

(No Model.)

3 Sheets—Sheet 1.

J. D. DAUGHERTY.
TYPE WRITING MACHINE.

No. 581,574.

Patented Apr. 27, 1897.

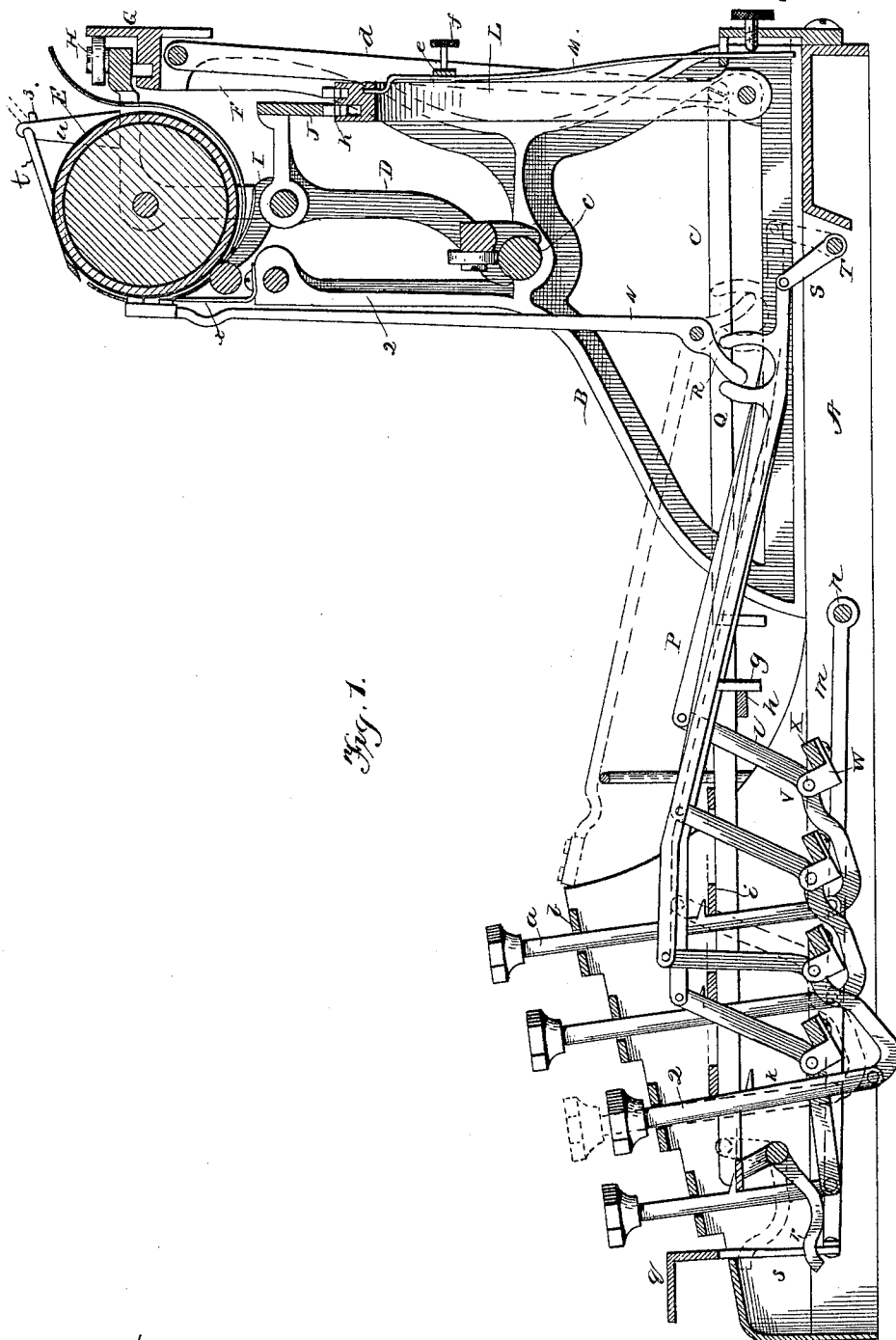


Fig. 1.

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attys

(No Model.)

