(No Model.) 2 Sheets—Sheet 1.

J. W. OSBORNE.

TYPE WRITING MACHINE.

No. 383,481. Patented May 29, 1888.

Fig. 1.

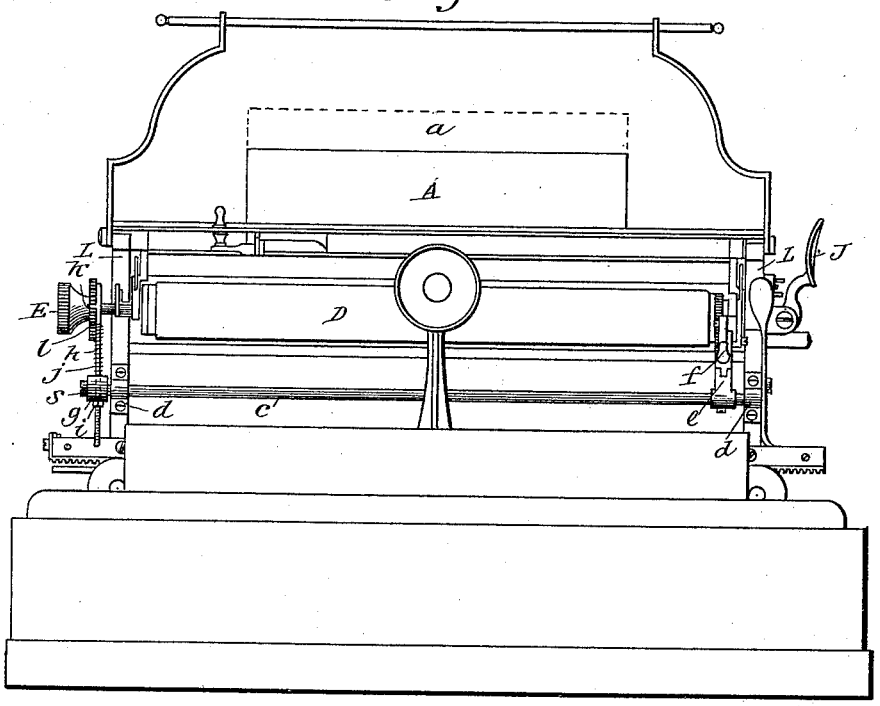


Fig. 2.

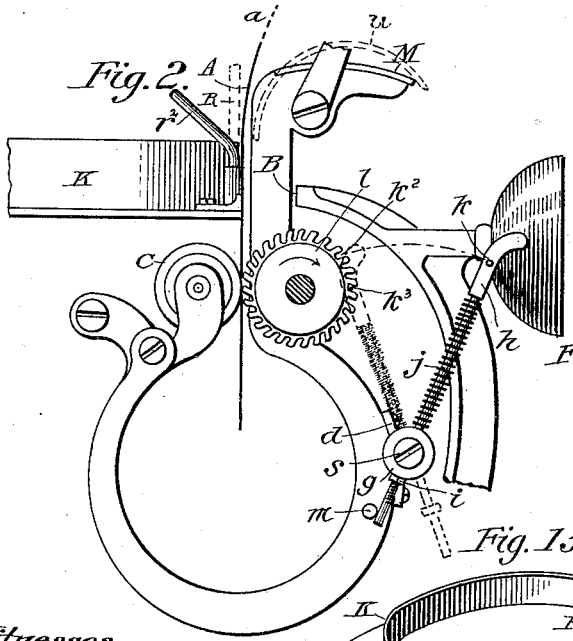


Fig. 3.

