

PATENT SPECIFICATION

DRAWINGS ATTACHED

919,998



Date of Application and filing Complete Specification April 7, 1961.

No. 12509/61.

Application made in Italy (No. 6909) on April 11, 1960.

Complete Specification Published Feb. 27, 1963.

Index at acceptance:—Class 106(1), B1C(1A:3).

International Classification:—G06c.

COMPLETE SPECIFICATION

Paper Carriage Control Mechanism for Accounting Machines

We, ING. C. OLIVETTI & C., Società per Azioni, a Body Corporate organized under the laws of Italy, of Ivrea, Italy do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to accounting machines having a travelling paper carriage, a cyclical operating mechanism, a printing mechanism, and a control member determining whether or not printing will take place and operable by said operating mechanism. More particularly, the invention relates to a carriage control mechanism comprising a set of column stops movable with said carriage, a counterstop normally cooperating with one of said stops to locate the carriage in a corresponding columnar position, and means operable by said operating mechanism for moving said counterstop to an ineffective position to release the carriage for a tabulating stroke.

In the accounting machines according to the prior art, the counterstop is invariably disengaged from the column stop at the end of each machine cycle, irrespective of the character of said cycle, under the direct control of either the depressed motor key or a tappet of the column stop itself. Therefore, said machines require special control devices to prevent said counterstop from being disengaged whenever no tabulating stroke is desired, as for example after a correction cycle or after each non-printing repeat cycle in the course of a multiplication or division operation. To meet these several requirements said control devices are intricate and render the machine expensive to manufacture.

According to the invention, in an accounting machine of the class described, we now provide a carriage control mechanism comprising means operable by said operating mechanism for disabling said counterstop to

release said carriage and characterized by an element cyclically sensing said member for controlling the operation of said disabling means.

Other objects, features and advantages of the invention will become apparent from the following detailed description of a preferred embodiment thereof, made with reference to the accompanying drawings, wherein:

Fig. 1 is a partial rear sectional view of a paper carriage control mechanism according to the invention, as embodied in an accounting machine;

Fig. 2 is a sectional view taken on the line II—II of Fig. 1;

Fig. 3 is a rear view of a detail of Fig. 1 in different position;

Fig. 4 is a partial right-hand longitudinal view of the mechanism of Fig. 1;

Fig. 5 is another partial right-hand longitudinal view of the mechanism of Fig. 1;

Fig. 6 is a rear view of a detail of Fig. 5;

Fig. 7 is a partial right-hand longitudinal view of the printing mechanism of the machine embodying the control mechanism of Fig. 1;

Fig. 8 is a plane view of a detail of Fig. 7.

The invention is embodied in an accounting machine having a transversely travelling paper carriage, a cyclical operating mechanism, and a printing mechanism.

Referring to Fig. 7, the printing mechanism is substantially of the type described in the British patent specification No. 737,050. Said printing mechanism is formed of a set of printing members, such as type wheel slides 100, cumulatively controlled by a universal bar 101 actuated by a cyclical operating mechanism comprising a conventional main shaft 10. Each printing member is further individually controlled by an upper end of a latch 102 normally engaging a transverse bail 103 rockably and slidably mounted

[Price 4s. 6d.]

on a stationary shaft 105. The bail 103 is provided with a cam slot 106 (Fig. 8) engaged by a projection 107 of a printing control member such as a slide 11 urged forwards by a spring 120 (Fig. 7) and contacting by means of a lug 108 an upper arm of a lever 109 cooperating with a cam 110 secured to the main shaft 10. Another cam 111 secured to the main shaft 10 is followed by a lever 112. An upper end 113 of the lever 112 is adapted to engage a projection 114 of the bail 103, which projection, however, is normally out of the path of the end 113 (Fig. 8).

The machine cycles may be of two different types namely, printing cycles such as adding, subtracting and total taking cycles, and non-printing cycles such as correction cycles, keyboard clearing cycles and repeat cycles in multiplication and division operations. Fig. 7 shows an adding key 115 adapted to condition the machine for a printing cycle, and a correction key 116 adapted to condition the machine for a non-printing cycle, said keys being further adapted in a manner known per se, to start the main shaft 10 for one cycle.