3 Sheets—Sheet 2.

J. D. DAUGHERTY.
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Fig. 2.

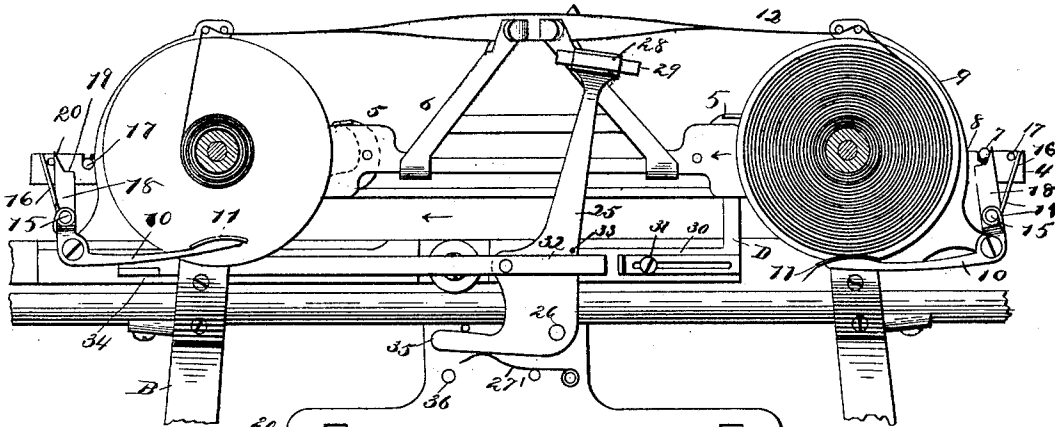


Fig. 4.

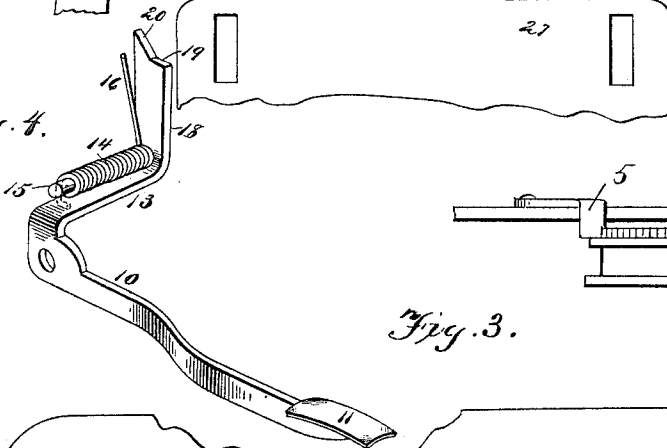


Fig. 5.

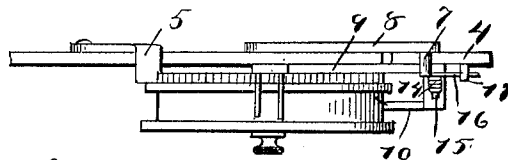
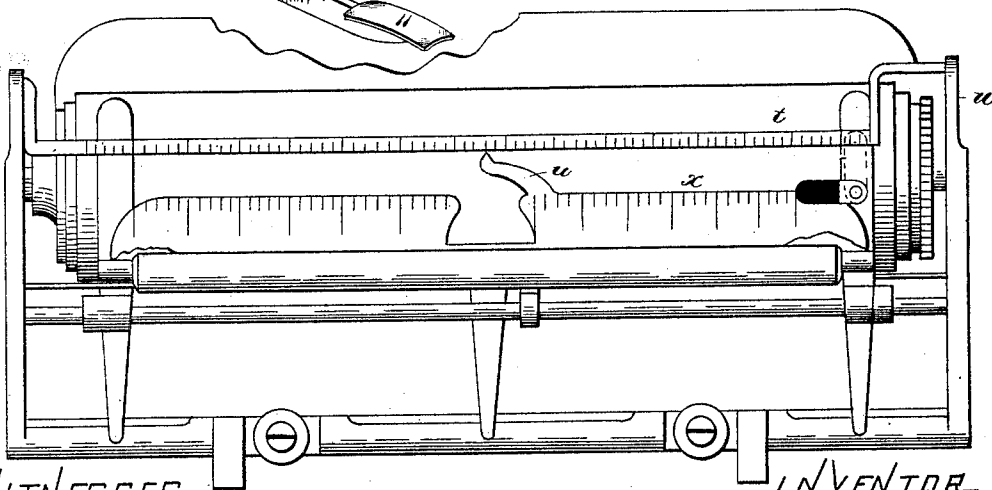


Fig. 3.



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(No Model.)

