

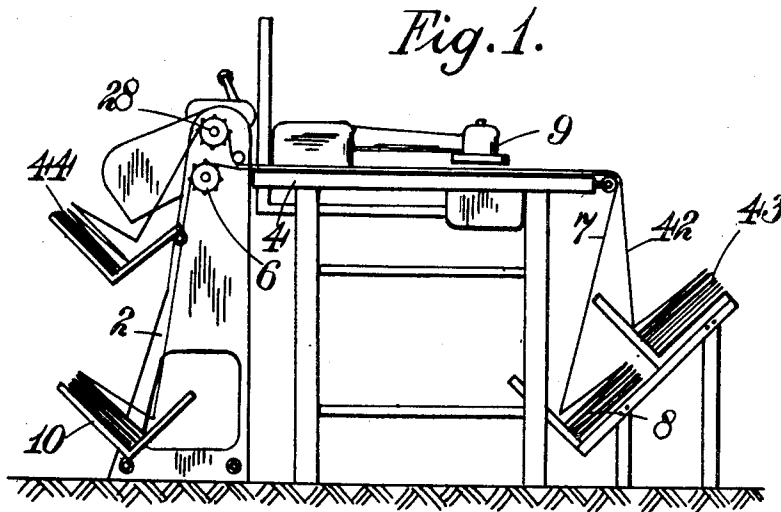
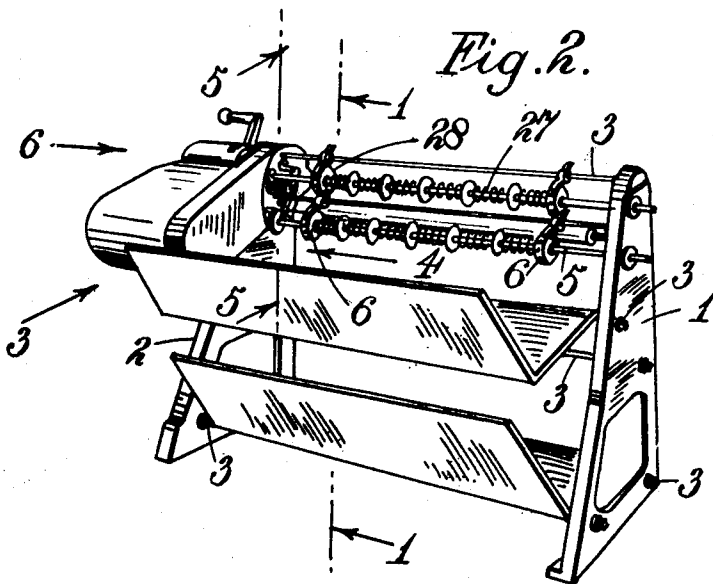
Jan. 3, 1950

