

No. 661,098.

Patented Nov. 6, 1900.

E. WINNE.

AUTOMATIC RIBBON REVERSING MECHANISM FOR TYPE WRITERS.

(Application filed June 6, 1900.)

(No Model.)

3 Sheets—Sheet 1.

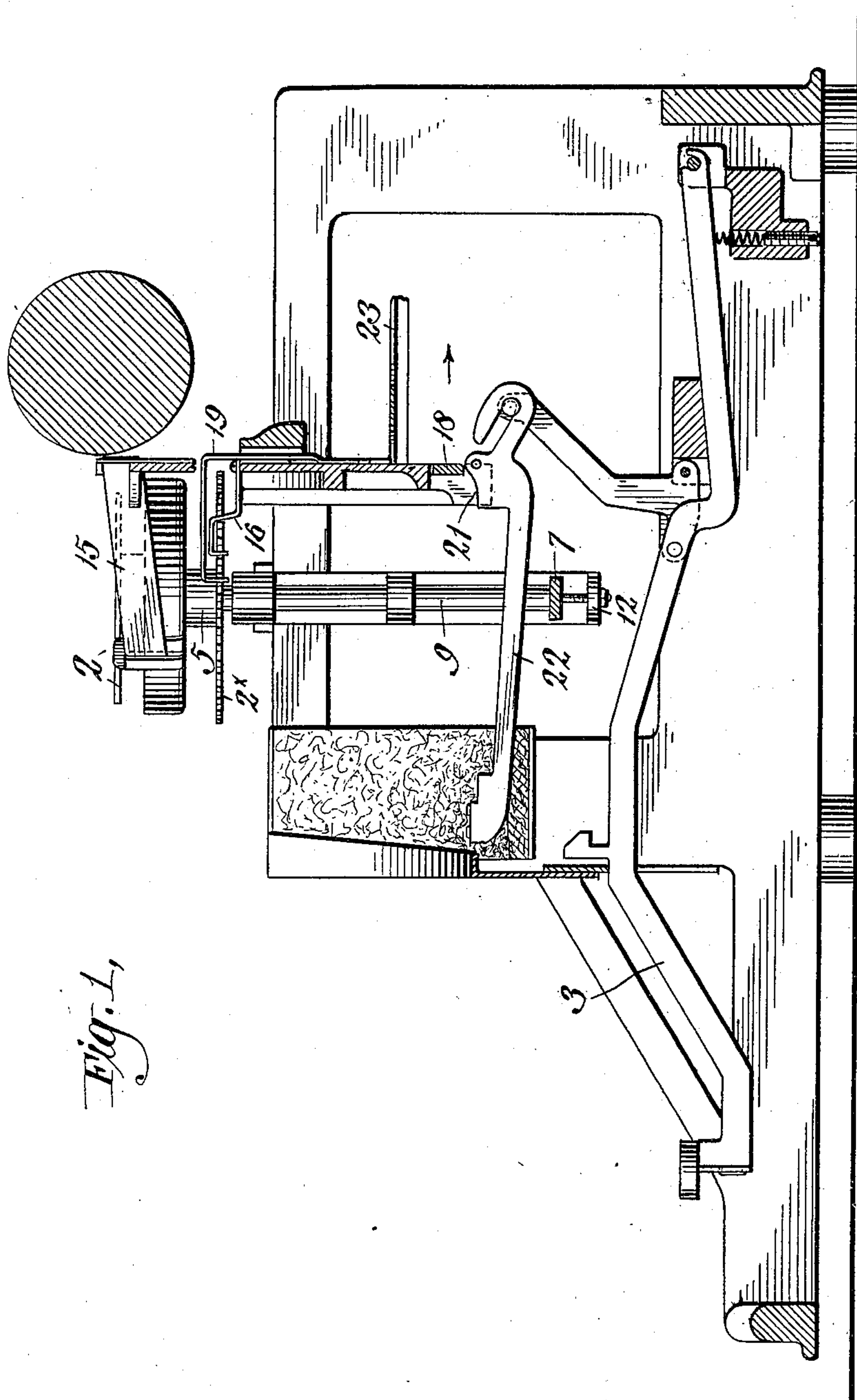


Fig. 1.