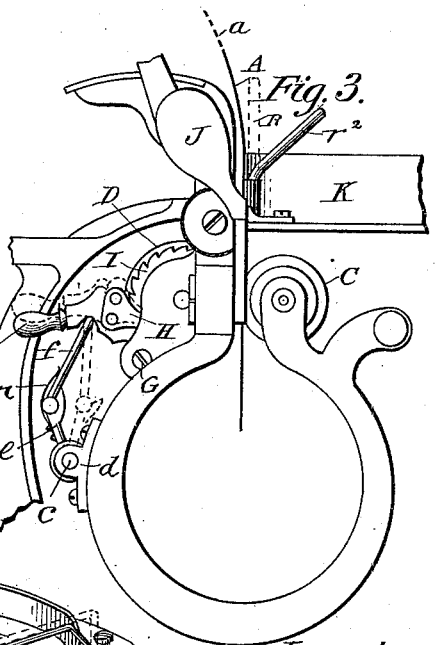
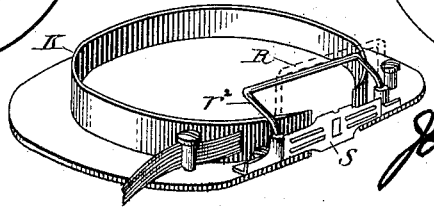


Fig. 15.



Witnesses.
J. L. Clark.
Philip Hammond.

Inventor:
John W. Osborne

(No Model.) 2 Sheets—Sheet 2.

J. W. OSBORNE.

TYPE WRITING MACHINE.

No. 383,481. Patented May 29, 1888.

Fig. 6.

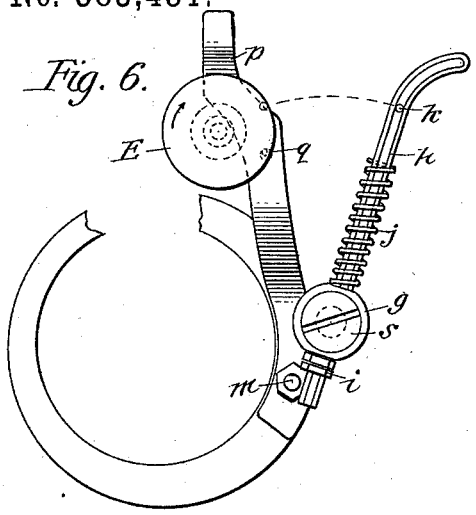


Fig. 7.

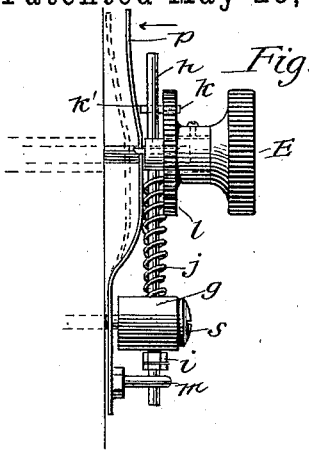


Fig. 4.

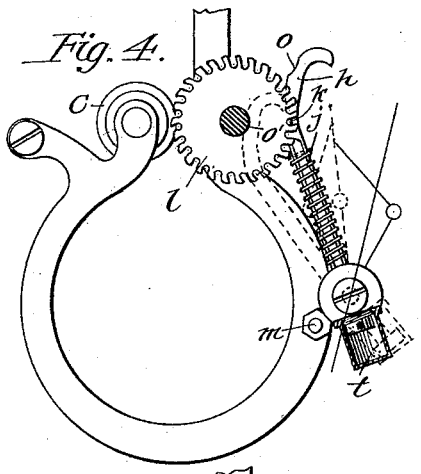


Fig. 5.

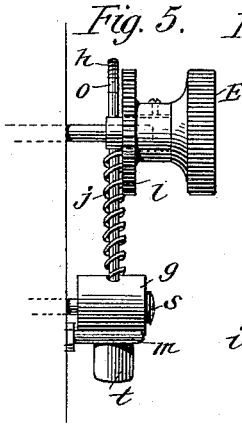


Fig. 13.

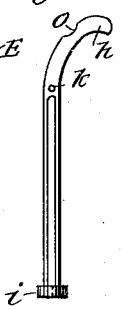


Fig. 14.

Fig. 8.

