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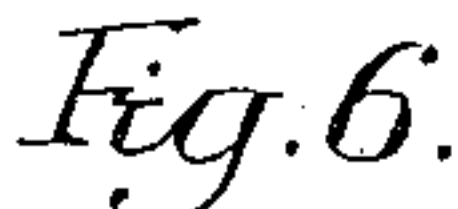


Diagram showing a square cross-section of a beam with a central hole. A vertical rod is inserted through the hole. The rod is labeled 'A' and the hole is labeled 'a'.

Inwitness  
Albert G. Sherwood,  
by his Attorneys,  
Couson & Howson



# UNITED STATES PATENT OFFICE.

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## DUPLICATING ATTACHMENT FOR TYPE-WRITING MACHINES.

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Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, ALBERT G. SHERWOOD, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented certain Improvements in Duplicating Attachments for Type-Writing Machines, of which the following is a specification.

One object of my invention is to provide an attachment for platen typewriters, by which it shall be possible to make upon a continuous web of paper a carbon or other copy of the printed matter written by means of the machine.

I further desire to provide an attachment for a typewriting machine, which in addition to possessing the above characteristics, shall have its parts so arranged that the web of material upon which the copies are formed may be cut into any desired lengths after the typewritten copy is made; it being desired to provide relatively simple and easily manipulated devices for supporting the continuous web of blank paper as well as carbon paper or ink ribbon employed in making copies of the typewritten material.

I further desire that the device constructed as above indicated shall be relatively simple and inexpensive in construction, as well as conveniently applicable to typewriting machines of any of the ordinary forms.

These objects and other advantageous ends I secure as hereinafter set forth, reference being had to the accompanying drawings, in which:

Figure 1, is a horizontal section illustrating the preferred arrangement of the parts constituting my invention; Fig. 2, is a vertical section on the line 2—2, Fig. 1; Fig. 3, is an end elevation of the structure shown in Fig. 1; Fig. 4, is a vertical section taken on the line 4—4, Fig. 1; Fig. 5, is a vertical section illustrating a modification of a special form of paper cutting knife and its associated parts, and Fig. 6, is a fragmentary side elevation of a special form of the device for securing my invention to the carriage of a typewriter.

In the above drawings, A represents two frames or brackets which are given a special form to adapt them for attachment to the carriage of various forms of typewriting machines; being illustrated in the present instance as held by screws *a* to a bar *A'*, forming part of the framework of the typewriter carriage. If desired or found advisable the attachment may be made as shown in Fig.

6 in which the lower end of the frame is forked to fit over the bar *A'* to which it is held by a clamping screw *a*<sup>8</sup>.

Upon the bar *A'* are mounted in the customary manner the bearings for the spindle *b* of the platen *B* which extends the whole length of the carriage. A casing *D* hereafter described is adjustably mounted on the frame *A* so that its distance above the platen as well as that of the apparatus carried by it may be varied at will. Said casing is provided with bearings for removably supporting a spindle *c* upon which is mounted a roll of blank paper, indicated at *C*, upon which are to be placed copies of the written matter passing through the machine. The casing *D* extends between the two frames *A* so as to cover and inclose the paper roll *C* and has a portion *d* of its side hinged to the remainder so as to permit of access to its interior when it is desired to insert a new roll of paper, etc.

