Oct. 29, 1940. C. W. DAWSON ET AL 2,219,299

MANIFOLDING REGISTER

Filed July 26, 1937 3 Sheets-Sheet 1

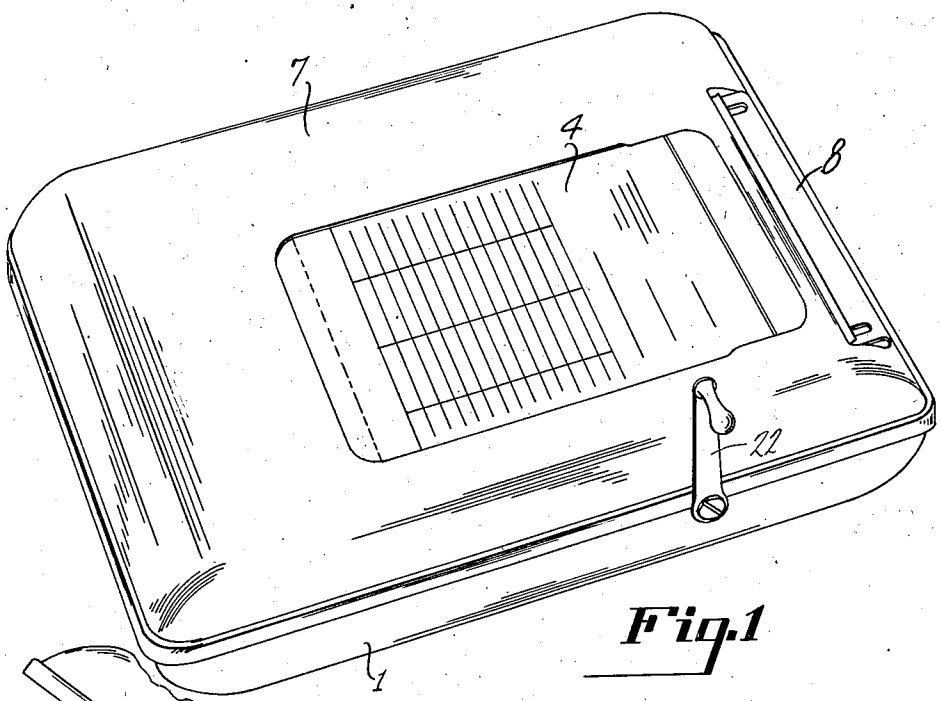


Fig. 1

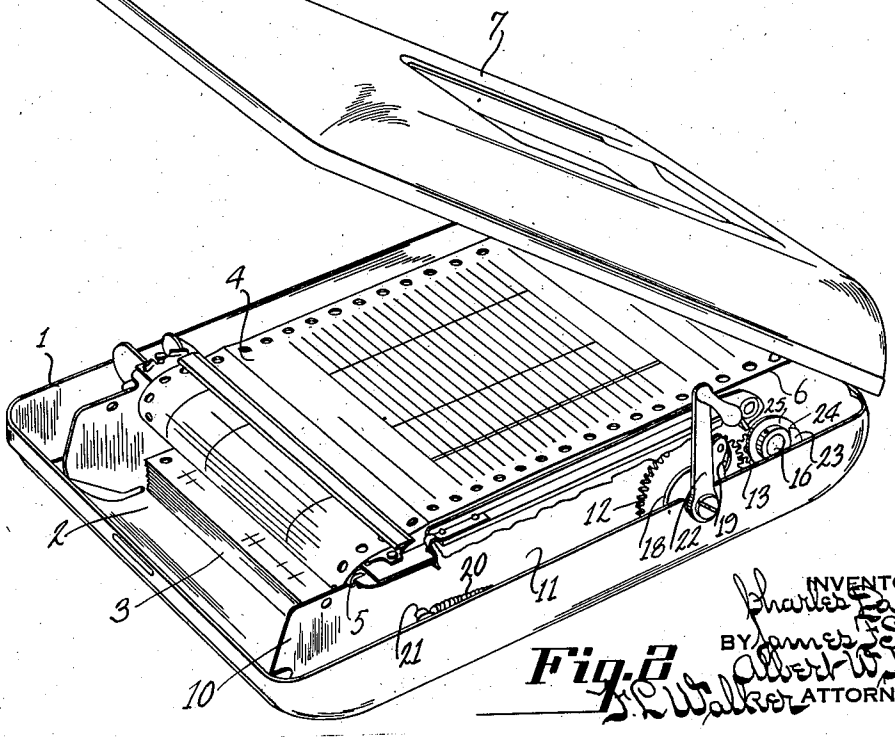


Fig. 2

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