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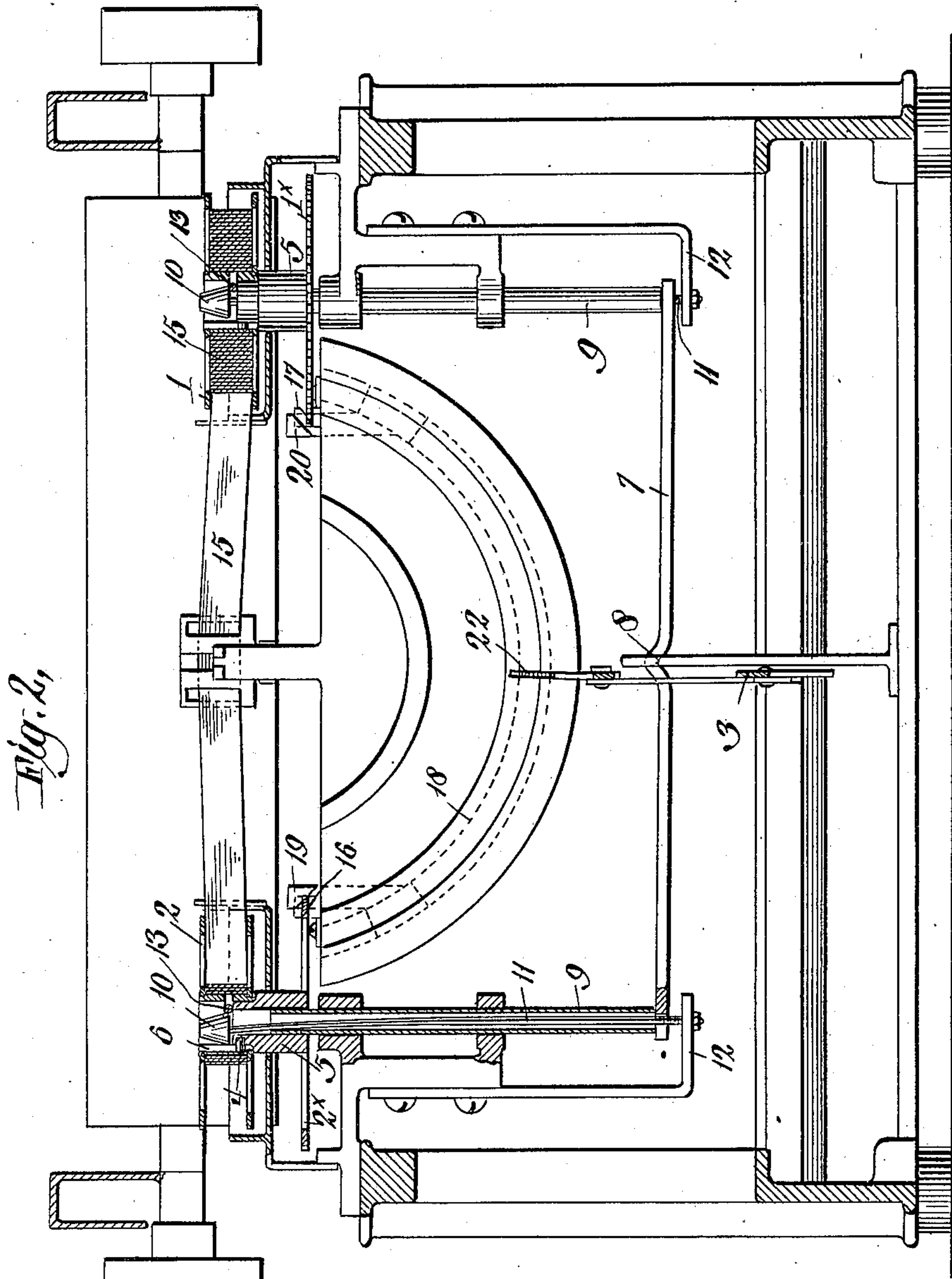
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3 Sheets—Sheet 2.



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3 Sheets—Sheet 3.