If a printing key, such as the adding key 115 is depressed, at the beginning of the ensuing machine cycle the cam 110 releases the lever 109 and the slide 11 is moved forwards by its spring 120 until arrested by a portion 117 of the machine frame. The projection 107 moves the bail 103 leftwards (upwards in Fig. 8) thus shifting the projection 114 into the path of the end 113 of the lever 112. At about mid-cycle the universal bar 101 (Fig. 7) has been removed from the path of the slides 100 in a manner known per se and the cam 111 will rock the lever 112 counterclockwise whereby the bail 103 will be rocked clockwise. The latches 102 are thus lowered to individually release the slides 100 and enable same to print an amount of the platen 71.

On the contrary, if a non-printing key, such as the correction key 116 is depressed a pin 118 of the key stem will be located into the path of a shoulder 119 of the slide 11. When at the beginning of the ensuing machine cycle the cam 110 releases the lever 109, the slide 11 will be immediately arrested by the pin 118, whereby the projection 114 will not enter the path of the end 113 of the lever 112 and the printing mechanism will not be operated. It will thus be clear that in printing cycles the slide 11 is controlled by the main shaft for conditioning the printing mechanism for operation.

The accounting machine is provided with a paper carriage 12 (Fig. 1) travelling transversely with respect to a stationary frame 16 by the action of spring or motor powered means known per se and not shown in the drawings. The carriage 12 is controlled by

a tabulating mechanism comprising a set of column stops 26 movable with the carriage. More particularly, the stops 26 are radially mounted on a drum 20 pivoted on a stationary pin 19 and connected through a train of gears 18, 17 and 14 to a rack 13 secured to the carriage 12. Each column stop 26 is provided with a projection 33 which upon rotation of the drum 20 is movable along a predetermined path and is adapted to be engaged by a counterstop 34 to locate the carriage in a corresponding columnar position.

The counterstop 34 is slidably mounted by means of a slot 35 on a stationary pin 36 and in a slot 37 of a stationary plate 38. The counterstop 34 is provided with a notch 39 flanked by a pair of abutments 40 and 41 normally embracing the projection 33 of one of the stops 26, the abutment 41 being longer than the abutment 40. The counterstop 34 is provided with a shoulder 43 adapted to engage the upper edge of the slot 37, and with an aperture 44 cooperating with means operable by the main shaft 10 for moving the counterstop 34 to an ineffective position against the urge of a spring 42. More particularly, said moving means comprise a lever 46 pivoted at 47 and provided with a pin 45 engaging the aperture 44 of the counterstop 34. The lever 46 is urged counterclockwise by a spring 48. Since the action of the spring 42 prevails over the spring 48 the lever 46 normally contacts the plate 38 (Fig. 1).

The arm 50 of the lever 46 is adapted to cooperate with a projection 51 of a lever 52 (Fig. 4), said projection being normally displaced forwards and upwards with respect to the arm 50. The lever 52 is linked at 53 to a sensing element such as a slide 54 urged rearwards by a spring 60 to contact a cam 61 of the main shaft 10 to be operable thereby. The lever 52 is spring urged to normally contact a pin 55 of a lever 56 fulcrumed at 57 on the machine frame and provided with a second pin 58 cooperating with another cam 59 of the main shaft 10.

The slide 54 is provided with a projection 62 adapted to sense a bent lug 63 of a pivoted lever 64 having a second bent lug 65 in the path of the forward end 11' of the slide 11. A further projection 66 of the slide 54 is adapted to sense a bent lug 67 of a manual means such as a manual lever 68 pivoted at 69 and movable to either one of two positions defined by a positioning latch 70.

