

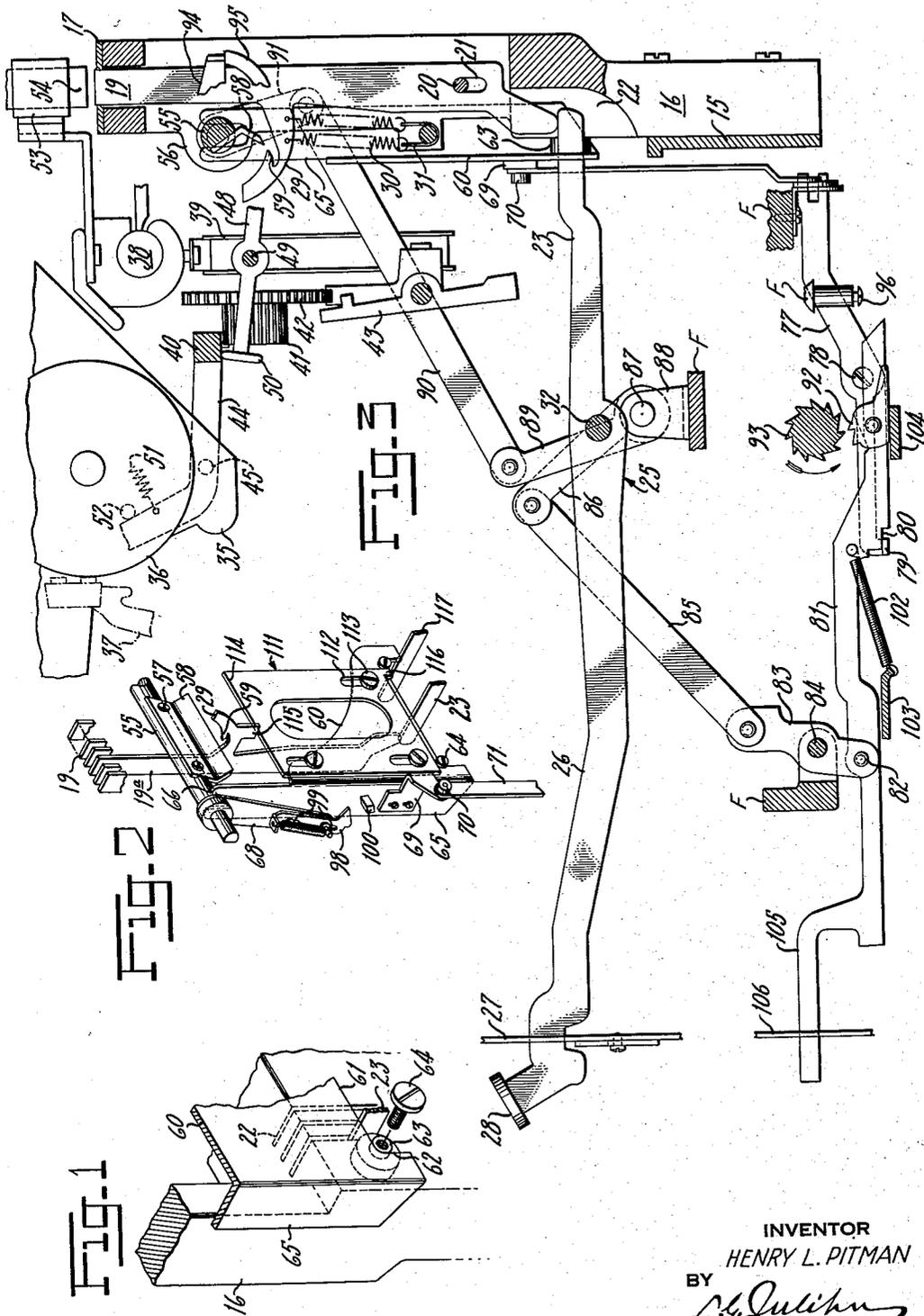
Dec. 30, 1941.