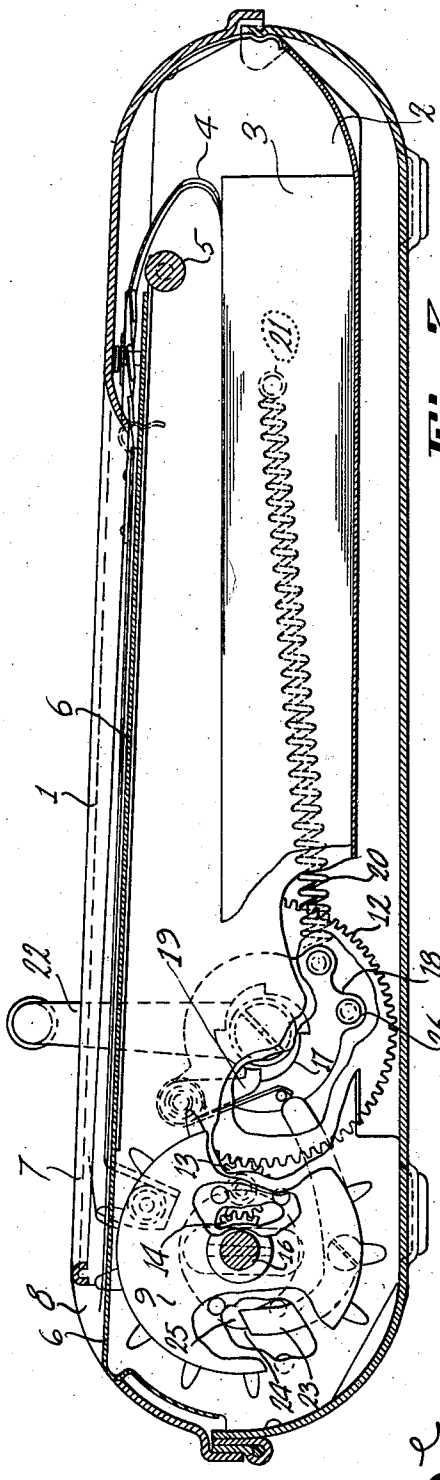


Fig. 5

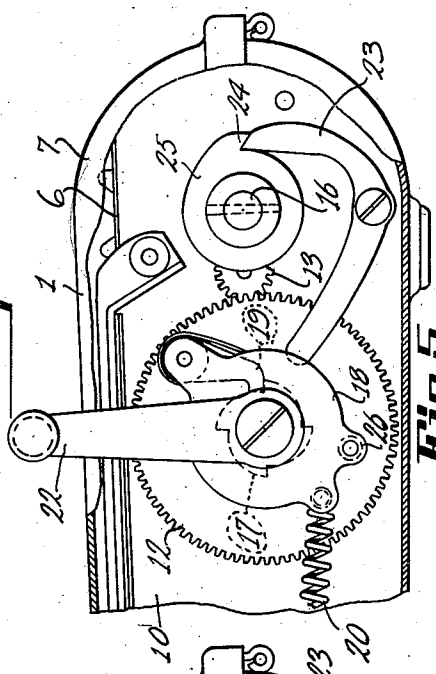


Fig. 5

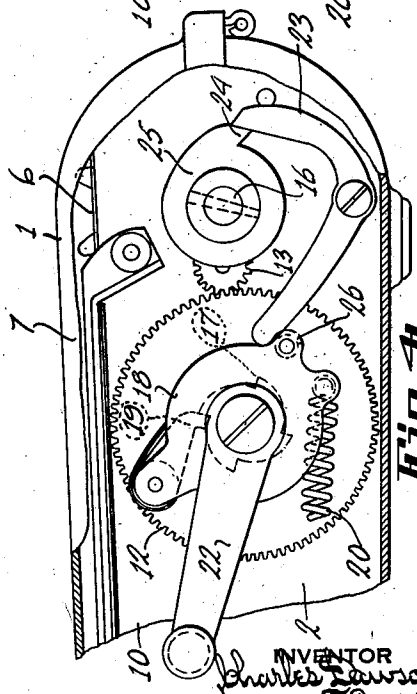


Fig. 4

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Filed July 26, 1937 3 Sheets-Sheet 3