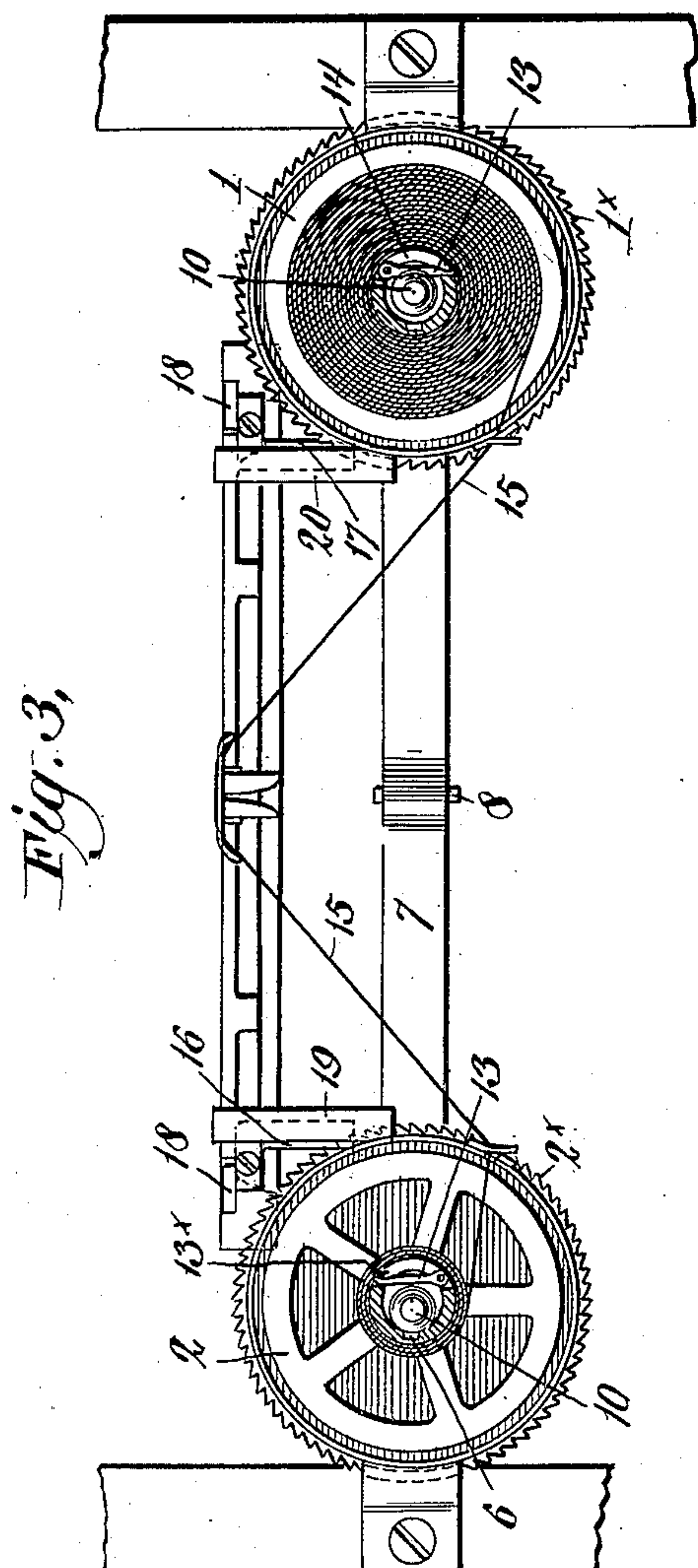


Fig. 5,

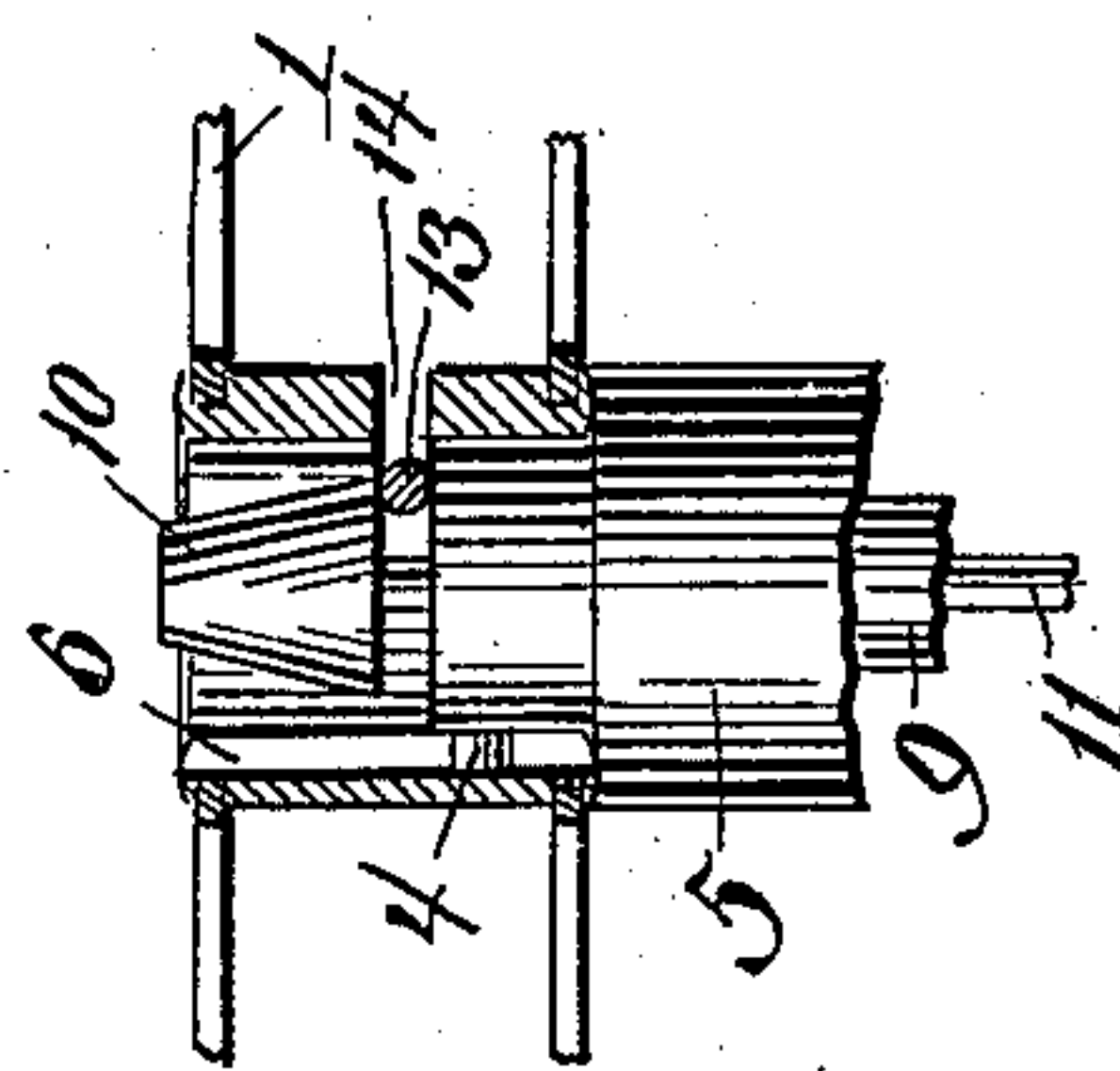
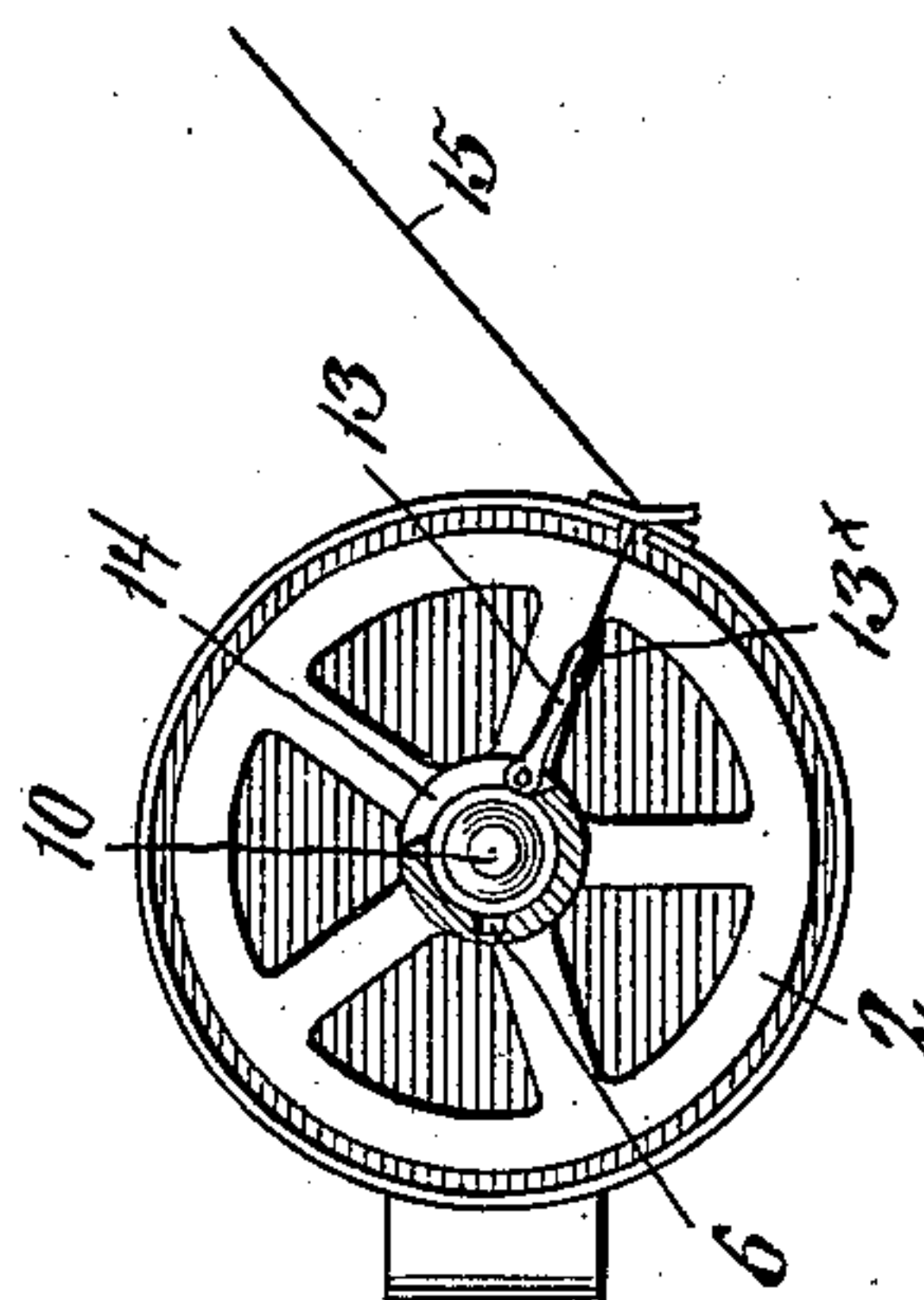


Fig. 4,



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AUTOMATIC RIBBON-REVERSING MECHANISM FOR TYPE-WRITERS.

