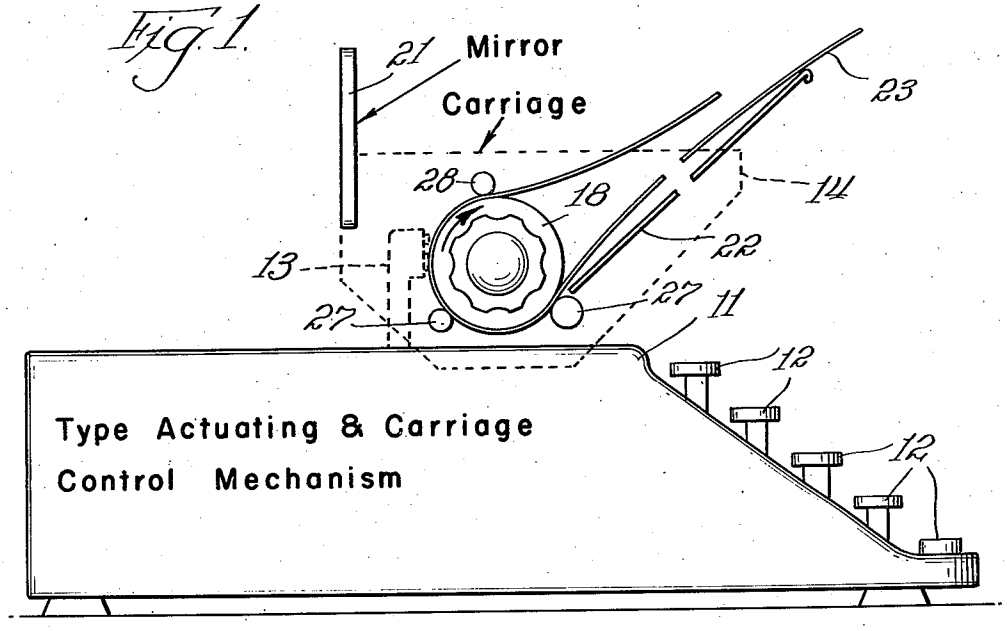
Oct. 9, 1945. W. W. DAVIDSON 2,386,442

TYPEWRITER

Filed Oct. 28, 1944

Fig. 1.



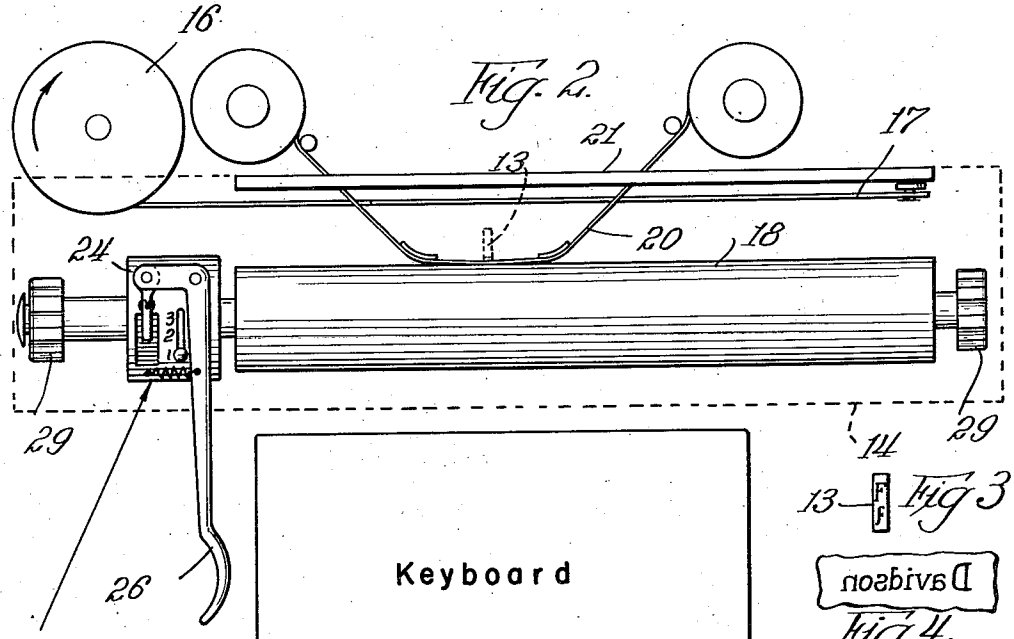


Fig. 2.