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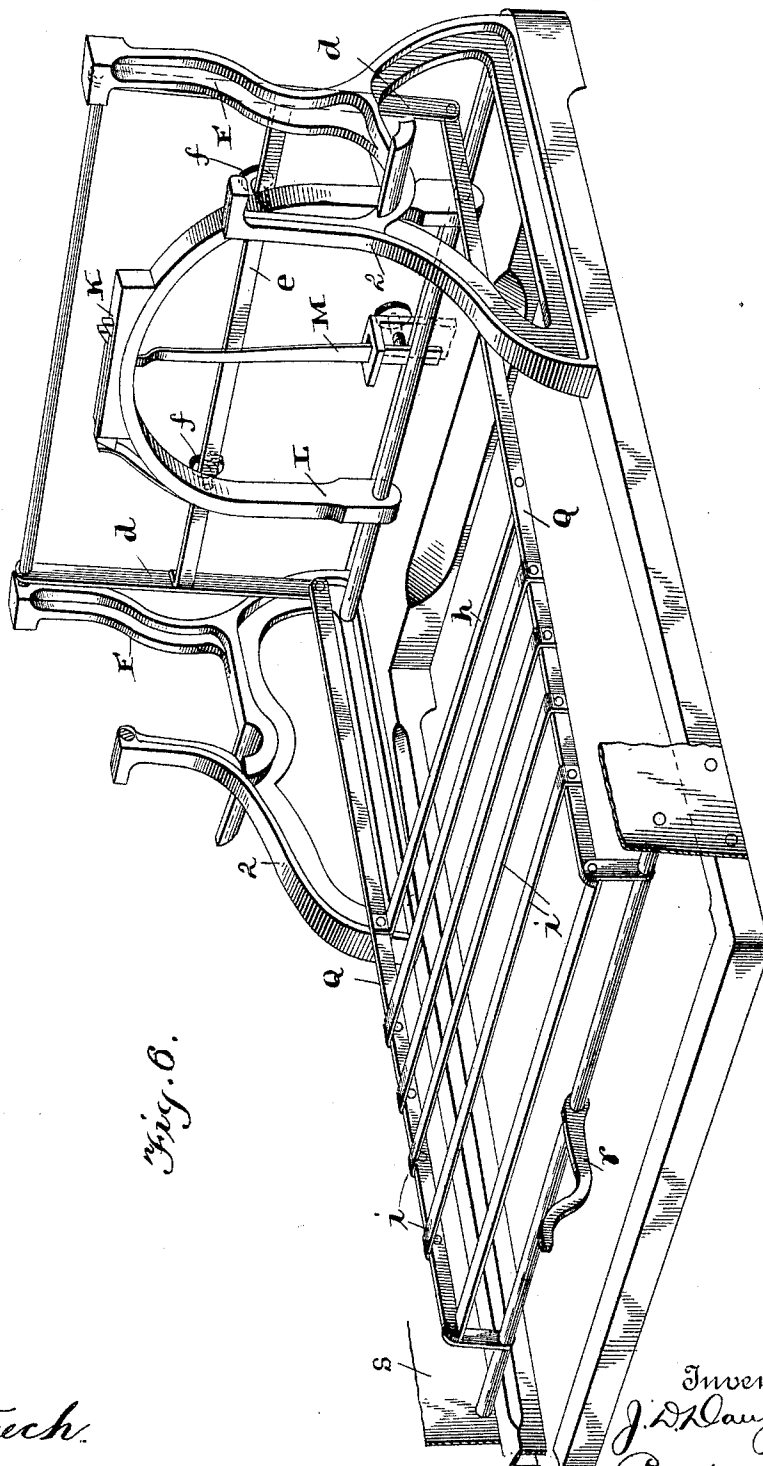


Fig. 3.

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UNITED STATES PATENT OFFICE.

JAMES DENNY DAUGHERTY, OF KITTANNING, PENNSYLVANIA.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 581,574, dated April 27, 1897.

Application filed September 15, 1894. Renewed September 4, 1896. Serial No. 604,895. (No model.)

To all whom it may concern:

Be it known that I, JAMES DENNY DAUGHERTY, of Kittanning, in the county of Armstrong and State of Pennsylvania, have invented certain new and useful Improvements in Type-Writing Machines; and I do hereby declare the following to be a full, clear, and exact description, of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification.

My invention relates to improvements in type-writing machines; and it consists in the arrangement and combination of parts which will be fully described hereinafter, and particularly pointed out in the claims.

One object of my invention is to prevent the piling of letters at the end of a line and permit the writing of two, three, or more letters thereafter to finish or complete a word and without the locking of the key-levers or type-bars, so that there is no strain thereon when struck at the end of a line, in contradistinction to the common method of locking the key-lever or type-bars, so that there is a strain thereon when struck by the operator when the end of the line is reached.