SPECIFICATION forming part of Letters Patent No. 661,098, dated November 6, 1900.

Application filed June 6, 1900. Serial No. 19,228. (No model.)

To all whom it may concern:

Be it known that I, ERNEST WINNE, a citizen of the United States, residing in the borough of Manhattan, city, county, and State of New York, have invented certain new and useful Improvements in Automatic Ribbon-Reversing Mechanism for Type-Writing Machines, of which the following is a specification.

My invention relates to automatic ribbon-reversing mechanism for type-writing machines. In the present instance I have applied my invention to an Underwood type-writing machine, though obviously the employment of my invention is not restricted to this particular type of machine, since by slight changes in detail of construction the invention may be adapted to various other type-writing machines.

Considerable difficulty has been experienced heretofore in providing an efficient automatic ribbon-reversing mechanism by reason of the fact that the imprinting characters would strike the same point on the ribbon several times during the reversing operation thereof and a faint imprint or no imprint at all would result. This defect is due to several causes, among which may be mentioned the fact that in some prior constructions a dead-center position is attained and maintained at each reversal of the ribbon during the imprint of several characters. Then, again, in constructions heretofore devised it has been customary to exert a strain upon some movable portion of the machine or upon the ribbon itself to effect a reversal of the ribbon at a predetermined time. The exertion of this strain upon the machine or the ribbon acted detrimentally to an efficient operation of the machine. Especially is this true when the strain is exerted upon the ribbon itself to bring about a shifting of the parts and a reversal of the direction of feed of the ribbon.

The object of my invention is to overcome these and other defects in type-writing machines heretofore devised; and to these ends my invention consists in the novel arrangement and combination of parts hereinafter described and claimed.

In the accompanying drawings, Figure 1 is

a central vertical sectional view of a sufficient number of parts of a type-writing machine to illustrate my invention. Fig. 2 is a longitudinal vertical sectional view of the same. Figs. 3 and 4 are detail plan views of portions of the device. Fig. 5 is an enlarged fragmentary vertical sectional view of portions of the device to be hereinafter more fully described.

One form or embodiment of my invention consists in the employment of ribbon-spools 1 2, which are intermittently rotated at each operation of a key-lever 3 to effect a movement of the ribbon in the direction of its length. The spools 1 and 2 are rotated by ratchet-wheels 1^x and 2^x, respectively, which are mounted to move in an axial or transverse direction as well as to rotate. Connection is made in the present instance between each spool and its ratchet-wheel by a pin 4, which is carried by a sleeve 5, Fig. 5, that is connected to each ratchet-wheel and is adapted to support a ribbon-spool in place. Each of these pins 4 is adapted to project into a slot 6 in the hub of the cooperating ribbon-spool, as clearly indicated in Fig. 5 of the drawings. A centrally-pivoted lever 7 supports each of the ratchet-wheels and spools and constitutes a balance for the ratchet-wheels and the parts which are carried by them or rotate in connection therewith. Thus the lever 7 is fulcrumed at 8, and each end thereof supports a tubular sleeve 9, which is connected at its upper end to the cooperating ratchet-wheel. Each of the ribbon-spools is preferably provided with a central opening, through which projects a locking-head 10, which in the present instance is shown tapering or in the form of a frustum that is carried upon the free end of a light spring 11, supported at its lower end to a bracket 12, which is secured to a fixed portion of the machine. Each of the spools has pivoted to its hub what I term a "latch" 13, which is adapted to move in a slitted portion 14 of the hub of the spool and to be projected transversely across the central opening of the spool to which said latch is attached, as indicated in Fig. 3. This latch 13 upon each of the ribbon-spools is provided with a hook 13^x or equivalent means, which are adapted to be

connected to one end of the ribbon 15. Each latch 13 is so arranged that it will be projected across the central opening in its ribbon-spool when one or more layers of the ribbon are wound upon a spool. When, however, the ribbon is completely unwound from the spool, the latch 13 will be withdrawn from the central opening in the spool, as illustrated in Fig. 4, for purposes which will hereinafter appear.