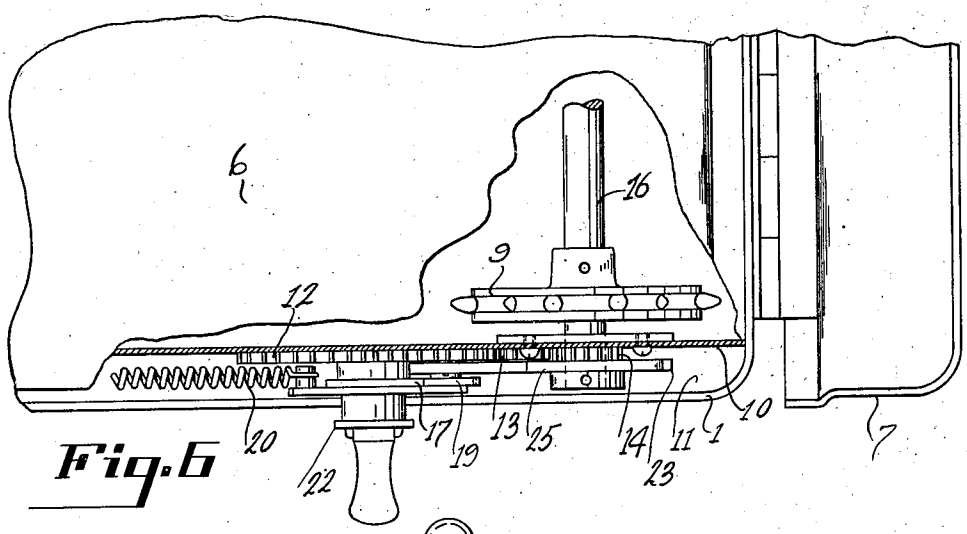


Fig. 6

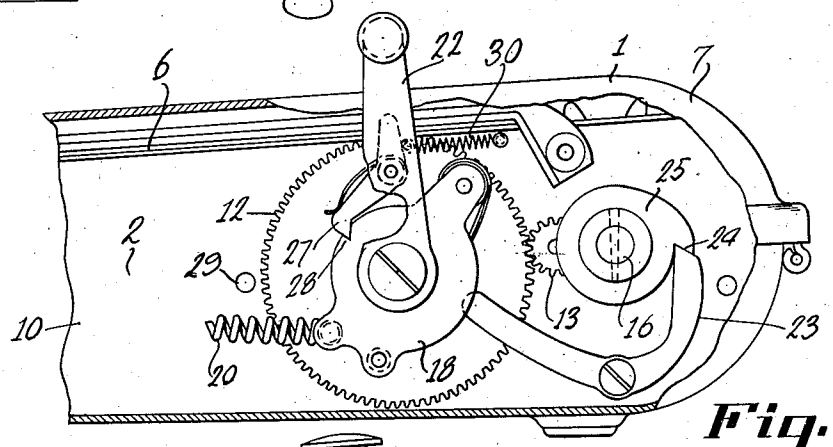


Fig. 7

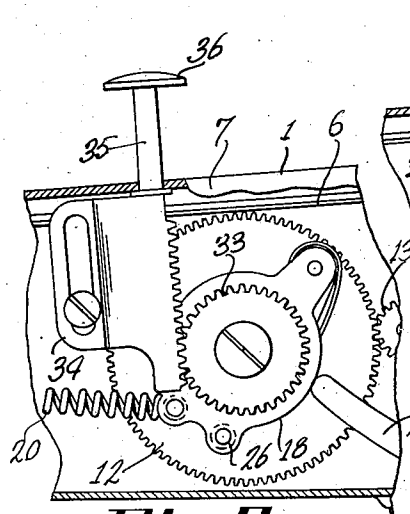


Fig. 9

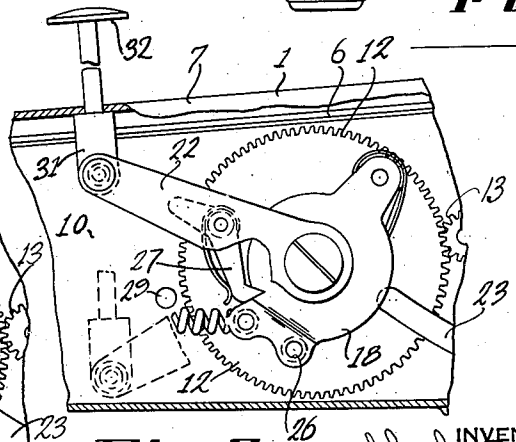


Fig. 8

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UNITED STATES PATENT OFFICE

2,219,299

MANIFOLDING REGISTER

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Application July 26, 1937, Serial No. 155,716