Another object of my present invention is to provide an automatic ribbon-reverse accomplished by the filling of a spool, which stores power for throwing the reverse-bar at the proper time and without any strain or tension upon the ribbon.

Another object of my present invention is to provide a lock for all of the finger-keys, whereby when one key is depressed for making an impression the others are locked so that they cannot be depressed, thus preventing any possible interference of the type-bars or type, while at the same time there is no interference with the quick and rapid operation of the machine.

Another object of my invention is to provide a swinging scale which serves the three-fold purpose of a scale, an envelop-guide and holder, and a support for the paper when swung back.

Another object of my invention is to so arrange and construct the key-lever action that a piano or staccato movement of the type-bar

is secured and an independently-guided finger-stem provided, whereby the finger-stem is allowed a perfectly straight movement independent of any lateral or side movement of the short end of the type-bar or its operating connection.

Another object of my present invention is to so arrange the universal bar that it is operated by the operating connection between the type-bars and the finger-keys.

In the accompanying drawings, Figure 1 represents a vertical longitudinal sectional view of a type-writer which embodies my invention. Fig. 2 is a front elevation of the ribbon-spool, the ribbon-shifting frame, showing the automatic ribbon-reverse, and the buffer for preventing the type from printing when the end of a line is reached. Fig. 3 is front elevation of the carriage, showing the swinging scale. Fig. 4 is a detached perspective view of one of the bell-crank shoe-levers used in the ribbon-reverse. Fig. 5 is a top view of one of the ribbon-spools and the ribbon mechanism shown in connection therewith. Fig. 6 is a perspective view of the base and end of the machine-frame, the universal and dog-carrying frames being shown in position thereon.

Reference is made to the drawings forming part of this specification, in which—

A indicates the base or bed of the machine, and B the standards at the sides thereof, which standards support the transverse carriage-rod C, upon which the rollers at the lower end of the carriage D rest and move.

The standards B have the vertical extensions F, provided with the vertical flange G, against which a roller H at the rear of the carriage rolls and which is substantially back of the printing-point of the cylinder or platen E.

I represents rearwardly-extending arms having the feed-rack J connected to their outer ends, with which the dogs K of the vibrating frame L engage.

The parts just enumerated form no part of the present invention except in combination with the other mechanisms to be presently described, they being fully shown and described in my patent granted February 13, 1894, No. 514,846, and they need not, therefore, be more fully described in this connection. The dogs

K may be of the form shown and described in said patent, or any other suitable form that may be preferred.

The vertical frame L, which carries the dogs K, is held outward by means of a spring M, capable of adjustment and of the same construction substantially as that shown and described in the above-named patent and need not be more particularly referred to in this application.

The type-bars N are pivoted near their lower ends in the segment of a vertical circle and supported in a vertically-shifting frame, (not here shown or described, but which is fully shown and described and claimed in my Patent No. 514,846, dated February 13, 1894, and which need not be further shown or described in this application in order to enable my present invention to be fully comprehended and understood.)

The type-bars N are thrown to the printing-point (shown in full lines in Fig. 1) through the medium of the endwise-moving connections P, which are provided with the upwardly-extending socket Q, which socket receives the depending short ends R of the type-bars. The inner ends of these connections P are pivoted to links S, supported by a transverse shaft T in the bed of the machine, and their outer ends are pivoted to the upwardly and inwardly extending ends U of the bell-crank levers V. These bell-crank levers V are intermediately pivoted in suitable hangers W, which are detachably connected to transverse bars X, held in any suitable manner in the bed A of the machine.

The finger-stems *a* pass through transverse guides *b* and have their lower ends pivotally connected to the outer ends of the bell-crank levers V.

It will thus be seen from this arrangement of parts that owing to the socket Q the short end R of the type-bars is permitted an independent movement of the said operating connection P, so that when thrown to the printing-point it has an independent rebound, and also so that the point at which the inner prong of the socket Q engages the portion R of the type-bars moves from the outer end of the portion R toward its pivotal point as it is carried upward, so that an increased movement is given to the bar as it travels toward the printing-point, thus affording what is known as the "piano" or "staccato" movement, by the endwise movement of the connection P when the finger-stem *a* is depressed.

