

No. 705,523.

Patented July 22, 1902.

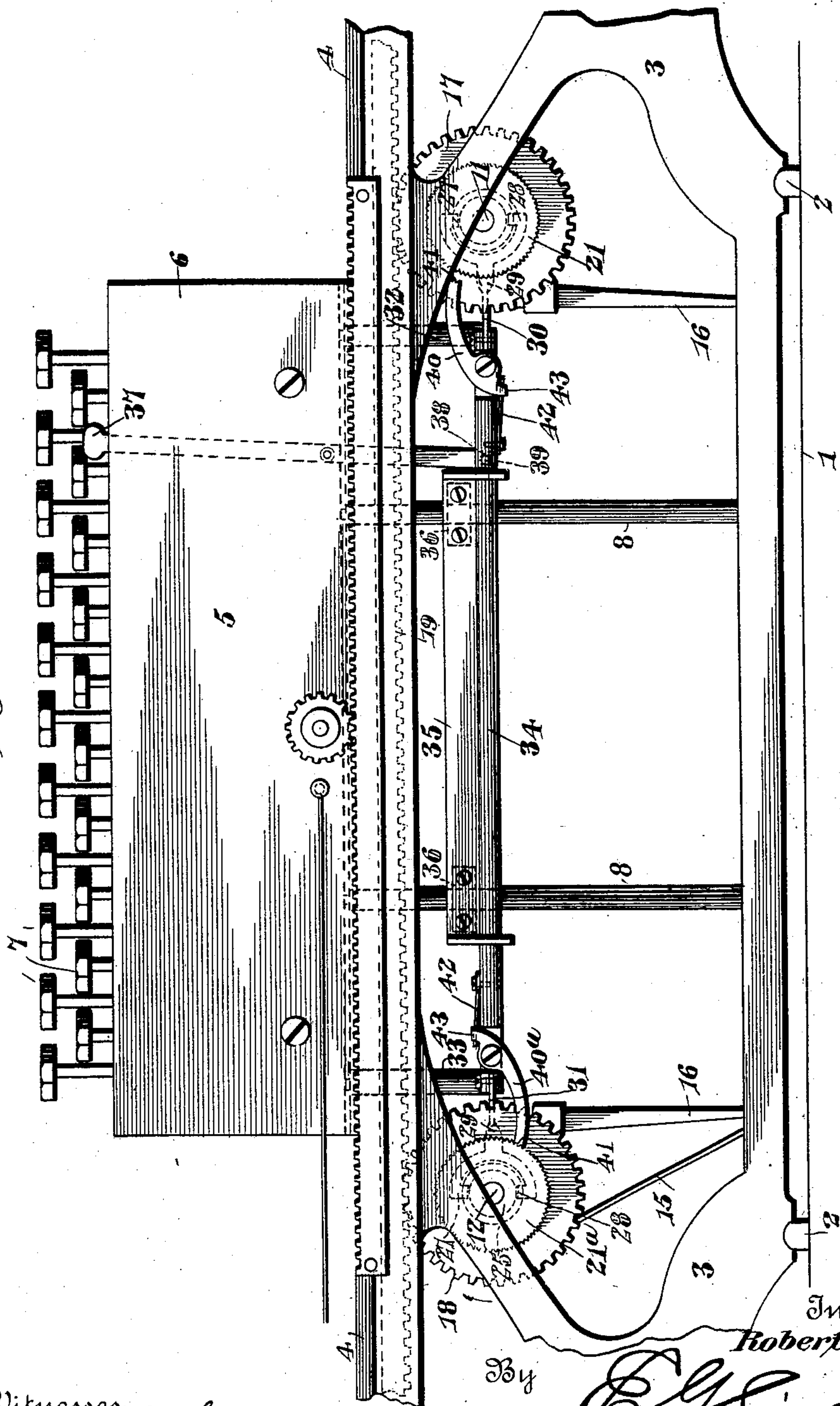
R. J. FISHER.

RIBBON FEEDING MECHANISM FOR TYPE WRITING MACHINES.

(Application filed June 21, 1901.)

(No Model.)

3 Sheets—Sheet 1.



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Fig. 2.

