July 16, 1963 I. SPIAZZI 3,097,846

DEVICES FOR UNLOADING ADDRESS PLATES ON ADDRESSING MACHINES

Filed Dec. 8, 1961 5 Sheets-Sheet 1

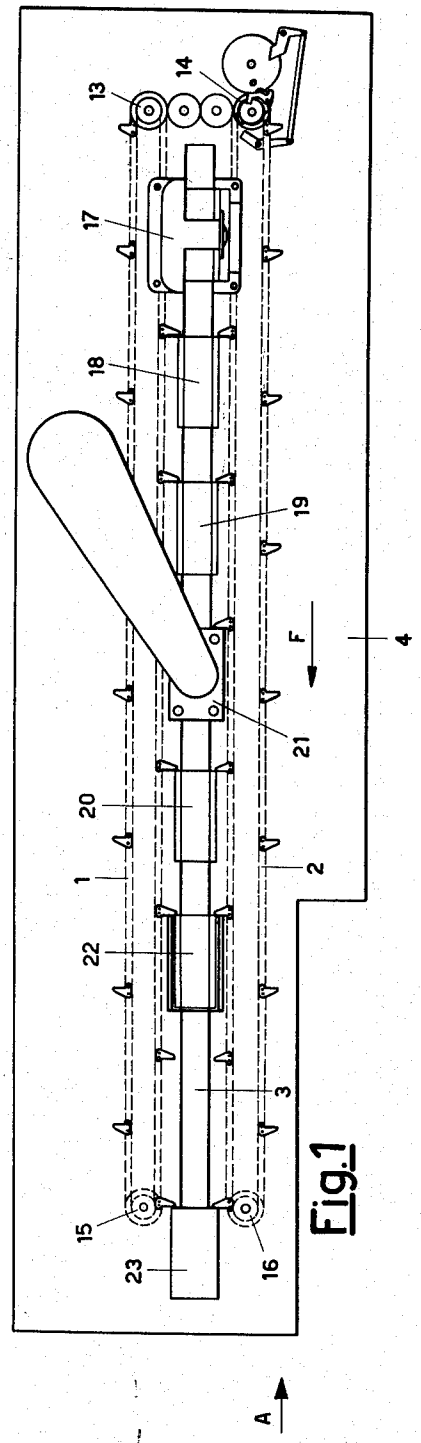


Fig.1

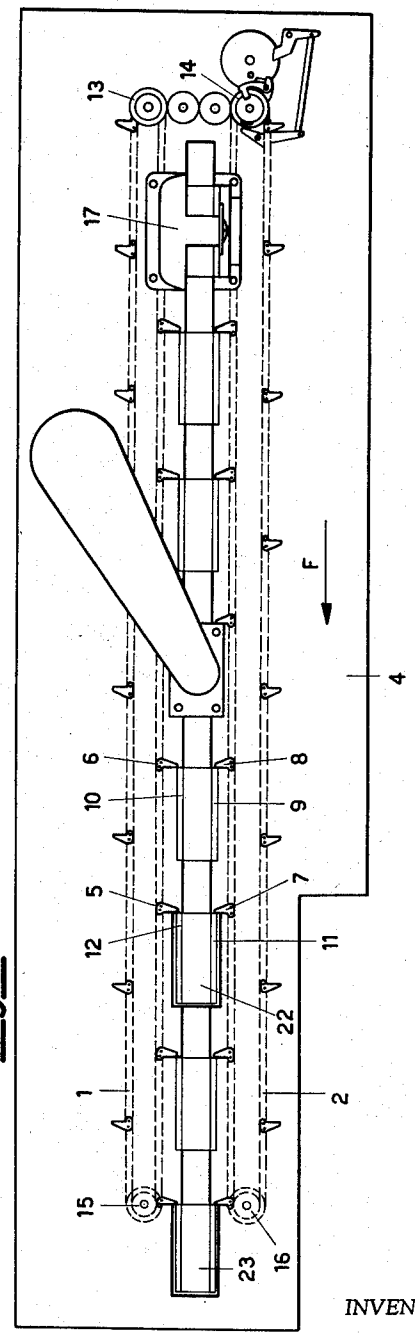


Fig.2

