

Aug. 6, 1940.

H. J. HART

2,210,168

TYPEWRITING MACHINE

Filed Aug. 28, 1939

3 Sheets-Sheet 1

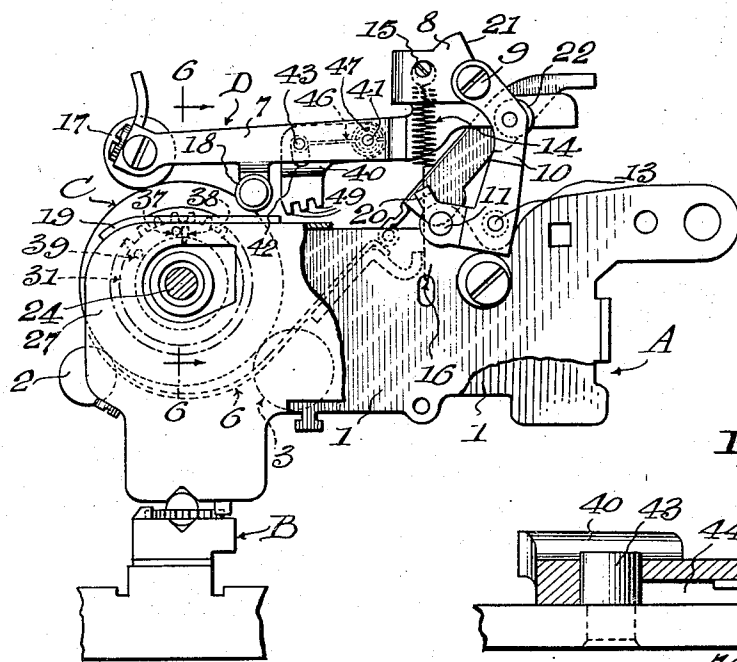


Fig. 1.

Fig. 5.

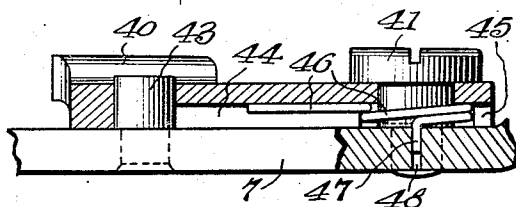
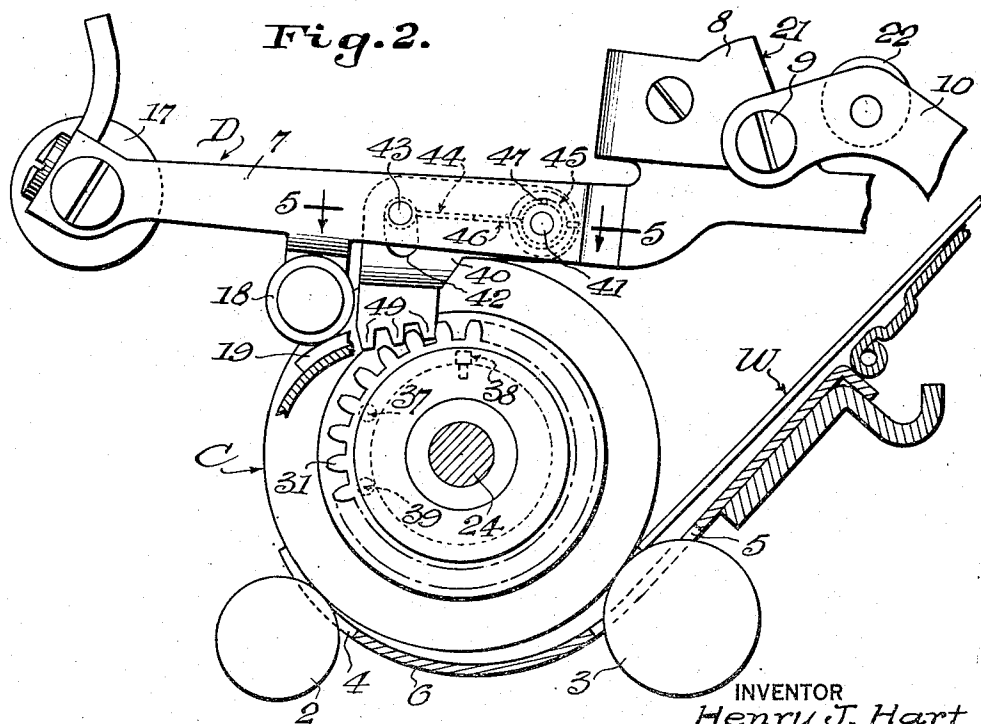


Fig. 2.



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3 Sheets-Sheet 2

Fig. 3.