Mounted on the carriage 12 is the conventional platen 71 (Figs. 5 and 7) and a line spacing mechanism therefor, said mechanism comprising a ratchet wheel 72 (Fig. 5) secured to the platen 71 and a pawl 73 linked to an upper arm of a lever 74 pivotally mounted at 76 on the carriage 12, the lower arm of said lever being formed of a bail

70

75

80

85

90

95

100

105

110

115

120

125

130

- 75 extending along the carriage. Pivoted on a stationary shaft 78 of the machine frame is a lever 77 adapted to cooperate with the bail 75 in any transverse position of the carriage 12. The lever 77 is normally urged by a spring 79 to contact a stationary pin 80 and is provided with a bent lug 81 engageable by a first arm 82 of a three-armed lever 83 fulcrumed on the pin 58 of the lever 56.
- 10 A second arm 84 of the lever 83 is urged by a spring 85 to contact a pin 86 of a control lever 87 pivoted on the shaft 78. The lower arm of the lever 87 contacts a pin 98 of the lever 52 by the urge of a spring 88 whose action prevails over the spring 85. The lever 87 thus normally keeps the arm 82 higher than the lug 81. A third arm 90 of the lever 83 cooperates with a lever 91 (Fig. 6) pivoted at 92 and lying in the path of a tappet 93 (Fig. 2) provided on predetermined column stops 26.
- 15 The operation of the carriage control mechanism is as follows:
- If a non-printing key, such as the key 116 (Fig. 7) has been depressed, during the machine cycle the slide 11 is prevented by the pin 118 from moving forwards. Thus the end 11¹ (Fig. 4) does not rock the lever 64, whose lug 63 prevents the slide 54 from moving rearwards. The lever 52 together with the levers 87 and 83 will remain in the position of Fig. 5, irrespective of the position of the manual lever 68.
- 25 Near the end of the machine cycle the cam 59 of the main shaft 10 rocks the lever 56 clockwise. On one hand the pin 55 of this lever rocks the lever 52 clockwise but the projection 51 (Fig. 4) does not engage the lever 46, whereby the counterstop 34 will not be disengaged. On the other hand the lever 56 moves the three-armed lever 83 rearwards (rightwards in Fig. 5), but the arm 82 does not engage the lever 77, whereby the line spacing mechanism will not be affected.
- 30 Assuming now that a printing key 115 (Fig. 7) is depressed, at the beginning of the ensuing machine cycle the slide 11 moves forwards to condition the printing mechanism 100 for operation, as described above. The forward end 11¹ (Fig. 4) of the slide 11 now engages the lug 65 and rocks the lever 64 counterclockwise, moving thus its lug 63 out of the path of projection 62 of the slide 54.
- 35 If the lever 68 is in its normal position of Fig. 4, its lug 67 is out of the path of the projection 66. During the machine cycle the cam 61 releases the slide 54 which is shifted rearwards by the spring 60 through its maximum extent to assume a first position. The lever 52 is moved along with the slide 54 and puts its projection 51 above the arm 50 of the lever 46. Simultaneously, the pin 89 of the lever 52 rocks the lever 87 counterclockwise. If the stop 26 actually embraced
- by the counterstop 34 is not provided with a projection 93, such as the right hand stop 26 shown in Fig. 2, the lever 91 is in the position shown by broken lines in Fig. 6, wherein its upper arm is out of the path of the arm 90 of the lever 83. Therefore, this lever may now follow the pin 86 (Fig. 5) of the lever 87 to rock clockwise and move its arm 82 to a position lower than the lug 81.
- 40 Near the end of the machine cycle, when the lever 56 is rocked clockwise the arm 82 does not engage the lug 81 and the lever 77 does not operate the line spacing mechanism. On the contrary, the projection 51 of the lever 52, which is rocked clockwise by the pin 55, engages the arm 50 (Fig. 1) of the lever 46 which is thus rocked counterclockwise. The pin 45 moves now the counterstop 34 leftwards (Fig. 1) to an ineffective position, thus disengaging the stop 26 and releasing the carriage for a tabulating stroke.
- 45 Upon completion of the machine cycle the cam 61 restores the slide 54 and the cam 59 enables the lever 56 to return to rest, together with the levers 52 and 83. The spring 42 (Fig. 1) now urges the counterstop 34 rightwards, but the shoulder 43 is arrested by the upper edge of the slot 37, thus locking the counterstop in an intermediate position wherein the shorter abutment 40 will be out and the longer abutment 41 will be in the path of the projection 33 of the stops 26 (Fig. 3).
- 50 When in the course of the carriage travel the next stop 26 having a projection 33 engages the abutment 41, the counterstop 34 is slightly rocked about the pin 36 and its shoulder 43 is disengaged from the slot 37. The counterstop 34 is now instantly moved rightwards by the spring 42 and restored to its effective position of Fig. 1 in which it embraces the projection 33 and prevents rebound of the carriage. The left hand edge of the aperture 44 of the counterstop 34 now restores the lever 46.
- 55 It will thus be clear that the lever 52 is controlled by the member 11 for causing the moving means 46 to be operated by the main shaft 10.
- 60 If, however, the manual lever 68 is rocked clockwise to be set in its rocked position as in Fig. 5, the lug 67 is moved into the path of the projection 66 of the slide 54. During the machine cycle the slide 11 rocks the lever 64 with its lug 63 out of the path of the projection 62. The slide 54, however, cannot be shifted rearwards through its maximum extent because upon being moved through an intermediate extent it is arrested by the lug 67 in an intermediate position. In this case the projections 51 (Fig. 4) is not put above the arm 50 of the lever 46 and the pin 89 rocks the lever 87 only partially, whereby the arm 82 of the lever 83 is put in front of the lug 81.