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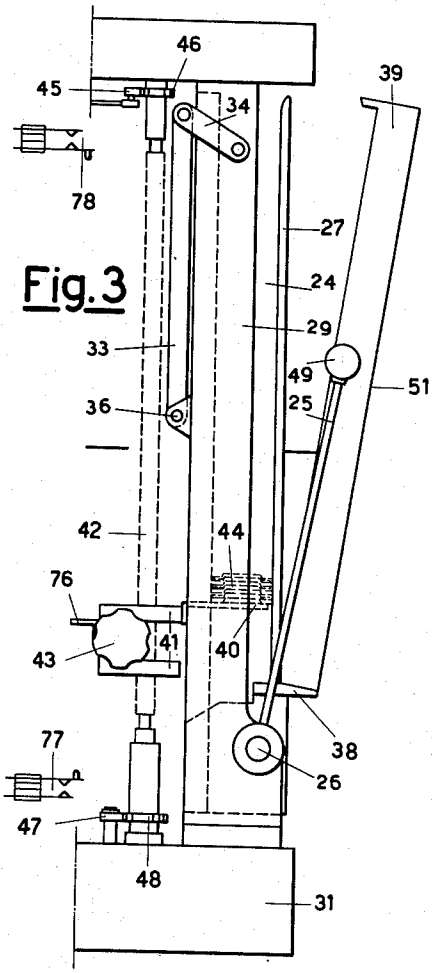


Fig.3

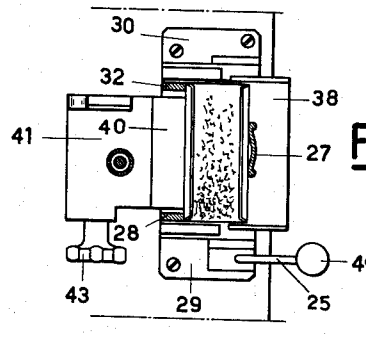


Fig.5

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Fig.4

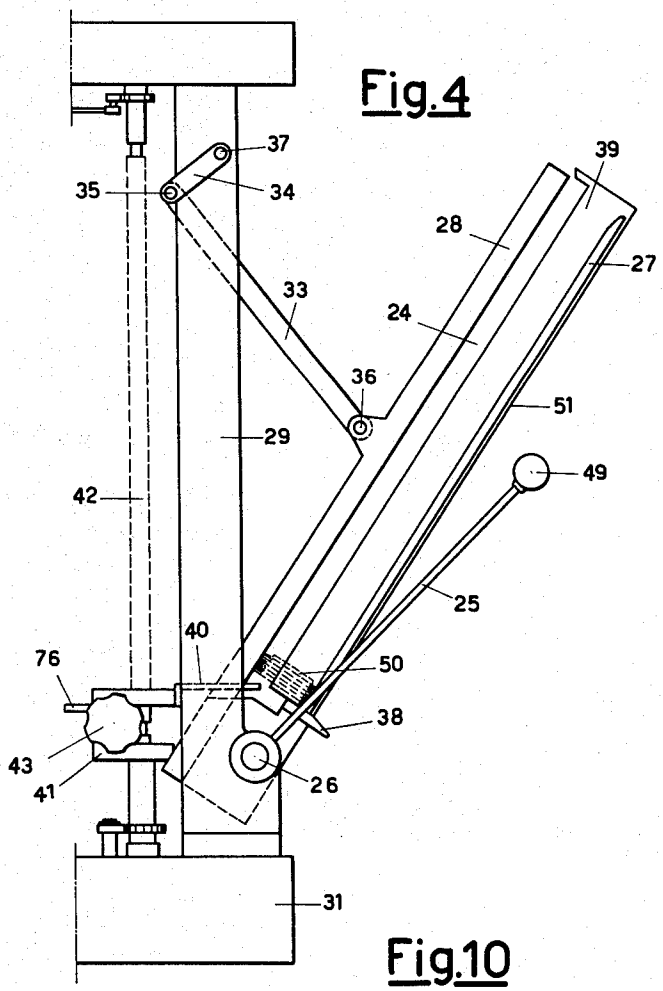
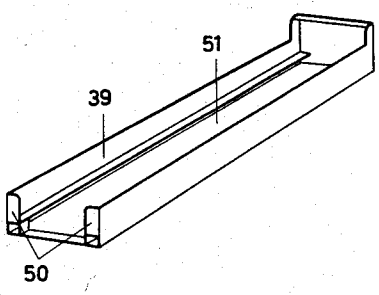