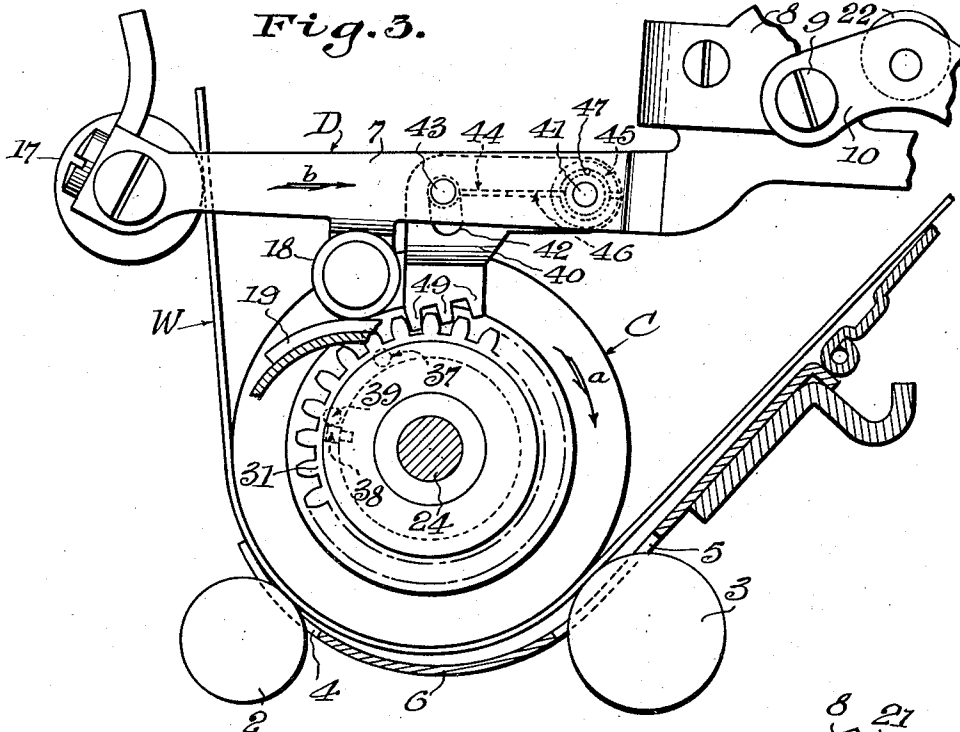
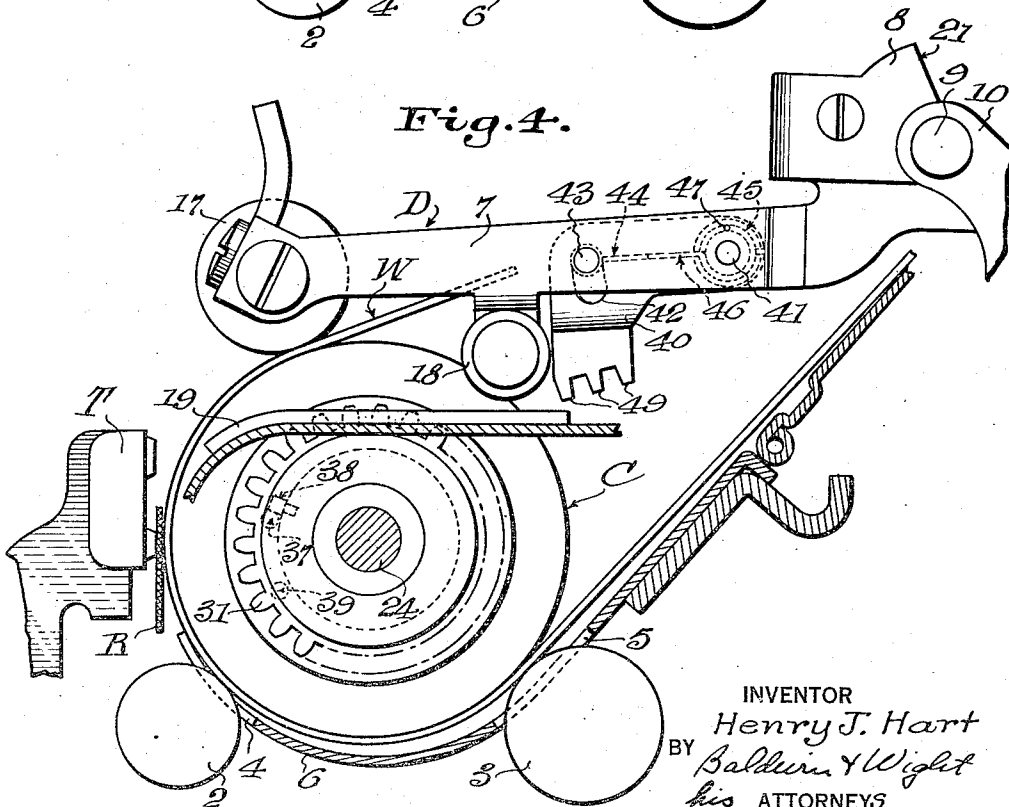


Fig. 4.