Mounted upon a fixed portion of the frame of the machine are retaining-pawls 16 and 17 to prevent a backward movement of the ratchet-wheels. These pawls 16 and 17 are so located that either one of them will be in engagement with its cooperating ratchet-wheel, the engagement therewith depending upon which ratchet-wheel is maintained in the elevated or operative position. Preferably upon the universal bar 18 of the machine (see Fig. 1) are fixed feed-pawls 19 and 20, each of which is adapted to cooperate with its respective ratchet-wheel to intermittently revolve the ribbon-spools. The ratchet-wheels 1^x and 2^x being mounted, as hereinbefore stated, to move up and down or in an axial or transverse direction are in this manner forced into and out of contact with the inclined faces of the feeding and retaining pawls—that is to say, when the ratchet-wheel 2^x upon one side of the machine is elevated it will be brought into contact with its cooperating pawls to feed the ribbon-spool in one direction, whereas the ratchet-wheel 1^x upon the opposite side of the machine will at this time be maintained out of engagement with its cooperating pawls, as indicated in Fig. 2 of the drawings. It having been before explained that the tapering locking-heads 10 are each contained within the central opening of one of the ribbon-spools and maintained centrally therein by its spring 11 it will be understood that the latch 13 carried by the ribbon-spool will be maintained either above or below the widest portion of the frustum 19 when the latch is projected transversely across the opening in the spool. The parts are so arranged that when the latch of one spool is above the widest portion of its frustum the latch of the opposite spool will be below the widest portion of the head, (see Fig. 2,) so as to prevent an axial or transverse movement of the ratchet-wheels and ribbon-spools until such time as the latch is withdrawn from beneath the head.

Having thus given a general description of a construction which shows one form or embodiment of my invention, I will proceed to describe the operation thereof.

We will assume that there are several layers of ribbon on the right-hand spool 1 and that the ribbon is being unwound therefrom, as indicated in Fig. 2 of the drawings. It will be understood that in these premises the latch 13 of the right-hand spool 1 will be located beneath its locking-head 10, whereas the latch of the left-hand spool 2 will be situ-

ated at or above the widest portion of its head. A continued operation of the machine will unwind the remaining layers of ribbon upon the right-hand spool 1, and when the end of the ribbon is reached the latch 13 of said ribbon-spool will be withdrawn from beneath its head, as indicated in Fig. 4. When the latch is thus withdrawn, the spools and ratchets are free to move in an axial or transverse direction. The ribbon having passed from the right-hand spool to the left-hand spool will have overweighted the parts of the ribbon-reversing mechanism upon that side of the machine and will cause the left-hand ribbon-spool and ratchet-wheel to be immediately depressed. In the depression of the left-hand ribbon-spool and ratchet-wheel the latch carried thereby will cause a lateral deflection of the cooperating locking-head until said latch has passed beneath it. The spring of the head will then restore it to the normal position, and the left-hand ribbon-spool and ratchet-wheel will be maintained by its latch in the lowered position. The lowering of the left-hand spool and ratchet-wheel in the manner described will through the intermediate lever 7 and connections cause the right-hand spool and ratchet-wheel to be elevated, it being understood that the latch 13 of the spool 1 is at this moment withdrawn to permit such movement of the spool and its cooperating ratchet-wheel. The depression of the left-hand spool 2 in the manner described causes the ratchet-wheel 2^x of said spool to be moved out of the operative position where it cooperates with its pawls 16 and 19, and a simultaneous axial or transverse movement of the right-hand ribbon-spool and ratchet-wheel will bring said ratchet-wheel 1^x into engagement with its cooperating pawls 17 and 20, so that an immediate reversal of the feed movement of the ribbon takes place.

It has been explained that the feed-pawls 19 and 20 are connected to a movable portion of the machine, such as the universal bar 18, so as to effect a feed of the ribbon. This universal bar 18 is shown in the present instance as segmental in form, as indicated in dotted lines in Fig. 2. This universal bar is moved in the direction of the arrow in Fig. 1 at each operation of a key-lever 3 by the heel 21 of any type-bar 22 contacting with said universal bar in the movement of the type-bar to the printing-point, as is usual in the Underwood type-writing machine. The universal bar, it will be understood, is spring-restored in the usual manner by the projection 23, which is connected with the feed mechanism. (Not shown.)

It will be observed that by my invention absolutely no strain is exerted upon any portion or movable part of the machine in order to bring about the reversal of the direction of feed of the ribbon. The element which effects the reversal is the weight of the ribbon itself, which in its passage from one spool to another causes the overbalancing of cer-

tain movable parts, and when the end of the ribbon is reached the movement of the latch of the unwinding spool will permit the immediate reversal to take place by the weight of the ribbon upon the opposite spool. Furthermore, there is no dead-center position in the reversing operation.

While I have shown and described with considerable detail one form of device embodying my invention, I would have it understood that I do not limit myself to such construction, since I am aware that various changes may be made without departing from the spirit of my invention, which involves the broad idea of employing the weight of the ribbon to effect a reversal of its feed.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In an automatic ribbon-reversing mechanism for type-writing machines the combination of balanced ribbon-spools, a ribbon and means for permitting a transverse movement of said balanced ribbon-spools when an end of the ribbon is reached.