Fig 3

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Fig. 4.

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TYPEWRITER

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Application October 28, 1944, Serial No. 560,774

9 Claims. (Cl. 197—1)

In certain forms of duplication or printing, copies are made directly from the master sheet or plate. For example, in direct lithographic printing a plate is prepared which bears a reversed image of the matter to be printed. This reversed image (often called mirror image) is reversed in applying it to the copy sheet so that as thus printed on the copy sheet it appears in final form.

For office duplicating or printing the most common subject-matter to be printed is typewritten matter. This has been done in the past principally by stencil, gelatin or spirit duplicating, but there has been no comparably inexpensive way of reproducing typewritten matter satisfactorily by the lithographic process. To the extent that the lithographic process has been used in the field, it has been the offset lithographic process rather than the direct lithographic process which has generally been used. There has been no simple and effective, inexpensive way to reproduce typewritten material by direct lithography. In this instance the matter was typed onto a plate, such as a flexible sheet of aluminum or paper-backed aluminum foil and the plate was put on a press having an offset blanket onto which the plate would print a reversed image so that the blanket in turn could print a normal image on the copy sheet.

According to the present invention the blanket becomes unnecessary by virtue of providing a practical manner of producing a reversed image of the plate. The omission of the blanket permits various simplifications and economies, so that a direct lithographic press can be produced and sold at a lower price than an offset lithographic press.

The reversed image is produced directly on the plate by a specially constructed typewriter in which the type is reversed as compared to ordinary typewriter type, so that instead of producing a normal letter it will produce a reversed letter. It has been suggested heretofore to do this, and to have the carriage move during typing from left to right instead of from right to left so that each line would begin at the right-hand side of the sheet. Of course, it is necessary in reversed typing to have each line read from right to left, so that after reproduction and the reversal inherent therein the line will read from left to right. However, in typing according to this previous suggestion the reversal of the lines, together with the reversal of the individual letters, made the work very hard and confusing for typists to read, even when a mirror is provided.

According to the present invention the carriage moves from right to left during typing (when viewed from the operator's position at the front of the machine), which is the same direction as conventional typewriters, but the type strikes against the paper at the rear side of the roller, the side remote from the operator. Thus the operator's left is the right-hand side of the face of the sheet being typed. A mirror is provided beyond the roll so that the operator can glance at the mirror and easily read or check her work. In the mirror the mirror-image work which she is typing is reversed so that it appears to be normal typing.

The line spacing mechanism operates to turn the roll in the reversed direction, as compared with a normal typewriter, so that the paper moves upwardly behind the roller. It will be observed that the manual operations of the typist and the view which she gets in the mirror are the same as conventional typewriters. Hence, an operator accustomed to conventional typewriters will have no difficulty in producing a reversed image plate on this special typewriter. She will hardly be aware that she is looking in a mirror. She will type in the usual way, with no more effort, and after each line she will shift the carriage in the usual direction and with the usual incidental effort of turning the roll in the right direction to advance the sheet. Of course, she will put sheets in at the front side of the roll instead of the rear side, but this will be the obvious thing to do since the guide plate will be at the front instead of at the back. The work will be as accessible for erasures as if she were typing at the front of the roll. In fact, in as much as the type mechanism will be at the rear of the roll, the roll will be further forward on the machine than usual, and hence will be closer to the operator for erasures.

A typewriter constructed in accordance with this invention will be very useful for other types of duplicating requiring reverse image master sheets, such as spirit duplicating, for example. It is especially important, however, for processes such as lithographic processes which may use a fairly heavy master sheet or plate which prevents the obtaining of sharp characters by striking through the sheet against a carbon paper.

Additional objects and advantages will become apparent from the following description and from the drawing, in which

Fig. 1 is a diagrammatic representation of the side view of the form of invention chosen for illustration;

Fig. 2 is a diagrammatic plan view thereof;

Fig. 3 is a face view of an example of positive image type which would be used in accordance with this invention for reversed image typing; and

Fig. 4 is an illustration of the resulting reversed image typing.

Although the law requires a full and exact description of at least one form of the invention, such as that which follows, it is, of course, the purpose of a patent to cover each new inventive concept therein, no matter how it may later be disguised by variations in form or additions of further improvements; and the appended claims are intended to accomplish this purpose by particularly pointing out the parts, improvements, or combinations in which the inventive concepts are found.