10 Claims. (Cl. 271—2.4)

This invention pertains to strip feeding mechanism for autographic registers, imprinting devices, and the like, and more particularly to motive means for automatically ejecting at the will of the operator measured lengths of record strips or succeeding forms of continuous series connected form stationery.

Autographic registers of both counter and portable styles, wherein one or more record copies of sales slips, forms, or short length portions are ejected by either frictional feed rollers or pin wheel feeding members engageable in marginally punched holes in the record strips and actuated by a manually operated rotary crank, have been quite common in the art.

Modern commercial practice necessitates more rapid operation with minimum effort of the operator. It is highly desirable that the time lost in "grinding out" inscribed portions of the record strips be saved, and that the result be accomplished by a single operative movement of a control or tripping device.

Electric motive power while quite successfully applied to counter type registers, is not practical for operation of portable registers, not only because its field of operation is necessarily restricted to cable length from a suitable source of electric current supply, but because incorporation of an electric motor renders such registers too heavy to be conveniently carried from place to place and held in the hand while in use.

By the present invention a relatively light weight, quick acting motive means is applied to the strip feeding device and tripped by the operator at the completion of the record inscribing operation, causing the record strip or strips to be automatically and instantly advanced a measured distance of one form length to thereby eject the inscribed portion thereof out of the register and present the succeeding portion or set of forms in writing position.

The object of the invention is to simplify the construction as well as the means and mode of operation of automatic strip feeding means, which may not only be economically manufactured, but will be more efficient in use, uniform in operation, automatic in action, having relatively few parts and unlikely to get out of repair.

A further and important object of the invention is to provide automatic ejector means for autographic registers and the like which will add minimum additional weight to the register.

A further object of the invention is to provide motive means which may be employed where electrical power is not available, and which will permit a register to be readily transported from place to place without restriction.

A further object of the invention is to provide motive ejector means which will instantly and with great rapidity discharge an accurately measured length of record strip material from the register.

A further object of the invention is to provide improved tripping means for initiating the feeding impulse.

A further object of the invention is to provide a strip feeding means having the advantageous structural features and meritorius characteristics herein disclosed.

A further and important object of the invention is to provide a strip dispensing apparatus wherein sufficient motivating power is stored prior to the feeding operation to energize the strip feeding mechanism and subsequently expended at the completion of the storing operation to advance the strip in a single cycle of operation.

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.

In the drawings wherein are shown the preferred, but obviously not necessarily the only forms of embodiment of the invention,

Fig. 1 is a perspective view of a portable autographic register to which the present invention is applied.

Fig. 2 is a perspective view thereof with the lid or cover raised exposing a part of the present strip ejecting mechanism.

Fig. 3 is a longitudinal sectional view with parts broken away to disclose operating parts of the ejector mechanism.

Fig. 4 is a detail side elevation of the ejector mechanism during actuation, the parts being in relative relation assumed immediately after initiation of the feeding movement.

Fig. 5 is a similar view showing the parts at the completion of the feeding operation.

Fig. 6 is a detail top plan view with portions of the housing broken away.

Figs. 7, 8 and 9 illustrate modifications.

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

While the present invention is equally ap-

plicable to frictional or other forms of feed devices for manifolding registers, imprinting and recording devices and the like, for illustrative purposes, but with no intent to unduly limit the application or scope of the invention, it is herein illustrated and described in association with a pin type feeding unit having progressive engagement in registering marginally punched holes in the superposed record strips to be fed. In the accompanying drawings there is illustrated a popular form of portable autographic register including a box like housing 1, having therein a compartment 2, to contain a supply packet 3 of superposed zig-zag folded strips 4, which are withdrawn from the supply compartment 2 and thence about a guide roller 5 into writing position upon a writing tablet 6 overlying the supply compartment. The housing is provided with a swinging lid or cover 7, having therein an opening 8 registering with the writing tablet 6, through which the withdrawn portions of the strips may be inscribed. The cover when raised affords access to the supply compartment 2, as shown in Fig. 2.