The inner end of the universal frame *c* is pivotally connected to the lower end of swinging arms or links *d*, having their upper ends pivotally connected with the upper ends of the standards F at the rear of the platen, as clearly shown in Fig. 1. Extending across in front of these arms *d* is a plate or bar *e*, which is connected rigidly with the dog-frame L and has its end in front of the said arms *d*. Adjusting-screws *f* pass through a cross-bar *e*, uniting these arms *d*, and engage the end of

the spring M, or may engage the frame L, so that the dog-frame L can be adjusted inward or outward in relation to the position assumed by the arms or links *d*, and thus the carriage made to feed at any desired portion of the swing of the type-bars, as will be readily understood.

The connections P, which operate the type-bars, are provided with depending lugs *g*, which rest and engage the inner edge of a transverse bar *h*, which has its ends connected to the side bars of the universal frame *c*. By this arrangement it will be understood that when one of the finger-keys is depressed and the connection P drawn endwise the lug *g* thereon engages the transverse bar *h* and moves the universal frame *c* endwise, drawing inward upon the lower end of the links *d*, which carries with it the dog-frame L, thus causing the dogs to move in and out of the feed-rack K, as is well understood by those versed in the art.

The locking of the finger-keys against movement of any one thereof when any other one is depressed for carrying the type-bar to the printing-point is accomplished by extending the universal frame *c* under the finger-keys, as shown, and providing it with transverse bars *i* immediately in front of the finger-key stems *a*. These finger-key stems *a* are each provided with inwardly-projecting lugs *k*, which engage the transverse bars *i* and prevent them from being depressed, as shown clearly in Fig. 1, when the universal frame *c* is moved outward by the depressing of any one of the finger-keys.

By reference to Fig. 1 it will be seen that the finger-key 2 has been depressed, thus moving the universal frame outward and bringing the transverse bars *i* under the lugs *k* of the other finger-keys, so that they cannot be depressed, as clearly shown. These lugs *k* are preferably situated a certain distance above the transverse bars *i*, so that the finger-keys *a* can be depressed a portion of their movement while any one of the type-bars is at the printing-point, but cannot be depressed sufficiently to cause the type-bar to interfere with the one which has printed or which is returning from the printing-point. It will be readily understood that this construction is best so that the finger-keys may be independently depressed, so long as they are not struck so irregularly as to cause the type-bars to interfere if a lock were not provided.

By providing the locking-lugs and so situating them upon the finger-stems that if the finger-keys are struck so irregularly as to cause the type-bars to interfere the lugs will strike the transverse bars *i* and lock the finger-keys against movement. By thus adjusting the lugs upon the finger-keys one finger-key may be depressed while a type-bar is returning from the printing-point and the other finger-key is rising, but if it should be depressed before the type-bar has receded sufficiently to prevent interfering with the suc-

ceeding type-bar the finger-key which is moving the succeeding type-bar will be locked by engaging the transverse bar *i*. If desired, however, these lugs may be so situated upon the finger-keys that when one finger-key has been depressed another cannot be depressed at all until the type-bar is substantially at rest. This, however, would prevent the independent movement of the finger-keys without accomplishing any more than the other adjustment named. The main object of this locking of the finger-keys is to prevent the interfering of the type-bars, which batter the face of the type and is liable to spring the bars out of their proper line, so that they might be caused to wedge or be lazy in their movement, owing to some abnormal friction.

Arms or links *m* have their inner ends supported by the shaft *n*, and connected with their outer ends is the spacing-bar *q*, which spacing-bar when depressed engages the bell-crank lever *r*, which bell-crank lever supports the outer ends of the universal frame *c*, as shown in Fig. 1. The outer end of the bell-crank lever *r* moves in a slot *s*, made in the depending portion of the space-bar *q*, so that the said lever is permitted a free up-and-down movement when the finger-keys are being operated for printing.

Reference being made particularly to Figs. 1 and 3, *t* represents a swinging scale which is essentially U-shaped, having its ends bent upward and outward and pivotally supported in lugs *u*, extending upward from the rearwardly-extending arms of the carriage. This swinging scale, when in the position shown in Figs. 3 and 1, serves the purpose of holding the flaps of envelopes and other narrow strips of paper, and also serves as a convenient scale in connection with the upwardly-extending pointer *w*, which is a part of the scale *x*, which is attached to the portion 2 of the standards B, as clearly shown in Fig. 1. The scale *t* is adapted to be thrown backward out of the way when desired, and when thrown backward, as shown partially in dotted lines in Fig. 1, it rests upon lugs 3 of the arm *q*, and in this position it forms a convenient support for the sheet of paper which is being printed upon, thus holding it in a convenient position to be read, as will be readily understood.

The ribbon-feed of this invention is the same as that shown and described in my patent, dated August 4, 1891, No. 457,258, and need be but briefly described here.

