O. B. HAGER.

TYPE WRITING MACHINE.

APPLICATION FILED APR. 22, 1916.

1,245,220.

Patented Nov. 6, 1917.

2 SHEETS—SHEET 1.

FIG. 1.

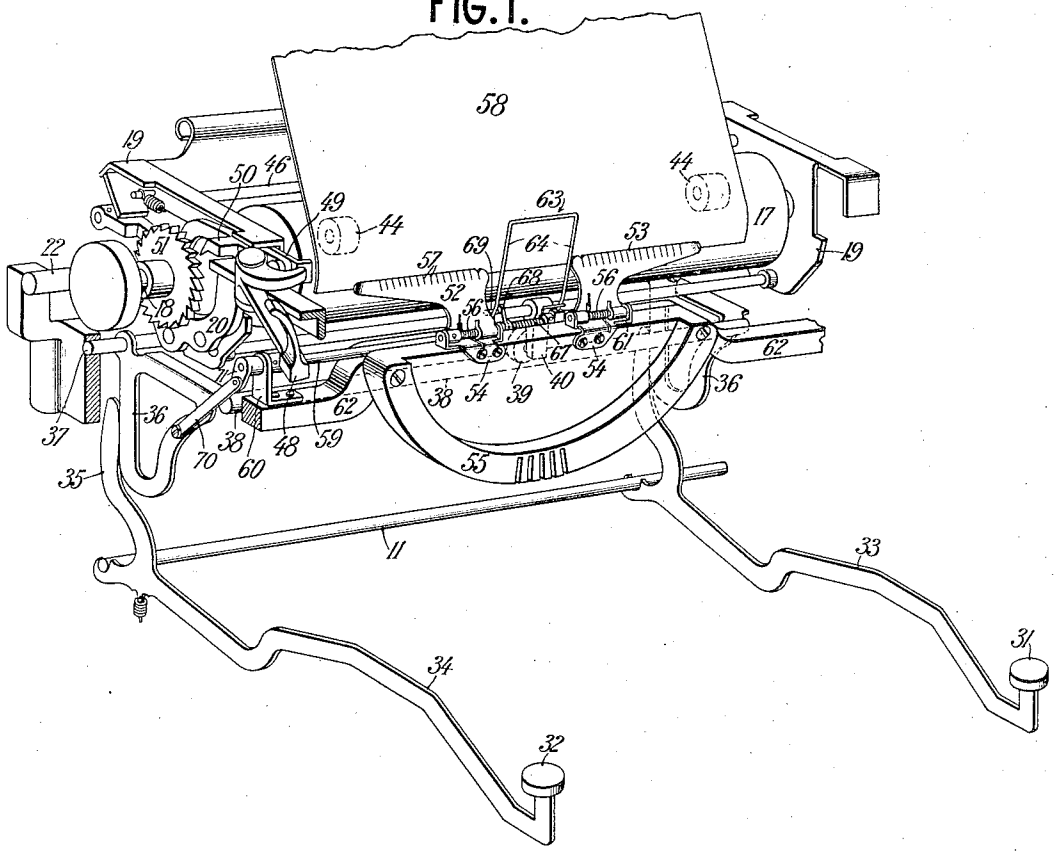


FIG. 2.

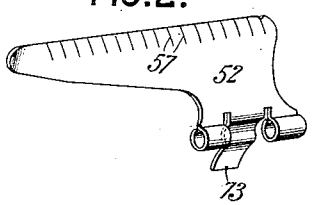


FIG. 3.

WITNESSES:

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2 SHEETS—SHEET 2.

FIG. 5.

