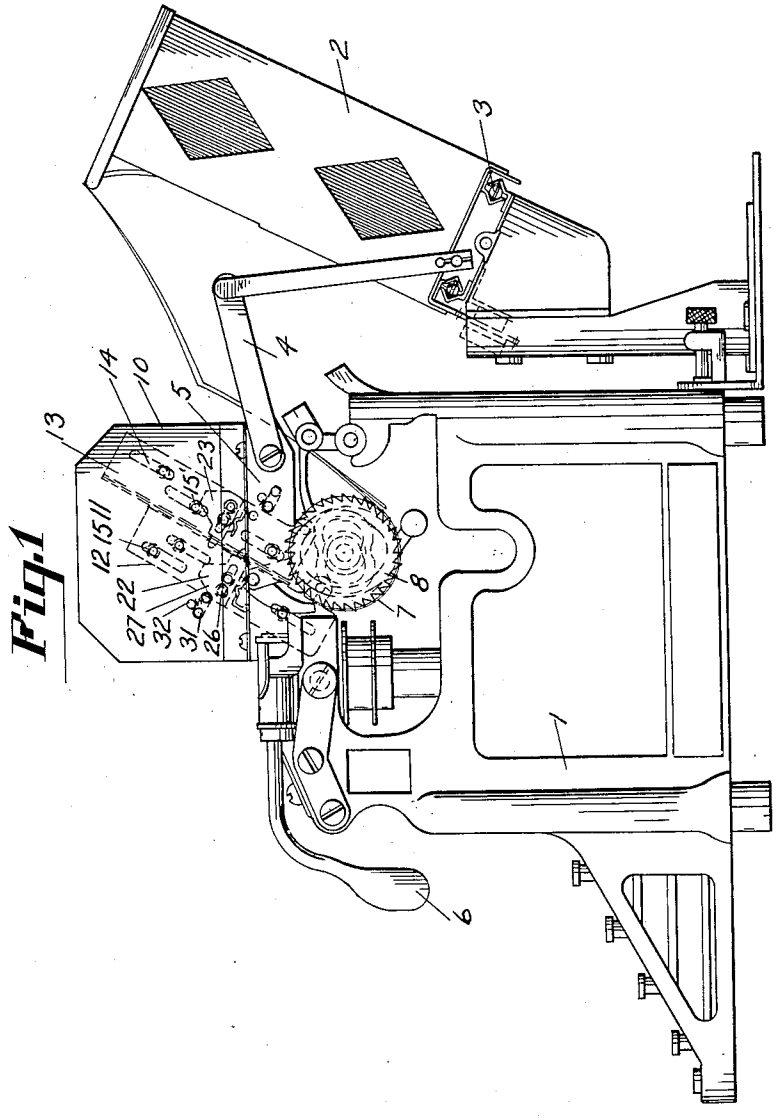
Sept. 22, 1936. J. Q. SHERMAN 2,054,837

PAPER FEEDING MECHANISM

Filed Aug. 2, 1933 3 Sheets-Sheet 1

Fig. 1



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PAPER