F. E. LANEGAN ET AL
MECHANISM FOR FEEDING CONTINUOUS STATIONERY
IN RECORDING MACHINES

2,493,411

Filed June 12, 1947

5 Sheets-Sheet 1



INVENTOR

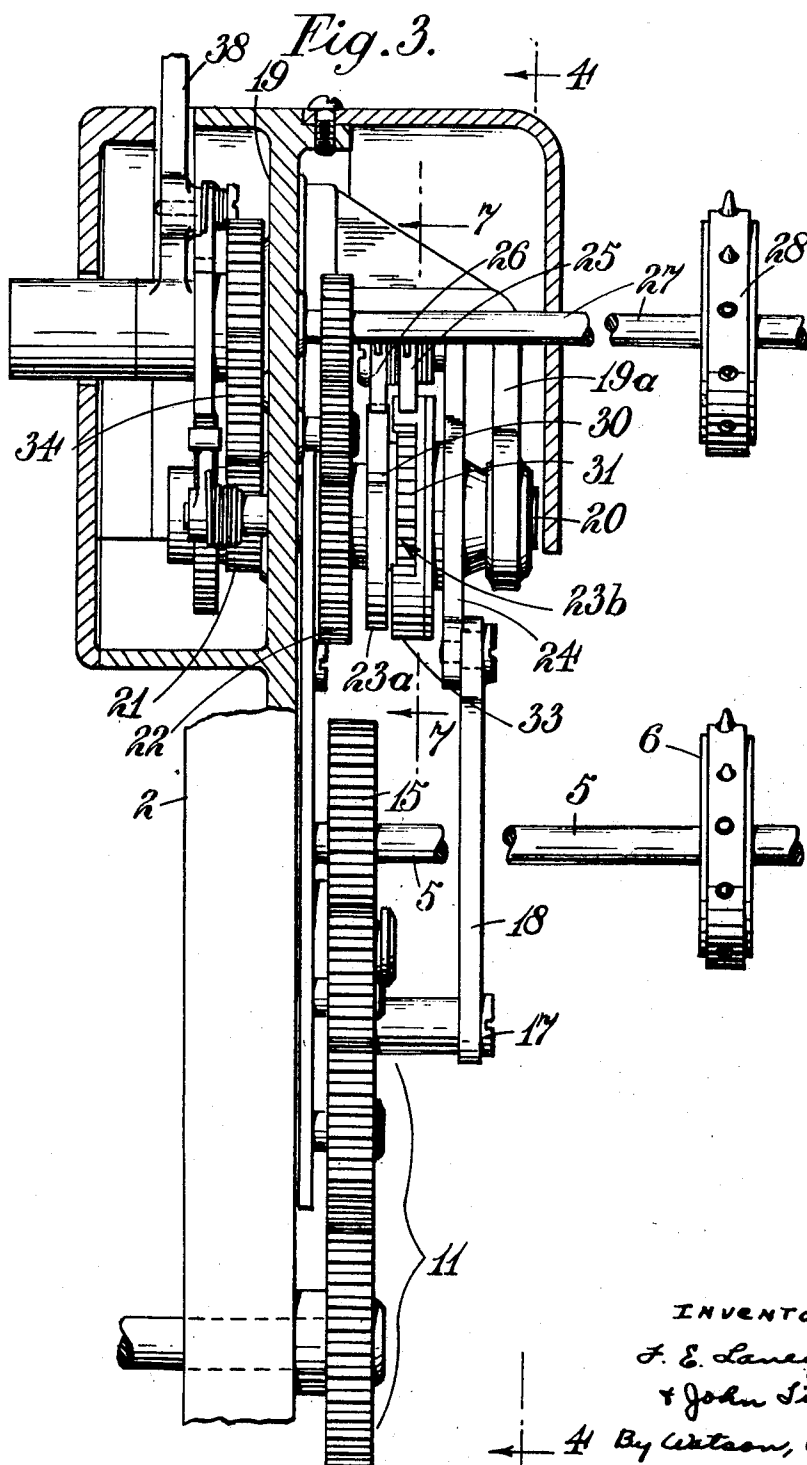
F. E. Lanegan &
John Sibble

By Watson, Cobb, Hummel & Watson

Filed June 12, 1947

F. E. LANEGAN ET AL

5 Sheets-Sheet 2



INVENTOR

F. E. Lanegan