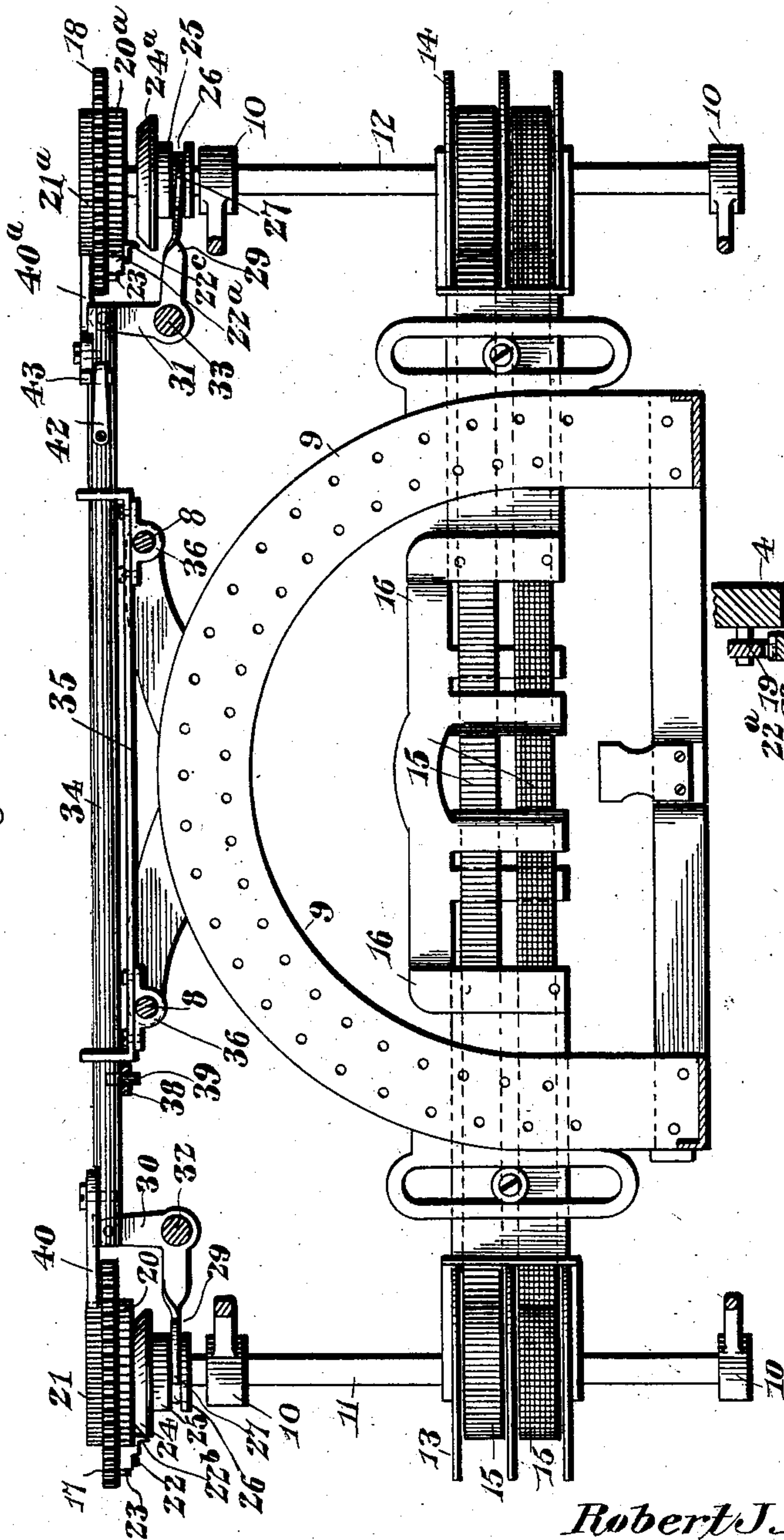
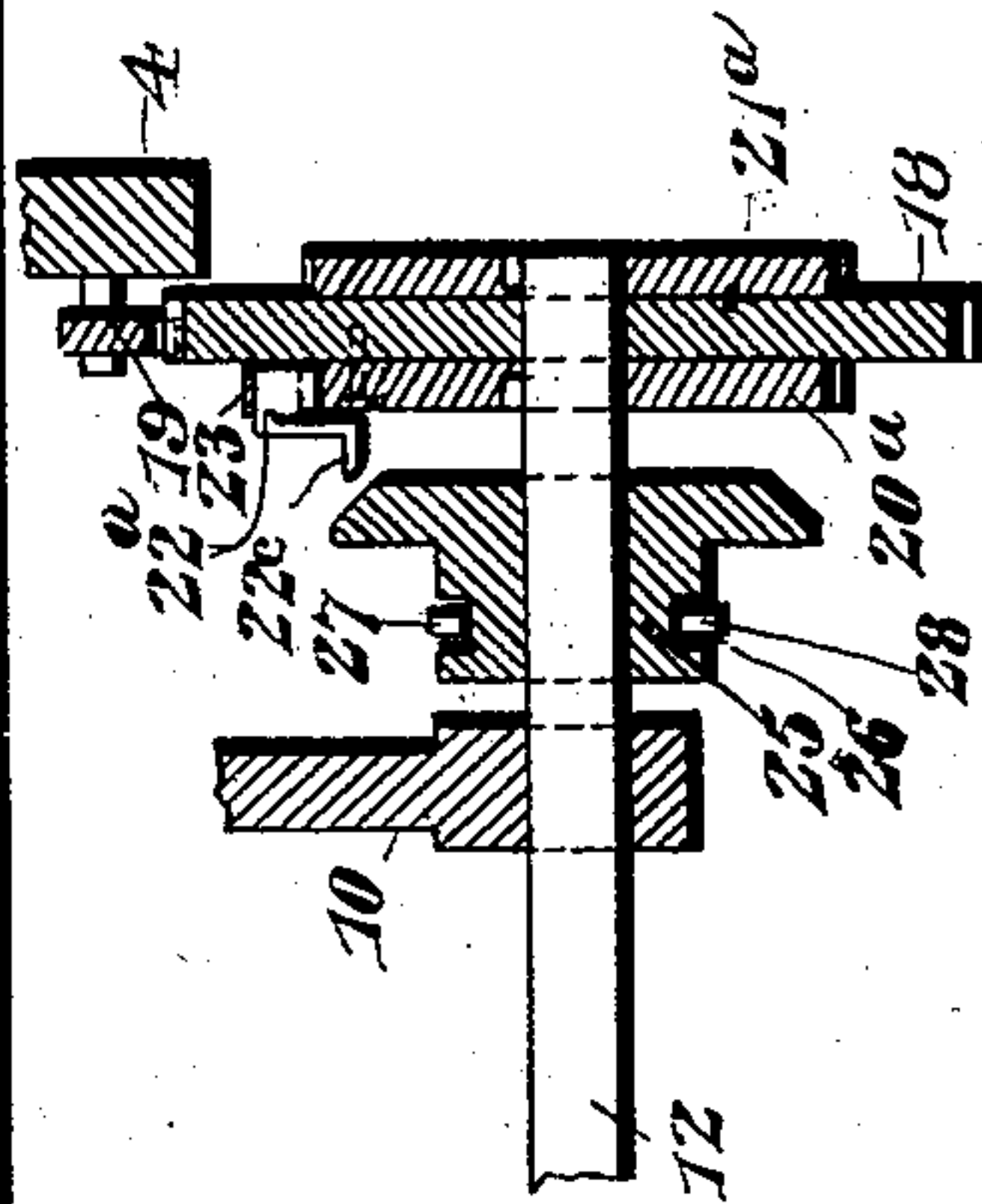


Fig. 5.