An endwise-moving bar 4 is supported as described in that patent and carries the dogs 5, which are operated by the tilting frame 6, as also fully described in that patent. This mechanism is thus briefly referred to in order to enable my automatic shift to be understood, which I will now proceed to describe.

The endwise-moving bar 4 is held in its reversed position by means of pins 7, which extend from pivoted arms 8 and rest in notches formed in the endwise-moving shift-bar 4.

Beneath this shift-bar 4 and outside of the spool 9 are the bell-crank levers 10, which have their inner ends provided with shoes 11, adapted to rest against the ribbon 12, as clearly shown at the right-hand end of Fig. 2. These bell-crank levers 10 are provided with inwardly-extending horizontal portions 13, which carry the springs 14 upon pins 15, these springs 14 having upwardly-extending ends 16, adapted to engage pins 17, extending outward from opposite ends of the endwise-moving shift-bar 4. The upper ends 18 of these bell-crank levers are provided with a straight portion 19, upon which the pins 7 are adapted to rest, and with the incline or cam-surfaces 20, adapted to engage the pins 7 and raise them out of their slots in the bar 4.

The operation of this automatic shift is as follows: By reference to Fig. 2 it will be seen that the spool at the right-hand end of said figure is about full and the automatic shift about ready to operate. The winding of the ribbon upon said spool has moved the lower end of the bell-crank lever 10 downward, moving its upper end inward, so that the cam-surface 20 is brought into contact with the pin 7. The inward movement of the upper end of the bell-crank lever has caused a tension upon the pin 17 through the medium of the upper end 16 of the coil-spring 14 and as the ribbon winds upon the said spool, and the lower end of the bell-crank lever is further forced downward, and from the shake of the machine the cam-surface 20 moves the pin 7 up out of the slot in the bar 4, and the end 16 of the spring 14 instantly throws the bar 4 endwise in the direction indicated by arrow in Fig. 2. This endwise movement of the bar 4 moves the dog 5 out of engagement with spool at the right-hand end of Fig. 2 and carries the dog 5 at the other end of the bar in contact with the ratchets of the spool at the opposite side of the machine and tilts the bell-crank lever at that side of the machine upward by engaging the end 16 of the spring. There is no opposition to the upward movement of the lower end of the bell-crank lever at the left-hand side of Fig. 2 when the bar 4 is moved endwise, owing to the fact that there is little or no ribbon thereon. As the ribbon winds upon the spool at this end the operation just described is repeated, and the endwise-moving bar 4 moves in the opposite direction and the ribbon is shifted. From this description it will be seen that I have produced an automatic shift which does not cause any strain upon the ribbon, but in which the winding of the ribbon stores power through the medium of the spring, and the bell-crank lever forms a trip for tripping the endwise-moving bar, so that the stored power throws it endwise, as will be readily understood. I do not desire to limit myself to a spring, for it will be readily understood that a weighted lever might be substituted for the spring, the upper end of the lever engaging the pin 17.

The mechanism for preventing piling of letters at the end of the line consists of an arm or lever 25, which is pivoted at the point 26 upon the extension 27, which extension projects upward from the base of the machine, and this lever 25 is normally held in the position indicated in full lines in Fig. 2 by means of a spring 27'. At the upper end of this lever is a buffer 28, and extending in opposite directions from this buffer are the arms 29. A slotted bar 30 is held to the carriage D by means of a screw 31 and is adjustable endwise. The inner end of this slotted plate 30 is bent outward and adapted to engage the projecting end of the intermediately-pivoted release-key 32, which is supported by the arm 25. A pin 33 prevents the short end of the release-key 32 from moving upward and holds it in the path traveled by the inner end of the slotted plate 30. The outer end 34 of the release-key 32 extends beyond the standards B for manipulation, as will presently appear.

As the carriage moves endwise in the direction indicated by arrow in Fig. 1 the inner end of the slotted plate 30 engages the inner end of the intermediately-pivoted release-key 32 and forces the arm 25 in the direction indicated by arrow, thus throwing the buffer 28 in the line of movement of the type-bars until the arm 35 of the lever 25 engages the stop 36, at which point the buffer is directly in front of the line of movement of the type-bar and the carriage is stopped, as will be readily understood. In this position the key-levers may be operated as freely as desired and the type-bars caused to strike the buffer 28 without bringing any strain whatever upon the machine. If it should be desired to complete the word, it is only necessary to press upward upon the outer end of the release-key 32, which will carry its inner end below the adjacent end of the plate 30, thus permitting the arm 25 to move in the position shown in full lines in Fig. 2, when the word can be added, as will be readily understood. Owing to the slotted plate 30, it will be seen that the said plate can be moved inward and the machine caused to be stopped at adjusted distances to the regulated length of line, as may be desired. It will thus be seen that I use a buffer in contradistinction to using a lock for the printing mechanism of the machine, whereby all the strain on the printing mechanism is avoided, while the same object is accomplished.