+ John Sibble

4 By Watson, Cole,
Grindle & Watson

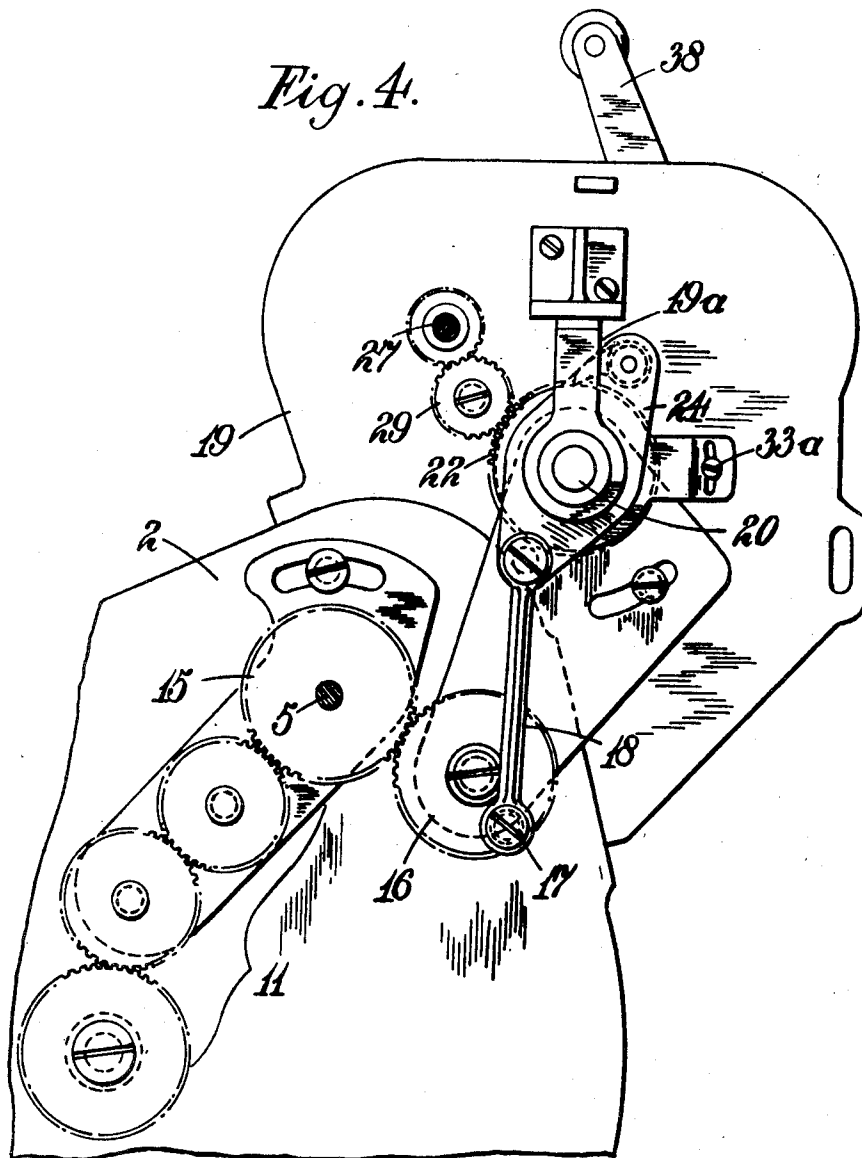
Jan. 3, 1950

F. E. LANEKAN ET AL
MECHANISM FOR FEEDING CONTINUOUS STATIONERY
IN RECORDING MACHINES

2,493,411

Filed June 12, 1947

5 Sheets-Sheet 3



INVENTOR

F. E. Lanegan
+ John Sibble

By Watson, Col. Brindle
+ Watson

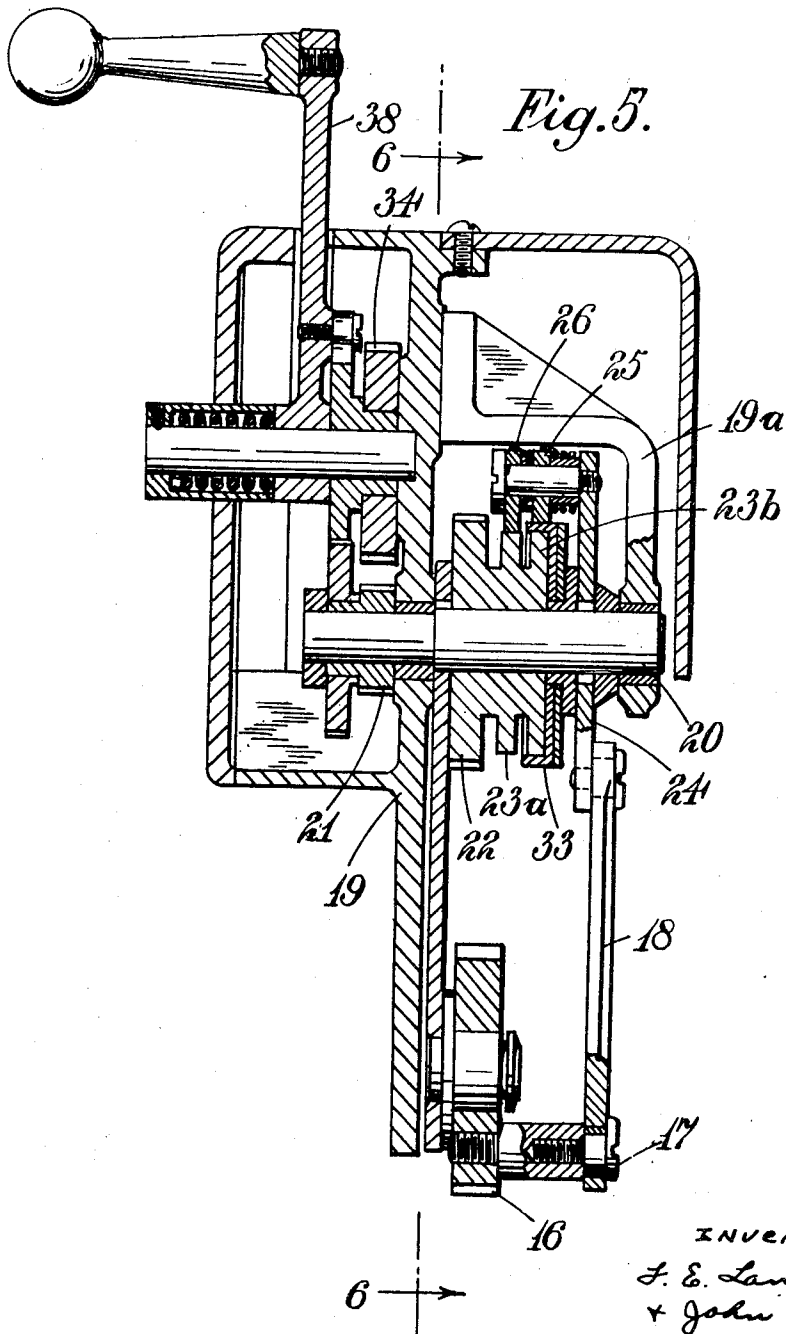