FEEDING MECHANISM

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Fig. 2

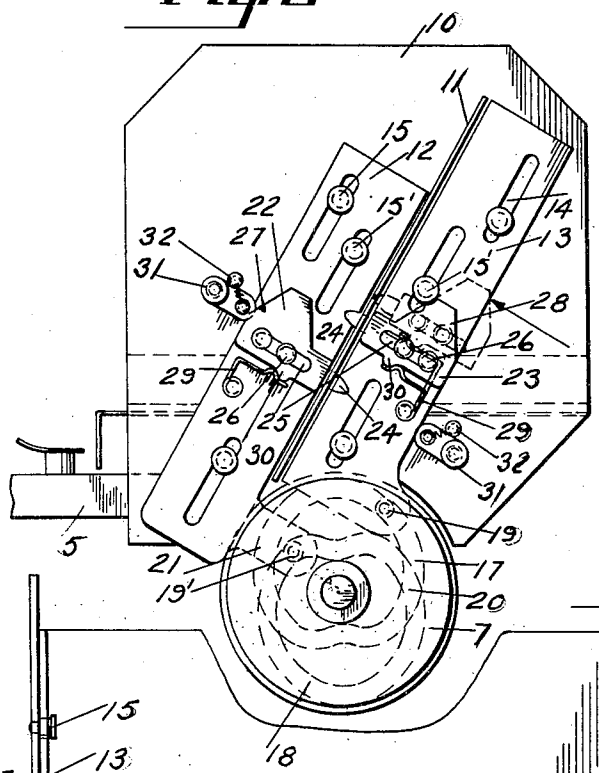
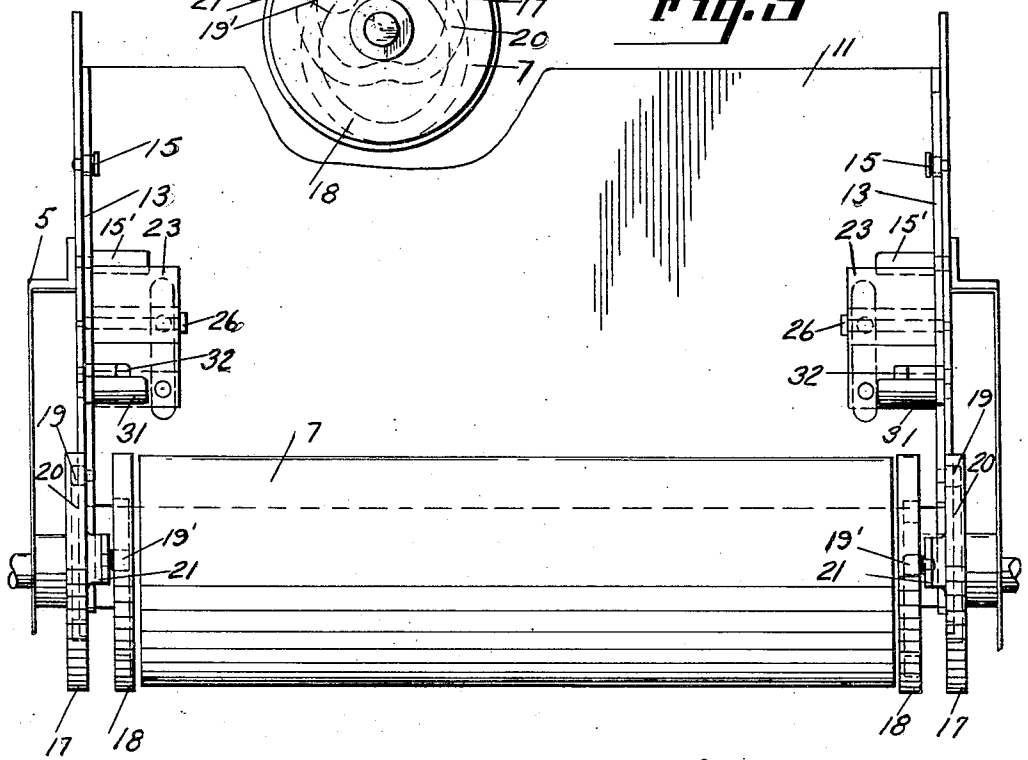