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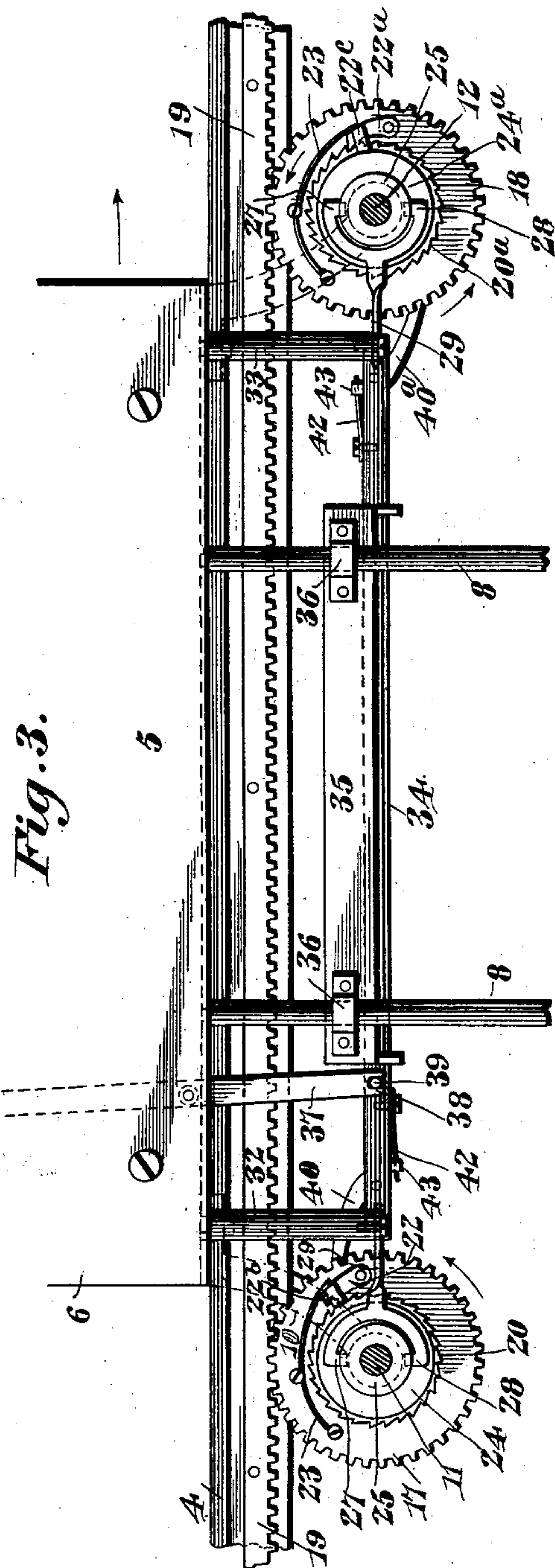


Fig. 3.

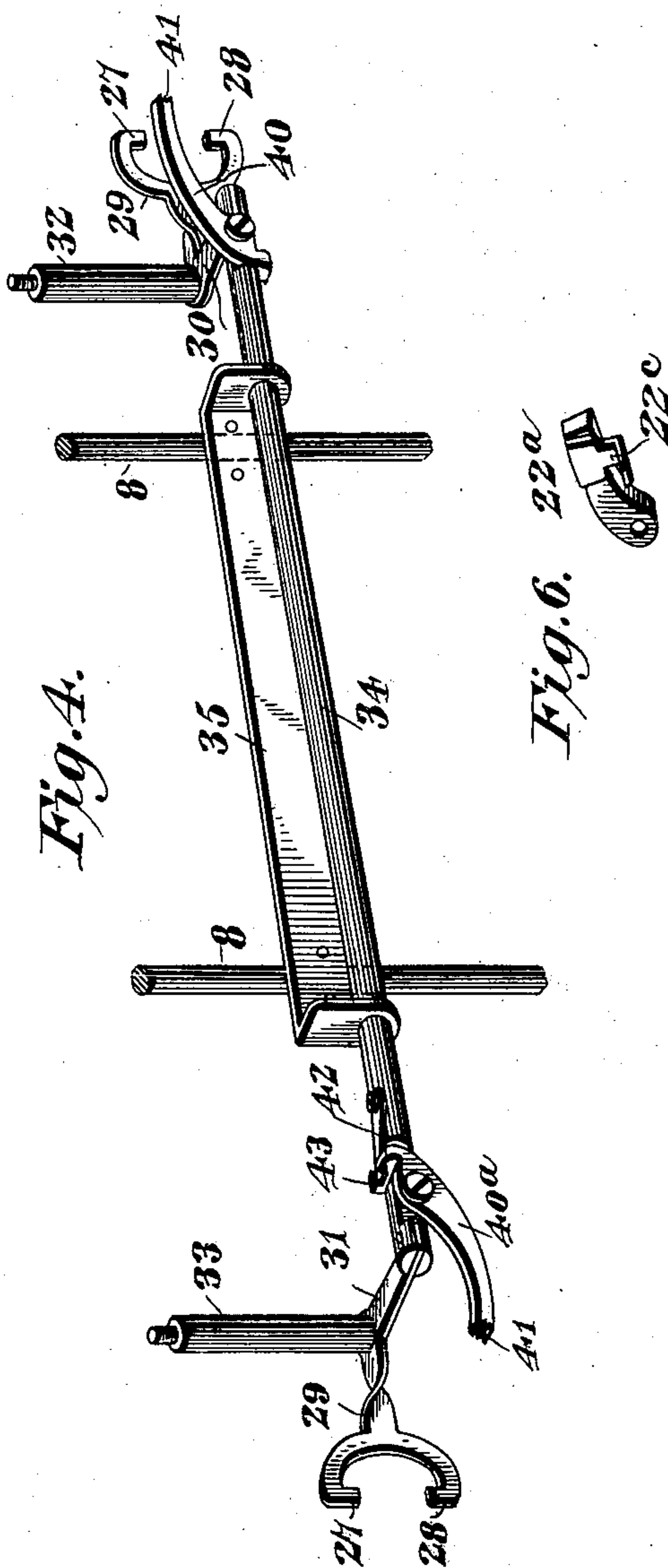


Fig. 4.



Fig. 6. 22a.

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UNITED STATES PATENT OFFICE.