Jan. 3, 1950

F. E. LANEGAN ET AL
MECHANISM FOR FEEDING CONTINUOUS STATIONERY
IN RECORDING MACHINES

2,493,411

Filed June 12, 1947

5 Sheets-Sheet 4



INVENTOR

F. E. Lanegan
+ John Sibble

By Watson, Cole, Grindle
+ Watson

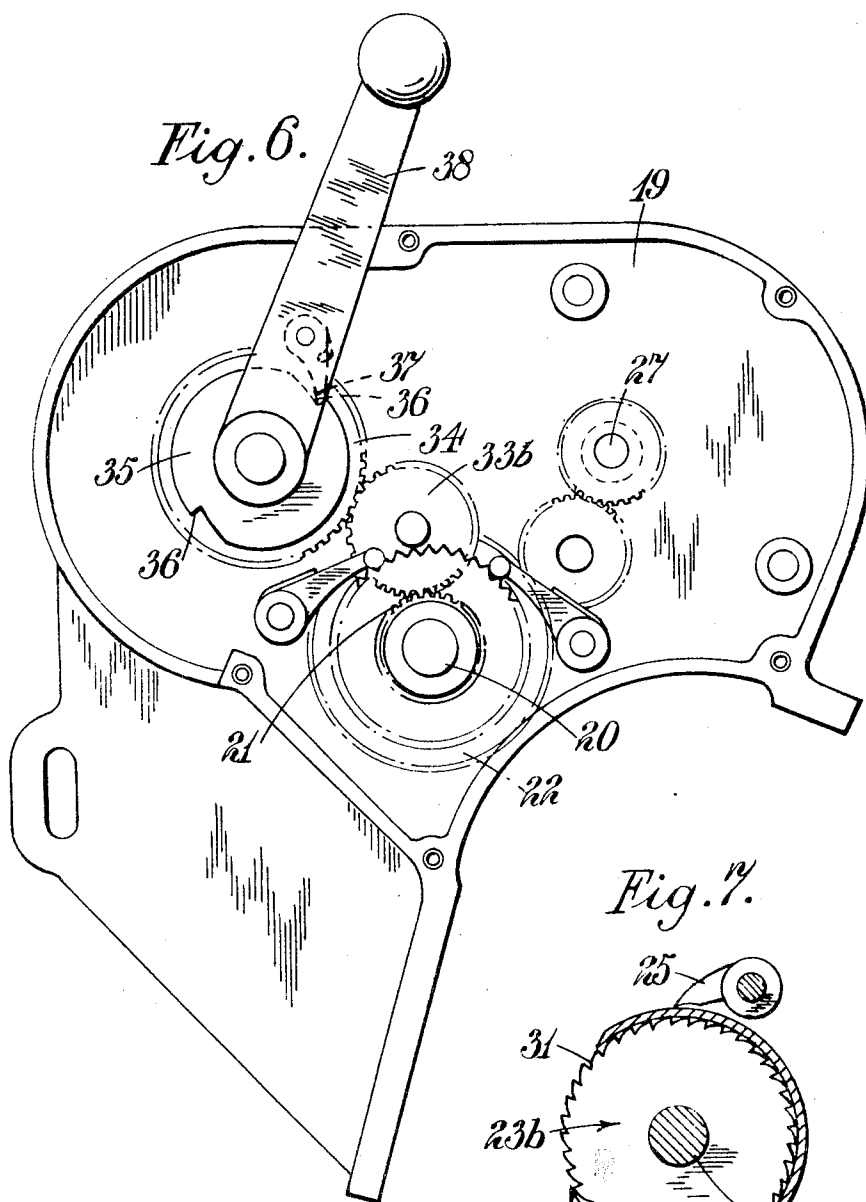
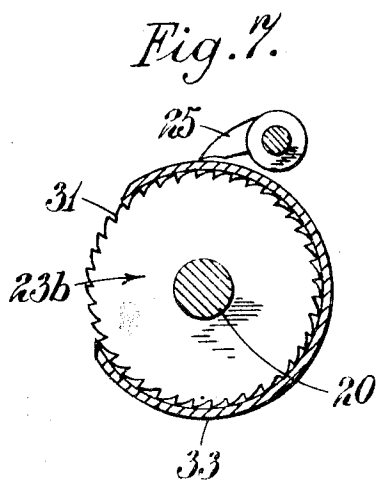
Jan. 3, 1950