Fig. 3



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Fig. 4

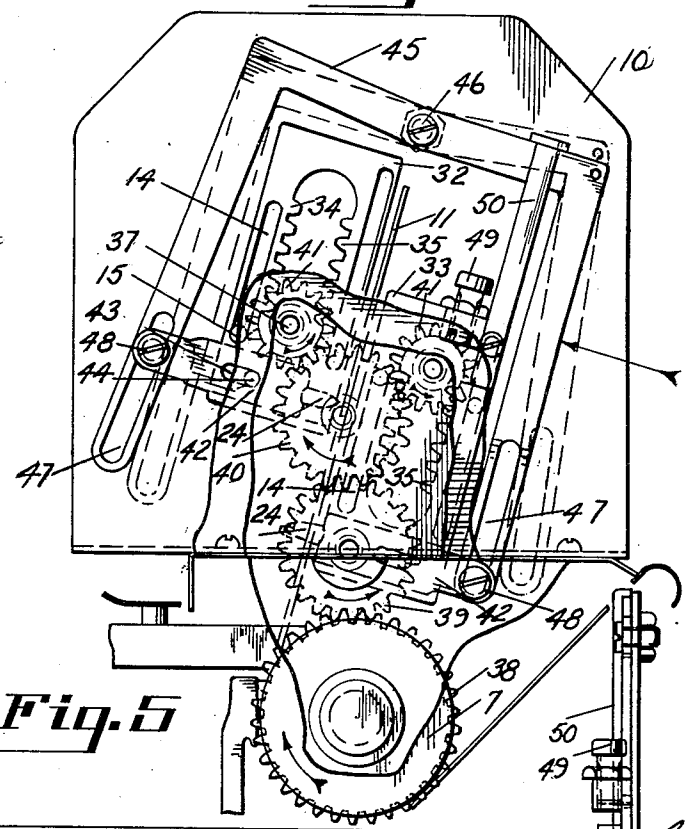


Fig. 6

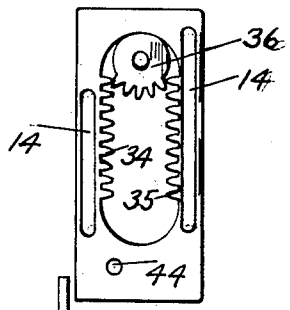
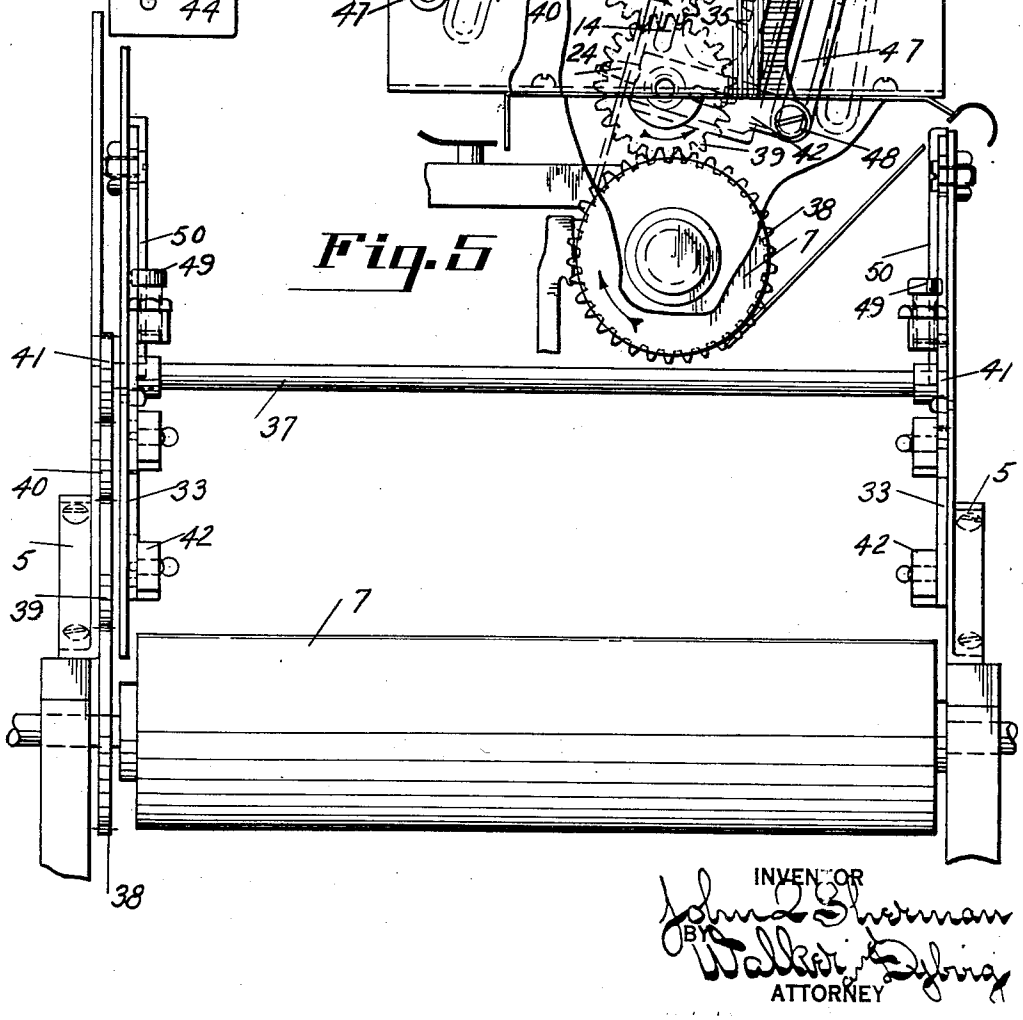