A pair of rolls or spindles *c'* and *c*<sup>2</sup> are placed between the spindle *c* and the platen *B* for a purpose hereafter noted, being mounted in any suitable manner in the ends of the casing *D*. This latter also has bearings for a spindle *e* upon which is mounted a roll *E* of carbon paper or ink ribbon, while on the opposite side of the paper roll is mounted a spindle *e'* for the reception of a second roll *E'* of the same material; it being understood that the said carbon paper or ribbon passes in a web *e*<sup>7</sup> from the roll *E* between the guide rolls *c'* and *c*<sup>2</sup> and around the platen *B* and then up over a guide roll *c*<sup>3</sup> to the spindle *e'* where it forms a roll *E'*. Instead, however, of passing this web *e*<sup>7</sup> directly to the roll *E* after it passes from the guide roll *c*<sup>3</sup> I preferably cause it to pass between a pair of nip rolls *e*<sup>2</sup> and *e*<sup>3</sup> whose spindles are supported in suitable bearings carried by the casing *D*. The spindle *e'* carrying the roll *E'* of carbon paper or ink ribbon is provided with bearings *e*<sup>4</sup> free to slide in suitable slots in the casing *D* and I provide under each bearing a spring *e*<sup>5</sup> whereby said spindle is at all times maintained in contact with the nip roll *e*<sup>2</sup>. Said bearings are, however, so constructed as to be easily removed when a predetermined amount of the carbon paper or ink ribbon has been wound upon the spindle *e'*.

Between the nip rolls *e*<sup>2</sup>, *e*<sup>3</sup>, and the roll *C* of blank paper web *I* extend the sheet material of the casing *D* inwardly to form a conduit *d*<sup>7</sup> for the reception of the paper web



after it leaves the platen B, and in this passage I mount a knife or shear F, which consists of a fixed member  $f$  extending completely across and substantially parallel with the platen B, and a member  $f'$  pivoted to the casing structure at  $f^2$ , as indicated in dotted lines in Fig. 1. The paper web in its passage through the conduit is forced to pass between these two shear members and as the movable blade or member  $f'$  projects at one end of the casing it may be operated when desired to cut the web of paper.

Under operating conditions it is necessary to drive the nip roll  $e^2$  and for this purpose I provide a rubber tired or other suitable wheel  $g$  on a spindle  $g'$  carried by the casing D so as to permit the periphery of said wheel to engage the surface of the platen B. This same spindle is provided with a gear wheel  $g^2$  which is operatively connected through a second gear wheel  $g^3$  to a pinion  $g^4$  fixed to the spindle of the nip roll  $e^2$ .

The casing has a second hinged cover or side portion  $d'$  which may be so moved as to permit of the insertion or removal of the rolled web on the spindle  $e'$ . For this purpose the pieces  $e^6$  (between which and the bearings  $e^4$  the springs  $e^5$  are normally confined) are made removable. The side portion  $d'$  has fixed to it another body of sheet material as shown at  $d^2$  which forms a guide or conduit for the original sheet of type written material after this passes from the platen.

In using the device a roll of blank paper is mounted on the spindle  $c$  and the paper web therefrom after being passed between the guide rolls  $c'$  and  $c^2$  and around the platen B is placed between the members of the knife F and permitted to extend up in the conduit  $d^7$ . A roll of carbon paper or ink ribbon is then mounted on the spindle  $e$ , and the web of the same is carried between the surface of the guide roll  $c'$  and the outer surface of the paper web  $c^5$  around the paper web upon the platen B to guide roll  $c^3$  and from this latter between the nip rolls  $e^2$  and  $e^3$ . From thence it passes part way around the nip roll  $e^2$  to the spindle  $e'$ . When therefore one or more sheets of paper for the reception of typewritten matter are placed in the machine in contact with the platen B in the customary way, any impression made upon such a sheet or sheets is transmitted there-through to the web  $e^7$  of carbon paper on the sides or bottom of the platen, thereby causing an impression to be made upon the blank paper web  $c^2$  which is interposed between the carbon paper web and the surface of said platen; it being understood that any blackened or other color bearing surface of the carbon paper web is placed next the surface of the web of blank paper.