When near the end of the machine cycle the lever 52 is rocked clockwise by the pin 55 the projection 51 does not engage the lever 46, thereby not affecting the tabulating mechanism. On the contrary, the arm 82 now engages the lug 81 and rocks the lever 77 counterclockwise. The bail 75 is thus rocked clockwise and the pawl 73 engages the ratchet wheel 72 to space the platen 71 one line.

It will thus be clear that the manual means 68 when set in the position of Fig. 5 prevents the element 54 from sensing the member 11, said element when so prevented causing operation of the line spacing mechanism.

If the manual lever 68 is in its normal position of Fig. 4 and the stop 26 actually embraced by the counterstop 34 is provided with a tappet 93, this tappet keeps the lever 91 in the position shown by full lines in Fig. 6. During the machine cycle the slide 54 is shifted rearwards to its first position thus causing operation of the tabulating mechanism as described above. When the lever 83 is released by the pin 86 to rock clockwise, the arm 90 is arrested by the lever 91 in such a position as to put the arm 82 in front of the lug 81, in the same manner as if the slide 54 would have been shifted to its above described intermediate position. When the lever 56 is rocked clockwise the arm 82 will engage the lug 81 and operate the line spacing mechanism.

It will thus be clear that the tappet 93 causes operation of the line spacing mechanism even if the manual lever 68 is in its position selecting operation of the tabulating mechanism.

It is intended that many changes, modifications and embodiments may be made to the control mechanism of the invention without departing from the scope thereof. For example, in order to arrest a return stroke of the carriage (made leftwards as seen in Fig. 1) an additional counterstop 34¹ may be provided which is identical to the counterstop 34, but turned over with respect thereto. The counterstop 34¹ may cooperate with a projection 33¹ (Fig. 2) of the stops 26. Obviously, during a tabulating or a return stroke of the carriage the projection 33¹, respectively, the projection 33 of the stop 26 will engage an inclined edge 94¹ or 94, respectively, thereby forcing leftwards the counterstop 34¹ or 34, respectively, which shall not arrest the carriage.

WHAT WE CLAIM IS:—

1. In an accounting machine having a travelling paper carriage, a printing mechanism, and a control member determining whether or not printing will take place and operable by a cyclical operating mechanism, a carriage control mechanism comprising a set of column stops movable with said carri-

age and individually cooperating with a normally effective counterstop to locate the carriage in a corresponding columnar position, and means operable by said operating mechanism for disabling said counterstop to release said carriage, characterized by an element cyclically sensing the position of said member for controlling the operation of said disabling means.