Fig. 5



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Patented Sept. 22, 1936 2,054,837

UNITED STATES PATENT OFFICE

2,054,837

PAPER FEEDING MECHANISM

John Q. Sherman, Dayton, Ohio

Application August 2, 1933, Serial No. 683,282

19 Claims. (Cl. 197—133)

This invention relates to writing machines, and more particularly to means for progressively feeding superposed strips of record material while maintaining proper alignment thereof with the printed forms thereon in accurate registry with each other. The present embodiment of the invention involves straight line motion feeding means having engagement with the superposed strips and moving them a predetermined distance through a substantially straight path of travel, after which the strips of record material are released and the strip engaging means is returned idly preparatory to a succeeding feeding operation. Multiple strip engaging devices are provided for alternating operation whereby during retrograde movement of one such device, another will be in operative engagement with the record strips, thereby effecting a substantially continuous advancement thereof. The apparatus is so controlled that each strip engaging device is actively engaged with the strips before disengagement of the other feeding device.

The object of the invention is to simplify the construction as well as the means and mode of operation of paper feeding means for writing machine, whereby it will not only be cheap in construction and economical for manufacture, but will be more efficient in use, positive in operation, uniform in action, of few parts compactly arranged, and unlikely to get out of repair.

A further object of the invention is to provide a reciprocatory feeding device for superposed strips or webs of record material which will, at all times, maintain operative engagement with the strips or webs of material, and which will serve to move such material in a straight line path of travel.

A further object of the invention is to provide straight line motion feeding means for strips or webs of writing material engageable in punched feeding holes in such material which will be automatically disengaged at the end of a predetermined path of travel and returned for reengagement at a different point throughout the length of the superposed strips or webs of material.

A further object of the invention is to provide strip or web feeding means having straight line engagement and disengagement substantially perpendicular to the strips or webs of record material at the opposite limits of its feeding movement.

A further object of the invention is to provide alternating strip feeding devices and means for effecting operative engagement of each of the devices with the material before the other device has been disengaged therefrom.

A further object of the invention is to provide improved actuating means for operating alternating strip feeding devices.

A further object of the invention is to provide improved means for automatically projecting a strip engaging member into operative relation with the strip and for automatically retracting it therefrom at the opposite limits of a predetermined path of feeding movement.

With the above primary and other incidental objects in view, as will more fully appear in the specification, the invention consists of the features of construction, the parts and combinations thereof, and the mode of operation, or their equivalents, as hereinafter described and set forth in the claims.

Referring to the accompanying drawings wherein is shown the preferred, but obviously not necessarily the only form of embodiment of the invention, Fig. 1 is a side elevation of a conventional form of typewriter having a traveling paper supply carrier associated therewith, and to which the present strip feeding mechanism has been applied. Fig. 2 is an enlarged detail side elevation of the strip feeding mechanism, forming the subject matter hereof. Fig. 3 is a rear elevation of the strip feeding mechanism and an associated platen roller as viewed from the right of Fig. 2. Fig. 4 is a side elevation of a modification of the feeding apparatus while Fig. 5 is a rear view of the apparatus illustrated in Fig. 4 as viewed from the right. Fig. 6 is a detail view.

Like parts are indicated by similar characters of reference throughout the several views.

Referring to the accompanying drawings, 1 indicates a conventional form of typewriter, associated with which is a traveling paper supply carrier 2, reciprocated to and fro upon the supporting track 3 by arms 4 connected to the carrier and projecting on opposite sides of the reciprocatory platen carriage 5 of the typewriter. The typewriter 1 is provided with the usual line spacing mechanism operated by the lever 6 to actuate the customary platen roller 7 through the medium of the ratchet wheel 8. The typewriter and line spacing mechanism, disclosed in the drawings, are for illustrative purposes only and it is to be understood that the paper feeding mechanism, forming the subject matter hereof, is applicable to various styles of writing machines and is not limited to the particular writing machine or mechanism illustrated.