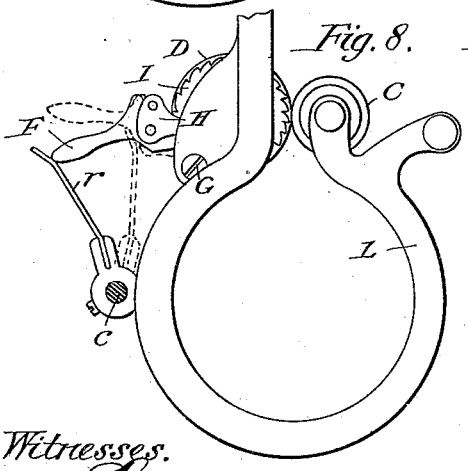


Fig. 9.

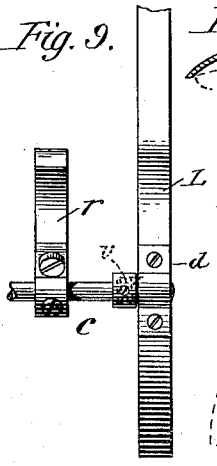


Fig. 10.

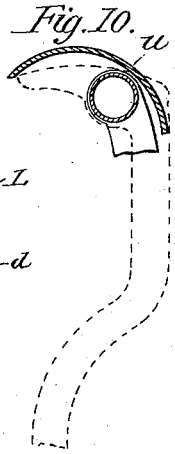


Fig. 11.

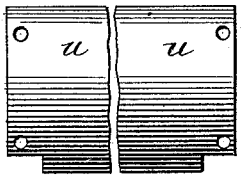
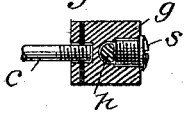


Fig. 12.



Witnesses.

J. Clark.

Philip Mauro.

Inventor.

John W. Osborne

UNITED STATES PATENT OFFICE.

JOHN W. OSBORNE, OF WASHINGTON, DISTRICT OF COLUMBIA.

TYPE-WRITING MACHINE.

SPECIFICATION forming part of Letters Patent No. 383,481, dated May 29, 1888.

Application filed February 19, 1887. Serial No. 228,196. (No model.)

To all whom it may concern:

Be it known that I, JOHN WALTER OSBORNE, a subject of the Queen of Great Britain, residing at Washington, in the District of Columbia, have invented certain new and useful Improvements in Type-Writing Machines; and I do 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 appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention is related to the devices used in connection with type-writers, which control and regulate the proper presentation of the paper which is to receive the impression from the type; and it is especially adapted for use in connection with the Hammond type-writer and others of similar construction in this respect, inasmuch as it furnishes means for the proper inspection of the writing, and at the same time greatly facilitates the erasure of errors.

In the drawings forming part of this specification, Figure 1 represents, on a reduced scale, my attachment as seen on the back part of a type-writer. Fig. 2 is an elevation of the same mechanism, seen from the right-hand side of a Hammond machine, with part of the latter. Fig. 3 is a similar view from the left. Figs. 4 and 5 illustrate a method of locking the feed-roll when the paper is raised. Figs. 6 and 7 show another method by which the same end is accomplished. Figs. 8 and 9 show details of a modification, as seen from the left and from the back. Figs. 10 and 11 illustrate in cross-section and front elevation the improved erasing-plate. Figs. 12, 13, and 14 show details of construction. Fig. 15 is a perspective view of an improved ribbon-shield.