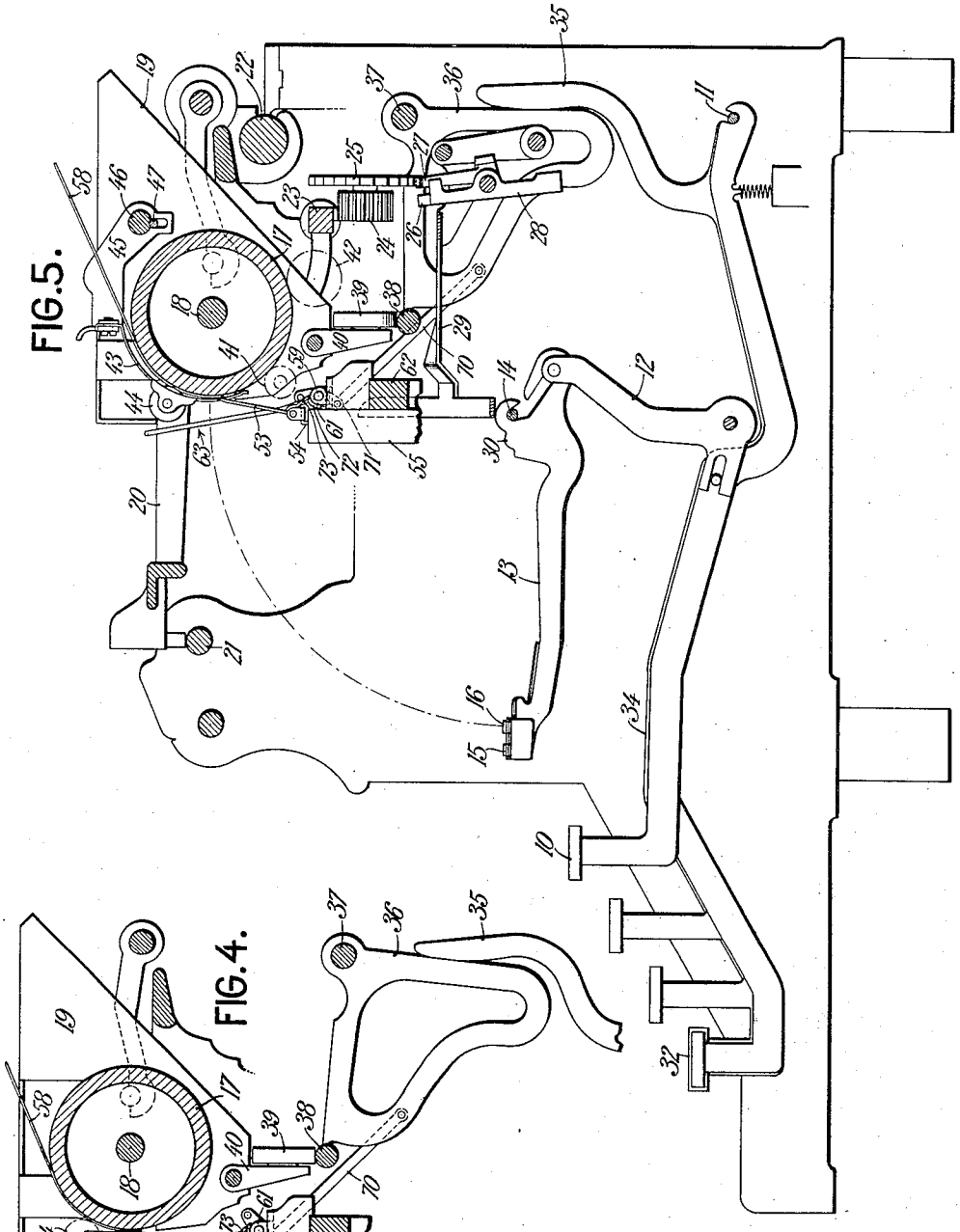


FIG. 4.

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UNITED STATES PATENT OFFICE.

ONSLOW B. HAGER, OF DANVILLE, VIRGINIA, ASSIGNOR TO UNDERWOOD TYPEWRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE.

TYPE-WRITING MACHINE.

1,245,220. Specification of Letters Patent. Patented Nov. 6, 1917.

Application filed April 22, 1916. Serial No. 92,815.

To all whom it may concern:

Be it known that I, ONSLOW B. HAGER, a citizen of the United States, residing in Danville, in the county of Pittsylvania and State of Virginia, have invented certain new and useful Improvements in Type-Writing Machines, of which the following is a specification.

This invention relates to means for enabling the printing on a typewriting machine to be carried to the extreme bottom edge of the work-piece, particularly in machines of the class in which a roller platen is shiftable to upper and lower case positions.