As the platen B is turned from time to time to permit written material being arranged in lines, motion is transmitted from

the end of said platen through the rubber tired friction wheel  $g$ , through the gears  $g^2$ ,  $g^3$  and  $g^4$  to the nip roll  $e^2$ ; and as a consequence the blank paper web  $c^5$  as well as the web  $e^7$  of carbon paper or ribbon is drawn through the device; the web  $c^5$  by reason of its engagement with the surface of the platen and the web  $e^7$  partly by reason of its engagement with the paper web  $c^5$  and also because of the nip roll  $e^2$ . Since this nip roll is always in engagement with the surface of the roll of paper or ribbon upon the spindle  $e'$ , motion is transmitted from said nip roll to said spindle or to the roll of material thereon, with the result that the carbon paper is wound up just as fast as it is fed through the device; the spring  $e^5$  yielding to accommodate the increasing size of this roll. As the two webs of paper are fed through the device and the used carbon paper is wound up, the web from the roll C passes out through the conduit  $d^7$ , as shown in Fig. 2, and may at any time be severed from the portion still in the machine by a suitable movement of the knife blade  $f'$ , which acts to cut it off shortly after its entrance into said passage  $d$ . The original sheet of typewritten matter passes from the platen B up through the conduit  $d^2$ .

In order that there may be no possibility of the short end of the blank paper web withdrawing from the guide  $d^7$  after it has been cut off and before it has been again fed forward for a considerable distance, I so arrange the lower portion of the guide between the knife F and the platen B that its sides are sufficiently near together to frictionally hold the paper web and prevent such withdrawal, though, if desired, I may make this portion of the device as shown in Fig. 5. With this latter arrangement a thin strip of sheet metal  $d^4$  is mounted just below the movable knife blade  $f'$  and has its lower edge curved or turned over so as to bring it relatively near a sheet metal structure  $d^3$  extending below the fixed member  $f$  of the knife. The paper web  $c^5$  is caused to pass between these two structures and if desired the strip  $d^4$  may be made more or less springy so as to positively hold the short end of said web to prevent its withdrawal after the knife has severed that portion of it which extends above the fixed member  $f$ .

As previously noted, I hinge a section  $d$  of the casing D to the remainder in order to permit of the introduction of the spindle  $c$  with its roll of blank paper; it being possible when this movable part is turned back to also place a full roll of carbon paper E upon the spindle  $e$ , as it is obvious that when the roll E' of carbon paper has reached a certain size it may be removed from the spindle  $e'$  and placed upon the spindle  $e$  for future use.

It is to be noted that under practical operating conditions, I may use either an ink ribbon, carbon paper, or web carrying ink or



any suitable coloring material, and it is to be understood that where in the claims I have used the term "ink carrying web or ribbon" I desire it to cover and include such equivalent means.

For the purpose of adjustably connecting the frame A and the casing D, I preferably mount at each end of the casing a vertically extending guideway  $d^{10}$  for the reception of an upwardly extending portion  $a^7$  of said frame. A set screw  $d^{10}$  mounted in the guideway is capable of engaging the portion  $a^7$  of the frame to maintain the casing in any adjusted position relatively thereto.

I claim:

1. The combination with the platen of a typewriting machine of a supporting structure, a web of blank paper mounted thereon and extending around the platen, with a web of color bearing material extending around the platen upon the outside of the paper web, a yieldingly supported spindle for the reception of said color bearing web after it has passed around the platen, a roller placed to frictionally engage the surface of the material wound on said spindle and means for driving said roller from the platen.

2. The combination with the platen of a typewriting machine of a supporting structure, a web of paper in the form of a roll having one end extending around the platen, a web of color bearing material, means for guiding said latter web around the platen upon the outside surface of said paper web, means for supporting a supply roll of the color bearing web at one end of the same, and means for winding up the other end of the said web, with a casing inclosing said rolls, a knife movably mounted adjacent to the path of the paper web, and an operating handle for the knife projecting at one side of the casing.

3. The combination with the platen of a typewriting machine, of a supporting structure for said platen, a frame mounted on said structure, a web of blank paper in the form of a roll having a supporting spindle mounted on the frame, a web of color bearing material extending around the platen, two spindles having wound upon them the respective ends of the color bearing web, means for yieldingly supporting one of said spindles, and means actuated from the platen for causing said latter web to be wound upon the yieldingly mounted spindles, said means being placed to frictionally engage the surface of the roll formed on the spindle.