ROBERT JOSEPH FISHER, OF ATHENS, TENNESSEE, ASSIGNOR TO THE FISHER BOOK TYPEWRITER COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF DELAWARE.

RIBBON-FEEDING MECHANISM FOR TYPE-WRITING MACHINES.

SPECIFICATION forming part of Letters Patent No. 705,523, dated July 22, 1902.

Application filed June 21, 1901. Serial No. 65,465. (No model.)

To all whom it may concern:

Be it known that I, ROBERT JOSEPH FISHER, a citizen of the United States, residing at Athens, in the county of McMinn and State of Tennessee, have invented a new and useful Ribbon-Feeding Mechanism for Type-Writing Machines, of which the following is a specification.

This invention relates to type-writing machines, and more particularly to ribbon-feeding mechanism therefor.

The object of the invention is to provide a simple and efficient form of mechanism for effecting the feeding of the ribbon automatically and capable of being readily shifted by the operator for the purpose of reversing the direction of the feed—as, for instance, when the ribbon has been wound from one spool to the other during the operation of the machine.

The ribbon-feeding mechanism comprehended by my present invention, while capable of use with other machines, is primarily designed for use in connection with what are known as “type-writing machines of the flat-platen type” and is devised with special reference to the equipment of what is known commercially as the “Fisher book type-writing machine,” exemplified in a number of patents heretofore issued to me—notably Nos. 569,625 and 637,749. It may therefore be well to recite briefly the characteristic differences between the ribbon motions or ribbon-feeding mechanisms heretofore employed and the subject-matter of the present application. It is for the purpose of illustrating the evolution of the ribbon-feed that the two patents above identified have been recited, as said patents disclose the original form of ribbon-feeding mechanism employed with the Fisher type-writing machine and a radical departure from such original form, which departure is now displaced by a simplified and more efficient form of mechanism to be hereinafter described.

In my Patent No. 569,625 is disclosed a book type-writing machine comprehending a flat platen above which is disposed a relatively movable machine-frame supporting a traveling carriage designed to be shifted upon the machine-frame in the direction of letter-

spacing or transversely of the platen. The inking-ribbon extends under the printing mechanism and has its opposite ends wound upon ribbon-spools, which are movable with the carriage. A comparatively wide ribbon is employed, and for the purpose of preventing the type from striking the ribbon at the same point continually said ribbon is fed or shifted laterally each time the carriage is moved in the direction of letter-spacing. This lateral feeding or shifting of the ink-ribbon is accomplished by the movement of the carriage relative to the machine-frame, and at the end of each line of writing the ribbon is shifted longitudinally the distance of one type-space, so that during the imprinting of the succeeding line of writing the used portion of the ribbon will be advanced beyond the printing-point, thus presenting an unused portion of the ribbon for contact with the type as said ribbon is fed laterally by the movement of the carriage in the direction of letter-spacing. This construction, while effective, was open to objections which need not be recited, and in due course the ribbon-feeding mechanism described was displaced by the adoption of the construction disclosed in my Patent No. 637,749. This latter construction involved the mounting of the ribbon-supporting mechanism upon the machine-frame instead of upon the carriage, as in the earlier construction, and comprehended the longitudinal feed of the ribbon as the carriage advanced in the direction of letter-spacing in contradistinction to the lateral feed of the ribbon in the earlier construction. This arrangement, while superior in many respects to what had preceded it, made necessary the provision of means for causing the ribbon supporting and feeding mechanism to be advanced along the machine-frame as the carriage was intermittently propelled in the direction of letter-spacing and also involved a construction which lacked the desired simplicity. This later construction also contemplated the feeding of the ribbon longitudinally through the medium of the type-action, as distinguished from the earlier construction, wherein the feeding of the ribbon during the letter-spacing was effected by the

movement of the carriage relative to the machine-frame. The feeding of the ribbon in the manner disclosed in the later patent imposed an additional load upon the key-action, 5 which is obviously undesirable. The third and by far the most efficient type of ribbon-feeding mechanism is comprehended by the present invention and is a logical evolution of the preceding conceptions, including the 10 advantageous features thereof and eliminating those characteristics which were found to be undesirable from the standpoints of both the manufacturer and the operator.

The object of the present invention may 15 therefore be said to be the provision of a simple, durable, and efficient ribbon-motion so constructed and arranged that all of the elements of the ribbon-feed, with the exception of an operating-rack, will be carried by and 20 movable with the traveling type-carriage, so that as the carriage is intermittently advanced in the direction of letter-spacing the ribbon will be fed longitudinally by the relative movement of the carriage with respect to 25 the machine-frame or other support and without imposing the burden of the feed upon the type-action.

A further object of the invention is to provide spool-pinions mounted directly upon the 30 spool-shafts and constantly engaging the rack and to provide a simple device for throwing said pinions alternately into and out of operative engagement with their shafts at any time regardless of the positions of the pinions, 35 so that the ribbon-feed may be instantly reversed in any position of the ribbon or of the elements of the feeding mechanism.

Further and subordinate objects of the invention will appear more fully hereinafter as 40 the necessity for their accomplishment is developed in the succeeding description of that form of my invention which is illustrated in the accompanying drawings.

In said drawings, Figure 1 is a rear elevation of a type-writing machine equipped with 45 my ribbon-feeding mechanism, portions of the machine-frame being broken away. Fig. 2 is a sectional view in a horizontal plane, showing the ribbon-feeding mechanism in 50 plan and omitting such parts of the mechanism as are not essential to the disclosure. Fig. 3 is a sectional elevation of so much of the machine structure as is necessary to illustrate the relation of the ribbon-spools and the 55 shifting or reversing means for changing the direction of feed. Fig. 4 is a detail perspective view of the shift-bar, its mounting, the bell-crank shifting-levers, and the restraining-dogs. Fig. 5 is a detail sectional view 60 illustrating the mechanism employed for releasing the spool-pinion from its shaft at any point in the rotation of said pinion, and Fig. 6 is a detail perspective view of one of the pawls for operatively connecting the spool-pinions and the spool-shafts. 65

Like numerals of reference refer to corresponding parts throughout the views.