In the illustrations of the invention only the features characteristic of the present invention and features necessary to the understanding thereof are illustrated, since the general details of construction of typewriters are so well known in the art as to need no illustration or description.

According to the invention the main typewriter frame 11 carries a suitable keyboard, comprising keys 12 at the front thereof which actuate type-carrying arms such as the arm 13 shown in dotted lines, one arm being actuated by each key in response to mechanism carried by the frame 11. A carriage, diagrammatically represented by the dotted outline 14, is mounted on the frame 11 for reciprocation thereon in the usual way.

To indicate that the carriage is biased toward the left, a conventional spring-actuated carriage moving roll 16 is illustrated in Fig. 2. When the carriage is shifted to the right the band 17 is drawn out from the roll 16, thus turning the roll 16 and winding the spring therein. As each key or space bar is pressed a conventional escapement mechanism permits the carriage to be drawn to the left the distance of one letter space, under the influence of the spring roll 16 and band 17.

Since the purpose of this invention is to type reversed image plates and the like, this can be accomplished with the carriage moving in the direction indicated if positive image type, such as shown in Fig. 3, strikes the paper on the rear side of the paper-carrying roll, as clearly indicated in Fig. 1. Accordingly the type-carrying arms 13 are arranged to move against the rear side of the roll 18, as indicated diagrammatically in Fig. 1. The actuating mechanism may comprise any suitable mechanical linkage, or it could comprise the electrical type-actuating mechanism simply turned around to face the rear of the roll as it has heretofore faced the front of the roll, the circuits to the keys remaining electrically unchanged.

A mirror 21 is so positioned that the typist typing on the keys 12 can look into the mirror 21 and check the work as it proceeds, adjust the paper, etc. The mirror could be carried by the frame 11, but it is at present preferred to mount it rigidly on the carriage 14 so that it moves with the carriage and, without being any longer than the roll 18, will permit reading the entire line, regardless of the position of the roll. The mirror could be adjusted for tilting about an axis parallel to the axis of the roll, or for other movement parallel to the axis, but the vertical position illustrated is believed to be most desirable since with it the typed matter and roll will appear to the typist exactly as she is accustomed to seeing it on conventional typewriters. Of course, the usual line guide would be carried by the frame 11 adjacent the roller 18, so that it would also appear in the mirror 21 and enable the operator to see just where a key would strike. Also the mirror may be removable, if desired, or movable in any way to give better access to the machine for changing the ribbon 20, cleaning the type, etc., the ribbon and type being naturally positioned to the rear of the roller.

Of course, the paper should be fed to the roll at the front side thereof, and accordingly a feeding guide 22 is provided. This guide preferably extends considerably further in a direction away from the cylinder than the feed guide in conventional typewriters so as to keep a fairly long sheet 23 from dropping to a position where it would obstruct the typist's vision of the keys 12.

In order to turn the roller 18 in the correct direction automatically, the usual ratchet mechanism will be varied to operate in the opposite direction than is customary, this ratchet mechanism being indicated diagrammatically at 24. The ratchet mechanism will be actuated by a carriage return lever 26, which may be conventional except as required by the reversed ratchet mechanism.

The conventional paper-feeding and holding pressure rollers 27 are provided, together with all other guiding, feeding and adjusting means. Shiftable pressure rollers 28 will be provided at about the position illustrated to hold the typed or upper portion of the sheet or plate down out of the line of vision between the typist's eyes and the mirror 21.

When the operator desires to turn the roll by means of one of the knobs 29, the direction to turn it will be obvious and so it will cause her no confusion even though she turns it in the opposite direction for raising the typed lines than she is accustomed to. If this should prove confusing to some operators, the knobs could be mounted on a gear meshing with the gear carried by the roller. The operator, desiring to raise the typed lines, would then turn one of these knobs in the same direction as that to which she is accustomed in raising the typed lines of a conventional typewriter. The ratchet line spacing mechanism could also be carried by this gear, in which case conventional ratchet mechanism could be used, the reversing being accomplished by the gears. However, the spring detent mechanism for line positioning should be directly associated with the roller to avoid any undesired effects due to play in the gears.

Of course, any other conventional or desirable features may be added to the illustrated machine. No attempt has been made to show the parts in their true proportions. It should be noted, for example, that the keys 12 would, except in portable machines, probably be spaced considerably further below the roll than has been illustrated. This would not only be in accordance with conventional practice, but would give more clearance so that it would be easier to position the guide 22 so as to hold the sheet where it would not obstruct the typist's view either to the keys 12 or to the mirror 21. This guide plate could be made adjustable, if desired, to suit the convenience of different operators.