2. In an automatic ribbon-feed mechanism for type-writing machines the combination of a ribbon, mechanism for imparting an intermittent feed movement to the ribbon and means controlled by the weight of the ribbon for effecting a change of direction of the ribbon-feed.

3. In an automatic ribbon-reversing mechanism for type-writing machines the combination of a ribbon, ribbon-spools, mechanism for imparting an intermittent feed movement to the ribbon-spools and means controlled by the weight of the ribbon upon one of the spools for effecting a reversal of the ribbon-feed.

4. In an automatic ribbon-feed mechanism for type-writing machines the combination of a ribbon, balanced ribbon-spools, means operatively connected to said balanced ribbon-spools for effecting a change in direction of feed of the ribbon and means for rendering said ribbon-spools and the means operatively connected thereto effective to change the direction of feed of the ribbon.

5. In an automatic ribbon-reversing mechanism for type-writing machines the combination of a ribbon, rotatable balanced ribbon-spools, rotatable ratchet-wheels which are likewise transversely movable and feed-pawls which coöperate with said ratchet-wheels to effect an intermittent feed movement of the ribbon and which are fixed with relation to the transverse movement of said ratchet-wheels whereby when the ribbon is wound upon one spool the weight of the ribbon will cause an engagement of the ratchet-wheel of one spool with the ratchet feed-pawl of said ratchet-wheel.

6. In an automatic ribbon-reversing mechanism for type-writing machines the combination of a ribbon-feed mechanism for alternately feeding the ribbon in opposite direc-

tions and means operated by the weight of the ribbon for bringing the feed mechanism into effective operation to feed the ribbon in one direction or another accordingly as the preponderance of ribbon is on one or the other side of the machine.

7. In an automatic ribbon-reversing mechanism for type-writing machines the combination of a ribbon-feed mechanism for alternately feeding the ribbon in opposite directions, means operated by the weight of the ribbon for bringing the feed mechanism into effective operation to feed the ribbon in one direction or another accordingly as the preponderance of ribbon is on one or the other side of the machine and controlling mechanism for permitting the movement of the weight-operated means at a predetermined point in the feed of the ribbon in either direction.

8. In an automatic ribbon-reversing mechanism for type-writing machines, the combination of ribbon-spools, a ribbon-feed mechanism for alternately and intermittently rotating said spools in order to alternately feed the ribbon in opposite directions, means operated by the weight of the ribbon for bringing the feed mechanism into effective operation to feed the ribbon-spools in one direction or another accordingly as the preponderance of ribbon is on one or the other ribbon-spool and a latch for permitting the movement of the weight-operated means at a predetermined point in the feed of the ribbon in either direction.

9. In an automatic ribbon-feed mechanism for type-writing machines the combination of a ribbon, a pair of rotatable ribbon-spools which are likewise moved transversely by the weight of the ribbon, intermediate connections between said ribbon-spools for transmitting a transverse movement to one of said spools when the other is moved transversely, means for locking either of said spools against transverse movement and means for releasing the locking means by a movement of the ribbon.

10. In an automatic ribbon-feed mechanism for type-writing machines the combination of a ribbon, a pair of rotatable ribbon-spools which are likewise moved transversely by the weight of the ribbon, intermediate connections between said ribbon-spools for transmitting a transverse movement to one of said spools when the other is moved transversely, locking means for both of said spools to lock the same against transverse movement, said parts being so arranged that the locking means of one spool will be free from engagement when the locking means of the other spool is in locking engagement, and means for releasing the locking means by a movement of the ribbon.

11. In an automatic ribbon-feed mechanism for type-writing machines the combination of a ribbon, a pair of balanced rotatable and transversely-movable ribbon-spools, the

said spools being moved transversely by the weight of the ribbon, intermediate connections between the said ribbon-spools for transmitting a transverse movement to one of said spools when the other is moved transversely, means for automatically locking either of said spools against transverse movement, means for releasing the locking means by a movement of the ribbon and ribbon-feed mechanism which is operative to transmit a rotary movement to the ribbon-spools in either direction, the direction of movement depending upon which spool is in engagement with the locking means.

12. In an automatic ribbon-feed mechanism for type-writing machines the combination of a ribbon, a pair of balanced rotatable and transversely-movable ribbon-spools, intermediate connections between said ribbon-spools for transmitting a transverse movement to one of said spools when the other is moved transversely, locking means for both of said spools to lock the same against transverse movement, said parts being so arranged that the locking means of one spool will be free from engagement when the locking means of the other spool is in locking engagement, means for releasing the locking means of either spool by a movement of the ribbon and ribbon-feed mechanism which is operative to transmit a rotary movement to the ribbon-spools in either direction, the direction of movement depending upon which spool is in engagement with the locking means.

