of an endless inking-ribbon, a plurality of ribbon-rollers supported upon but one side and arranged to support the ribbon, means for
40 conducting the ribbon to said supporting-rollers in one direction as the ribbon is being withdrawn therefrom in another direction, a ribbon-guide that coöperates with the ribbon, and guide-rollers which maintain the
45 ribbon in substantial parallelism in its movements to and from the supporting-rollers and to and from the ribbon-guide.

15. In a type-writing machine, the combination of a type-carrier, an endless inking-
50 ribbon, a portion of which is maintained in a coil, means for feeding the inking-ribbon in the direction of its length at each operation of a type-carrier, and so that the ribbon will be fed to the coil at the same rate of speed that
55 it is withdrawn therefrom, a movable ribbon-guide, and mechanism for moving the movable guide at each operation of a type-carrier to interpose the ribbon in the path of the type on the type-carrier.

60 16. In a type-writing machine, the combination of a type-carrier, an endless inking-ribbon, means for supporting a portion of said ribbon in a coil, means for feeding the inking-
65 ribbon in the direction of its length at each operation of a type-carrier, a movable ribbon-

guide, and mechanism for moving the movable ribbon-guide at each operation of a type-carrier to interpose the ribbon in the path of the type on the carrier.

17. In a type-writing machine, the combination of a type-carrier, an endless inking-
70 ribbon, a plurality of ribbon-rollers each of which is supported upon but one end, said rollers having a plurality of superposed layers of said ribbon supported thereon, and means for
75 moving ribbon on said rollers at each operation of a type-carrier.

18. In a type-writing machine, the combination of an endless inking-ribbon, a ribbon-supporting device therefor, and means for
80 enabling the said device and the endless ribbon to be removed together from the machine.

19. In a type-writing machine, the combination of an endless inking-ribbon, a supporting device which supports a portion of the
85 ribbon in a coil made up of superposed layers of ribbon, and means for affording a removal of the ribbon-supporting device from the machine with the coil of ribbon in place on said device.
90

20. In a type-writing machine, the combination of an endless inking-ribbon, a ribbon-support, a plurality of ribbon-supporting rollers carried by said support, and means for
95 removably securing said ribbon-support in place, whereby the said rollers with the ribbon coiled thereon and said support may be removed as an entirety from the machine.

21. In a type-writing machine, the combination of an endless inking-ribbon, a ribbon-
100 support, pintles projecting from said support, ribbon-supporting rollers carried by said pintles, and means for removably securing said ribbon-support in place, whereby the said
105 rollers with the ribbon coiled thereon and said support may be removed as an entirety from the machine.

22. In a type-writing machine, the combination of an endless inking-ribbon, a supporting-plate, means for removably securing said
110 plate in place, ribbon-supporting rollers carried by said plate, said rollers having unsupported free ends, and guiding means for guiding the ribbon in its movement to and from the supporting-rollers, the plane of said supporting-plate being at an angle to the plane
115 of the ribbon where it coöperates with the guiding means.

23. In a type-writing machine, the combination of a type-carrier, an endless inking-
120 ribbon, a movable ribbon-guide which conducts the ribbon to the printing-point in the form of a loop, means for supporting a portion of the ribbon in a coil, means for feeding all portions of the ribbon at each operation
125 of the type-carrier, and mechanism for moving the movable guide.

24. The combination of an endless inking-ribbon, a ribbon spool or device upon which
130 said endless ribbon is coiled or wound, and

means for affording a removal of said device from the machine with the coil of ribbon thereon.

25. The combination of an endless inking-ribbon, a ribbon spool or device upon which said endless ribbon is coiled or wound, the ribbon unwinding from said spool on one side of the coil as it is wound on at the other side thereof, and means for affording a threading of the ribbon in the machine without disconnecting the ends thereof.

26. The combination of an endless inking-ribbon, a ribbon spool or device upon which said endless ribbon is coiled, the ribbon unwinding from the inside of the coil as it winds on the outside thereof, means for affording a removal of the said spool or device with the coil of ribbon thereon, and means for affording a threading of the ribbon in the machine without disconnecting the ends of the endless ribbon.

27. In a type-writing machine, the combination of an endless inking-ribbon, means for supporting a portion of said ribbon in a coil, and means for intermittently and simultaneously feeding all portions of said ribbon in the direction of its length and for turning the said coil at each intermittent feed movement of the ribbon.

28. In a type-writing machine, the combination of an endless inking-ribbon, means for effecting an intermittent longitudinal feed of said ribbon, coil-supporting means for the ribbon, and means for maintaining the ribbon taut at all points throughout its extent.

29. In a type-writing machine, the combination of an endless inking-ribbon having single layer or ply portions adapted to be fed toward and from the printing-point and having an intermediate coil comprising a plurality of portions wound circularly one upon another, and means for affording a withdrawal of the ribbon from the machine without disconnecting the ends thereof.

30. In a type-writing machine, the combination of an endless inking-ribbon, a remov-

able support 38 that carries a portion of said ribbon in a coil, and a ribbon-guide 21 that receives said ribbon and coöperates therewith in the movement of the ribbon to and from the coil.

31. In a type-writing machine, the combination of an endless inking-ribbon, a support 38 that carries a portion of said ribbon in a coil, a ribbon-guide 21 that receives said ribbon and coöperates therewith in the movement of the ribbon to and from the coil, and means for affording a removal of said ribbon-guide and support from the machine.

32. In a type-writing machine, the combination of an endless inking-ribbon, means for supporting a portion of said ribbon in a coil, conoidal guide-rollers 36 and 42^x coöperating with the coil in its movement to and from the coil, and a ribbon-guide 21 that coöperates with the ribbon.

33. In a type-writing machine, the combination of an endless inking-ribbon, means for supporting a portion of said ribbon in a coil, a ribbon-guide 21, guide-rollers 25, 26 and 27, and means for affording a threading of the ribbon on or a dismounting of it from said guide and rollers without dismounting the parts or disconnecting the ends of the ribbon.

34. In a type-writing machine, the combination of an endless inking-ribbon, a device for supporting a portion of said ribbon in a coil, a ribbon-guide 21, guide-rollers 25, 26 and 27, means for affording a threading of the ribbon on or a dismounting of it from said guide and rollers without dismounting the parts or disconnecting the ends of the ribbon, and means for affording a removal of said coil-supporting device.

Signed in the borough of Manhattan, city of New York, in the county of New York and State of New York, this 29th day of July, A. D. 1901.

LEE S. BURRIDGE.

Witnesses:

CHARLES E. SMITH,
E. M. WELLS.