The invention regarded simply as ribbon feeding and shifting mechanism is susceptible of a wide range of application; but inasmuch 70 as it is intended primarily for use in connection with machines of that type which embody a traveling type-carriage I have illustrated the said invention as applied to a machine known commercially as the "Fisher book type- 75 writing machine" and exemplified, as stated, in my former patents, Nos. 569,625 and 637,749. The illustrated form of the Fisher type-writing machine comprehends a flat platen 1, supporting main tracks or guides 2, upon which 80 travels longitudinally of the platen a machine-frame 3, comprising more or less elevated carriage-guides 4 for the support of the traveling printing mechanism or type-carriage 5. This type-carriage comprises a case 85 6, within which the primary elements of the key-action (not illustrated) are located. Above the case at one side thereof is located the keyboard 7, and from the bottom of the case depends suitable hanger-rods 8 for the 90 support of the type-ring 9. (See Fig. 2.) This type-ring 9 is designed for the support of the fulcrums of the type-bars, (not shown,) and is located in a horizontal plane closely adjacent to the surface of the platen. The 95 several elements of the machine described constitute no part of my invention, except in so far as the stated organization of parts is productive of a traveling carriage intermittently urged in the direction of letter-spacing 100 by any suitable means and serving to support the several elements of the ribbon feeding and shifting mechanism to be described.

From the bottom of the carriage-case 6, at 105 the opposite ends thereof, depend suitable spool-shaft hangers 10, rotatably supporting a pair of parallel spool-shafts 11 and 12, located slightly beyond the opposite ends of the carriage and carrying ribbon-spools 13 and 14, 110 of any desired form. The ribbon-spools are mounted upon the spool-shafts in a manner to cause said spools to rotate with the shafts when the latter are rotated, and the inking ribbon or ribbons 15, having its or their opposite ends wound upon the spools, are provided with a suitable ribbon-guiding frame 16, 115 which leads the ribbon or ribbons to a point immediately above the writing-surface for presentation to the type in the usual manner. 120 It is usual to provide means for feeding the ribbon for the purpose of preventing the type from striking continuously thereon at the same point, and it is evident that this will be accomplished by imparting rotary movement 125 in the proper directions to the ribbon-spools 13 and 14.

We have seen that the spool-shafts carrying ribbon-spools 13 and 14 are in turn supported by the hangers 10, pendent from the 130 carriage-case 6. The spools and shafts must therefore travel with the carriage as the latter is intermittently moved in the direction of letter-spacing. In accordance with the

present invention this intermittent movement of the carriage is designed to effect the intermittent feeding of the ribbon in either direction—that is to say, from the spool 13 to the spool 14 or vice versa—according to the will of the operator, and provision is made for preventing any feeding of the ribbon during the return movement of the carriage for the purpose of beginning a new line. A simple and convenient arrangement for attaining the desired ends is shown in the drawings and includes a pair of spool-pinions 17 and 18, loosely mounted upon the rear ends of the spool-shafts 11 and 12 and constantly meshing with the rack 19, (see Fig. 3,) rigidly secured to and disposed parallel with the rear elevated guide 4 of the machine-frame 3. The rack 19 remains stationary while the carriage moves along the guides, and as a consequence the spool-pinions 17 and 18 are necessarily rotated whenever the carriage is moved either forward or backward. It follows, therefore, that means must be provided for effecting an operative connection of either pinion with its shaft for the purpose of imparting motion to the latter to rotate the spool and feed the ribbon whenever the carriage is moved forwardly—that is to say, to the right—and it is equally desirable that both pinions be entirely disconnected from their shafts whenever the carriage is retracted in order that during such retractile movement the ribbon will not be fed from one spool to the other. To effect this result, the loosely-mounted pinions 17 and 18 are each disposed between a ratchet-wheel 20 or 20^a and a peripherally-knurled check-wheel 21 or 21^a, both fixed upon the spool-shaft to rotate therewith.

As indicated in the drawings, the ribbon is wound upon each of the spools in the same direction for the reason that notwithstanding the change of direction of the feed the positively-operated spool, whichever it may be, must turn in a direction to wind the ribbon thereon, and as neither of the spools is designed to be rotated during the retraction of the carriage it follows that the arrangement must be such as to permit the winding of either spool to be effected by the forward movement of the carriage in the direction of letter-spacing. It is for this reason that the ratchet-teeth of both ratchet-wheels 20 and 20^a are disposed in the same direction, as said teeth are designed to be engaged by the pawls 22 and 22^a, pivoted upon the front side faces of the pinions 17 and 18 and urged toward the ratchet-teeth by suitable springs 23. (See Fig. 3.) Thus it will appear that whenever the carriage is moved in the direction of the arrow in Fig. 3 the pinions 17 and 18 will be rotated in the direction of the arrows in said figure, and unless the pawls are held away from the ratchet-wheels they will engage the latter for the purpose of effecting an operative connection between the pinions and their spool-shafts. Means should therefore be pro-