Fig.10



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Fig.6

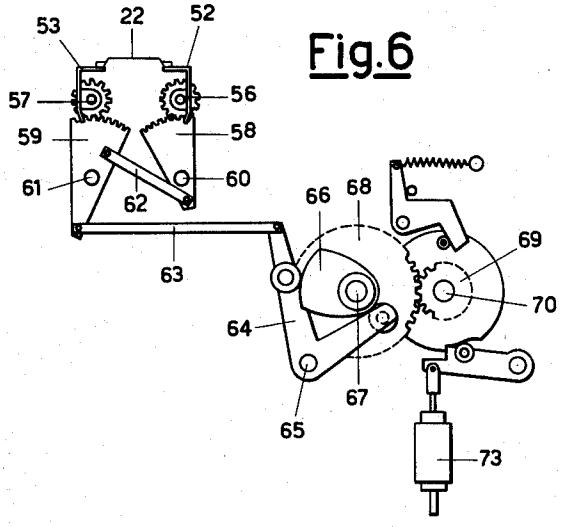
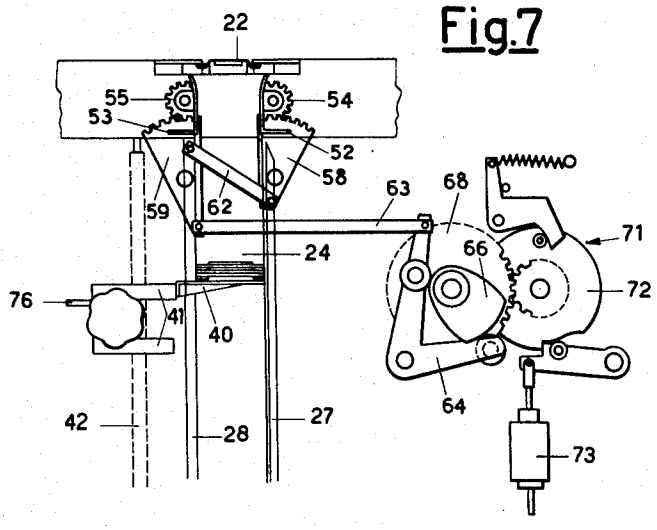


Fig.7



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Fig.8

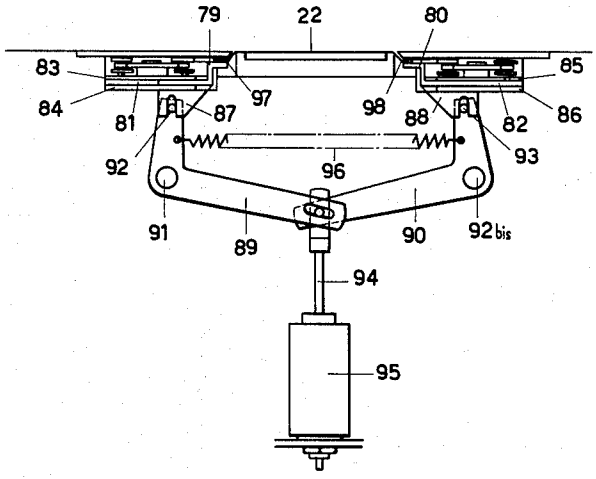
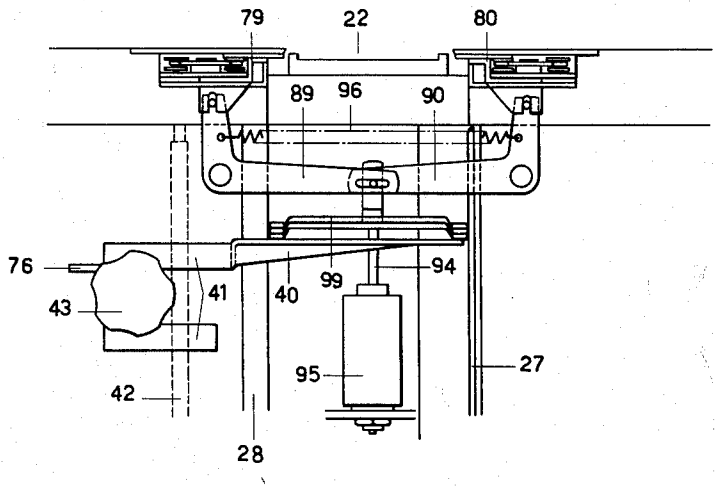


Fig.9



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3,097,846

DEVICES FOR UNLOADING ADDRESS PLATES ON ADDRESSING MACHINES

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7 Claims. (Cl. 271—88)

Technical advances and the constantly increasing demands of the work performed have gradually brought about an increase in the number of impressions per hour which can be obtained from addressing machines.