In the type-writer patented to J. B. Hammond, December 18, 1883, and numbered 290,419, which is now made and sold in substantial accord with said patent, the paper A, which receives the writing, is moved up or down, as desired, between the type-segments (vibrating horizontally within the "type-wheel guard K") and the hammer-face at B, by means of two rubber rolls, C and D, which grasp the same, one of which can be rotated by the hand. For this purpose it has a "knob" or milled head, E, upon the end of its shaft upon the right-hand side, (not shown in Figs. 2 and 3,) and is called the "feed-roll." When the machine is in use, this roll is positively fixed in one direction, while in the other it admits of a very partial rotation against a stiff spring on the axis of the "line-feed" lever J. The former direction is that which sends the paper up, and my invention has special reference to the rotation of the feed-roll in that way, as it would, if sufficient in amount, disclose the last line written. In these machines as at present manufactured it is difficult to see the last words written, inasmuch as parts of the mechanism are directly in the way, and although it is possible to see a few of the last letters of the last word if the feed-roll D be turned down, as before stated, yet this partial expedient can be used only when the line-feed is large—so that in practice it is usual to press the paper back from the ribbon-shield with the finger, and then, by leaning forward, manage to get an oblique view of the writing below, in a manner that will be understood by all those who are conversant with and able to operate this form of type-writer. As before explained, the feed-roll is locked, so that it cannot be accidentally moved while the writing is in progress, a precaution that is necessary so as to insure a true alignment, which is one of the characteristics of this machine. This is accomplished by letting the convex nose of the "feed-pawl" F in the figures jam under the projecting stud at G, which is part of the screw so lettered in Fig. 3. In my invention I release the nose of the pawl from this position, and also lift the yoke H, to which the pawl is attached (under control of a feeble spring) in a manner which is now to be described, reference being made to Figs. 1, 2, and 3, wherein small letters only will be used for the new parts, and capitals, as heretofore, for those already in common use, which latter will also be called by their accepted trade-terms.

When the locking mechanism of the feed-roll F is released, the latter can be freely rotated in either direction by its knob E. This release may be effected by lifting the pawl and the yoke H, to which it is hung, by the oper-

ator's left hand, while his right controls the knob at the other side of the machine.

I accomplish both the release and subsequent rotation of the roller by the interposition of a system of levers or lever-connections extending from the pawl to the knob, and so arranged that with one hand the operator can free the roller and turn it up at the same time, and afterward return it with precision to the position it had at the time of starting. The system of levers by the intervention of which this is made possible will now be described.

At the back of the carriage the small shaft *c* is attached to the carriage ends L by means of the bearings *d*, in which it can turn. Near the left end of the shaft, (having reference to the right and left of the operator at the key-board,) and directly under the pawl F, a toggle, consisting of the two parts *e* and *f*, is attached, the upper end of the piece *f* reaching into a notch in the pawl F. At the other end of the shaft *c* and outside the bearing *d* a boss, *g*, is made fast, the construction of which will be afterward more fully described, through which the lever *h* slides in a direction at right angles to the shaft. This device, which I shall call the "line-lift lever," has a nut or other stop, *i*, at its lower end, which bears against the under side of the boss *g* by reason of the compression-spring *j* butting against the boss and the projection on the upper part of the lever, and it also carries the tooth or stud *k* on its side.

It will be seen that as the rubber feed-roll D has to be altogether freed, it is necessary not only to get the nose of the pawl F from under the stud G, which could be done by lifting the yoke-piece H alone, but also to get the pawl out of engagement with the ratchet-wheel I, which is done by lifting the pawl itself besides. The ratchet I is fixed on the end of the feed-roll, and it has, in the Hammond machines as at present constructed, twenty-seven teeth. As a consequence, therefore, whenever a line of writing is being made the feed-roll which holds the paper is in one of twenty-seven definite positions, and can be in no other. Making use of this fact, I place on the other end of the feed-roll shaft a toothed wheel, *l*, inside the milled head or knob E, which latter is removed in Fig. 2, so as not to hide the wheel. This forms a kind of coupling mechanism between the system of levers and the knob, and I shall call it, for convenience, the "stud-wheel." It contains twenty-seven teeth, like the ratchet, and each space between two adjacent teeth is adapted to receive the round stud or tooth *k*, projecting from the lever *h*. The form of these spaces and the position of the stud-wheel on the shaft are such that when the stud is brought forward with the lever carrying it, which oscillates over the center of the boss *g*, it falls easily and exactly between two teeth, the center line of any such space, when the stud enters it, being right in the sweep made by the stud, and not necessarily radial.