F. E. LANEGAN ET AL
MECHANISM FOR FEEDING CONTINUOUS STATIONERY
IN RECORDING MACHINES

2,493,411

Filed June 12, 1947

5 Sheets-Sheet 5



INVENTOR

F. E. Lanegan +
John Sibble

By Watson, Cole, Brundell & Watson

UNITED STATES PATENT OFFICE

2,493,411

MECHANISM FOR FEEDING CONTINUOUS STATIONERY IN RECORDING MACHINES

Frederick Edward Lanegan and John Tibble,
London, England, assignors to W. H. Smith &
Son Limited, London, England, a British com-
pany

Application June 12, 1947, Serial No. 754,232
In Great Britain July 4, 1946

6 Claims. (Cl. 271—2.4)

1

This invention relates to mechanism for use in recording machines for feeding step by step past an impression position a so-called continuous web of stationery bearing a succession of printed forms, headed sheets or the like (herein referred to generically as "forms") and comprising impression spaces separated by printed matter (herein referred to as "headings"). Mechanisms for this purpose have been proposed and constructed, the mechanisms being arranged to feed the web a comparatively small amount (e. g. a line space) at each step when an impression space is at the impression position for the reception of successive impressions and when a heading arrives at the impression position automatically to increase the length of the feed to traverse the heading past the impression position at one throw. The invention has for an object the provision of an improved and simplified mechanism of this kind which is hereinafter referred to as "the kind described."

The invention consists in mechanism of the kind described characterised by feeding means for traversing a web past the impression position, oscillatory (used herein to include "reciprocatory") driving means for the feeding means having operative strokes sufficient to operate the feeding means to feed the length of a heading past the impression position and two intermittent driving connections between the said driving means and the web feeding means of which one is arranged for driving connection once per form length and maintains the connection sufficiently long to traverse the web the length of the heading and of which the other is shielded from driving engagement for a portion of each stroke of the operating means and makes driving connection with the feeding means during only the remainder of the stroke to feed the web by the aforesaid comparatively small amount. It is an advantage of the mechanism just described that the operating means is arranged to make a continuous succession of strokes of the same length which simplifies the mechanism and makes it especially suitable for incorporation in an attachment to be fitted to a machine of existing design, such for instance as the machine disclosed in German patents 382,860, 398,863 and 412,568.

In a more specific form of the invention mechanism of the kind described is characterised by rotatable web feeding means (e. g. in the form of a friction platen or pin-type feeding devices), two ratchet wheels in driving connection with the feeding means, the spacing of the teeth on one wheel (hereinafter referred to as "the head-

2

ing wheel") corresponding to a full form length and the spacing of the teeth on the other wheel (hereinafter referred to as "the line wheel") corresponding to the aforesaid comparatively small amount of feed, two pawls engageable with the teeth in the two ratchet wheels respectively to effect, by a rocking movement of the pawls, a one-way driving engagement therewith, means common to the two pawls for rocking both the pawls by an amount sufficient to feed the length of a heading at each rocking movement and means for partially shielding the teeth on the line wheel from engagement by the corresponding pawl to limit the throw of the wheel at each rocking movement of the pawl to less than the travel of the pawl (e. g. to one tooth of the wheel) while permitting the pawl engaging the heading wheel to rotate that wheel the full throw of the pawl as and when a tooth presents itself for engagement by the pawl (i. e. at the end of each form).