2. A mechanism according to Claim 1, characterized by a presettable manual means for preventing said element from sensing said member to prevent the operation of said disabling means.

3. A mechanism according to Claim 2, including a line spacing mechanism operable by said main operating mechanism, characterized by means controlled by said element when so prevented for causing operation of said line spacing mechanism.

4. A mechanism according to Claim 3, characterized in that said element is normally latched in an ineffective position and is released by said member when operated.

5. A mechanism according to Claim 4, characterized in that said manual means is movable between a predetermined position for selecting said disabling means for operation and another position for selecting said line spacing mechanism for operation, an element on said stop being adapted to cause operation of said line spacing mechanism irrespective of the position of said manual means.

6. A carriage control mechanism according to any preceding claim, wherein said counterstop is formed with a pair of abutments one longer than the other, said counterstop being spring urged to a normally effective position wherein said abutments embrace one of said stops, characterized by means effective upon disabling said counterstop for launching said counterstop in a substantially intermediate position wherein said longer abutment only extends into the path of said stops, said longer abutment when contacted by one of said stops being disengaged from said latching means.

7. A mechanism according to Claim 6, characterized in that said counterstop is moved along a first direction by said disabling means against said spring urge and for a limited extent along a second direction by said spring urge, said latching means being adapted to intercept the return movement of said counterstop along said first direction upon its movement along said second direction.

8. A mechanism according to Claim 7, characterized in that said counterstop is adapted to be shifted along said first direction and to be rocked along said second direction.

9. A mechanism according to Claim 6, wherein said carriage is selectively travelling in two opposite senses and wherein each one

70

75

80

85

90

95

100

105

110

115

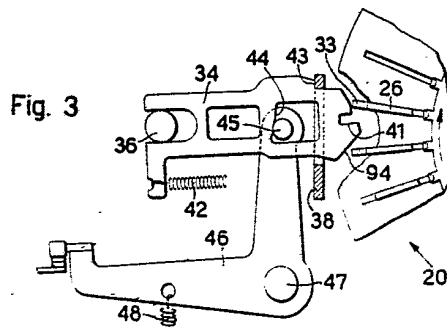
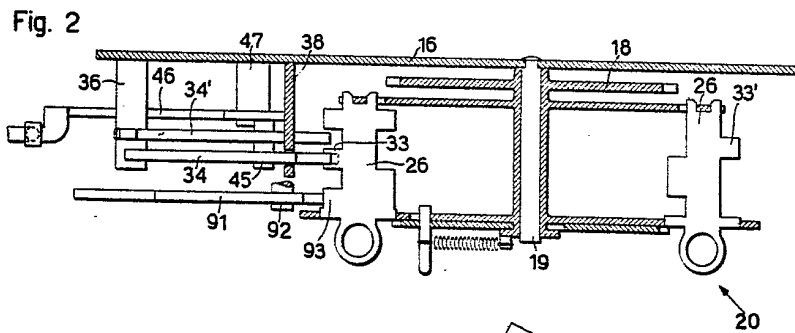
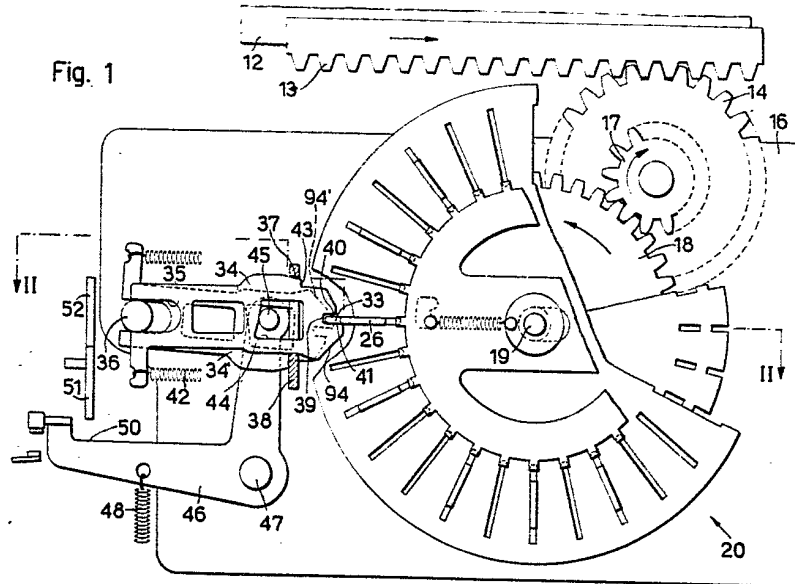
120