vided for holding either of said pawls out of engagement with its ratchet in order that the ribbon may be wound by the positive rotation of the other spool-shaft, it being understood that when the ribbon is wound upon one spool the other spool should be free to rotate independently of its pinion in order to permit the unwinding of the ribbon from one spool and its winding upon the other spool at the opposite end of the carriage. For this reason I shiftably mount upon each spool-shaft a beveled disk 24 or 24^a, arranged when thrown toward the adjacent ratchet-wheel to strike against a forwardly-projecting lug 22^b or 22^c, provided upon each of the pawls 22 and 22^a, so that either pawl may be urged away from its ratchet and retained in its disengaged position by the slight shifting of these beveled disks. Therefore in order to shift the feed of the ribbon it is simply necessary to operate the disks so as to drop one pawl into engagement with its ratchet and to move the other pawl out of its engaged position. This shifting of the disks may be effected in a variety of ways; but a simple and convenient mechanism for the purpose is shown in the drawings. Each disk 24 and 24^a is provided with a hub 25, formed with an annular groove or channel 26. These annular grooves are designed for the reception of the opposed terminals 27 and 28 of the forked or spanning ends 29 of a pair of bell-crank shifting-levers 30 and 31, fulcrumed upon pendent studs 32 and 33, screwed or otherwise secured at their upper ends to the base or floor of the carriage-case 6. The extremities of these bell-crank levers 30 and 31 opposite the hubs are disposed rearwardly for connection with the opposite ends of what may be termed a "shift-bar" 34, slidably supported by a shift-bar bracket 35, secured in any suitable manner, as by clamps 36, to any suitable part of the carriage structure—as, for instance, to the back hanger-rods 8. (See Figs. 1, 2, and 3.) The longitudinal shifting of the shift-bar 34 will obviously shift the bell-crank shifting-levers 30 and 31 in opposite directions, with the result that one of the beveled disks will be thrown toward its ratchet for the purpose of moving the contiguous pawl outwardly to its disengaged position, while the other beveled disk will be withdrawn from engagement with the lug of the adjacent pawl to permit the engagement of said pawl with its ratchet. Thus the operator by shifting the rod 34 in the desired direction may shift the direction of feed of the ribbons by releasing one of the spool-pinions from its shaft and simultaneously connecting the other pinion with its shaft to reverse the direction of rotation of the spools.

A convenient actuator for the shift-bar 34 is shown in Fig. 1 of the drawings. This actuator is in the form of a shift-lever 37, extending upwardly through the case 6 within convenient reach of the operator, said lever being preferably fulcrumed adjacent to the

base of the case and having its lower end forked, as indicated at 38, for operative connection with a laterally-extending pin 39, rigid with the shift-bar.

5 The construction described comprehends a complete embodiment of the invention in one aspect, because it includes ribbon supporting, feeding, and shifting mechanism carried by and movable with the traveling type-carriage; but it has been found in practice that
10 during the retraction of the carriage the slipping of the engaged pawl over the teeth of the adjacent ratchet-wheel exerts some slight tendency to rotate the ribbon-spool, and thus
15 relieve the tension upon the ribbon by slackening the same to a greater or less extent. To overcome this objection, I have developed the invention somewhat further by providing the opposite ends of the shift-bar 34 with
20 pivoted retaining or locking dogs 40 and 40^a, having knurled extremities 41, designed for presentation to the knurled check-wheels 21 and 21^a. The engaging ends of these dogs are disposed, respectively, above and below the
25 plane of the shift-bar, inasmuch as they are designed for contact with the contiguous portions of the peripheries of wheels which rotate in the same direction. In order to permit these dogs to yield when necessary, each
30 is arranged to be pressed into engagement with its knurled wheel by means of a spring 42, bearing against a stop-lug 43, formed on each dog at the side of its pivot opposite the knurled end and arranged to bear against the
35 shift-bar for the purpose of limiting the movement of the dog when the latter is out of engagement with its wheel. It will now be observed that when the shift-bar is moved to withdraw one of the beveled disks from its
40 pawl, and thereby permit the pawl to move to its engaging position, the contiguous retaining or restraining dog will be thrown into engagement with the adjacent check-wheel, while the dog at the opposite end of the carriage is simultaneously withdrawn from en-
45 gagement with its check-wheel, for the reason that the pawl at this latter end of the carriage is out of engagement with its ratchet and there is therefore no tendency to rotate the disengaged spool during the retraction of
50 the carriage. In other words, the restraining-dog is brought into engagement with its knurled wheel whenever the adjacent pawl is dropped into engagement with the ratchet by the withdrawal of the beveled disk. It should
55 be observed, furthermore, that by the employment of these beveled disks the feed of the ribbon may be shifted at any point irrespective of the positions of the various parts, because while the pawls move in circular paths they are at all times disposed for actuation by the disks.

Assuming the parts to be in the positions illustrated in Figs. 1, 2, and 3 of the drawings, the operation of the mechanism is as follows: The carriage 5 is propelled, as usual,
65 in the direction of letter-spacing, as shown

by the arrow in Fig. 3. This movement of the carriage will effect the rotation of the spool-pinion 18 in the direction of the arrow
70 in Fig. 3, and as the pawl 22^a is in engagement with the ratchet-wheel 20^a motion will be imparted to the spool-shaft 12 and the ribbon will be wound upon the spool 14. The spool 13, from which the ribbon is wound, will
75 be rotated by the tension on the ribbon, for the reason that the spool-pinion 17, mounted on the spool-shaft 11, is out of engagement with said shaft, as it will be seen that the beveled disk 24 at the left-hand end of the
80 carriage is thrown to a position which will cause the pawl 22 to be swung back out of engagement with the adjacent ratchet-wheel 20. Upon reaching the end of a line the carriage is retracted in the usual manner, and
85 this serves to reverse the direction of rotation of the pinions 17 and 18, the former of which will of course rotate idly on the shaft 11 and the latter of which—to wit, the pinion 18—will likewise rotate idly upon the shaft
90 12, because the pawl 22^a, carried by the pinion 18, will click idly back over the teeth of the ratchet-wheel 22^a. Thus the ribbon will remain stationary during the retraction of the carriage, and any tendency of the pinion
95 18 to rotate the shaft 12, and thereby slack the ribbon, will be overcome by the retaining or check dog 40^a engaging with the knurled check-wheel 21^a, fixed upon the spool-shaft 12. If now it is desired to reverse the direction of feed of the ribbon, it is simply necessary to swing the shift-bar lever 37 for the purpose of shifting the bar 34 to reverse the positions of the beveled disks, and thereby effect an operative engagement between
105 the pinion 17 and its shaft and the disconnection of the pinion 18 from the shaft 12, this movement of the shift-bar serving to withdraw the dog 40^a from engagement with the knurled wheel 21^a and to effect the engagement of the dog 40 with the check-wheel 21. The advance of the carriage in the direction of letter-spacing will now cause the ribbon to be fed from the spool 14 to the spool 13 until the bar 37 is again shifted to
115 reverse the direction of feed in the manner stated.