This entails an increase in the speed of movement of the address plates along the plate track and hence the need not only to ensure regular unloading of the plates which have already been used for printing, but also to transfer said plates in the shortest possible time into the trays wherefrom they were taken to be fed into the machine.

One of the objects of the present invention is to facilitate unloading by making use of a vertically disposed drop magazine, which is, however, improved so as to facilitate the transfer of the plates stacked therein into the plate holding tray, and this is achieved by making it possible to tilt the walls of the magazine at the time of making said transfer.

Another object is to avoid stopping the machine during the operation of transferring the plates from the magazine to the holder tray, and this is achieved by providing the machine with two discharge traps, each provided with a magazine, arranged in succession along the plate track, means being provided for closing the first trap whilst the plates are directed towards the second trap.

Finally, another object is to improve the system of transporting the plates in order to make the unloading thereof easier and so to arrange the plate transport system that the lower part of each plate is completely unencumbered and hence free to fall into the underlying discharge magazine, even though said magazine is included within the field of the plate transport system.

In the accompanying illustrations:

FIG. 1 shows a partial plan view of the addressing machine, which brings out the arrangement of the two discharge magazines with the plates being conveyed towards the first discharge magazine;

FIG. 2 shows the same as FIG. 1 with the plates being conveyed towards the second discharge magazine;

FIG. 3 shows a side view according to arrow A of FIG. 1, with the discharge magazine in the filling stage;

FIG. 4 shows the same view as FIG. 3 with the discharge magazine in the unloading stage;

FIG. 5 shows a plan view of FIG. 4;

FIG. 6 shows a contrivance for closing the inlet mouth to the discharge magazine, in the closed position;

FIG. 7 shows the same view as FIG. 6, with the contrivance in the open position;

FIG. 8 shows another embodiment of the device of FIG. 6, in the closed position;

FIG. 9 shows the device of FIG. 8, in the open position;

FIG. 10 shows a perspective view of an address plate holder tray.

As may be seen in FIGURES 1 and 2, the track for conveying the address plates, such as **18**, **19** and **20**, is formed in the table of the addressing machine.

The plates from feed magazine **17**, which is disposed vertically above the machine table, are taken one by one, starting from the last, by the advancing device, and conducted step by step along track **3** through various intermediate stations, to printing station **21** and then to first unloading station **22** or second unloading station **23**, both of which are disposed vertically beneath table **4**, one following the other along track **3**.

The advancing device consists of two endless chains **1** and **2** on which, at intervals corresponding to the equal gap between one plate and its successor along the plate track, suitably shaped links such as **5** and **6** on chain **1**, and **7** and **8** on chain **2** are fitted so as to extend into the zone of advancement of the plates and thus engage the ends of the turned up edges **9**, **10** and **11**, **12** of the plates. The chains are caused to move, step by step, by driving sprocket wheels such as **13** and **14**, and are sent back by the driven sprocket wheels **15** and **16**.

As may be seen from FIGURES 3 and 4, the vertical discharge magazine **24**, which is disposed beneath the unloading station **22**, consists of a rear wall formed of two rods **28** and **32**, and a part opposite thereto formed of blade **27**, which parts are rigidly joined together and to an operating lever **25** which is revolvable about **26** mounted on shoulders **29** and **30** fastened by means of screws to supporting stand **31** of the machine. The rotation of magazine **24** is lmited by the range of movement of the two connecting rods **33** and **34** hinged together at **35** and connected at **36** to the magazine and at **37** to shoulders **29** and **30**.

Ledge **38** is formed on the bottom of the container in order to support the plate holder tray **39** when unloading. Between rods **28** and **32** within the magazine compartment, when the latter is in the vertical position (FIG. 3), there is disposed a movable ledge **40** integral with block **41** which carries the lead screw coupled to screw **42**.

By turning knob **43**, the connection between screw **42** and its lead screw can be eliminated in a known manner.