From the foregoing it is seen that a highly practical typewriter is provided for typing reversed image matter on lithographic plates or

other types of master sheets. Once the paper is positioned the typist types in the usual way, and the work appears to her in the mirror just as in positive image as she is accustomed to seeing it. Although the sheet is fed to the front of the roller instead of the back, this causes no confusion inasmuch as the guide plate 22 clearly indicates where to feed it.

I claim as my invention:

1. A typewriter for producing reversed image work including a keyboard at the front of the machine, a carriage including a roller for carrying the sheet to be typed, type mechanism controlled by the keys and adapted to strike the sheet at the rear side of the roller and to produce a reversed image thereon, carriage-control mechanism adapted to move the carriage from right to left as the typing proceeds, line spacing and carriage return means adapted to return the roll and move the rear of the roll upwardly, and a mirror carried by the carriage positioned rearwardly of the roll and facing forwardly, suitably disposed for the operator using the keyboard to view the line being typed.

2. A typewriter for producing reversed image work including a keyboard at the front of the machine, a carriage including a roller for carrying the sheet to be typed, type mechanism controlled by the keys and adapted to strike the sheet at the rear side of the roller and to produce a reversed image thereon, carriage-control mechanism adapted to move the carriage from right to left as the typing proceeds, line spacing and carriage return means adapted to return the roll and move the rear of the roll upwardly, and a mirror positioned rearwardly of the roll and facing forwardly, suitably disposed for the operator using the keyboard to view the line being typed.

3. A typewriter for producing reversed image work including a keyboard at the front of the machine, a carriage including a roller for carrying the sheet to be typed, type mechanism controlled by the keys and adapted to strike the sheet at the rear side of the roller and to produce a reversed image thereon, carriage-control mechanism adapted to move the carriage from right to left as the typing proceeds, manually operated combined line spacing and carriage return means adapted to return the roll and move the rear of the roll upwardly, and a mirror positioned rearwardly of the roll and facing forwardly, suitably disposed for the operator using the keyboard to view the line being typed.

4. A typewriter for producing reversed image work including a keyboard at the front of the machine, a carriage including a roller for carrying the sheet to be typed, type mechanism controlled by the keys and adapted to strike the sheet at the rear side of the roller and to produce a reversed image thereon, carriage-control mechanism adapted to move the carriage from right to left as the typing proceeds, and line spacing and carriage return means adapted to return the roll and move the rear of the roll upwardly.

5. A typewriter for producing reversed image work including a keyboard at the front of the machine, means for holding a member to be typed exposed for typing on the face thereof remote from the operator, type adapted to produce reversed image characters, means controlled by said keyboard for impressing the type against said remote face, and a mirror disposed for the typist operating the keyboard to view the typing to present a normal view thereof.

6. A typewriter for producing reversed image work including a keyboard at the front of the machine, means for holding a member to be typed exposed for typing on the face thereof remote from the operator, type adapted to produce reversed image characters, means controlled by said keyboard for impressing the type against said remote face, a mirror disposed for the typist operating the keyboard to view the typing to present a normal view thereof, and means for holding the member so it does not obstruct the typist's view of the mirror or of the keyboard.

7. A typewriter for producing reversed image work including a keyboard at the front of the machine, means for holding a member to be typed exposed for typing on the face thereof remote from the operator, type adapted to produce reversed image characters, and means controlled by said keyboard for impressing the type against said remote face.

8. A typewriter for producing reversed image work including a keyboard at the front of the machine, a carriage including a roller for carrying the sheet to be typed, type mechanism controlled by the keys and adapted to strike the sheet at the rear side of the roller and to produce a reversed image thereon, carriage control mechanism adapted to move the carriage from right to left as the typing proceeds, and manually operated combined line spacing and carriage return means adapted to return the roll and move the rear of the roll upwardly.

9. A typewriter for producing reversed image work including a keyboard at the front of the machine, means for holding a member to be typed exposed for typing on the face thereof remote from the operator, type adapted to produce reversed image characters, means controlled by said keyboard for impressing the type against said remote face, and means for holding the member so it does not obstruct the typist's view of the mirror or of the keyboard.

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