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3 Sheets-Sheet 3

Fig. 7.

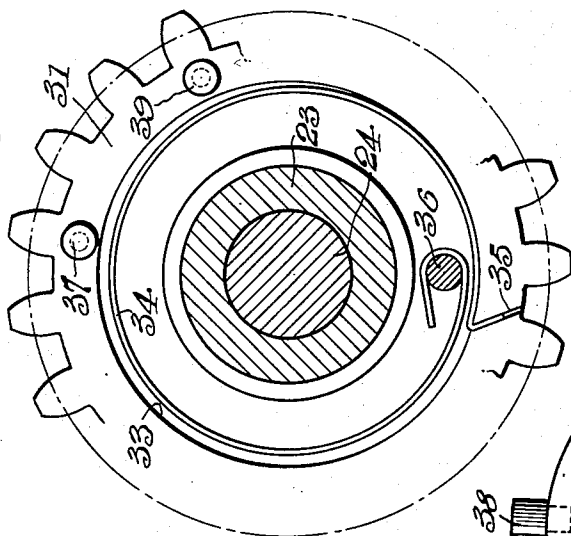


Fig. 8.

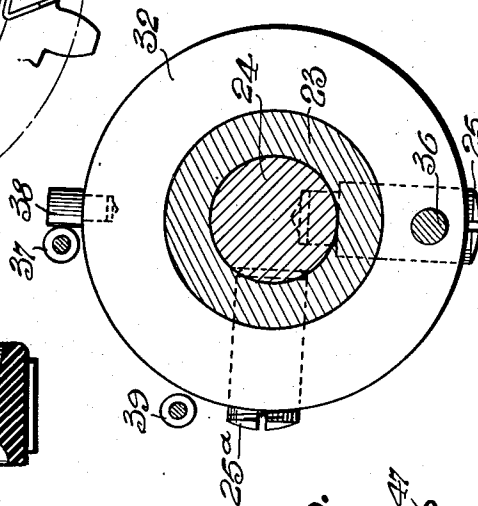


Fig. 9.

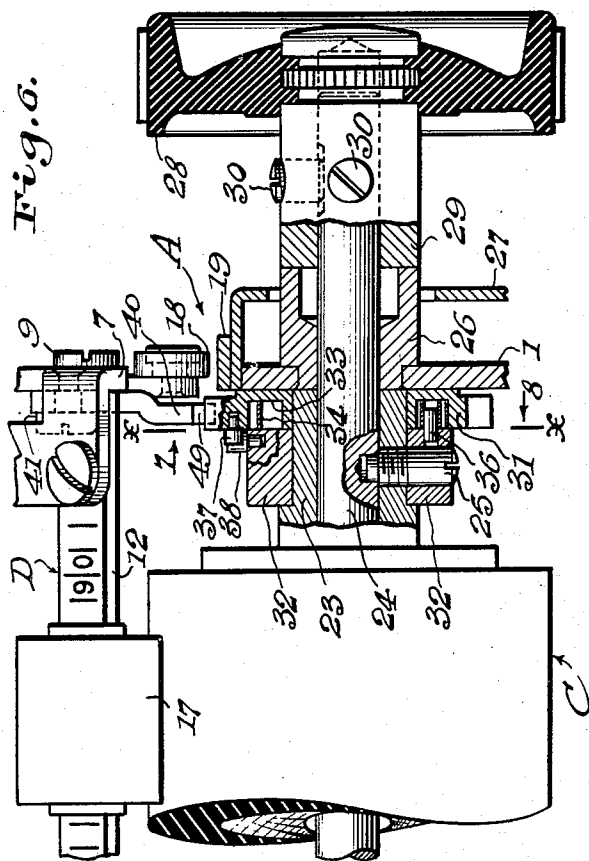


Fig. 10.

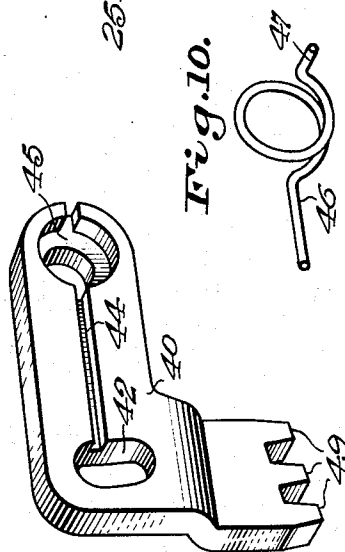


Fig. 9.