It is customary in machines of the above noted class, to provide paper holding devices extending along the platen at the printing line, which devices may be in the form of scale plates which serve to hold the work closely to the platen at the printing line, and further, indicate the position of the printing line on the work-sheet. Such work-holding devices being mounted on the machine frame, the platen is shiftable up and down relatively thereto. If an attempt is made to print close to the bottom margin of a work-piece, and the platen is shifted upward for printing an upper case character, the edge of the sheet will be lifted above said holding devices, which being held closely to the platen, will catch on the edge of the work-piece as the platen descends, thus marring and disarranging the work-piece.

An object of the present invention is to provide means whereby this difficulty is overcome, so that the printing may be carried as close to the bottom edge of the sheet as desired. To this end, means is provided for automatically shifting the work-holders or wings away from the platen when the latter is shifted upwardly, and holding them away until the platen and work thereon has been lowered to bring the lower edge of the work behind the work-holders.

To effect this operation, the said work-holders may be controlled by the platen shift keys, which may operate a rock shaft extending parallel with the platen below said work-holders, the latter each being operated by a cam on said rock shaft.

A further feature of the invention relates to auxiliary work-holding means to hold the work closely against the platen near the printing point, while the main work-holding devices or wings are held off the platen. For this purpose, the auxiliary work-holding device, which may be pivoted on said rock shaft, is arranged to swing rearwardly and bear against the work while the main work-holding devices are held off the work. An arm on the rock shaft may normally hold said auxiliary work-holder off the platen, but when said shaft is rocked to cam the main work-holders away from the platen, said auxiliary holder is moved by a spring to holding position. The parts may be so timed that the auxiliary holder engages the work substantially simultaneously with the release of the main work-holders, and vice versa.

Other features and advantages will hereinafter appear.

Referring to the accompanying drawings:

Figure 1 is a front perspective view, showing the invention as applied to an Underwood typewriting machine.

Fig. 2 is a perspective view of a paper-holding gage plate or wing.

Fig. 3 is a perspective view, showing the cam shaft which controls the work-holding devices.

Fig. 4 is a sectional elevation showing the platen shifted to upper case position, the bottom end of a work-sheet thereon being close to the printing line.

Fig. 5 is a sectional elevation of the machine, with the platen in lower case position.

Keys 10, fulcrumed on a rod 11, are connected through bell-cranks 12 to swing type-bars 13 upwardly and rearwardly about a fulcrum 14, to cause the upper and lower case types 15 and 16 to print at the front surface of the platen 17. The platen axle 18 is journaled in the ends of the platen frame 19, the latter mounted to shift up and down on the carriage 20 to upper and lower-case positions. The carriage is mounted to travel on front and rear guide rails 21 and 22, being driven in letter-feed direction by the usual spring motor, not shown. A carriage rack 23 runs on an escapement pinion 24 connected to drive an escapement wheel 25, the letter-feed movements of the carriage being controlled by escapement dogs 26 and 27 on a dog rocker 28. The dog rocker is actu-

ated at each type stroke by a universal bar 29, which is moved rearwardly by shoulders 30 on the type-bars.

Shift keys 31 and 32 are carried on shift-key levers 33 and 34, fulcrumed on the rod 11, each lever being provided with an upwardly-extending arm 35 to engage behind a frame end or bracket 36 of the platen-shifting frame. The frame ends 36 are fixed to the fulcrum rod 37 of the shift frame, and are also connected by a shift-rail 38 on which runs a roll 39 on an arm 40 on the platen frame. When either shift key is depressed, the platen is moved upwardly to upper-case position, to permit the upper-case types to print. Front and rear feed rolls 41 and 42 bear against the under surface of the platen and coöperate therewith to feed the work around the platen and upward past the printing line as the platen is rotated. Marginal paper-guiding fingers 43 may be arranged above the printing line to hold the work-sheets close to the platen and guide them as they are fed beyond the printing line. Said fingers are provided with rolls 44 to run on the paper and hold it against the platen. The fingers 43 may be carried by bracket arms 45, fulcrumed on a tie-rod 46 of the platen frame, said brackets being held in operative position by spring-pressed detent rollers 47 seating in a longitudinal groove in the rod 46. The paper fingers 43 and brackets 45 may be swung rearwardly about the rod 46 as a fulcrum, to permit the work-sheets to be manipulated. Said fingers are also adjustable along the platen to bring them over the margins of the work-sheets.