4. The combination with the platen of a typewriting machine of a supporting structure, a web of blank paper in the form of a roll mounted thereon and having its end extending around the platen, a web of color bearing material, means for feeding said latter web around the platen in engagement

with the paper web, and means for cutting off the paper web after it has passed around the platen, the same including a fixed blade placed adjacent to the path of the web and a pivoted blade carried by the supporting structure so as to co-act with the fixed blade.

5. The combination with the platen of a typewriting machine of a supporting frame, a web of color bearing material carried upon the frame and extending around said platen, a web of paper in the form of a roll mounted on the frame and extending around the platen between its surface and the color bearing web, a guide placed to receive the paper web after it has passed around the platen, with a knife having a movable member placed to be capable of acting upon the web to positively cut the same while it is in the guide.

6. The combination with the platen of a typewriting machine of a supporting structure, a web of color bearing material in the form of a roll mounted on said frame, said web extending around the platen, means for winding said web in a roll after it has passed around the platen, and a web of paper also carried on the frame and extending around the platen between the surface thereof and the web of color bearing material, with a knife pivoted at one side of the frame and extending across the same so as to be operated at will to cut off a length of the paper web.

7. The combination with the platen of a typewriting machine of a supporting frame, a friction roller mounted therein, means for driving said roller including gearing actuated from the platen, a color bearing web formed at its ends into a supply roll and a yieldingly mounted receiving roll, said friction roller being placed to frictionally engage the web on said receiving roll, with a web of blank paper in the form of a roll supported from the frame and extending with the ink bearing web around the platen.

8. The combination with the platen of a typewriting machine of a frame, a roller mounted therein, means for driving said roller including gearing actuated from the platen, a color bearing web formed at its ends into a supply roll and a yieldingly mounted receiving roll, the latter of said rolls being placed with its web in frictional engagement with the surface of said platen-actuated roller, with a web of blank paper in the form of a roll supported from the frame, said paper web extending with the color bearing web around the platen, said receiving and supply rolls for the color bearing web being removable.

9. The combination with the platen of a typewriting machine, of a frame, a spindle supported in said frame, a web of paper in the form of a roll mounted on said spindle and extending around the platen, a guide



placed to receive the paper web after it leaves the platen, a hand operated knife placed to be capable of positively cutting a web of paper in said guide, a web of color bearing material extending around the platen over the paper and wound in supply and receiving rolls placed respectively on opposite sides of the platen.

10 The combination with the platen of a typewriting machine, of a frame, a spindle supported in said frame, a web of paper in the form of a roll mounted on said spindle and extending around the platen, a guide placed to receive the paper web after it leaves the platen, a web of color bearing material extending around the platen over the paper and wound in supply and receiving rolls placed respectively on opposite sides of the platen, with means operative at will for positively cutting off the paper web adjacent to the platen and after it has entered said guide.

11. The combination with the platen of a typewriting machine, of a frame, a roller mounted in bearings thereon, a friction wheel carried by the frame and placed to be driven by the platen, gearing connecting said friction wheel with said roller, a web of color bearing material passing around said roller and the platen and having its ends wound in the form of supply and receiving rolls, a spindle removably mounted in the frame for supporting the said receiving roll, and means for pressing said spindle toward

the driven roller to bring the receiving roll into frictional engagement with the surface of said driven roller.

12. The combination with the platen of a typewriting machine, of a web of paper extending around the platen and carried upon the frame in the form of a roll, a guide for the reception of said paper web, and a knife for cutting said paper after it has passed around the platen, said paper guide having portions placed to frictionally engage the end of the paper so as to prevent it from withdrawing from the vicinity of the knife after it has been severed thereby.

13. The combination with the platen of a typewriting machine of a frame, a web of paper extending around the platen and carried upon the frame in the form of a roll, a guide for the reception of said paper web, and a knife for severing said paper after it has passed around the platen, said guide having portions of its sides relatively close to each other to hold the end of the paper from withdrawing from the vicinity of the knife after it has been cut off, with a web of color bearing material extending around the platen upon the outside of the paper web.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

ALBERT G. SHERWOOD.

Witnesses:

WILLIAM E. BRADLEY,  
JOS. H. KLEIN.