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UNITED STATES PATENT OFFICE

2,210,168

TYPEWRITING MACHINE

Henry Joseph Hart, West Hartford, Conn., assignor to Royal Typewriter Company, Inc., New York, N. Y., a corporation of New York

Application August 28, 1939, Serial No. 292,327

19 Claims. (Cl. 197—138)

This invention relates to typewriting machines and more particularly to work sheet holders and actuating mechanism for such holders.

Conventional standard typewriters are constructed to feed work sheets from behind, down under and then up in front of the cylinder or platen. Such machines customarily include paper holders such as clips, rolls, or the like for holding the upwardly projecting portion of the sheet back against the platen. In some machines the paper holders are mounted to move forwardly away from the platen to facilitate insertion and positioning of the work sheet and to then be moved rearwardly to engage the work sheet and press it snugly against the platen. The sequence of operations followed in inserting a work sheet in such prior machines and preparing for typing is as follows: The sheet holder is moved forwardly away from the platen. The work sheet is then pushed down between the rear of the platen and the usual rear lower feed roller. The platen is then rotated until the leading edge of the sheet passes upwardly between the platen and sheet holder. The sheet holder is then moved rearwardly to engage the sheet and press is rearwardly against the platen. It is necessary for the operator to rotate the platen just the right amount after initial insertion of the sheet in order properly to locate the start of typing vertically on the sheet. These several steps performed separately by the operator require some time and, when they are not performed carefully, the first line of typing may not be positioned uniformly on different sheets.

An object of the present invention is to provide a typewriting or like machine of the character referred to equipped with mechanism automatically operable in response to sheet-feeding movement of the platen for moving the sheet holder to press the sheet against the platen. This arrangement saves time, since it eliminates one of the steps heretofore necessary when inserting and positioning a work sheet in the machine.

Another object is to provide a machine equipped with mechanism of the kind referred to and which is adapted to effect the desired automatic movement of the paper holder to holding position in response to a predetermined amount of sheet-feeding movement of the platen. Thus, not only is the paper holder set automatically, but also it is set always when a predetermined length of work sheet is projected above the writing line. This assures uniform spacing of the first typed line from the top of the sheet.

A further object is to provide mechanism for operating sheet holders in the manner set forth above which is of simple construction and readily attachable to existing typewriters or like machines.

Other objects will become apparent from a reading of the following description, the appended claims, and the accompanying drawings, in which:

Figure 1 is a side elevation showing parts of a typewriter carriage and mechanism supported on the carriage and arranged in accordance with the invention, a platen shaft being shown in section. In this view the parts are shown in the positions occupied during typing operation;

Figure 2 is a fragmentary side view, partly in elevation and partly in section, drawn on an enlarged scale and showing the parts in the positions they occupy just prior to rotating the platen to feed a work sheet preparatory to the starting of typing;

Figure 3 is a view similar to Figure 2 but showing the parts in the positions occupied during the first part of return movement of paper-holder parts effected by paper-feeding movement of the platen;

Figure 4 also is a view similar to Figure 2 but showing the parts in the positions occupied after insertion of a work sheet and movement of the paper holder to holding position;

Figure 5 is a detailed sectional view taken on the line 5—5 of Figure 2 and drawn on an enlarged scale;

Figure 6 is a longitudinal sectional view taken substantially on the line 6—6 of Figure 1 and drawn on an enlarged scale;

Figure 7 is a cross sectional view taken on the line x—x of Figure 6, looking in the direction of the arrow 7 and drawn on an enlarged scale, and with two abutment pins shown in elevation;

Figure 8 is a section taken on the line x—x of Figure 6 looking in the direction of the arrow 8, and drawn on an enlarged scale;

Figure 9 is a detached perspective view of a pawl; and

Figure 10 is a detached perspective view of a pawl-urging spring.

Mechanism embodying the invention may be incorporated in typewriting or like machines of various kinds, either as original equipment built in during manufacture of new machines, or as attachments to be added to existing machines. For purposes of illustration, the invention is shown as being embodied in a Royal Standard typewriter having a carriage A supported for

longitudinal travel on a main frame track rail B. The carriage A is provided with the usual supports or end plates 1—1 on which is mounted a rotary cylindrical sheet-feeding platen C. Bottom feed rollers 2 and 3 mounted on the carriage respectively project partially through openings 4 and 5 in an apron 6 for cooperation with the platen in feeding work sheets.