Mounted upon each end of the reciprocatory

platen carriage 5 are vertical frame plates 10 interconnected by a rearwardly inclined table or guide plate 11, over which the superposed strips or webs of record material pass from the platen roll 7 of the writing machine. Mounted upon the inner faces of the frame plates 10 for alternating reciprocatory motion in directions parallel with the guide plate or table 11, are alternating slides 12 and 13 disposed on opposite sides of the guide platen or table 11.

Slides 12 and 13 are mounted in any suitable form of guides upon each end plate 10 for relative alternating reciprocatory motion. For simplicity and economy of manufacture, the slides are shown provided with longitudinal slots 14 through which project headed studs 15 fixedly secured in the end plates 10 and supporting the slides 12 and 13 for to and fro motion. The slides 12 and 13 are actuated by cams 17 and 18 concentrically mounted at each end of the platen roller 7 with which they are connected for unison rotation. Fig. 3, being a rear view, the slides 13 only are visible at each end of the plate 11. The companion slides 12 are located beyond the guide plate 11. The corresponding slides at opposite sides of the machine operate in unison and alternately with those on the opposite side of the guide plate 11. The slides 13 carry rollers 19 engaging in the cam grooves 20 of the actuating cams 17, at each end of the platen roll. Likewise, the slides 12 carry rollers 19' engaging cams 18, each controlling a slide 12 at each end of the machine. The slides 13, being located substantially in alignment with their actuating cam 17, the roller 19 is mounted directly upon the slides. To the contrary the slides 12 being offset forwardly of the actuating cams and platen roller 7, such slides 12 are provided with rearwardly extending arms 21 carrying the rollers 19' engaging in the cam ways of the actuating cams 18. The cams 17 and 18 are set to retract one slide, while the other slide is being advanced, thus alternating the direction of movement of the slides 12 and 13. This relation of parts clearly appears in Fig. 2.

Upon the respective reciprocatory slides 12 and 13 are pin carrying heads 22 and 23 respectively, mounted for reciprocatory motion transversely of the slides 12 and 13 upon which they are carried. Each of the transversely reciprocatory heads 22 and 23 carries a paper engaging pin or stud 24 projected into and withdrawn from punched feed holes of the superposed manifolding strips passing over the guide plate 11. The transversely adjustable heads 22 and 23 are provided with slots 25 through which extend headed studs 26 fixedly secured in the reciprocatory slides 12 and 13. The heads 22 and 23 are tapered or inclined to present cam surfaces 27 and 28. They are held in their transversely adjusted positions relative to the slides 12 and 13 by spring detent fingers 29 which engage with rounded bosses 30 on the under side of the adjustable heads.

In the positions shown in Fig. 2, the feeding studs or pins 24 of both of the heads are in active feeding engagement with the manifolding material which extends across the guide plate 11 from the platen roll 7. The pin 24 of the feeding head 23 is about to be withdrawn and the pin 24 of the head 22 has just been projected into feeding position preparatory to its upward feeding motion. The inclined cam face 27 of the head 23, as shown in Fig. 2, has just contacted with the head of the stud 15', and upon continued upward movement of the slide 13, the camming action of the surface 27 will retract the head 23 to withdraw its pin 24 from engagement with the paper. This retractive movement is against the tension of the detent spring 29 which yields to the pressure of the projection 30 and finally snaps into place beyond such projection to hold the head 23 retracted during the retrograde motion of the slide 13.