In conclusion it should be noted that the longitudinal feed of the ribbon is effected by the movement of the type-carriage relative
120 to the machine-frame and that by reason of the novel construction employed the feed of the ribbon may be reversed in any position of the carriage. In drawing the claims I shall refer to the spool-pinions as being operatively
125 related to the rack, and by this expression I mean that the pinions are designed to be rotated by reason of their movement with the carriage, whether geared directly or indirectly to the stationary rack mounted independently of the carriage.
130

The term "ribbon-shifting mechanism" comprehends, broadly, that aggroupment of elements which is necessary to reverse the

direction of feed of the ribbon, and the term "shifting mechanism," employed in combination with releasing mechanism or releasing devices, is intended to comprehend those elements which serve to shift the beveled disks or equivalent elements arranged to effect the release of the pinions from their spool-shafts. The expression "spool-operating mechanism" is employed to designate the means for rotating the spools to effect the longitudinal feeding of the ribbon.

The subject-matter of this application, while specifically different from the invention of John A. Smith, Serial No. 65,475, comprehends the same in a broad sense, as a certain underlying thought is present in both inventions, and the claims appended have been drawn to generically cover the Smith invention.

It is thought that from the foregoing the construction, operation, and general utility of my invention will be obvious; but while the present embodiment of said invention may perhaps be preferable I wish to be distinctly understood as reserving to myself the right to effect such changes, modifications, and variations of the illustrated structure as may hereafter be suggested by experience or experiment or may be necessary in order to adapt the invention for use in connection with various forms of type-writing machines, provided, of course, that such variations are embraced within the scope of the protection prayed.

What I claim is—

1. In a type-writing machine, the combination with a traveling carriage, of a rack mounted independently thereof and arranged parallel with the line of writing, ribbon-spools arranged at each side of the carriage and terminating adjacent to the rack, separate gearing for connecting each shaft independently to the rack, pinions constituting elements of said separate gearing, and means for throwing said pinions out of gear with the shafts.

2. In a type-writing machine, the combination with a traveling carriage, and a rack mounted independently thereof, of spool-shafts movable with the carriage, ribbon-spools and spool-pinions mounted on said shafts, said pinions being constantly in direct engagement with the rack, and means for alternately effecting the operative connection of said pinions with their shafts, and their disconnection from said shafts.

3. In a type-writing machine, the combination with a traveling carriage, and a rack mounted independently thereof, of spool-shafts movable with the carriage, a ribbon-spool and a spool-pinion mounted on each shaft, said pinions being constantly and directly geared to the rack, and shifting mechanism movable with the carriage and disposed to alternately connect the pinions with their shafts.

4. In a type-writing machine, the combination with a traveling carriage, and a rack mounted independently thereof, of spool-shafts movable with the carriage, a ribbon-spool and a spool-pinion mounted on each shaft, said pinions being directly geared to the rack, releasing means for releasing the pinions from their shafts, and shifting mechanism for operating the releasing means to release the pinions.

5. In a type-writing machine, the combination with a traveling carriage, and a rack mounted independently thereof, of spool-shafts movable with the carriage, a ribbon-spool and a spool-pinion mounted on each shaft, said pinions being directly geared to the rack, separate releasing devices for releasing the pinions from their shafts, and shifting mechanism mounted on the carriage and arranged to shift the positions of the releasing devices to release the pinions alternately from their shafts.

6. In a type-writing machine, the combination with a traveling carriage, and a rack mounted independently thereof, of spool-shafts movable with the carriage, a ribbon-spool and a spool-pinion mounted on each shaft, said pinions being operatively related to the rack, pawl-and-ratchet mechanism disposed to connect each pinion with its shaft, and shifting mechanism disposed to move said pawls out of their engaging positions.

7. In a type-writing machine, the combination with a traveling carriage, and a rack mounted independently thereof, of spool-shafts movable with the carriage, a ribbon-spool and a spool-pinion mounted on each shaft, a pawl and a ratchet-wheel constituting means for operatively connecting each pinion to its shaft, and shifting mechanism for moving the pawls to their disengaging positions, said shifting mechanism being effective in any position of the pawls.

8. In a type-writing machine, the combination with a traveling carriage, and a rack mounted independently thereof, of spool-shafts movable with the carriage, a ribbon-spool and a spool-pinion mounted on each shaft, said pinions being operatively related to the rack, a ratchet-wheel fixed on each shaft, a pawl mounted on each pinion to engage the adjacent ratchet-wheel, disks shiftably mounted on the shafts and disposed to move the pawls out of engagement with their ratchet-wheels, and means for operating said disks.

9. In a type-writing machine, the combination with a traveling carriage, and a rack mounted independently thereof, of spool-shafts movable with the carriage, a ribbon-spool and a spool-pinion mounted on each shaft, said pinions being operatively related to the rack, a ratchet-wheel fixed on each shaft, a pawl mounted on each pinion to engage the adjacent ratchet-wheel, beveled disks shiftably mounted on the shafts and

disposed to move the pawls out of engagement with their ratchet-wheels, and means for operating said disks.

10. In a type-writing machine, the combination with a traveling carriage, and a rack mounted independently thereof, of spool-shafts movable with the carriage, a ribbon-spool and a spool-pinion mounted on each shaft, said pinions being geared to the rack, a ratchet-wheel on each shaft, a pawl on each pinion to engage the adjacent ratchet-wheel, disks shiftably mounted on the shafts to move the pawls out of engagement with the ratchet-wheels, and means for shifting said disks simultaneously in opposite directions.

11. In a type-writing machine, the combination with a traveling carriage, and a rack mounted independently thereof, of spool-shafts movable with the carriage, a ribbon-spool, a spool-pinion and a ratchet-wheel mounted on each shaft, a pawl on each pinion to engage the adjacent ratchet-wheel, beveled disks shiftably mounted on the shafts to move the pawls out of engagement with the ratchet-wheels, and means for shifting said beveled disks simultaneously in opposite directions.

12. In a type-writing machine, the combination with a traveling carriage, and a rack mounted independently thereof, of spool-shafts movable with the carriage, a ribbon-spool and a spool-pinion mounted on each shaft, releasing mechanism for effecting the release of each pinion from its shaft, a reciprocatory shift-bar mounted on the carriage and connected to said releasing mechanism, and means for reciprocating said shift-bar.