A paper holder generally designated D and of known construction mounted on the supports 1—1 independently of the platen C comprises side arms, only one, 7, of which is shown. Each of the side arms 7 has its upper portion 8 pivoted as at 9 to an arm or link 10, in turn pivoted on the adjacent carriage end plate 1 as at 11. The paper holder D is in the form of an overhead ball including a front cross bar 12 (see Figure 6). A cross bar 13 (see Figure 1) extends between the arms 10 for bracing them and causing them to rock in unison about their pivots. A spring 14 connected to the arm 7 as at 15 and connected as at 16 to the end plate 1 normally holds the paper holder D and associated parts in the position shown in Figures 1 and 4. When the ball is in this position, pressure rolls 17 carried by the front cross bar 12, and only one of which is shown, are urged downwardly and rearwardly with respect to the platen for gripping a work sheet W tightly against the platen and holding it smooth along the writing line. The ball may be moved forwardly to the position shown in Figure 2 against the urge of the spring 14, and during such movement it is guided by a roller 18 carried by the arm 7 and arranged to run on a track 19 supported on the carriage. When the ball has been moved forwardly to its inactive or non-holding position shown in Figure 2, the spring 14 will pull the ball downwardly, but will permit it to remain in its forward position. If the ball is moved partially toward its aft position, the spring 14 will become effective to pull it completely to its aft position. Thus the spring and the associated arms 7 and 10, and the pivot mounting on the carriage, constitute a spring toggle device which tends to maintain the ball in either of its two extreme positions to which it has been moved. A stop lug 20 carried by the arm 10 is engageable with the carriage end plate 1 for limiting forward movement of the ball, and a heel 21 on the ball arm 7 is engageable with an adjustable eccentric 22 on the pivoted arm 10 for limiting upward swinging movement of the ball about the pivot 9. The general arrangement and manner of operation of the paper holder mechanism thus far described are similar to that disclosed in the patent to Bernard J. Dowd, No. 1,547,305, granted July 28, 1925.

The platen C is shown as being provided with a hub 23 to which a shaft 24 is fixed by means of a pilot set screw 25 and a headless set screw 26. The shaft 24 is journaled in a bearing 26 which is secured rigidly to the end plate 1 and extends through an end plate cover 27. A platen-rotating knob 28 carried by a sleeve 29 is mounted on the shaft 24 by set screws 30. The parts and arrangements of parts described thus far are known, and do not per se constitute the present invention. Mechanism in accordance with the invention comprises other parts and mechanism, and combinations thereof with the mechanism described thus far.

In accordance with the invention, mechanism is provided for automatically moving the paper holder from inactive or non-holding position to active or paper-holding position in response to

paper-feeding movement of the platen C. The illustrative embodiment includes a gear 31 loosely mounted on the hub 23 between the adjacent end plate 1 and a sleeve 32 secured to the shaft 24 by means of the pilot screw 25. The gear is formed with a recess 33 which houses a spring 34 anchored at one of its ends to the gear 31 as at 35, and anchored at the other of its ends to a stud 36 fixed to the sleeve 32. The spring 34 is so tensioned as at all times to urge the gear clockwise as viewed in Figures 1, 2, 3, 4, and 8, and counterclockwise as viewed in Figure 7. Such movement of the gear is limited by engagement of a positioning abutment pin 37 on the gear with a driving abutment pin 38 carried by the sleeve 32. A driven abutment pin 39 fixed to the gear 31 is adapted to be engaged by the driving abutment 38 for rotating the gear in response to paper-feeding rotation of the platen. Rotation of the gear 31 is utilized to effect movement of the paper holder from inactive position to active position. For transmitting drive from the gear to the paper holder, a limbered rack pawl 40 is pivoted as at 41 on the ball arm 7, and is provided with a slot 42 which receives a guide pin 43 fixed to the arm 7. Preferably, the pawl 40 is grooved as at 44 and counterbored as at 45 to receive compactly a wrap spring 46 having a laterally extending anchoring portion 47 seated in a hole 48 in the ball arm 7 (see Figure 5). Oblique angle teeth 49 on the pawl are adapted operatively to engage the teeth of the gear 31.

Prior to the insertion of a work sheet preparatory to typing, the parts will be in the position shown in Figure 1. To prepare for the insertion of a work sheet, the paper holder D first is moved manually from the position shown in Figure 1 to the position shown in Figure 2. During this movement, the pawl 40 will engage the gear 31, so that, during the latter part of the movement of the paper holder to its fore or inactive position, the gear 31 will be rotated counterclockwise, positioning the gear abutments 37 and 39 in spaced relation to the driving abutment 38, and additionally tensioning and storing energy in the spring 34. The amount of rotation of the gear 31 effected by movement of the paper holder will be the same for each such movement of the paper holder, and, accordingly, when the paper holder has been moved completely to its fore or inactive position, the driven pin 39 always will be in the same circumferentially spaced relation to the driving abutment 38.