The toggle, consisting of the pieces *e* and *f*, is fastened to the shaft *c* in such angular relation to the sliding lever *h* that when the toe of the toggle just clears the notch in the pawl F the lower end of the line-lift lever *h* is in contact with the stop *m* in the end of the carriage L. Furthermore, the lift of the toggle is such that when the two pieces *e* and *f* are at their highest, forming one straight line, the tooth *k* will then have just entered the stud-wheel *l*, and the feed-roll D will be a little more than clear. By this is meant that the pawl F and yoke H should be so high that the latter can be let down a little without again clamping the feed-roll or interfering with its motion in either direction. If it is now desirable to see the writing, it is only necessary—the tooth *k* being engaged with *l*—to rotate the feed-roll D in the direction of the arrow in Fig. 2, so as to throw the paper, and with it the last words written, above the type-wheel guard K into full view of the operator. In doing this the angular position of the lever *h* will accommodate itself to the partial rotation of the tooth *k* about the center of the stud-wheel, while the spiral spring *j* will yield to the downward pressure and allow the lever *h* to slide downward through the boss *g*. After inspection the feed-roller will, if let do so, rotate backward to its starting-point and not farther, the backward rotation being limited by the nut *i* at the lower end of the line-lift lever *h*, which strikes against the boss *g*, and thus serves as an effective stop. The tooth *k* being then thrown out, the strong spring on the axis of the line-feed lever J will bring down the pawl F, and throw the toggle out until the lower extremity of the lever *h* strikes the stop *m*, when the roll will be again locked fast and the writing can be proceeded with in perfect alignment.

In Fig. 2 the dotted drawing of the sliding lever indicates the position it will take when the paper A has been thrown up to the distance indicated by the dotted line at *a* in Figs. 2 and 3. In the latter the change caused in the position of the toggle, pawl, and yoke, by the movements which have been described, is also represented by dotted lines. In Fig. 2, k^2 is the place first occupied by the tooth *k*, when the sliding line-lift lever is brought over for engagement with the stud-wheel, and k^3 the position occupied by the same when the paper has been raised and the lever itself is in the dotted position. It will be seen that the stud-wheel *l*, having exactly the same number of teeth as the feed-roller ratchet, will be always in a proper position for engaging with the stud on the line-lift lever, and that with said stud it forms a coupling, uniting at the proper time the system of levers which I use to release the feed-roller with the knob; also, that the knob E with the line-lift lever, being so coupled together, accommodate themselves to the compound movements which are unavoidable when the system of levers is operated, and the pawl F not only lifted, but held

out of engagement with the ratchet until the stud returns to the position of its first contact with the wheel, and, following that, the disengagement and removal of the line lift lever have taken place. Furthermore, it is evident that the coils of the spring *j* may be made so as to come in contact with each other when the same has been compressed to any predetermined amount, whereby a stop will be provided beyond which the roller F cannot be rotated; but this end may also be reached in other ways, to which reference will subsequently be made. It is also necessary to add that the spring *n*, acting on the upper piece, *f*, of the toggle, is desirable to maintain that piece in its normal place, so that the notch in the pawl may fall upon it exactly whenever the pawl and yoke have been lifted by the hand of the operator in placing a new sheet of paper, or by the periodic use of the line-feed lever J in the regular way.

In Fig. 12 the boss *g* is shown in horizontal section. This construction is adopted to prevent the turning of the line-lift lever, to the end that the tooth *k* may always be properly presented to the stud-wheel *l*, and enter between two teeth parallel to its axis. To accomplish this, the lever *h* has a flat filed upon the sliding portion, (see Figs. 13 and 14,) which flat is flush with the bottom of the little chamber filled by the screw *s*, the end of which is turned perfectly flat. As this screw when tight in its place rests upon the bottom of the chamber only, the line lift lever can slide up and down, but cannot turn, and therefore the direction of the tooth *k* is at all times at right angles to the plane of the stud-wheel.