The mechanism according to the invention as described above may be used in autographic registers, accounting, tabulating and like recording machines or be constructed as an attachment to be used therewith. The mechanism may also be used in addressing and like series printing machines or as an attachment therefor. In such series printing machines successive impressions are made from automatically changed printing plates or equivalent printing devices which are frequently arranged to print several lines (e. g. a name and address) on each of a succession of forms printed on a continuous web. In certain circumstances it may be desirable to make on an independent strip a condensed record printed line-by-line of part, say the names only, of the impressions made. For example, the forms may be impressed by the machine with different names and addresses for dispatch respectively to various persons and it may be required to prepare a compact list of the names only of the persons to whom forms have been addressed, the said list having small equal line spaces between the names. The mechanism according to the invention is especially suitable for the production of such a condensed record.

The invention in one of its forms accordingly includes mechanism as described above in combination with means for traversing a further web—or set of superposed webs—past the impression position with the aforesaid web. The further web or set of webs, which may receive the full impression, may be fed by a constant length at each operation, and the length fed may

3

be different from either of the lengths by which the first-mentioned web receiving the condensed record is fed.

In the preferred form of the invention the mechanism includes a compensating device manually operable by movement of a handle through a stroke of constant length and at any stage of completion of the impression space on a form, to bring the beginning of the impression space on a new form to the impression position.

One specific device according to the invention will now be described, by way of example, with reference to the accompanying drawings in which:

Figure 1 is a view, largely diagrammatic, showing the device attached to a known form of addressing machine,

Figure 2 is a perspective view of the device,

Figure 3 is a view of part of the device and partly in section, in the direction of the arrow 3 in Figure 2,

Figure 4 is a view in the direction of the arrow 4 in Figure 2,

Figure 5 is a section on the line 5—5 in Figure 2,

Figure 6 is a view in the direction of the arrow 6 in Figure 2, with the cover removed and

Figure 7 is a detail sectional view on the line 7—7 in Figure 6.

The device forming the subject of this example is intended as an attachment to be fitted to an existing addressing machine to feed, in the manner later described two superposed strips of stationery past the impression position of the machine.

The attachment comprises a frame consisting of two side members 1, 2 connected by cross bars 3, the frame being arranged to be secured behind the table 4, of the addressing machine. A feed-shaft 5 extends between the two side members and is rotatable in bearings on the members. The shaft carries pin-wheels 6 arranged to engage in marginal perforations in a stationery strip 7 and on rotation to draw the strip from a zig-zag folded supply pack 8 over the table 4 where impressions are made in known manner by a presser head 9 operating in conjunction with changing printing plates under the strip 4 to deliver the strip to a receiving tray 10 when it refolds into zig-zag pack form. The shaft 5 is in known manner, intermittently rotated in timed sequence with the operation of the head 9 to feed the strip between imprinting impressions, by a constantly rotating electric motor driving the shaft through a solenoid controlled clutch and stop device and a train of gears 11, the arrangement being such that the solenoid operates to release the stop device and engage the clutch on upward movement of the pressure head under the control of an electric switch operated by such upward movement.

On the feed-shaft 5 inside the side frame member 2 there is provided a toothed wheel 15 forming part of the train 11 and in driving engagement with a second wheel 16 rotatably supported on the frame member. The wheel 16 is provided with an eccentric crank-pin 17 to which is attached a connecting rod 18. Mounted in bearings in an extension 19 of the frame 12 above the second wheel and on a bracket 19 there is a short countershaft 20 carrying on the outside of the frame a gear wheel 21 and on the inside of the frame a gear-wheel 22, a double ratchet wheel 23 as later describe and a rocking arm 24, the

4

wheels being secured to the shaft 20 and the arm being free to rotate on it. The rocking arm is attached to the connecting rod referred to above and the arrangement is that rotation of the feed shaft and corresponding rotation of the second gear wheel 16 imparts a rocking movement to the arm. The arm carries 2 pawls 25, 26 which are pivotally attached to the arm on the side of the arm remote from the connecting rod and which are spring pressed into engagement with the teeth on the two parts of the double ratchet wheel 23 respectively.