A work sheet W is then placed as shown in Figure 2 to be gripped between the platen C and bottom feed roll 3. The platen is rotated clockwise in the direction of the arrow a in Figure 3 so as to feed the work sheet under the platen between the platen and the bottom feed roll 2, and thence upwardly and in front of the platen to the position shown in Figure 3, wherein the work sheet will be disposed behind the cross bar 12 and pressure rolls 17. During this paper-feeding movement of the platen, the driving abutment 38 will move clockwise until the lost motion between the drive connections 38—39 is taken up and the abutment 38 is in temporary driving engagement with the abutment 39. Further rotation of the platen with the abutment 38 in driving engagement with the abutment 39 will rotate the gear 31 clockwise so as to move the pawl 40 and paper holder D rearwardly in the direction of the arrow b in Figure 3, the pressure caused by the pawl spring 46 being sufficient to hold the pawl down in operative intermeshing engagement

with the gear teeth. Following this initial rearward movement of the paper holder effected by paper-feeding movement, the spring 14 will become effective to pull the paper holder all the way to its aft position, thus disengaging the pawl device 40 from the gear and forcibly pressing the rolls 17 against the leading edge of the work sheet and the latter against the platen in a downward and rearward direction so as to pull the work sheet snugly around the platen at the printing line, indicated by the positions of the type head T and ribbon R in Figure 4. As soon as the pawl element 40 has been moved out of engagement with the gear element 31, the energy stored in the spring 14 will rotate the gear counterclockwise and bring it to its starting position relative to the platen, with the positioning abutment 37 bearing against the driving abutment 38. The insertion and positioning of the work sheet will then have been completed, and typing may be proceeded with.

Each time the platen is rotated to feed a newly inserted sheet, the paper holder will be moved to paper-holding position after a uniform predetermined amount of paper-feeding movement of the platen has taken place. When the paper holder reaches its paper-holding position, there always will be the same amount of leading edge of the work sheet extending above the writing line. Thus, uniform spacing of the first typed line from the top of each sheet will be assured. However, the disengagement of the pawl 40 with the gear 31 when the paper holder has been moved completely to its paper-holding position makes it possible, if desired, to provide a different spacing between the first typed line and the top of any particular sheet by merely rotating the platen in the usual manner.

The placement of the positioning abutment 37 and the driven abutment 39 on the gear 31 determines the amount of paper-feeding movement of the platen which will be effected before the paper holder is moved automatically to paper-holding position. It will be apparent that the spacing of the pins may be varied in manufacture in accordance with particular requirements as to the spacing of the first typed line from the top of the sheet. The gear abutments 37 and 39 need not be formed separately, but may be comprised, for example, by the opposite ends of a single solid abutment, the angular spacing of the opposite ends of which would determine the amount of paper-feeding movement of the platen required to effect automatic setting of the paper holder.

Although the spring 46 presses the obliquely cut teeth 49 of the pawl into engagement with the gear teeth with sufficient force to prevent raising of the pawl when the gear 31 is driven in paper-feeding direction, the tooth angles and tooth pressure are such that the pawl will lift and ride idly on the gear if the platen is turned in a counterclockwise direction, that is, opposite paper-feeding direction, when the holder is in its fore position as shown in Figure 2. This permits adjustment of the sheet prior to setting of the paper holder in holding position whenever any special sheet-positioning is required.

The mechanism shown for the purposes of illustration embodies the invention in its now preferred form, but it will be understood that various changes may be made without departing from the invention as defined in the claims.

I claim:

1. In a typewriting or like machine, a support; a sheet feeder mounted for movement on

the support; a sheet holder mounted on said support independently of said feeder for movement to inactive or non-holding position and to active or holding position in which it holds a sheet to be typed upon against said feeder in position to be fed by operation of the feeder, the sheet feeder being movable relative to the sheet holder during sheet feeding operation of the sheet feeder; and means responsive to sheet feeding operation of the sheet feeder when the sheet holder is in inactive position for establishing temporary driving connection between the feeder and the holder and for moving the holder to active position.

2. In a typewriting or like machine, means including a platen for supporting a work sheet in writing position and for feeding the sheet past the writing line; a sheet holder mounted for movement to inactive or non-holding position and to active or holding position wherein it presses the sheet against the platen, the platen being movable relatively to the sheet holder during sheet feeding to feed the sheet past and in contact with the sheet holder; and means responsive to sheet feeding for moving the holder from inactive to active position.

3. In a typewriting or like machine, a work sheet feeding platen; a sheet holder for pressing a work sheet against the platen and being movable to inactive position and to sheet-pressing position; means independently mounting the platen and the sheet holder for relative movement of the platen to the holder during sheet-feeding movement of the platen; and means responsive to sheet-feeding movement of the platen for automatically moving the sheet holder to sheet-pressing position.