Every time a plate such as **44** falls into the discharge magazine **24**, the moving ledge **40** must shift downwards by a distance equal to the vertical space taken up by the plate itself, and this is achieved by causing screw **42** to rotate by a certain appropriate amount by means of a pawl **45** and toothed wheel **46** which is formed on the screw itself.

The rotation of the wheel **46** causes the lead screw to move and hence also the block **41** and the moving ledge **40**.

To avoid a backward movement of screw **42**, a pinion **47** is provided which is capable of rotating in one direction only and meshes with toothed wheel **48** keyed on the screw itself.

The device described works as follows.

Moving ledge **40** is initially elevated to its extreme top position by turning knob **43** in order to eliminate the connection between screw **42** and its lead screw. During the operation, the plates fall one after the other into compartment **24** of the movable magazine, through inlet **22**, FIG. 1, formed in the table of the printing machine, and moving ledge **40** gradually descends until, when the magazine is full, it occupies the position corresponding to the bottom stop as in FIG. 4.

In order to extract the plates, the plate holder tray **39** is placed on support ledge **38** and held manually in the position indicated in FIG. 3; handle **49** of operating lever **25** is then gripped and movable magazine **24** is tilted downwards. In this manner, the stack of plates **44**, pushed by rods **28** and **32** and sustained by blade **27**, slides off the moving ledge **40** and onto the lateral flange **50** of the plate tray **39**, whilst blade **27** remains compressed between one face of the stack of plates and the bottom **51** of the plate tray.

Thereafter, when the tilting movement has been completed as shown in FIG. 4, the plate tray is lifted out upwards, care being taken to cause bottom **51** of the plate tray to run parallel with blade **27** in order to prevent the plates from being displaced by blade **27** itself which slides

out along the bottom 51 while the plates remain arranged in a stack in the plate tray.

As will be observed, with this type of vertical discharge magazine, even though the plates do not fall directly into the plate tray, the operation of extracting said plates from the discharge magazine includes the task of introducing same into the plate tray. Therefore the two operations aforesaid, which for ease of description have been separately indicated, take place simultaneously and are in practice executed in a single movement.

In comparison with known vertical magazines, the vertical magazine in question eliminates the necessity for a transfer tray and the operations connected with the use thereof, whilst conserving the inherent virtues of vertical magazines and essentially that of fast unloading.

In comparison with horizontal magazines, it keeps the practical advantage of direct collection of the plates in the plate tray. With reference to FIGURES 6 and 7, we shall now describe the device which enables the inlet for the plates to the first discharge magazine 24, to be closed. As may be seen in FIGURES 6 and 7, the device is fitted at inlet mouth 22 to discharge magazine 24, i.e. to the first discharge magazine which is encountered along the plate track 3 in the direction of arrow F, FIG. 1.

As illustrated in FIGURES 7 and 2, when the first discharge magazine 24 is completely full of plates, any further plates have to be shunted towards the second discharge magazine 23, and it is therefore necessary that the inlet to discharge magazine 22 be closed as in FIG. 6. To obtain this there are two movable traps 52 and 53 which, since they are integral with pinions 54 and 55, can rotate with the latter on axes 56 and 57.

Pinions 54 and 55 engage respectively with toothed sectors 58 and 59 which can rotate on axes 60 and 61. Sector 58, on account of connection 62, rotates in the opposite direction to sector 59, to which motion is given through link 63 and bellcrank 64, hinged at 65, from eccentric 66 of shaft 67. On shaft 67 there is keyed a toothed wheel 68 which meshes with pinion 69 mounted freely on the continuously rotating driving shaft 70. Pinion 69 can be connected with its shaft 70 by means of one-cycle clutch 71, partially visible in FIGURES 6 and 7, and which has a cam disc 72 that is integral with pinion 69. An electromagnet 73 is provided for the operation of the one-cycle clutch (of known design), which, when duly energized, causes pinion 69 to rotate with its shaft 70.