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

1. A type-writer comprising a series of outwardly-extending type-bars having short depending ends, a series of key-levers, a series of horizontally-moving connections beneath said type-bars and substantially parallel therewith when the latter are at rest, one end of said connections loosely connected with the key-levers, a movable support for their

opposite ends, the connections having upwardly-extending sockets receiving the depending short ends of the type-bars, as shown.

2. A type-writer comprising a series of outwardly-extending type-bars pivoted near their inner ends, a series of finger-keys, a series of rods beneath and substantially parallel with the type-bars when the latter are at rest, a movable support at their inner ends, said rods having upwardly-projecting sockets receiving the inner short ends of the type-bars, the outer ends of said rods being operatively connected with said finger-keys, substantially as specified.

3. A type-writer comprising a series of substantially horizontal outwardly-extending type-bars pivoted near their inner ends, a series of endwise-moving rods beneath and parallel with the type-bars when the latter are at rest, having upwardly-extending sockets receiving the short ends of the type-bars, the inner ends of said rods being suitably supported, bell-crank levers to one end of which the outer ends of the said rods are connected, and finger-keys connected to the opposite ends of the said bell-crank levers, substantially as shown.

4. A type-writer comprising a series of bell-crank levers at the keyboard end of the machine, a series of links at the opposite end of the machine, endwise-moving substantially horizontal rods having their ends connected respectively with said bell-crank levers and links and provided at their inner ends with sockets, endwise-moving finger-keys connected with the opposite ends of said levers, and a series of outwardly-extending type-bars having their inner ends pivotally supported above and adjacent to said sockets, each bar having a depending short arm resting in the socket of the corresponding endwise-moving rod, substantially as described.

5. A type-writer comprising a series of type-bars, a series of finger-keys, endwise-moving type-bar-operating connections having one end operatively connected to the finger-keys, an endwise-moving universal frame, said operating connections adapted to engage the endwise-moving frame, substantially as specified.

6. A type-writer comprising a series of bell-crank levers, a series of finger-keys connected at one end thereof, a series of endwise-moving rods connected with the opposite end, said rods adapted to operate the type-bars, an endwise-moving universal frame, and depending lugs from said endwise-moving connections adapted to engage the said universal frame, substantially as set forth.

7. A type-writer comprising a series of type-bars, a series of finger-keys, a series of connections between the type-bars and the finger-keys, an endwise-moving universal frame adapted to be operated by the connections between the finger-keys and the type-bars, a depending vibrating frame pivoted at its upper end and connected at its lower end to the

endwise-moving universal frame, and a vibrating dog-frame operated by the depending vibrating frame, substantially as specified.

8. A type-writer comprising a series of type-bars, a series of finger-keys, a series of operating connections between the finger-keys and the type-bars, an endwise-moving universal frame operated by the said intermediate connections, a depending vibrating frame pivoted at its upper end, a vibrating dog-frame, and an adjustable connection between the depending vibrating frame and the dog-frame, substantially as set forth.

9. A type-writer comprising a series of type-bars, a carriage, a feed mechanism for said carriage, a series of type-bars, an endwise-moving universal frame connected with and operating said carriage-feed, a printing mechanism adapted to actuate said universal frame and including finger-keys, the finger-keys having shoulders adapted to engage the universal frame for the purpose described.

10. A type-writing machine comprising a series of type-bars, a series of finger-keys operatively connected therewith, a carriage-feed mechanism, an endwise-moving universal frame operatively connected with the finger-keys and with said carriage-feed mechanism, the finger-keys having shoulders, said universal frame provided with transverse bars adapted to engage the said shoulders of the finger-keys when moved thereby, substantially as and for the purpose described.

11. A type-writer comprising a series of type-bars, a series of finger-keys operatively connected therewith, said finger-keys having an independent movement sufficient to move the type-bars to a point where two of said bars will nearly interfere, and a movable universal frame common to and adapted to engage and lock the said finger-keys when the said interfering-point is reached, substantially as and for the purpose set forth.