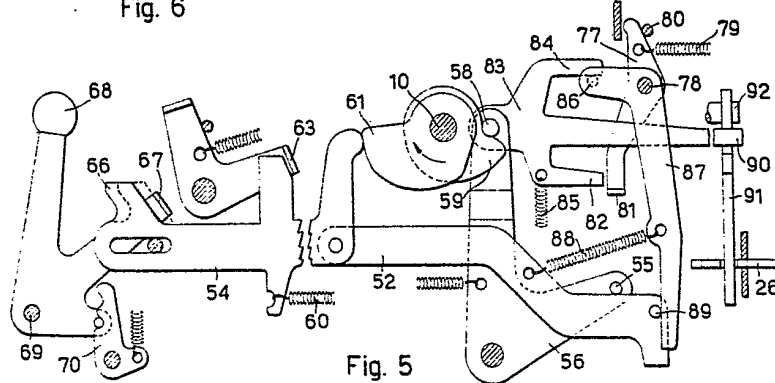
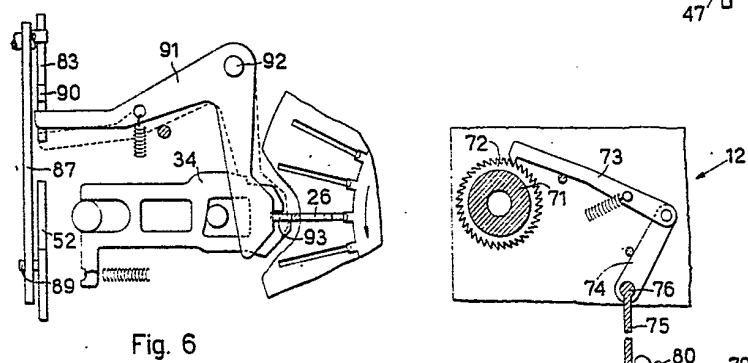
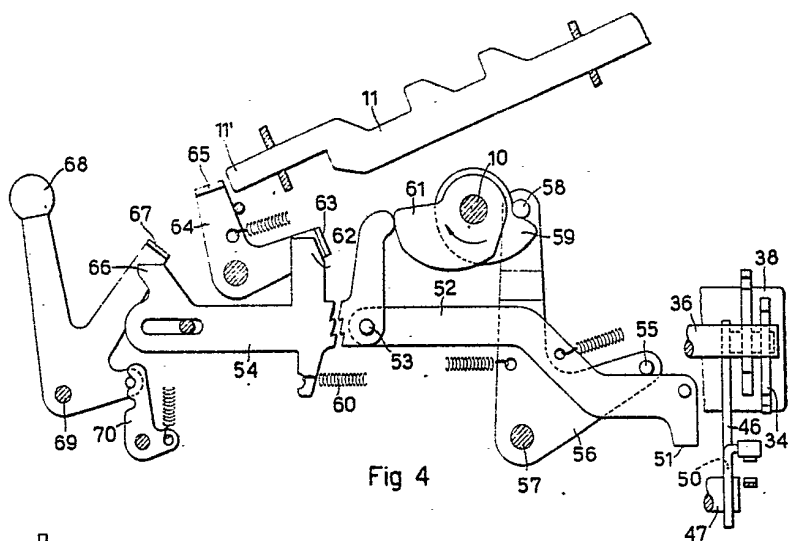
125