During its retrograde motion the head engages and idly pushes aside a pivoted contact member 31 carried by the mounting plate 10 and spring pressed into the path of travel of the head 23. The contact member 31 normally engages a stop stud 32 which resists movement of the contact as the head 23 travels upwardly permitting swinging motion in one direction only. The feeding head 23 passes beyond the spring actuated contact member 31 in its retractive movement, and upon the initial return movement of the slide the cam face 28 of the head contacts with the member 31, which is then unyielding, and as the slide continues to move the head 23 is cammed transversely into operative engagement with the manifolding material, against the yielding resistance of the spring detent 29 past which the projection 30 is forced, and which thereupon holds the head in adjusted position. The feeding pin 24 carried by the head 23 is thus thrust into registered feeding apertures of the manifolding strips which engagement is maintained throughout the advance movement of the slide 13 until the head 23 is retracted transversely of the slide by engagement of its cam face 27 with the fixed stud 15' to withdraw the feeding pin 24 from the manifolding material.

The action of the slide 12 and feeding head 22 is identical with that of the head 23 heretofore described, except that it is differently timed to alternate with the slide 13 and head 23 in actuating the manifolding material. The studs 15' and contact members 31 are so spaced that the feeding pin 24 of one head is projected into engagement within the registered feeding holes of the manifolding material before the pin 24 of the other head is disengaged therefrom.

Illustrative of the wide range of variation of possible embodiment of the invention there is shown in Fig. 4 a modification wherein the reciprocatory slides are gear actuated and the feeding heads are lever actuated.

Mounted on the end plates 10 for alternating reciprocatory motion at opposite sides of the guide plate 11 are two slides 32 and 33 corresponding to the slides 12 and 13 of the construction first described. These slides are slotted at 14 for engagement with guiding studs 15 projecting from the end plates 10. The slides 32 and 33 are centrally open and provided with two series of inwardly projecting rack teeth 34 and 35, alternately engaged by associated gear segments 36 carried on shafts 37 journaled in the end plates 10 and extending transversely of the machine. The shafts 37 carry gear segments 36 at each end engageable with corresponding double rack slides on each end plate 10, to drive the slides first in one direction and then in the other. It will be understood that the slides or double racks 32 and 33 are provided in pairs, one member of each pair being located at each side of the machine, and operating in unison and the respective pairs being located in front and behind the guide plate 11 and alternating in their movements.

The gear segments 36 are actuated from the

platen roll 7 by a gear train, the initial member 38 of which is mounted concentrically with the platen roller and is connected thereto for unison rotation. The primary gear 38 meshes with a second gear 39 mounted on the end plate 10 which in turn drives a third gear member 40 having simultaneous engagement with two gear pinions 41 mounted on the segment shafts 37 pertaining to the respective gear rack slides 32 and 33. Thus rotary motion is transmitted to the gear segments 36 in unison with the rotation of the platen.

These gear segments are mounted in the openings of the slides 32 and 33 and in their rotation engage first one series and then the other series of rack teeth 34 and 35 to drive the slide first in one direction and then in the other. The openings within the slides 32 and 33 are terminally enlarged beyond the ends of the gear racks 34 and 35 sufficiently to permit the gear segments 36 to idly turn from one gear rack to the other. Having intermeshed with one series of gear teeth and thereby having driven the slide longitudinally in one direction to the limit of its movement the gear segment disengages the first series of rack teeth and by a partial rotation engages the second series of rack teeth to drive the slide an equal distance in reverse direction.

In Fig. 6, the gear segment 36 is shown in an intermediate position, passing from one gear rack to the other. Thus the direction of movement of the slides alternates, and moreover the respective pairs of slides 32 and 33 at the front and rear of the guide plate 11 alternate with each other.

Slidingly mounted upon each of the reciprocatory slides 32 and 33 for transverse movement relative thereto is a head 42 corresponding to the heads 22 and 23 of the construction first described. Each carries a feeding pin 24. These heads 42 are provided with slots 43 in which engage guide studs 44 carried by the slides.

For reciprocating the heads 42 to project and withdraw the feeding pins 24 relative to the manifolding material there is provided a "walking beam" type of lever 45 pivoted at 46 to the end plates 10, the arms of which extend downwardly in approximately parallel relation with the reciprocatory slides.

Each arm of the rocking lever 45 is slotted at 47. Within these slots the heads 42 are slidingly engaged by studs 48, whereby the feeding heads 42 may move up and down in unison with the reciprocation of the slides independently of the rocking lever. Upon oscillation of the lever such feeding heads, carrying the paper engaging pins 24 are shifted transversely of the slides upon which they are carried, to advance the pin 24 of one head into engagement with the manifolding material and withdraw the pin 24 of the other head therefrom. Such movement occurs only when one of the slides and its feeding head is at the upper limit and the other slide and feeding head at the lower limit of their range of reciprocatory motion.