4. In a typewriting or like machine, a rotary cylindrical work-sheet-feeding platen; a sheet holder for pressing a work sheet against the platen and being movable to inactive position and to sheet-pressing position; means independently mounting the platen and the sheet holder for relative movement of the platen to the holder during sheet-feeding movement of the platen; and means responsive to rotary sheet-feeding movement of the platen for automatically moving the sheet holder to sheet-pressing position.

5. In a typewriting or like machine, a work-sheet-feeding platen; a sheet holder for pressing a work sheet against the platen and being movable to inactive position and to sheet-pressing position; means independently mounting the platen and the sheet holder for relative movement of the platen to the holder during sheet-feeding movement of the platen; and means responsive to a predetermined amount of sheet-feeding movement of the platen for automatically moving the sheet holder to sheet-pressing position.

6. In a typewriting or like machine, a work-sheet-feeding platen; a sheet holder for pressing a work sheet against the platen and being movable to inactive position and to sheet-pressing position; means independently mounting the platen and the sheet holder for relative movement of the platen to the holder during sheet-feeding movement of the platen; means for yieldably maintaining the sheet holder in said positions respectively when moved thereto; and means responsive to sheet-feeding movement of the platen for automatically moving the sheet holder toward sheet-pressing position.

7. In a typewriting or like machine, a rotary cylindrical work-sheet-feeding platen; a sheet

holder for pressing a work sheet against the platen and being movable to inactive position and to sheet-pressing position; means independently mounting the platen and the sheet holder for relative movement of the platen to the holder during sheet-feeding movement of the platen; means for yieldably maintaining the sheet holder in said positions respectively when moved thereto; and means responsive to a predetermined amount of rotary sheet-feeding movement of the platen for automatically moving the sheet holder toward sheet-pressing position.

8. In a typewriting or like machine, a rotary cylindrical work-sheet-feeding platen; a bail having sheet-engaging means for pressing a work sheet against the platen; means mounting the bail independently of the platen to provide for movement of the sheet-engaging means to sheet-pressing position and to inactive position relatively far removed from the platen; and means including connections between the bail and platen responsive to rotary movement of the platen for moving the sheet-engaging means to sheet-pressing position.

9. In a typewriting or like machine, a rotary cylindrical work-sheet-feeding platen; an overhead bail pivotally mounted at the rear of the platen and projecting forwardly over the platen; sheet-engaging means carried by the forwardly projecting part of the bail and being adapted to press a work sheet against the platen; means mounting the bail to provide for movement of the sheet-engaging means to sheet-pressing position and to inactive position relatively removed from the platen; and means including connections between the bail and platen responsive to rotary movement of the platen for moving the sheet-engaging means to sheet-pressing position.

10. In a typewriting or like machine, a rotary cylindrical work-sheet-feeding platen; a work sheet holder; means mounting said holder for movement to an inactive non-pressing position relatively removed from the platen and to an active position in which the holder engages the work sheet and presses it snugly against the platen; elements connected to the platen and holder respectively and being operatively disconnected from each other when the holder is in active position but being adapted operatively to engage each other when the holder is in inactive position for establishing operating connection between the platen and the holder and for effecting movement of said holder from said inactive position to an intermediate position in response to sheet-feeding movement of the platen; and a spring toggle device for then moving said holder from said intermediate position to said active position.

11. In a typewriting or like machine, a rotary cylindrical work-sheet-feeding platen; a work sheet holder; means mounting said holder for movement to an inactive non-pressing position relatively removed from the platen and to an active position in which the holder engages the work sheet and presses it snugly against the platen; a rotatable gear; a lost motion driving connection between the platen and the gear; and a device connected to the holder and being operatively disconnected from the gear when the holder is in active position but being adapted operatively to engage the gear when the holder is in inactive position and to be driven by said gear during sheet-feeding movement of the platen for moving said holder toward said active position.

12. In a typewriting or like machine, a rotary cylindrical work-sheet-feeding platen; a work sheet holder; means mounting said holder for movement to an inactive non-pressing position relatively removed from the platen and to an active position in which the holder engages the work sheet and presses it snugly against the platen; a rotatable gear; a lost motion driving connection between the platen and the gear; a motion-transmitting device connected to the holder and being operatively disconnected from the gear when the holder is in active position but being adapted operatively to engage the gear when the holder is in inactive position and to be driven thereby to impart to the sheet holder an initial movement toward said active position in response to rotation of the gear and platen in sheet-feeding direction; and a spring connected to said holder and effective to move it to active position subsequent to said initial movement of the holder in response to rotation of the platen.