130

- of said stops may be provided with an
arresting element in either one of two separate
positions associated with said two opposite
senses, characterized in that one of said
5 arresting elements is adapted to cooperate
with said counterstop, and that the other of
said arresting elements adapted to cooperate
with a second counterstop formed like the
first counterstop and turned over with respect
10 thereto.
10. A mechanism according to Claim 9
characterized in that said counterstops may
be simultaneously disabled by said disabling
means, each one of said arresting elements
associated with the selected sense of carriage
travel when contacting the associated longer
abutment being adapted to disengage the
associated counterstop from said latching
means.
11. A mechanism substantially as described
with reference to the accompanying drawings.
- ING. C. OLIVETTI & C., SOCIETA
p. AZIONI,
by
Mario Winkler, Manager,
c/o British Olivetti Limited,
30, Berkeley Square, London, W.1.

Leamington Spa: Printed for Her Majesty's Stationery Office by the Courier Press.—1963.
Published at The Patent Office, 25, Southampton Buildings, London, W.C.2, from which copies may be obtained.





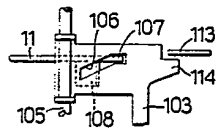
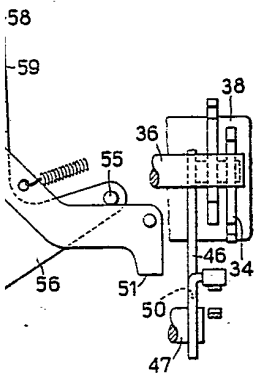
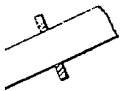


Fig. 8

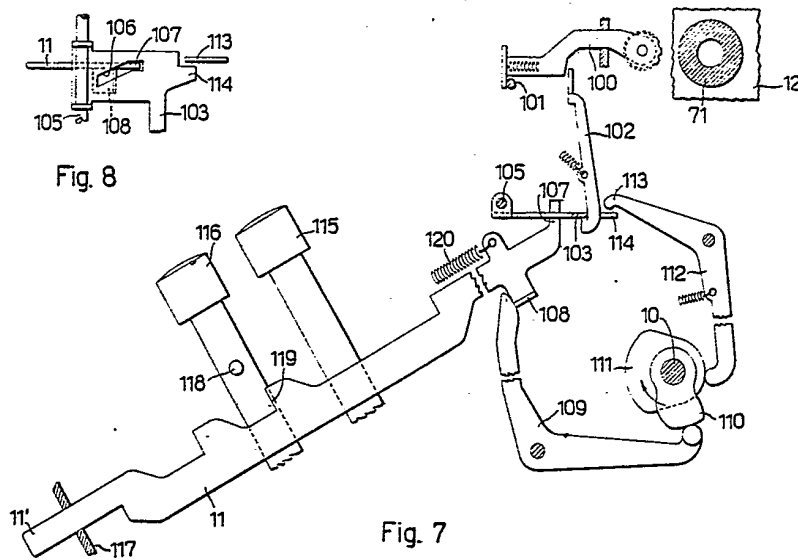
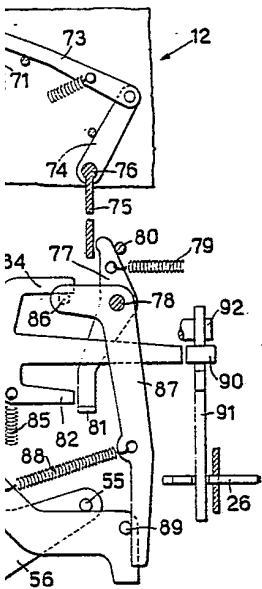