Line-spacing mechanism for rotating the platen comprises a line-spacing lever 48, operable to move rearwardly a slide bar 49, to which is pivoted a dog 50, which actuates a line-space ratchet wheel 51 fixed to the platen axle. The mechanism thus far described may be that which is common to the commercial Underwood typewriting machine.

Wing scale plates 52 and 53 are pivoted on brackets 54 mounted on the type-bar segment 55 on the main frame of the machine. Springs 56 cause said wings to bear along their upper edges with a yielding pressure against the platen or the work thereon. Said upper edges of the wings normally extend along the base of the printing line on the platen when the latter is in lower-case position. The wings thus serve as work-holders to hold cards or work-sheets closely against the platen at the printing point, and are also useful in squaring and adjusting the work to the printing line. The wings are provided with scale markings 57 at letter-space intervals, to assist the operator in adjusting a sheet lengthwise of the platen to center any desired letter-space at the printing point.

As the wings 52 and 53 are mounted on the machine frame, the platen, during the case shifting, moves up and down relatively to said wings, and it will be seen that when the work-sheet 58 has been fed to the position shown in the drawings, in which the lower edge thereof is close to the printing line, said edge, when the platen is shifted to upper-case position, will be carried above the wings 52, 53. Unless some provision is made for holding the wings off the platen while the latter again descends to lower-case position, the lower edge of the work is liable to catch on said wings, particularly as said edge has a tendency to spring away from the platen at the printing line when freed from said wings. As a result, the work-sheet is mutilated or disarranged and displaced, so that further printing may be prevented, and if continued, is out of alinement. To overcome this difficulty and permit the printing to be carried as close as desired to the bottom edge of the sheet, the following mechanism is provided.

A rock shaft 59 extending lengthwise of the platen below the printing line, is journaled at its ends in brackets 60 and 61 on the machine frame 62. An auxiliary work-holder 63 is pivotally mounted on the rock shaft 59. Said work-holder, as shown, comprises arms 64 attached to and extending upwardly from collars 65 rotatable on the rock shaft, said arms being located at opposite sides of the printing point and connected at their upper ends by a cross-piece 66. A coiled spring 67 applies pressure to said holder in a direction tending to swing it rearwardly and to hold it against the platen but said holder is normally held off the platen by an arm 68 fixed to the rock shaft 59 and having a pin 69 to engage behind an arm 64 of the holder. The holder is thus normally held in a forwardly-inclined position (Fig. 5) in which interference between it and the fingers 43 and rolls 44 is prevented.

The holder 63 is designed to coöperate with the wings 52 and 53 for holding the work against the platen while the latter is in upper-case position, and to guide the lower edge of the work-sheet between the wings and the platen when the latter is returned to lower-case position. To this end, the rock shaft 59 is arranged to control both the said wings and the holder 63, and to cause said wings to be swung away from the platen as the latter shifts up and down, the holder 63 at the same time being swung rearwardly to hold the work in position against the platen. To effect such operations the rock shaft 59 is controlled from the platen-shifting frame, being connected thereto through a link 70 connected at one end to a rock arm 71 on the shaft 59, and at its other end to an end 36 of the platen-shifting frame. The wings 52, 53 are operated by cams 72 on the rock shaft 59, each

wing for this purpose being formed with a depending lug 73 in the path of a cam 72.

When the shift key is depressed to lift the platen, the platen-shifting frame operates through the link 70 to rock the shaft 59 and swing the arm 68 thereon rearwardly, thereby permitting the holder 63 to be moved against the platen by its spring 67. The cams 72 during this movement of the rock shaft, swing the wings 52, 53, away from the platen. The parts are thus brought to the Fig. 4 position for upper-case printing, in which position the bottom edge of the work-sheet is held to the platen along the printing line by the holder 63.

As the platen is returned to lower-case position, these movements are reversed, so that the wings 52, 53 again engage the sheet while the holder 63 is swung away from the platen. The movements of the work-holding devices are so timed that the wings 52, 53 are only returned to the platen when the latter has about reached its lower-case position, thus insuring the return of the lower edge of the sheet to a point below the holding edge of the wings before the latter reach their holding position. The holder 63 is also timed to swing free from the work-sheet about simultaneously with the engagement of said sheet by the wings.