In Figs. 4 and 5 the further development of this invention with a view to the correction of errors in the writing is shown in end and side elevation. When engaged in erasing, it is necessary that the operator have both his hands free, and it therefore follows that when a typewritten sheet of paper is thrown up in the manner hereinbefore described it must be held or locked at a sufficient height while the erasure is being made. This may be accomplished by so adjusting the relative positions of the line-lift lever, the tooth upon it, and the setting of the stud-wheel on its shaft that when the stud has fallen in and engaged the wheel it will, after passing through an arc of six or seven teeth of the wheel, cause the line-lift lever to have passed the line joining the centers of the boss and stud-wheel. When the milled head E is released in such a position, the tendency of the compressed spring *j* will be to force the sliding lever up on the other side of the feed-roll shaft, and if it is hindered from obeying that impulse it will necessarily remain locked. This is what actually takes place, as will be seen by an inspection of Figs. 4 and 5, in which the line-lift lever is shown when it first engages the wheel, as well as the final position reached (in dotted lines) when the feed-roll is locked with the paper raised high above the type-wheel guard K. In this case it is obvious without much explanation that when the notch at *o* strikes the feed-roll shaft at *o'*, or any projection thereon, it can go no farther, whereby the upper extension of the line-lift lever assumes the function of a stop, and the lever having passed the line connecting the centers cannot go back till the hand of the operator forces the spring *j* again to shorten in length and carries the line-lift lever over the center, when the feed-roll D will return with decision to the position where its engagement first took place and not farther, by reason of the stop *i* coming in contact with the boss *g*, as above explained, and the lever being thrown out the paper is again held down to the line-guides by a roller that is effectually locked.

In Figs. 4 and 5 a small metallic box or case, *t*, is shown. This is a non-essential but useful addition to the line-lift lever *h*, for as the latter must be kept oiled, to admit of its sliding easily, the projecting end below the boss *g* is apt to soil the hands or work, and so to cause inconvenience.

Figs. 13 and 14 show in elevation from the end of the machine and from its back the line-lift lever by itself, for the better elucidation of its functions and the positions of the flat upon its side and the projecting stud or tooth *k*.

The Hammond type-writer as now manufactured is provided with an erasing-plate, M, (see Figs. 1, 2, 3, and 4,) which is not conveniently placed. I have modified this essentially by constructing one which is much rounder and which extends much lower, it being placed tangentially to the upright sheet of paper. This is shown in cross-section in Figs. 2 and 10 and in front elevation (partially) in Fig. 11, and is marked with the letter *u*. Against this the paper is laid when the line is lifted, the erasure made with suitable implements, and the line then returned to the proper position for writing by a reverse rotation of the milled head E. The gain in certainty and in time which this part of my invention effects is important, for the paper is held upon a smooth solid surface and at a most convenient angle, and the word to be corrected is not too far lifted from its original position to show an aberration therein, which is always apparent when a restoration to position from a considerable elevation is made by means of the rubber feed-roll. It does not seem necessary to contrast the facilities my invention offers for the making of erasures with the difficulties attending the methods at present in use.

Although the method hereinbefore described for locking the feed-roll D, when it has lifted the sheet to its highest position for correction, leaves nothing to be desired, there are other ways in which the same may be satisfactorily accomplished. Figs. 6 and 7 show such a method in end and side elevation. In this case the flat spring *p* is made fast to the end L of the carriage by means of the screw of the stop at *m*, which passes through it. The tooth *k* is also made to project both ways from the line-lift lever *h*, giving rise practically to a

second tooth, k'. When the line-lift lever is brought forward, as before described, and its tooth k engages with the stud-wheel l, the back tooth, k', does not touch the flat spring p, but as the milled head E is turned in the direction of the arrow, for the purpose of sending the paper up, the back tooth, k', meets the side of said spring and causes it to be deflected to the dotted position in Fig. 7 until a hole in the same at q is reached, which falls over the tooth k', the flat spring p thereby assuming its original position. When from this locked position it is desirable that the feed-roll should be released, it is only necessary to bend back the flat spring p by pressing its upper extremity in the direction of the arrow in Fig. 7 till the tooth k' is free to move, when the roll may be restored to its original position. This method of locking the feed-roll renders it feasible to let the tooth k engage the stud-wheel at a much higher point than is desirable when the hereinbefore-described method is employed, in which the necessity for the flat spring does not exist.