13. In a typewriting or like machine, a rotary cylindrical work-sheet-feeding platen; a work sheet holder; means mounting said holder for movement to an inactive non-pressing position relatively removed from the platen and to an active position in which the holder engages the work sheet and presses it snugly against the platen; a gear coaxial with said platen; cooperating driving abutments on the gear and platen respectively; means including a spring interposed between said gear and platen normally yieldably maintaining said abutments in predetermined relative positions out of mutual driving connection whereby when the gear is stationary a predetermined amount of sheet-feeding movement of the platen takes place before the abutment on the platen comes into driving engagement with the abutment on the gear; and means connected to the holder and engageable with said gear when the holder is in inactive position for moving the holder toward active position in response to sheet-feeding rotation of the platen with the abutments in mutual driving engagement and consequent rotation of said gear.

14. In a typewriting or like machine, a rotatable paper-feeding platen; a paper holder movable towards and from the platen; a gear journaled coaxially with the platen; a driving abutment on the platen; a positioning abutment on the gear; a spring connected to the gear and urging it to rotate relative to the platen and yieldably to maintain said positioning abutment against said driving abutment; a driven abutment on said gear; a rack connected to said paper holder and being engageable with said gear for rotating the gear during movement of said paper holder away from the platen and for then moving said paper holder toward said platen consequent upon a predetermined amount of paper-feeding movement of the platen effecting, first, the engagement of said driving abutment with said driven abutment, followed by conjoint rotation of the platen and gear in paper-feeding direction.

15. In a typewriting or like machine, a rotatable paper-feeding platen; a paper holder movable towards and from the platen; a gear journaled coaxially with the platen; a driving abutment on the platen; a positioning abutment on the gear; a spring connected to the gear and urging it to rotate relative to the platen and yieldably to maintain said positioning abutment against said driving abutment; a driven abut-

ment on said gear; a limbered rack pawl pivoted on said paper holder and being operatively disengaged from said gear when the paper holder is in paper-holding position, said pawl being engageable with said gear when the paper holder is moved away from the platen for rotating the gear to position the driven abutment in predetermined angularly spaced relation to the driving abutment, and said pawl serving to move the paper holder back toward the platen when the platen is rotated in paper-feeding direction and the gear driven through engagement of the driving and driven abutments.

16. In a typewriting or like machine, a rotatable paper-feeding platen; a paper holder movable towards and away from the platen; a gear; lost motion driving connections between the gear and platen; and a spring-urged limbered pawl carried by the paper holder and being operatively disconnected from said gear when the paper holder is in operative position, said pawl being operatively engageable with said gear when the paper holder is moved away from the platen, rotation of the gear effected by drive through said lost motion connections during rotation of the platen in paper-feeding direction driving said pawl and moving said paper holder towards said platen.

17. In a typewriting or like machine, a rotatable paper-feeding platen; a paper holder movable towards and away from the platen; a gear; lost motion driving connections between the gear and platen; a spring-urged limbered pawl carried by the paper holder and being operatively disconnected from said gear when the paper holder is in operative position, said pawl being operatively engageable with said gear when the paper holder is moved away from the platen, rotation of the gear effected by drive through said lost motion connections during rotation of the platen in paper-feeding direction driving said pawl and moving said paper holder towards said platen; and means effective after a predetermined amount of movement of the paper holder toward the platen for moving the paper holder further toward the platen to paper-holding position and moving the pawl out of operative engagement with said gear.

18. In a typewriting or like machine, a rotatable paper-feeding platen; a paper holder

movable towards and away from the platen; a gear; lost motion driving connections between the gear and platen; and a spring-urged limbered pawl carried by the paper holder and being operatively disconnected from said gear when the paper holder is in operative position, said pawl being operatively engageable with said gear when the paper holder is moved away from the platen, rotation of the gear effected by drive through said lost motion connections during rotation of the platen in paper-feeding direction driving said pawl and moving said paper holder towards said platen, said pawl comprising a rack having teeth cut on an oblique angle whereby the pawl will ride idly on the gear when the rack is in engagement with the gear and the platen and gear are rotated reversely to paper-feeding direction.

19. In a typewriting machine, a rotary work-sheet-feeding platen; means for directing a work sheet under the platen and thence up in front of the platen; a bail mounted for fore and aft movements and including a front cross bar equipped with a roll adapted to be disposed in a fore position in front of a work sheet extended upwardly in front of the platen and to be disposed in an aft position in which it engages the sheet and holds it snugly back against the platen; and means for moving said roll from its fore position to its aft position including a gear journaled coaxially with the platen, a driving abutment on the platen, a driven abutment on the gear, means including a spring interposed between the gear and platen for normally but yieldably maintaining said abutments in predetermined spaced relation, toothed means on said bail operatively disconnected from the gear when the bail is in its aft position but being operatively engaged with the gear when the bail is in its fore position, said abutments constituting a lost motion driving connection between the platen and gear for driving the gear positively after predetermined feeding movement of the platen and projection of a work sheet up between said roll in its fore position and said platen, such driving of the gear then moving said toothed means and moving the ball toward its aft position.

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