Variations may be resorted to within the scope of the invention, and portions of the improvements may be used without others.

Having thus described my invention, I claim:

1. In a typewriting machine, the combination with a platen, and means to shift the platen to upper and lower case positions, of a work-holding device bearing against the work on the platen adjacent the printing line while the platen is in lower-case position, and means to automatically shift said device away from the platen when the latter is shifted to upper-case position.

2. In a typewriting machine, the combination with a roller platen, of means to shift the platen up and down to upper and lower case positions, a work-holding gage extending along the platen at the printing line, means to hold said gage with a yielding pressure against the platen while the latter is in lower-case position, and means connected to said platen-shifting means, for swinging said gage away from the platen as the latter is shifted to upper-case position, and holding it off the platen until the latter, during its return movement, nears its lower-case position.

3. In a typewriting machine, the combination with a roller platen, of means to shift the platen up and down to upper and lower case positions, a work-holding gage extending along the platen at the printing line, means to hold said gage with a yielding pressure against the platen while the latter is in lower-case position, means to swing said gage away from the platen as the latter is shifted to upper-case position, and hold it off the platen until the latter, during its return movement, nears its lower-case position, and an auxiliary device for bearing against the work adjacent the printing line and holding it to the platen at the printing line while said gage is held off the platen.

4. In a typewriting machine, the combination with a platen frame and platen, of a set of types to print thereat, a type-carrying frame, said frames relatively shiftable to different case positions, a work-holder mounted on the type-carrying frame and arranged to bear on the work along the printing line during printing in one case position, and means to automatically lift said work-holder from the work while it is shifted to the other case position.

5. In a typewriting machine, the combination with a platen frame and platen, of a set of types to print thereat, a type-carrying frame, said frames relatively shiftable to different case positions, a work-holder mounted on the type-carrying frame and arranged to bear on the work along the printing line during printing in one case position, means to automatically lift said work-holder from the work while it is shifted to the other case position, and an auxiliary work-holder arranged to bear against the work adjacent the printing line, while the first-mentioned holder is held off the work.

6. In a typewriting machine, the combination with a platen and a platen frame shiftable to upper and lower case positions, of a shift-key for shifting the platen, a work-holding plate pivoted on the machine frame, a spring to normally hold said plate against the platen with its edge extending along the printing line, and means operated by said shift-key to swing said plate away from the platen when the said key is operated.

7. In a typewriting machine, the combination with a platen frame and a roller platen thereon, of a platen-shifting frame operable to shift the platen up and down to upper and lower case positions, wings pivotally mounted on the machine frame and extending upwardly from their pivots in front of the platen, with their upper edges extending along the platen at the printing line, springs to swing said wings rearwardly and hold them against the work on the platen at the printing line, a rock shaft, connections between said rock shaft and the platen-shift-frame for rocking said shaft when the shift-frame is shifted, and means on the rock shaft for swinging said wings forward away from the work as the platen rises, and permitting them to return

as the platen is returned to lower-case position.

8. In a typewriting machine, the combination with a platen frame and a roller platen thereon, of a platen-shifting frame operable to shift the platen up and down to upper and lower case positions, wings pivotally mounted on the machine frame and extending upwardly from their pivots in front of the platen, with their upper edges extending along the platen at the printing line, springs to swing said wings rearwardly and hold them against the work on the platen at the printing line, a rock shaft, connections between said rock shaft and the platen-shift-frame for rocking said shaft when the shift-frame is shifted, means on the rock shaft for swinging said wings forward away from the work as the platen rises, and permitting them to return as the platen is returned to lower-case position, and an auxiliary work-holding device arranged to hold the work against the platen at the printing line while said wings are held off the platen.

9. In a typewriting machine, the combination with a platen frame and a roller platen thereon, of a platen-shifting frame operable to shift the platen up and down to upper and lower case positions, wings pivotally mounted on the machine frame and extending upwardly from their pivots in front of the platen, with their upper edges extending along the platen at the printing line, springs to swing said wings rearwardly and hold them against the work on the platen at the printing line, a rock shaft, connection between said rock shaft and the platen-shift-frame for rocking said shaft when the shift-frame is shifted, means on the rock shaft for swinging said wings forward away from the work as the platen rises, and permitting them to return as the platen is returned to lower-case position, an auxiliary work-holding device arranged to hold the work against the platen at the printing line while said wings are held off the platen, means to hold said auxiliary device away from the platen while the latter is in lower-case position, and means on said rock shaft to automatically swing said auxiliary device to work-holding position while said wings are held off the work.