The toggle-joint for lifting the pawl and yoke (shown in Figs. 1 and 2 and indicated in Fig. 4) may have other devices substituted for it—as, for instance, a lever of the third order having a cam surface and made to reciprocate with the shaft c under the pawl F. In Figs. 8 and 9 such a cam is shown, which takes the form of a somewhat elastic steel blade, r. This engages with the under surface of the pawl as soon as ever the line-lift lever (on being brought forward) begins to move, the dotted lines in Fig. 8 showing its final position and the change in that of the pawl and yoke. It will be seen that the work to be done is by these means accomplished with few pieces and little complexity. When, after an inspection or erasure, the line-lift lever h returns to the position shown in Fig. 2, the action of the strong spring on the axis of the line-feed lever J will generally throw back the cam-faced lever r, and with it the lever h, automatically, until the latter strikes the stop m below. To make this action more certain and pronounced, a spiral spring, v, may be concealed within the collar, which is fast to the shaft C and made to react against the bearing d, as seen in Fig. 9. This spring is especially useful when a toggle is used in place of the cam r if, as is sometimes the case, the same has a slight inward inclination at the time when it should be automatically thrown out.

In this type-writer a movable device called the "ribbon-shield" is introduced between the paper to be written upon and the ink-ribbon. In Fig. 15 this part of the machine is shown in perspective and as it would appear if seen from the back, the carriage having been first removed. It consists of a thin plate of metal, S, (the function of which is to keep the paper clean,) with a square hole in the middle, through which the hammer-face B reaches the type. This plate is strained by a bow or "holder" made of stiff wire and shown in its usual position by the dotted lines at R. To enable the writing to be better seen, and, incidentally, to facilitate the erasure of errors on the erasing-plate u, I bend the side wires of the bow to an obtuse angle, thereby causing the horizontal wire to leave its position close to the paper and perpendicularly above the line that is being printed, and to extend over the type-wheel guard toward the front of the machine, as shown at r^2. In Figs. 2 and 3 the position of the ribbon-shield holder, both in its original and altered form, may also be clearly seen, the letters R and r^2 indicating them respectively. By bending the plane of the stiff-wire bow in this way, the inspection of the writing under all circumstances is very greatly facilitated; but I do not claim, specifically, the improved ribbon-shield in this specification, inasmuch as it forms the subject of a previous application for patent, and refer to it herein only in as far as it conduces to the successful practice of the present invention.

From the foregoing it will be readily understood that my invention may be looked upon as an attachment or addition adapted for use in connection with the Hammond type-writer, and that although it may of course be manufactured with and form part of every finished machine it may also be attached to type-writers now in existence which were not designed to receive it, as they require no change of the least importance to fit them for its adaptation unless the substitution of an improved ribbon-shield for one of the present form be so regarded; and although the application of my invention has been described and illustrated with reference to a Hammond type-writer it is manifest that it admits of being used in connection with any type-writer in which the paper is held and controlled by a roller locked and fed forward in an analogous manner.

Having thus described my invention and the practical working of the same, I wish it to be understood that I do not confine myself to the special devices shown and described, as I am well aware that others may be substituted for them without in any way departing from or changing the character of my invention or the principles that underlie it.

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

1. In a type-writer having a line-feed mechanism, the combination of a positively-operated feed-roller, and locking mechanism therefor, with a knob for operating the roller independently of the feed mechanism, and a lever-connection for disengaging the locking mechanism extended within operative proximity of the knob, substantially as described.

2. In a type-writer having a line-feed mechanism, the combination of a positively-operated feed-roller, and locking mechanism therefor, with a knob for operating the roller independently of the feed mechanism, a lever-connection extending within operative proximity of the knob for disengaging the locking mechanism and accommodating coupling mechan-

ism, substantially as described, for establishing and maintaining operative connection between the lever-connection and the knob during the rotation of the latter, whereby the roller may be freely rotated by the knob when its locking mechanism is disengaged, substantially as described.