12. The combination in a type-writer of a platen, a pressure-roller coacting therewith, and a U-shaped swinging frame or scale pivotally supported at its ends and swinging entirely independent and free from engagement with said pressure-roller, and a stop adapted to limit the rearward movement of said frame, whereby it will support the paper at the rear of the platen while the machine is in operation, substantially as described.

13. A type-writer comprising a scale above the printing-point, a scale beneath the printing-point, said under scale being cut out to permit an impression, and a pointer extending from the under scale around, over and in a line with the printing-point and cooperating with the upper scale.

14. The combination with a type-writing machine, of a movable buffer adapted to be actuated across the line of travel of the type by the movement of the carriage, substantially as described.

15. The combination in a type-writer of a movable buffer adapted to be moved by the carriage in the path traveled by the type-bar, said buffer adapted to arrest the movement of the carriage at the end of the line.

16. The combination in a type-writer of a buffer adapted to be moved by the carriage into the path traveled by the type-bar at the end of the line, said buffer having a movement independent of the carriage to be moved out of said path to permit the printing of the letters.

17. The combination in a type-writing machine, of a carriage, a movable arm carrying a buffer, the said arm adapted to be moved by the carriage in the path traveled by the type at the end of the line.

18. The combination in a type-writing machine of the carriage, a movable arm carrying a buffer, and a trigger or lever adapted to be engaged by the carriage for moving the arm in the path traveled by the type-bars, said trigger adapted to be moved out of line of the carriage and permitting a backward movement of said arm for the purpose described.

19. The combination in a type-writing machine of the carriage, a vertical arm pivoted at its lower portion, a spring for normally holding the upper end of the arm to the right, said arm adapted to be moved by the carriage across the path of the type-bars for the purpose specified.

20. The combination in a type-writing machine of a vertical arm pivoted near its lower end, the upper end of the said arm carrying a buffer normally to the right of the path traveled by the type-bars, a lever carried by said arm adapted to be engaged by the carriage, the lever adapted to have its engaged end moved out of engagement with the carriage for the purpose set forth.

21. The combination in a type-writing machine of an arm pivoted near its lower end carrying a buffer at its upper end, said arm adapted to be operated and moved across the path traveled by the type-bars by the carriage, a lever engaged by the said carriage, the lever having one end extended to the outside of the frame of the machine to be operated for throwing it out of engagement with the carriage as and for the purpose described.

22. The combination in a type-writing machine of an arm pivoted near its lower end, and extending upward to near the printing-point and provided with a buffer, the upper end of the said arm normally resting at the right of the printing-point, the arm adapted to be engaged and moved by the carriage, and a stop for the said arm whereby the carriage is arrested for the purpose described.

23. The combination in a type-writing machine of a movable buffer adapted to be moved by the carriage across the path traveled by the type-bars when the end of the line is

reached, and a means for adjusting and regulating the point at which the said buffer shall be moved, whereby the length of the line before the buffer is at the printing-point is regulated substantially as specified.

24. The combination in a type-writing machine of a movable arm carrying a buffer, said arm adapted to be moved by the carriage across the line traveled by the type-bars, and an adjustable stop upon the carriage for engaging the said arm for the purpose set forth.

25. A type-writer-ribbon feed comprising a movable bar carrying dogs for operating the spools, levers having one end engaging the ribbon as wound upon the spool, a stop for the said movable bar, the opposite end of the levers adapted to engage the stop for throwing it out of engagement with the bar, and a spring carried by the lever adapted to engage the bar for moving it endwise when the stop is thrown out.

26. A type-writing machine comprising a reversible ribbon-feed, a movable shoe engaged by the ribbon as it is wound upon the spool, a means for moving the ribbon-reverse, said means engaged and set by the movement of the shoe, and a stop for the movable re-

verse engaged and tripped by the movement of the said shoe.

27. A type-writing machine comprising a reversible ribbon-feed, and a trip engaged and operated by the ribbon winding upon the spool, and a spring carried by the trip engaging and adapted to throw the reverse.

28. A type-writing machine comprising a reversible ribbon-feed, a trip for the ribbon-reverse engaged and operated by the winding of the ribbon, and a means carried by the said trip for throwing the reverse.

29. A type-writing machine comprising a ribbon-reverse, a lock therefor, a bell-crank lever carrying a shoe at one end adapted to be engaged by the winding of the ribbon upon the spool, the opposite end of the said lever adapted to engage the said reverse-lock and trip it, and a means carried by the lever for throwing the said reverse.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES DENNY DAUGHERTY.

Witnesses:

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JOHN T. CRAWFORD.