13. In an automatic ribbon-feed mechanism for type-writing machines the combination of a ribbon, a pair of rotatable and transversely-movable ribbon-spools, the transverse movement of said ribbon-spools being effected by the weight of the ribbon, intermediate connections between said spools for transmitting a transverse movement to one of said spools when the other is moved transversely, means for locking either of said spools against transverse movement, means for releasing the locking means by a movement of the ribbon, ratchet-wheels for rotating said ribbon-spools, feed-pawls for rotating said ratchet-wheels and means for moving said ratchet-wheels and pawls into and out of coöperative relation, the movement of the ratchet-wheels and pawls into and out of coöperative relation being effected by the transverse movement of the ribbon-spools.

14. In an automatic ribbon-feed mechanism for type-writing machines the combination of a ribbon, a pair of rotatable and transversely-movable ribbon-spools, the transverse movement of the ribbon-spools being effected by the weight of the ribbon, intermediate connections between said ribbon-spools for transmitting a transverse movement to one of said spools when the other is moved transversely, automatic locking means for both of said spools to lock the same against transverse movement, said parts being so arranged that the locking means of one spool will be free

from engagement when the locking means of the other spool is in locking engagement, means for releasing the locking means of either spool by a movement of the ribbon, ratchet-wheels for rotating said ribbon-spools, feed-pawls for rotating said ratchet-wheels and means for moving said ratchet-wheels and pawls into and out of coöperative relation, the movement of the ratchet-wheels and pawls into and out of coöperative relation being effected by the transverse movement of the ribbon-spools.

15. In an automatic ribbon-feed mechanism for type-writing machines the combination of a ribbon, ribbon-spools therefor, each of said ribbon-spools having a central opening therein and a pivoted latch carried by each of said ribbon-spools, each latch being adapted to be connected to the ribbon and to be projected across the central opening in its coöperative ribbon-spool and a locking-head coöperating with each latch.

16. In an automatic ribbon-feed mechanism for type-writing machines the combination of a ribbon, ribbon-spools therefor, each of said ribbon-spools having a central opening therein, a pivoted latch carried by each of said ribbon-spools each latch being provided with means for connecting it to the ribbon and adapted to be projected across the central opening in its coöperating ribbon-spool and a spring-pressed tapering locking-head projecting into the central opening in each ribbon-spool and coöperating with the latch thereof.

17. In an automatic ribbon-feed mechanism for type-writing machines the combination of a ribbon, rotatable and transversely-movable ribbon-spools therefor, each of said ribbon-spools having a central opening therein, means for rotating said ribbon-spools in either direction according to the transverse position of said ribbon-spools, a pivoted latch carried by each of said ribbon-spools, each latch being adapted to be connected to the ribbon and to be projected across the central opening in its coöperating ribbon-spool and a locking-head coöperating with each latch.

18. In an automatic ribbon-feed mechanism for type-writing machines the combination of a ribbon, rotatable and transversely-movable ribbon-spools therefor, each of said ribbon-spools having a central opening therein, means for rotating said ribbon-spools in either direction according to the transverse position of said ribbon-spools, a pivoted latch carried by each of said ribbon-spools each latch being provided with means for connecting it with the ribbon and adapted to be projected across the central opening in its coöperating ribbon-spool and a spring-pressed tapering locking-head projecting into the central opening in each ribbon-spool and coöperating with the latch thereof.

19. In an automatic ribbon-feed mechanism for type-writing machines the combination of a ribbon, balanced ribbon-spools there-

for each ribbon-spool having an opening therein, a ratchet-wheel operatively connected to and movable with each of said spools, an automatically-operated locking-head projecting into the opening in each spool, a latch cooperating with each locking-head and adapted to be operated by the ribbon, a universal bar, feed-pawls moved by the universal bar and adapted to cooperate with the ratchet-wheels whereby when one latch is in engagement with its locking-head the feed-pawls and ratchet-wheel of one spool will be in cooperative relation and the feed-pawl and ratchet-wheel of the other spool will be out of cooperative relation.

20. In an automatic ribbon-feed mechanism for type-writing machines the combination of a ribbon, balanced ribbon-spools therefor, each ribbon-spool having a central opening and a ratchet-wheel operatively connected to and movable with each of said spools,

an automatically-operated laterally-deflectable tapering locking-head projecting into the opening in each spool, a latch cooperating with each locking-head and adapted to be operated by the ribbon and to deflect its locking-head laterally, feed-pawls adapted to cooperate with the ratchet-wheels whereby when one latch is in locking engagement with its locking-head the feed-pawl and ratchet-wheel of one spool will be in cooperative relation and the feed-pawl and ratchet-wheel of the other spool will be out of cooperative relation and whereby a movement of one spool from the locked position will bring about the automatic locking engagement of the latch of the other spool with its locking-head.

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Witnesses:

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