The device works as follows: When inlet 22 to magazine 24 has to be opened, magnet 73 is energized. For this purpose there is a lug 76 projecting from block 41, FIG. 3, which, depending upon whether or not the movable container 24 is full or enmpty, is capable of acting on contacts of switches 77 and 78, respectively, through which electromagnet 73 is energized. The energizing of the electromagnet operates the one-cycle clutch and thus connects pinion 69 with its shaft 70 which, for one cycle, transmits its rotation, through toothed wheel 68, to shaft 67 and hence to eccentric 66. Assuming the magazine 24 is empty and the block 41 has been shifted into its uppermost position, the lug 76 thereon will engage the contacts of the switch 78 to actuate the electromagnet 73, whereby the eccentric 66 is made to rotate, and through links 63 and 62, the toothed sectors are caused to rotate and with them pinions 54 and 55. Movable traps 52 and 53 thus shift into the position indicated in FIGURE 7, leaving inlet 22 to movable magazine 24 free.

Access traps 52 and 53 remain in this open position until the movable magazine is completely full of plates, and at this point lug 76 of block 41, which will then be at the bottom stop, acts on contacts of switch 77 in order once again to energize electromagnet 73. In this manner clutch 71 is once again operated and hence traps 52 and 53 are caused to move into the closed position as shown in FIG. 6. When the traps 52 and 53 are closed, the addressing machine continues to work, whilst the plates are shunted across the closed traps towards the second discharge magazine 23, during the filling whereof magazine 24 is emptied.

We shall now describe, with reference to FIGURES 8 and 9, another embodiment, offered as an alternative, of the device for closing the inlet mouth 22 to plate container 24 in FIGURES 6 and 7.

According to the embodiment shown in FIGURES 8 and 9 for the closure of mouth 22, two movable leaves 81 and 82 are provided, which can slide between guide surfaces 83, 84, 85 and 86, parallel to themselves in the printing table, in the sense of approaching together or moving away from each other. Each of said leaves 81 and 82 has a bent up edge—79 on leaf 81 and 80 on leaf 82—and these form the sliding planes for the corresponding guide edges 97 and 98 of the address plates when the device is in the closed position as in FIG. 8.

Leaves 81 and 82 are provided with projections 87 and 88 the lower ends of which are notched to accommodate pins 92 and 93, respectively. Pins 92 and 93 are carried by one end of angle levers 89 and 90, which are hinged at 91 and 92 and connected at their other ends to a prolongation 94 of the core of electromagnet 95, corresponding to electromagnet 73 of the device of FIGURES 6 and 7. As with electromagnet 73, contacts 77 and 78 of FIG. 3, actuated by lug 76 of block 41, are inserted in the supply circuit of electromagnet 95.

Levers 89 and 90 are normally held in the closed position, shown in FIG. 8, by spring 96. This is the situation with electromagnet 95 not energized.

Considering the device in the open position as in FIG. 9 (electromagnet 95 energized), as address plates 99 arrive one by one at inlet mouth 22 along plate track 3, since said address plates find no support in this position, they fall into the compartment of container 24 on to support ledge 40 which, as described, descends by degrees towards the bottom. When container 24 is completely full of plates, lug 76 of block 41 acts on contact 77 and deenergizes electromagnet 95.

Spring 96 then causes levers 89 and 90 to rotate on pins 91 and 92 in the direction of bringing pins 92 and 93 closer together, since they are no longer prevented from so moving by the opposition of the stem 94 of the core of electromagnet 95.

As a consequence, leaves 81 and 82 shift towards each other to occupy the closed position as shown in FIG. 8.

Electromagnet 95 remains deenergized and hence the device in the closed position, until, after the extraction of the stack of plates from container 24, the lug 76 on block 41 is brought to the top travel end position to actuate contact 78 which, by closing the circuit feeding the electromagnet 95, causes same to be energized and hence leaves 81 and 82 to move apart as in FIG. 9.

In order to avoid taking up any space whatsoever beneath the plate track, the system for advancing the plates consists of two closed ring chains 1 and 2 lying in a plane parallel to that of the plate track and disposed longitudinally along the sides of the plate track 3 formed in table 4 of the addressing machine.

As may be seen in FIGURES 1 and 2, the two chains with the series of pushing teeth 5, 6, 7 and 8 act on the rear ends (in relation the direction of advancement indicated by arrow F) of the bent up edges of the plates, so as to push them step by step along the plate track from the loading magazine 17 through the various stations 18, 19 and 20 at which the plates stay for the execution of the operations connected with the functioning of addressing machines, and through the printing station 21 up to the discharge magazines 22 and 23.