10. In a typewriting machine, the combination with a platen frame and a roller platen thereon, of a platen-shifting frame operable to shift the platen up and down to upper and lower case positions, wings pivotally mounted on the machine frame and extending upwardly from their pivots in front of the platen, with their upper edges extending along the platen at the printing line, springs to swing said wings rearwardly and hold them against the work on the platen at the printing line, a rock shaft, connections between said rock shaft and the platen-shift-frame for rocking said shaft when the shift-frame is shifted, means on the rock shaft for swinging said wings forward away from the work as the platen rises, and permitting them to return as the platen is returned to lower-case position, work-holding fingers arranged to overlie the side margins of the work-piece, an auxiliary work-holding device, means to hold said auxiliary device against the work along the printing line when said wings are held off the platen, and means operated by said rock shaft to swing said auxiliary device away from the platen to prevent interference with said work-holding fingers while the platen is in lower-case position.

11. In a typewriting machine, the combination with a platen shiftable to upper and lower case positions, of work-holding fingers carried with the platen and arranged to engage the side margins of a work-piece on the platen, a work-holding device arranged to bear against the work and hold it close to the platen at the printing point when the platen is in upper-case position, and means to automatically move said holding device away from the platen to prevent interference with said fingers when the platen is moved to lower-case position.

12. In a typewriting machine, the combination with a roller platen, of means for shifting the platen to upper and lower case positions, a line-gage mounted on the machine frame and extending along the printing line on the platen close to the work when the platen is in lower-case position, means to automatically move said gage away from the platen when the latter is shifted to upper-case position, paper guides carried with the platen and arranged to overlie the side margins of a work-sheet on the platen, a work-holding device arranged to bear against the work on the platen adjacent the printing point while the platen is in upper-case position, and means to hold said device away from the platen while the latter is in lower-case position, to prevent interference with the marginal paper guides.

13. In a typewriting machine having a case shift, the combination of a platen, a line-gage extending along the printing line at the platen, the platen being movable relatively to said gage during a case-shifting movement, whereby, when the bottom margin of a work-sheet has been brought to the printing line, the edge of said sheet is carried beyond said gage during the case-shifting movement, and means to automatically hold said gage off the platen during the return movement to prevent fouling of the work-sheet with the gage.

14. In a typewriting machine, the combination of a platen, a gage extending along the printing line on the platen, while the latter is in lower-case position, the platen

being shiftable relatively to said gage to upper-case position, and means to enable the printing to be carried to the bottom edge of a work-sheet without interference between the said gage and the work-sheet during case-shifting movements, said means comprising mechanism operable automatically to move the gage away from the platen as the latter is moved to upper-case position and to return the gage when the platen is returned to lower-case position, the parts being timed to effect the return movement of the gage as the platen has about completed its return movement, whereby, during said return movement, the bottom edge of the work-sheet, when close to the printing line, is carried below the upper edge of the gage before the gage is returned, so that the work is prevented from catching on the gage.

15. In a typewriting machine, the combination with a platen shiftable to upper and lower case positions, of a device relatively to which the platen shifts, and adapted to hold a work-sheet flat against the platen in the neighborhood of the printing point in lower-case position, a separate, normally ineffective device for holding the work-sheet against the platen when the platen is in upper-case position, and connections whereby shifting the platen to effect a case-shift makes the first device ineffective and the second device effective.

16. In a typewriting machine, the combination with a platen shiftable to upper and lower case positions, of a device relatively to which the platen shifts, and adapted to hold a work-sheet flat against the platen in the neighborhood of the printing point in lower-case position, a separate, normally ineffective device for holding the work-sheet against the platen when the platen is in upper-case position, connections whereby shifting the platen to effect a case-shift makes the first device ineffective and the second device effective, and normally effective holding devices above the printing line adapted to hold the work-sheet against the platen.

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