3. In a type-writer having a line-feed mechanism, the combination of a feed-roller, and locking mechanism held in engagement with the roller by a spring, with a knob for rotating the roller independently of the feed mechanism, a lever-connection extended within operative proximity of the knob for lifting the locking mechanism against the action of its spring, and accommodating coupling mechanism, substantially as described, for establishing and maintaining operative connection between the lever-connection and the knob pending the rotation of the latter from its original position, whereby the connection of the knob with the lifting mechanism will be automatically severed when the knob returns to its original position, substantially as described.

4. In a type-writer having a line-feed mechanism, the combination of a feed-roller, and automatic locking mechanism therefor, with a knob for rotating the roller independently of the feed mechanism when the locking mechanism is lifted, and a stop for limiting the rotation of the roller by the knob, and a lock for holding it in its limited position, substantially as described.

5. In a type-writer having a line-feed mechanism, the combination of a feed roller, and automatic locking mechanism therefor, with a knob for rotating the roller independently of the feed mechanism, a cam for lifting the locking mechanism, a shaft for actuating the cam extending within operative proximity of the knob, and accommodating coupling mechanism, substantially as described, for establishing and maintaining operative connection between the shaft and knob when the latter is actuated, substantially as described.

6. In a type-writer having a line-feed mechanism, the combination of a feed-roller, and automatic locking mechanism therefor, with a knob for rotating the roller independently of the feed mechanism, a lever-connection for disengaging the locking mechanism terminating within operative proximity of the knob in a sliding rod, a stud on the rod, a toothed wheel on the knob or roller arranged for engagement with the stud, and a spring controlling the rod, substantially as described.

7. In a type-writer having a line-feed mechanism, the combination of a feed-roller, locking and releasing mechanism therefor, and a knob for rotating the roller independently of the feed mechanism, with stops for limiting the rotation of the released roller in both directions, whereby the paper may be raised for correction or inspection and again returned to its original position, substantially as described.

8. In a Hammond type-writer, an erasing-plate arranged behind the paper and in proximity to the same, curved, as described, to be tangential to the paper where the same appears above the type-wheel guard, substantially as described.

9. In a type-writer having an oscillating type-wheel, the combination of an erasing-plate suitably curved, as described, to be tangential to and located behind the paper, with a ribbon-shield and its bow, the latter being bent forward at an angle over the type-wheel guard and from the paper, whereby the writing upon the same is fully exposed to view and is accessible to erasing-tools, substantially as described.

10. In a type-writer, the combination of a feed-roller, and locking mechanism therefor, with a lever-connection for lifting the locking mechanism, a knob for rotating the roller when the locking mechanism is disengaged, and a toothed wheel connected with the knob and feed-roller, and a reciprocating coupling-rod constituting a part of the lever-connection for locking the same to the toothed wheel and roller pending the rotation of the latter, substantially as described.

11. In a type-writer, the combination of a feed-roller, a ratchet connected therewith, a pawl for actuating the ratchet and for locking the same and the roller, with a toothed wheel connected with the roller having teeth corresponding in number to those of the ratchet, a lever-connection for disengaging the pawl from the ratchet, a coupling-rod constituting a part of the lever-connection for actuating the same, and a stud upon said rod engaging the toothed wheel, substantially as described.

12. In a type-writer provided with a paper-carriage, a feed-roller mounted thereon, and a knob for rotating the latter when disengaged, and a locking mechanism and stop for holding the released roller after its rotation through a predetermined length of arc, consisting of a toothed wheel fast to the roller and knob, in combination with a boss journaled to the carriage-frame, a rod sliding across said boss, but sustained and controlled therein by a spring, a stud projecting from the rod adapted to engage the teeth of the wheel, and an extension of the rod formed and arranged to strike the shaft of the feed-roller as a stop when the predetermined rotation is completed and the engaged stud has been carried across and beyond a line in passing through the center of the wheel and that of the boss upon the carriage-frame, whereby said wheel is persistently urged by the controlling-spring upon the rod in a direction it cannot follow, substantially as described.

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

JOHN W. OSBORNE.

Witnesses:
PHILIP MAURO,
C. J. HEDRICK.