Fig. 7

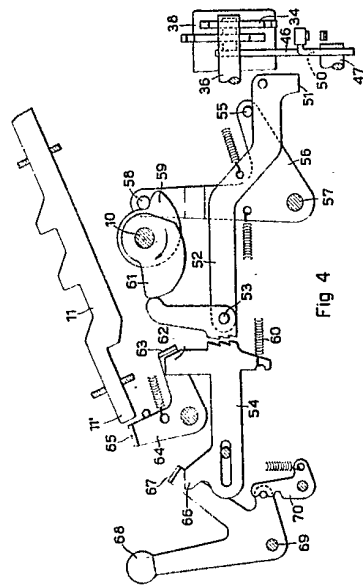


Fig. 4

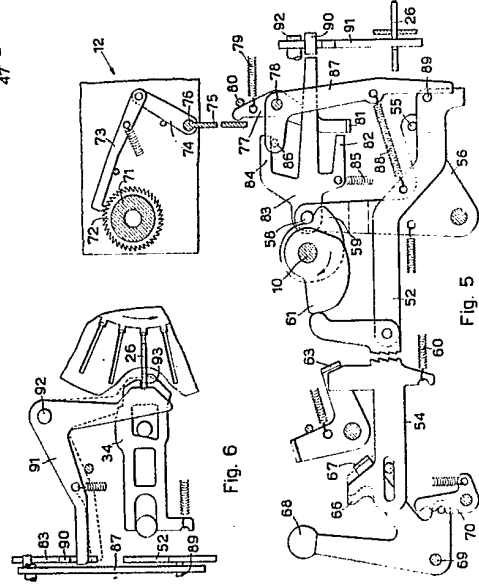


Fig. 5

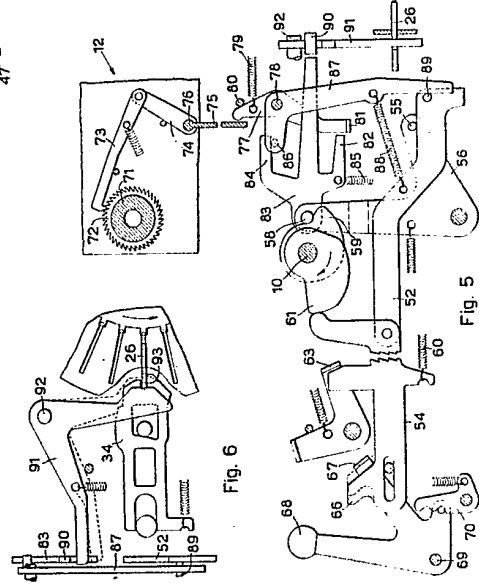


Fig. 6

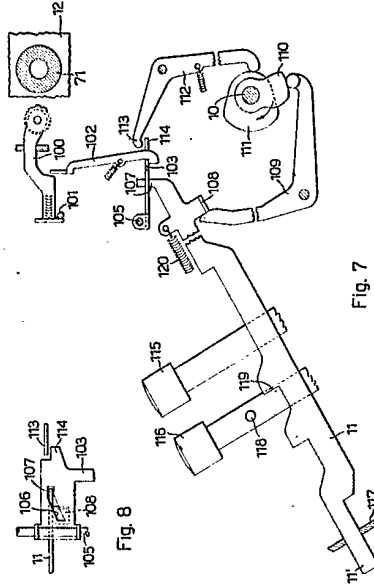


Fig. 7

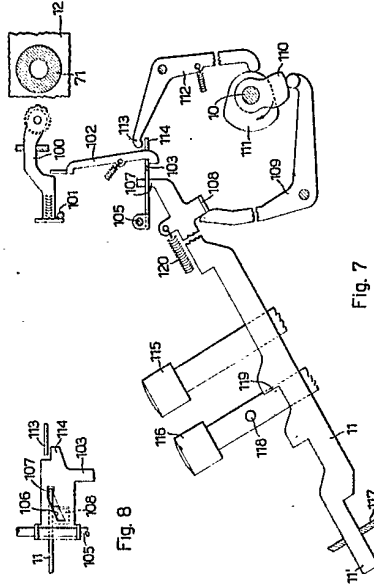


Fig. 8