13. In a type-writing machine, the combination with a traveling carriage, and a rack mounted independently thereof, of spool-shafts movable with the carriage, a ribbon-spool and a spool-pinion mounted on each shaft, separate releasing devices for effecting the release of the pinions from their shafts, a shifting-lever connected to each releasing device, and a shift-bar connected to both of said levers to effect their simultaneous movement in opposite directions.

14. In a type-writing machine, the combination with a traveling carriage, and a rack mounted independently thereof, of spool-shafts movable with the carriage, a ribbon-spool and a spool-pinion mounted on each shaft, pawl-and-ratchet mechanism for connecting each pinion to its shaft, beveled disks arranged to shift the positions of the pawls and having grooved hubs, bell-crank shifting-levers engaging the grooved hubs of the disks, a shift-bar connected to both of said bell-crank levers, and a lever operatively connected to the shift-bar to actuate the same.

15. In a type-writing machine, the combination with a traveling carriage, and a rack mounted independently thereof, of ribbon-spools movable with the carriage, spool-pinions operatively related to the rack and arranged to rotate the spools in a given direction, and means for positively locking the

spools against rotation in a direction to slacken the ribbon.

16. In a type-writing machine, the combination with a traveling carriage, and a rack mounted independently thereof, of ribbon-spools movable with the carriage, spool-pinions operatively related to the rack, mechanism for connecting each pinion to its spool to cause the rotation of the spool in one direction and to permit the pinion to rotate idly in the opposite direction, and locking means for preventing either spool from rotating during the idle movement of its pinion.

17. In a type-writing machine, the combination with a traveling carriage, and a rack mounted independently thereof, of spool-shafts movable with the carriage, a ribbon-spool and a spool-pinion mounted on each shaft, said pinions being operatively related to the rack, a check-wheel and a ratchet-wheel fixed upon each spool-shaft, a pawl mounted on each pinion and disposed to engage the ratchet-wheel, and restraining-dogs disposed to alternately engage the check-wheels to prevent rotation of the spool-shaft whose pawl is moving idly over the ratchet-teeth of the adjacent ratchet-wheel.

18. In a type-writing machine, the combination with a traveling carriage, and a rack mounted independently thereof, of spool-shafts movable with the carriage, a ribbon-spool and a spool-pinion mounted on each shaft, said pinions being operatively related to the rack, shifting mechanism for effecting the alternate engagement and disengagement of the pinions to and from their shafts, and restraining mechanism for said shafts, said restraining mechanism being controlled by the shifting mechanism.

19. In a type-writing machine, the combination with a traveling carriage, and a rack mounted independently thereof, of spool-shafts movable with the carriage, a ribbon-spool, a spool-pinion, a ratchet-wheel and a check-wheel mounted upon each spool-shaft, a pawl mounted upon each pinion to engage the adjacent ratchet-wheel, a shift-bar mounted upon the carriage, restraining-dogs carried by said shift-bar and designed for presentation to the check-wheels, and means connected with said shift-bar for throwing the pawls out of engagement with their ratchet-wheels.

20. In a type-writing machine, the combination with a suitable support, of a spool-shaft, a ribbon-spool carried by said shaft, a spool-pinion loosely mounted on the shaft and provided with a pawl, a ratchet-wheel mounted to rotate with the shaft and disposed for engagement by the pinion, a beveled disk shiftably mounted in operative relation to the pawl to urge the same out of engagement with the ratchet-wheel, and means for shifting said beveled disk.

21. In a type-writing machine, the combination with a traveling carriage, and a rack mounted independently thereof, of spool-shafts movable with the carriage, a ribbon-

spool, and a spool-pinion mounted on each shaft, said pinions being operatively related to the rack, pawl-and-ratchet mechanism disposed to connect each pinion with its shaft, and shifting mechanism disposed to move said pawls out of their engaging positions.

22. In a type-writing machine, the combination with a traveling carriage, and a stationary rack mounted independently thereof, of spool-shafts movable with the carriage, a ribbon-spool, and a spool-pinion mounted on each shaft, said pinions being operatively related to the rack, a ratchet-wheel on each shaft, a pawl on each pinion to engage the adjacent ratchet-wheel, disks shiftably mounted on the shafts to move the pawls out of engagement with the ratchet-wheels, and means for shifting said disks simultaneously.

23. In a type-writing machine, the combination with a traveling carriage, and a stationary rack mounted independently thereof, of spool-shafts movable with the carriage, a ribbon-spool, a spool-pinion, and a ratchet-wheel mounted on each shaft, a pawl on each pinion to engage the adjacent ratchet-wheel, beveled disks shiftably mounted on the shafts to move the pawls out of engagement with the ratchet-wheels, and means for shifting said beveled disks simultaneously.

24. In a type-writing machine, the combination with a traveling carriage, and a rack mounted independently thereof, of spool-shafts movable with the carriage, a ribbon-spool and a spool-pinion mounted on each

shaft, said pinions being operatively related to the rack, shifting mechanism for effecting the alternate feeding of the ribbon from one spool to the other, and restraining mechanism for said shafts, said restraining mechanism being controlled by the shifting mechanism.

25. In a type-writing machine, the combination with the traveling carriage, of a rack mounted independently thereof and arranged parallel with the lines of writing, ribbon-spool shafts arranged at each side of the carriage and terminating adjacent to the rack, and separate gearing for connecting each shaft independently to the rack, said gearing having means for releasing the connection at will.

26. In a type-writing machine, the combination with the traveling carriage, of a rack mounted independently thereof and arranged parallel with the line of writing, ribbon-spool shafts arranged at each side of the carriage and terminating adjacent to the rack, separate gearing for connecting each shaft independently to the rack, pinions constituting elements of such independent gearing, and means for simultaneously throwing one of the pinions into gear with its shaft and the other pinion out of gear with its shaft.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

ROBERT JOSEPH FISHER.

Witnesses:

A. R. WARNER,
CHAS. F. LAGANKE.