At the forward end of the housing is a pin type feeding unit comprising two relatively spaced interconnected pin wheels 9, disposed in approximately tangential relation with the plane of the writing tablet 6 and journaled in bearings in a wall 10 of the compartment 2 spaced inwardly relative to the sides of the housing 1. The pin wheels 9 are progressively engageable in marginally punched holes in the strips to advance the strips from the supply compartment over the writing tablet and past the inscription receiving position. The pin wheels 9 are so proportioned that one complete rotation thereof will advance the strips a full measured form length, and they then come to rest with the succeeding set of forms in writing position.

Ordinarily the pin wheels 9 are actuated by a rotary hand crank necessitating one or more turns to complete the feeding of a full form length. In the present construction, the usual hand crank is replaced by a spring actuated automatic feeding mechanism.

Located within the space 11 intermediate the compartment wall 10 and the side of the housing 1, and journaled on a stud projecting from the wall 10 is a gear wheel 12, meshing with an idler pinion 13, which in turn meshes with a driven gear 14 upon the pin wheel shaft 16. The hub of the driving gear 12 is formed with a succession of ratchet teeth 17. Mounted concentrically with the driving gear 12 is an independent oscillatory disc 18, to the inner side of which is pivoted a spring actuated pawl 19 having engagement with successive ratchet teeth 17 in the hub of the gear. Also connected with the disc 18 is a retractile actuating spring 20, the opposite end of which is connected to a stud 21 projecting from the opposite end of the wall 10.

A hand lever 22 is connected in offset relation with the disc 18 for oscillation in a plane outside the housing 1. The pin wheels 9 are arrested in their advanced position by engagement of a detent lever 23 with a stop shoulder 24 of a disc 25 secured to the extremity of the pin wheel shaft 16 and rotating therewith. Before the pin wheels may be rotated it is necessary to withdraw the detent from locking relation with the disc 25. Projecting from the inner side of the operating disc 18 is a stud 26 which in the final position of retractive movement of the disc 18 engages with the arm of the detent 23 to oscillate the detent out of engaging relation with the shoulder 24.

To operate the strip feeding mechanism, the lever 22 is manually retracted from the Fig. 5 position to one slightly beyond that shown in Fig. 4. The lever being coupled to the disc 18 oscillates the disc against the tension of the retractile spring 20 and carries with it the spring actuated pawl 19 until the latter engages the next succeeding ratchet tooth 17 of the gear hub.

As the disc approaches the limit of its retractive movement, the stud 26 engages the extremity of the arm of detent 23 and oscillates the latter out of engagement with the stop shoulder 24 as is shown in Fig. 4. This engagement occurs sufficiently in advance of the limit of the range of retractive movement of the disc that on return motion the gear train will be initially actuated sufficiently before the stud 26 disengages the detent arm to carry the stop shoulder 24 past the detent head 23 as shown in Fig. 4.

At the rear limit of retractive movement of the operating lever 22, and with it the disc 18, the operator releases the lever and the tensioned spring 20 quickly and forcibly propels the disc and lever forwardly, transmitting through the pawl 19 and ratchet tooth 17 a rapid partial rotation to the driving gear 12 which is in turn transmitted through the gear train comprising gears 12, 13 and 14 to the pin wheel shaft 16. This rotates the pin wheels 9, which being engaged in the marginal holes of the record strips, imparts to the strips a quick forward motion until a full form length is ejected by completion of one complete rotation of the pin wheels 9. The stop disc 25 on the end of the pin wheel shaft being cam shaped permits the detent 23 to return to engaging relation in the path of the stop shoulder 24 and engage therewith at the end of one complete rotation of the pin wheels.

Thus, it is merely necessary to manually pull the lever 22 backward through a partial rotation and release it, whereupon a measured length of the strips is instantly and automatically ejected.