Mounted in the frame above the feed shaft there is a second cross shaft 27 (hereinafter referred to as "the line shaft") carrying a second pair of pin-wheels 28 and driven through an idler gear 29 from the aforesaid gear wheel 22 on the countershaft 20.

One part 23a of the double ratchet wheel (later referred to as the heading ratchet wheel) is provided with one or more spaced notches 30 in its periphery for engagement by the corresponding pawl 26 and the ratio between the gears and the timing is such that one of these notches is presented for engagement by the heading pawl 26 each time the end of a sheet or form reaches the impression position. The other part 23b of the double ratchet wheel (later referred to as the line ratchet wheel) has notches 31 at a spacing corresponding to the minimum amount of the stationery strip required to be fed at each operation. The throw of the two pawls at each stroke is sufficient to feed the length of the heading at the head of each sheet or form.

An arcuate shield 32 is secured to the frame by a screw 33a and surrounds a part of the circumference of the line ratchet wheel 23b the shield being arranged to prevent engagement of the line pawl with the teeth of the wheel during the initial part of the operative stroke of the pawl.

The gear wheel 21 on the outside of the frame is in driving engagement through an idler gear 33b with a larger gear 34 providing a 2-1 ratio. The larger gear 34 is integral with a further ratchet wheel 35 having two notches 36 and co-operating with a pawl 37 carried on a manually operable handle 38. The handle operates in a slot in the casing as shown in Figure 3 and the ends of the slot constitute stops limiting the travel of the handle. There is also a detent wheel 39 secured to the shaft 20 and co-operating with spring detent 40 for the purpose of accurately registering the position at which the shaft stops. The purpose of this arrangement of ratchet wheel and handle is to provide a compensating feed as later described.

The operation of the mechanism is as follows: The strip 7 has successive forms printed along its length and the feed shaft is arranged to traverse the successive forms past the impression position, one form length of, say 5½", being fed at each operation. The line shaft 27 and its associated feed mechanism is arranged to draw a second strip 42 from a separate supply pack 43 over the impression position on top of the strip 7 and to deliver the second strip to a separate issuing point or re-folding position 44. A single line of each of the impressions made on the first strip 7 is duplicated on the second strip 42 by means of a narrow strip of carbon paper or tape which lies between the strip 7 and 42 over the appropriate line on the printing plate. At each operation of the feed shaft 5 the line shaft 27 is rotated to feed the second strip 42 by engagement of one or

5

other of the two pawls 25, 26 with the corresponding part of the double ratchet wheel 23. So long as an impression space on the second strip 42 is at the impression position, the heading pawl 25 rides on a smooth part of the heading ratchet wheel and does not make driving engagement with the wheel. The line pawl 25, on the other hand, rides over the shield 33 for the initial part of its movement and then engages with a tooth on the line ratchet wheel 23b and feeds the wheel by one tooth which is equivalent to one line space of the strip, say $\frac{1}{3}$ ". Feeding in this way continues until such time as the end of a form or sheet on the second strip 42 is reached, when a notch 30 in the heading ratchet wheel presents itself for engagement by the heading pawl 26 which rotates the wheel sufficiently far to feed the heading past the impression position—say $1\frac{1}{3}$ "—and to bring a new impression space into position.

Addressing and like machines are usually arranged to print a series of printing plates and at the end of a series the machine is arranged automatically to stop. In practice it is unlikely that the end of the series will correspond with the end of an impression space on the second strip, but it will normally be desired that the recording of the next series should begin on a new impression space. It is for the purpose of bringing a new impression space into the impression position under these conditions that the compensating device referred to above is provided. To operate the compensating device it is only necessary to depress the handle 38 which travels freely by an amount corresponding to the proportion of the impression space already traversed and then engages the pawl 37 with one of the two notches 36 in the ratchet wheel 35 and rotates the wheel until the handle abuts against the end of the slot in which it travels, the end being positioned to correspond with the arrival of the new impression space at the impression position.

The shield 33 for the line ratchet wheel is adjustable in position by rotation about the axis of the ratchet wheel so that if desired the pawl may be permitted to rotate the wheel by more than one tooth space at each operation.