I claim:

1. In an addressing machine including a horizontally disposed table, and means for conveying address plates one by one past a printing station on said table to at least one discharge opening in said table, means beneath

said table for collecting the address plates one above another as they fall through said opening, comprising

(*a*) at least one guide member extending downwardly beneath said table,

(*b*) a vertically movable platform mounted beneath said table in registry with said opening in said table,

(*c*) means mounting said guide member adjacent the lower end thereof for limited pivotal movement about a horizontal axis between a first position in which said member is positioned vertically beneath said opening and a second position in which said member is inclined from the vertical, and

(*d*) means for removably supporting beneath said table for pivotal movement with said guide member, a plate-holding tray having a plate receiving opening at its top at least as long as the stack of plates collectable on said platform,

(*e*) said guide member, when in said first position, being operative to guide a plate onto said platform as it falls through said opening, and being operative, upon the pivoting thereof from said first to said second position, to engage the plates stacked on said platform and to push the plates off of said platform and into a plate-holding tray.

2. In an addressing machine including a horizontally disposed table, and means for conveying address plates one by one past a printing station on said table to at least one discharge opening in said table, means beneath said table for collecting the address plates one above another as they fall through said opening, comprising

(*a*) at least two guide members extending downwardly beneath said table,

(*b*) a vertically movable platform mounted beneath said table in registry with said opening in said table,

(*c*) means mounting said guide members adjacent the lower ends thereof for limited pivotal movement as a unit about a horizontal axis between a first position in which said guide members are positioned vertically beneath said table adjacent opposite sides of said opening, and a second position in which said members are inclined from the vertical, and

(*d*) means for removably supporting beneath said table for pivotal movement with said guide members a plate-holding tray having a plate receiving opening at its top at least as long as the stack of plates collectable on said platform,

(*e*) said guide members being operative, when in said first position, to guide plates onto said platform as they fall through said discharge opening, and

(*f*) at least one of said guide members being operative, upon the movement of said members from said first to said second position, to engage the plates stacked on said platform and to push the plates off of said platform and into a plate-holding tray.

3. In an addressing machine as defined in claim 2 wherein said collecting means includes a manually operable lever connected at one end to said guide members and pivotal in opposite directions to move said members between said first and said second position, respectively.

4. In an addressing machine as defined in claim 2, wherein said supporting means comprises

(*a*) a further platform which is fixed to, and which projects transversely outwardly from the other of said two guide members adjacent the lower end thereof, and wherein

(*b*) said further platform is adapted to support the lower end of a plate-holding tray beneath the first-named platform, when said guide members are in said first position, and is adapted to receive and support the lowermost plate in a stack, when the stack is pushed off of said first-named platform, upon the movement of said members to said second position.

5. In an addressing machine as defined in claim 3 wherein

(*a*) said table has at least one further discharge opening therein spaced from the first-named discharge opening,

(*b*) a magazine is mounted beneath said further discharge opening for collecting address plates which fall therethrough, and including

(*c*) means operable for opening and closing said first-named discharge opening relative to the address plates conveyed thereto by said conveying means,

(*d*) said conveying means being operative to convey plates over said first-named discharge opening, when it is closed, to said further discharge opening.

6. In an addressing machine as defined in claim 5 including

(*a*) control means mounted adjacent the lower ends of said guide members and engageable by the first-named platform to cause said opening and closing means to close said first-named opening, when said first-named platform has moved vertically downward beneath said table to a lowermost position in which it is completely stacked with plates, and

(*b*) further control means vertically spaced above the first-named control means,

(*c*) said further control means being engageable by said first-named platform to cause said opening and closing means to open said first-named opening relative to said address plates, when said first-named platform is moved upwardly from said lowermost position after the removal of plates from said first-named platform.

7. In an addressing machine as defined in claim 2 wherein said conveying means comprises

(*a*) a pair of endless chains mounted to rotate in a plane parallel to said table,

(*b*) each of said chains has a run extending parallel to and spaced from a corresponding run on the other of said chains, and said parallel runs flank opposite sides, respectively, of said printing station and discharge opening,

(*c*) each of said chains has thereon a plurality of equispaced teeth which project inwardly toward the space between said parallel runs, and which teeth are adapted to engage a vertical flange formed on the rear edge of a respective address plate thereby to push said plate the length of the space between said parallel runs when said chains are rotating, whereby said plate will be free to drop through said discharge opening when it passes thereover.

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