The lever 45 is rocked by the movement of one or the other of the slides as they approach the limit of their movement in each direction. While various operating connections may be employed, there is shown in Fig. 4 an adjustable contact 49 on the upper end of the reciprocatory slide 33 which engages the under side of the rocking lever 45 as the slide approaches the upper limit of its range of travel, and thereby oscillates the rocking lever 45 to withdraw the head carried by the slide 33 and project the head carried by the slide 32 into operative engagement with the manifolding material. At the limit of the downward movement of the slide an offset or flange upon an upwardly extending adjustable bar 50 also carried by the reciprocatory slide 33 engages the upper side of the rocking lever 45 to oscillate the lever in reverse direction and thereby reverse the engagement of the feeding heads.

From the above description it will be apparent that there is thus provided a device of the character described possessing the particular features of advantage before enumerated as desirable, but which obviously is susceptible of modification in its form, proportions, detail construction and arrangement of parts without departing from the principle involved or sacrificing any of its advantages.

While in order to comply with the statute, the invention has been described in language more or less specific as to structural features, it is to be understood that the invention is not limited to the specific features shown, but that the means and construction herein disclosed comprise the preferred form of several modes of putting the invention into effect, and the invention is therefore claimed in any of its forms or modifications within the legitimate and valid scope of the appended claims.

Having thus described my invention, I claim:

1. A feeding mechanism for a writing machine utilizing superimposed strips of punched record material, a pair of reciprocating feeding members, a plunger carried by each of said feeding members, said plungers engaging the record material when the reciprocating members move in a direction of the advancement of the record material, and means for retracting one of the plungers out of engagement with the record material during the movement of the other plunger in the opposite direction.

2. In a writing machine for use with punched record material, a rotary platen past which the record material is fed, means for intermittently aligning the strips of record material, said means including a pin traveling along a straight line when in engagement with the record material, said means advancing at a speed substantially equal to the peripheral speed of the platen when the pin is in engagement with the record material and traveling in the direction of the record material contiguous thereto when aligning the strips, the pin being retractable from the record material but pointing in the same general direction when out of engagement.

3. In a writing machine, a platen, feeding means for advancing the record material provided with feed holes past the platen, said feeding means including a pair of pins alternately engaging said feed holes and continuously advancing along a straight line when feeding the record material past the platen and returning along a circuitous path but pointing in the same direction.

4. In a writing machine, a platen, a pair of devices cooperating to advance a record sheet provided with feed holes past the platen, each of said devices including a pin intermittently engaging the feed holes in the writing material and traveling in a straight line when in engagement therewith, the pin of one device being adapted to engage record material when a pin of the other device is out of engaging position.

5. In a writing machine for operating upon sheets of punched record material, a pair of feeding pins alternately and successively engaging said sheet to feed the same through said machine,

the pins traveling along a straight line when advancing the sheet, but entering the same from opposite sides of the record material.

6. In a machine for feeding sheets of record material provided with aligned apertures, a pair of pins alternately advancing the record material in registry, reciprocatory supports for the pins, means for retracting one of said supports to withdraw its pin out of engagement with the record material when a pin of the other support is in engagement with the record material.

7. A pin feeding device for feeding superposed strips of continuous length record material provided with apertures including a pair of reciprocatory supports, a pin carried by each of said supports, said pin having a reciprocatory movement therewith and means for retracting one of the supports and its pin from engagement with the record material when the pin of the other support engages the same.

8. In a writing machine for use with superposed strips of record material having aligned feeding holes, a rotary platen, a reciprocatory carriage adjacent to the path of travel of the record material passing around the platen, said carriage having a to and fro movement parallel to the path of travel of the record material adjacent thereto, and an aligning pin movably mounted upon the carriage, said pin movably mounted upon the carriage in a direction traversing the path of movement of the record material so as to enter into a feed hole and to be retracted therefrom, the feeding pin entering a hole when the carriage moves in the direction of the movement of the record material so as to hold the same in alignment while passing around the platen, the lineal speed of the carriage being substantially equal to the peripheral speed of the platen.