We claim:

1. Stationary feeding mechanism of the kind described comprising rotatable web feeding means, heading and line ratchet wheels in driving connection with the feeding means, the spacing of the teeth on the heading wheel corresponding to a full form length and the spacing of the teeth on the line wheel corresponding to the aforesaid comparatively small amount of feed, two pawls engageable with the teeth in the two ratchet wheels respectively to effect, by a rocking movement of the pawls, a one-way driving engagement therewith, means common to the two pawls for rocking both the pawls by an amount sufficient to feed the aforesaid increased length on each rocking movement and a stationary shield extending around part of the periphery of the line ratchet wheel and arranged to engage with the line ratchet wheel engaging pawl and to hold it out of engagement with the line ratchet wheel over part of the movement of the said pawl in the driving direction, thereby limiting the throw of the line ratchet wheel on each rocking movement of the pawl to less than the travel of the pawl while permitting the pawl engaging the heading wheel to rotate that wheel the full throw of the pawl as and when a tooth presents itself for engagement by the pawl.

6

2. Mechanism as claimed in claim 1 in combination with means for traversing a further web past the impression position with the aforesaid web.

3. Mechanism as claimed in claim 1 and including a compensating device manually operable by movement of a handle through a stroke of constant length and at any stage of completion of the impression spaced on the form, to bring the beginning of the impression space on a new form to the impression position.

4. Mechanism as claimed in claim 1, and including a compensating device comprising a compensating ratchet wheel in driving connection with the aforesaid feeding means and having ratchet teeth spaced apart around the circumference of the wheel by amounts corresponding to the full form length to be fed, a handle, a pawl movable by the handle to engage the ratchet teeth and to rotate the wheel and stops limiting the movement of the handle to the amount required to drive the feeding means to feed a full form length, the arrangement being such that as the feeding means are operated by rotation of the line wheel aforesaid the compensating ratchet wheel is rotated ahead of the associated pawl and on subsequent operation of the handle the pawl is moved idly until it picks up a tooth on the ratchet wheel when it rotates the wheel for the remainder of the handle stroke.

5. Stationary feeding mechanism of the kind described comprising pin-type web feeding means, heading and line ratchet wheels in driving connection with the feeding means, the spacing of the teeth on the heading wheel corresponding to a full form length and the spacing of the teeth on the line wheel corresponding to the aforesaid comparatively small amount of feed, two pawls engageable with the teeth in the two ratchet wheels respectively to effect, by a rocking movement of the pawls, a one-way driving engagement therewith, means common to the two pawls for rocking both the pawls by an amount sufficient to feed the aforesaid increased length on each rocking movement and a stationary shield extending around part of the periphery of the line ratchet wheel and arranged to engage with the line ratchet wheel engaging pawl and to hold it out of engagement with the line ratchet wheel over part of the movement of the said pawl in the driving direction, thereby limiting the throw of the line ratchet wheel on each rocking movement of the pawl to less than the travel of the pawl while permitting the pawl engaging the heading wheel to rotate that wheel the full throw of the pawl as and when a tooth presents itself for engagement by the pawl.

6. Stationary feeding mechanism of the kind described comprising rotatable web feeding means, heading and line ratchet wheels in driving connection with the feeding means, the spacing of the teeth on the heading wheel corresponding to a full form length and the spacing of the teeth on the line wheel corresponding to the aforesaid comparatively small amount of feed, two pawls engageable with the teeth in the two ratchet wheels respectively to effect, by a rocking movement of the pawls, a one-way driving engagement therewith, means common to the two pawls for rocking both the pawls by an amount sufficient to feed the aforesaid increased length on each rocking movement and a stationary shield extending around part of the periphery of the line ratchet wheel and arranged to engage with the line ratchet wheel engaging

pawl and to hold it out of engagement with the line ratchet wheel over part of the movement of the said pawl in the driving direction, thereby limiting the throw of the line ratchet wheel on each rocking movement of the pawl to less than the travel of the pawl while permitting the pawl engaging the heading wheel to rotate that wheel the full throw of the pawl as and when a tooth presents itself for engagement by the pawl, and means for adjusting the shield around the periphery of the line ratchet wheel to vary the number of teeth shielded for engagement by the line ratchet-wheel-engaging pawl.

FREDERICK EDWARD LANEGAN. 15
JOHN TIBBLE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,421,489	Joslin	July 4, 1922
2,059,215	Dreher	Nov. 3, 1936
2,131,895	Kolm et al.	Oct. 4, 1938
2,327,377	Sherman et al.	Aug. 24, 1943
2,331,120	Hill et al.	Oct. 5, 1943
2,384,807	Bickel	Sept. 18, 1945