In Fig. 7 there is shown a modification, wherein the parts and their operation is the same except the operating lever is not fixedly coupled to the disc 18 but is concentrically pivoted for independent relative oscillation. Carried by the lever 22 is a spring pressed pawl 27, engageable in a notch 28 in the edge of the disc 18. The pawl 27 is provided with a trip arm which as the disc and lever approach the limit of their retractive movement against the tension of the spring 20, engages with a fixed stud or pin 29 projecting from the wall 10. The engagement of the pawl arm 27 with the stud 29 oscillates the pawl out of engagement with the disc, which being thus released is returned by the spring 20 independently of the lever to transmit motion to the pin wheels as before described. When released by the operator, the lever is automatically returned preparatory to the next operation by a relatively light spring 30.

The degree of oscillatory motion of the operating lever 22 necessary to effect the desired rotation of the strip feeding device whether one complete rotation or more or less may be varied by suitably proportioning the ratio of the gears of the motion transmitting train.

As a further variation of the operating or tripping movement to be performed by the operator, employing the construction illustrated in Fig. 7 and heretofore described, the lever may be positioned interiorly of the housing within the space 11, and the notch 28 so positioned in the disc 18 that the relative movement of the lever

is from the solid line position to the dotted line position of Fig. 8, wholly within the space 11 interiorly of the housing. A vertically moving plunger 31 pivoted to the end of the lever and projecting above the top of the register where it carries a button 32 provides means for manual operation of the lever. By a mere downward thrust motion upon the plunger the lever and disc are retracted and the spring tensioned, and then automatically released as the arm of the pawl 27 engages the stud 29 at the limit of the setting operation.

In Fig. 9 the disc 18 is shown provided with a gear wheel 33 affixed thereto, with which meshes a reciprocatory rack bar 34, having a stem 35 extending above the top of the register and carrying a push button 36. The depression of the button 36 transmits rotary motion to the disc to tension the spring and upon release of the button, the disc is actuated by the spring in reverse direction to drive the strip feeding means as before described. Such reciprocatory operating rack bar 34 may be disposed either vertically or horizontally with the same effect.

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 our invention, we claim:

1. A strip feeding apparatus wherein a strip of continuous series connected marginally punched forms are intermittently advanced from a reversely folded zigzag packet thereof within a compartment of a housing over a writing tablet forming a part of the housing into record receiving position by a pair of rotary pin wheel feeding members disposed in approximately tangential relation with the writing tablet and having progressive feeding engagement in the marginally punched holes of the strip to advance the strip over the writing tablet, and wherein a detent member limits the rotation of the pin wheels to a degree of movement only sufficient to eject from the register a predetermined measured form length, characterized by driving and driven gears, the latter being connected with the pin wheel feeding members, a ratchet hub upon the driving gear, an oscillatory actuator mounted concentrically therewith, a pawl on the actuator engageable with succeeding ratchet teeth of the gear hub, an impeller spring for the actuator tensioned by the oscillation thereof necessary to effect engagement of the pawl with a succeeding tooth of the ratchet hub of the gear, a manually operated member for retracting the actuator, and means upon the actuator for disengaging the detent as the actuator approaches the limit of its retractive movement against the tension of the impeller spring, said parts being so constructed and arranged that upon release of the actuator at the limit of its retractive movement, its return motion under influence of the impeller spring is transmitted to the pin wheel members to actuate the latter until arrested by the detent and thereby eject a measured length of the record material.

2. A strip feeding apparatus wherein a strip of continuous series connected marginally punched forms are intermittently advanced from a source of supply past a writing position by intermittently rotative pin wheel feeding devices progressively engageable in marginally punched holes in a strip to be fed, characterized by an oscillatory actuator therefor, an impeller spring for urging the actuator in a direction to drive said pin wheels, driving means intermediate the actuator and pin wheels including a pawl and ratchet mechanism by which the actuator is permitted idle retractive movement against the resistance of the spring which is tensioned thereby, detent means normally preventing actuation of the pin wheel feeding devices by the actuator, manual means for retracting the actuator and rendering the detent means ineffective, the actuator being releasable at the limit of its retractive movement for return operative driving movement of the pin wheels under influence of the spring.