9. In a writing machine utilizing superposed strips of record material provided with feed holes, a rotary platen past which the record material passes, and a pin feeding device including a reciprocatory carriage having an operative and an inoperative stroke each in a path parallel to the movement of travel of the record material contiguous thereto, the rate of speed of the carriage during the operative stroke being substantially equal to the peripheral speed of the platen, a pin carried by said carriage and means associated with said carriage for advancing the pin into engagement with the feed holes of the record material during the operative stroke of the carriage, said pin being retracted out of engagement during the inoperative stroke.

10. In a pin feeding device for a writing machine for use with record material having feed holes, a pair of reciprocating carriages, each of which has an operative stroke and an inoperative stroke, each of said carriages including a pin, and means associated with the carriages for advancing the pin carried by the carriage into engagement with the record material during the operative stroke of the carriage and for withdrawing the pins from the record material during the inoperative stroke thereof.

11. In a writing machine, a platen, a pair of pin feeding devices for advancing the record material past the platen, each of said pin feeding devices including a reciprocating carriage having an operative and an inoperative stroke, and a pin carried by said carriage moving into engagement with the record material during the operative stroke and moving out of engagement during the entire inoperative stroke of the carriage, and means for actuating the carriages in synchronism but phase opposition so that the record material is always engaged by at least one pin.

12. In a pin feeding device for a writing machine for use with record material having feed holes, a pair of carriages having alternate advance and return strokes, each of said carriages having a pin, the pins moving into engagement with the record material during the advance stroke of the carriage and being retracted from the record material during the return stroke of the carriage.

13. In a writing machine, a platen, a plurality of reciprocating carriages for advancing the record material past the platen, each of said carriages having an operative stroke and a return stroke, a pin carried by each of the carriages, said pins moving into engagement with the record material during the operative stroke of the carriage and moving out of engagement with the record material during the return stroke.

14. In a writing machine, a platen, a pair of pin feeding devices alternately operative to advance the record material past the platen, each of said pin feeding devices including a pin mounted in a support and an oscillating arm for controlling the movement of the pin with respect to the support, the arm of one pin feeding device alternating with the arm of the other.

15. In a writing machine, a platen, a pair of pin feeding devices alternately operative to advance the record material past the platen, each of said pin feeding devices including a reciprocating carriage, a pin carried by said carriage, and an oscillating arm for controlling the movement of said pin relative to the carriage, the arm of one feeding device alternating with the arm of the other, so as to maintain continuous engagement of the record material with at least one pin.

16. In a writing machine, a platen, a pair of reciprocating carriages each having an operative stroke and an inoperative stroke for advancing the record material past the platen, a pin carried by each of said carriages, and oscillating arms advancing the pins into engagement and retracting the pins from engagement with the record material during the operative and the entire inoperative strokes respectively of each carriage, the carriages being disposed on opposite sides of the record material fed by said pins.

17. In a writing machine, a platen, a pin feeding device for advancing the record material past the platen, a plurality of pins for engaging the record material to advance the same beyond the platen, and a plurality of oscillating arms for advancing the pins into engagement with the record material and retracting the same therefrom, one of said arms retracting one pin while another arm advances another pin into the record material so that the record material is continuously engaged by at least one pin.

18. In a writing machine for use with continuous strips of record material having aligned feed holes, a platen, a pair of pin feeding devices having pins alternately engaging holes provided therefor in the record material, the pins of one pin feeding device advancing into the feed holes from one side of the record material and the pins of the other pin feeding device advancing into the holes of the record material from the opposite side.

19. In a writing machine for use with punched record material, a rotary platen past which the record material is fed, means having an operative stroke for aligning the strips of record material

and an inoperative stroke, said means including a pin traveling along a straight line when in engagement with the record material, means for actuating said aligning means at a rate of speed substantially equal to the peripheral speed of the platen during the operative stroke when the record material is aligned, and means for causing the pin to pass through a circuitous path but pointing in the same general direction during the inoperative stroke.

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