3. A strip feeding apparatus wherein a strip of continuous series connected marginally punched forms are intermittently advanced from a source of supply past a writing position by intermittently operable traveling pin type feeding means having progressive engagement in longitudinally spaced holes in a strip to be fed for advancing the strip through succeeding step-by-step movements, an actuator mounted for to and fro motion, characterized by motive means for urging the actuator in one direction, an intermediate driving connection between the actuator and the pin type feeding means enabling idle retractive movement of the actuator preparatory to return motion in operative driving relation with the pin type feeding means, detent means preventing actuation of the pin type feeding means by the actuator, manual means for retracting the actuator and detent means, the actuator being releasable at the limit of its retractive movement for return operative movement under influence of the motive means.

4. A strip feeding apparatus for advancing a continuous strip of record material intermittently from a supply compartment over a writing tablet and successively presenting prescribed portions thereof in writing position on the writing tablet by progressive engagement of a traveling pin type feeding device in longitudinally spaced holes in the strip, characterized by driving means for the pin type feeding device, an impeller spring for the driving means, manual means for tensioning the impeller spring independently of the traveling pin type feeding device, and means for automatically releasing the tensioned impeller spring by continued operation of the manual spring tensioning means at the limit of the tensioning operation, the construction and arrangement being such that upon release the tensioned impeller spring will drive the pin type feeding device to advance the strip through a predetermined range of travel.

5. In a strip feeding apparatus, intermittently actuated strip engaging means for advancing a continuous strip of material through successive step-by-step movements, driving means therefor,

an impeller spring for the driving means, manual means for tensioning the impeller spring independently of the strip engaging means, and means for automatically releasing the tensioned impeller spring by continued operation of the manual spring tensioning means at the limit of the tensioning operation, the construction and arrangement being such that the tensioned impeller spring when released will drive the strip engaging means to advance the strip through a predetermined range of travel.

6. In a strip feeding apparatus, intermittently actuated strip engaging means for advancing a continuous strip of material through successive step-by-step movements, driving means therefor, an impeller spring for the driving means, manual means for tensioning the impeller spring independently of the strip engaging means, stop means for arresting the operation of the strip engaging means when a predetermined length of strip has been advanced, and means for automatically releasing the strip engaging means by the operation of the manual spring tensioning means, the construction and arrangement being such that the tensioned impeller spring when released will drive the strip engaging means to advance the strip through a predetermined range of travel.

7. In a strip feeding apparatus, intermittently actuated strip engaging devices operative to advance a strip of material through successive step-by-step movements, means for arresting the strip engaging devices at the limit of a predetermined strip feeding movement, an actuator therefor mounted for to and fro motion, an impeller spring urging the actuator in a direction to drive the strip engaging devices, manual means for retracting the actuator against the tension of its spring, means operated by the actuator as it approaches the limit of its retractive movement for releasing the strip engaging devices for operative action, means for operative connecting the actuator with the strip engaging devices for driving operation thereof, during its return movement said actuator being releasable when retracted for return movement under influence of the spring.

8. A strip feeding means wherein a continuous strip of record material is intermittently advanced through successive measured distances into and past a writing position, characterized by spring actuated operating means for the strip feeding means, an impeller spring therefor, manual means for tensioning the impeller spring, detent means normally preventing actuation of the strip feeding means by the spring actuated operating means, said detent means being rendered ineffective at the end of the tensioning movement of the manual means, and means for automatically limiting the degree of feeding movement of the strip feeding means controlled by the movement of the manual spring tensioning means.

9. A strip feeding means wherein a continuous strip of record material is intermittently advanced through successive measured distances into and past a writing position, characterized by spring actuated operating means for the strip feeding means, an impeller spring therefor, manual means for tensioning the impeller spring, including an oscillatory crank arm releasably engageable with the spring actuated operating means, coupling means therefor automatically disengaged at the limit of the tensioning movement, detent means normally restraining the feeding means against actuation by the spring actuated operating means, and means for releasing the detent means at the limit of tensioning movement of the manual means to enable the strip feeding means to be actuated by reaction of the impeller spring.

10. A strip feeding means wherein a continuous strip of record material is intermittently advanced through successive measured distances into and past a writing position, characterized by spring actuated operating means for the strip feeding means, an impeller spring therefor, manual means for tensioning the impeller spring, including an oscillatory crank arm coupled with the spring actuated operating means to be released at the limit of the spring tensioning movement, detent means normally restraining the feeding means against actuation by the spring actuated operating means, and means for releasing the detent means at the limit of tensioning movement of the manual means to thereby enable the strip feeding means to be actuated by the reaction of the impeller spring.

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