H. L. PITMAN  
TYPEWRITING MACHINE

2,267,947

Filed May 16, 1939

3 Sheets-Sheet 1



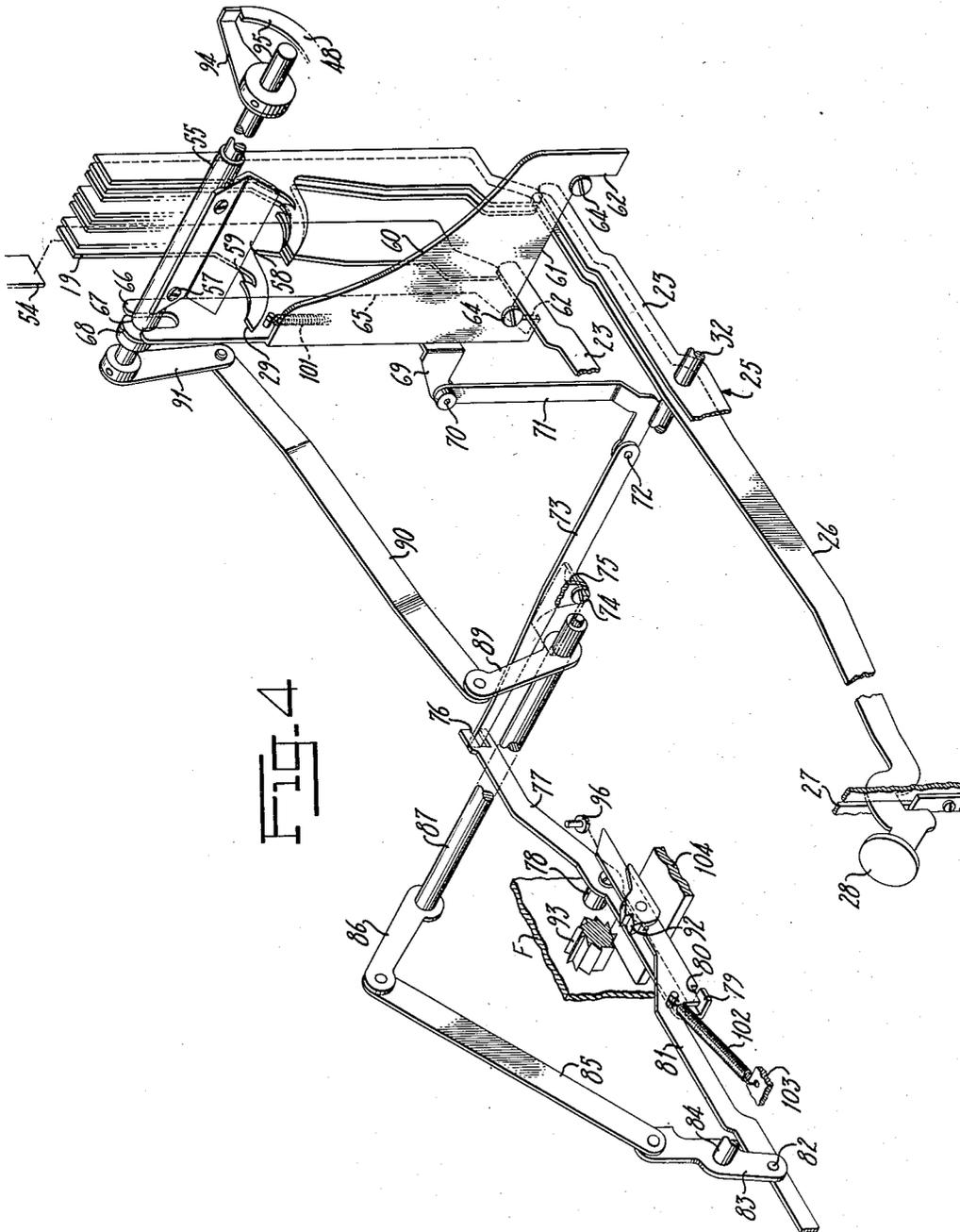
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# UNITED STATES PATENT OFFICE

2,267,947

## TYPEWRITING MACHINE

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Application May 16, 1939, Serial No. 273,931

16 Claims. (Cl. 197—178)

This invention relates to typewriting machines and more particularly to provision for actuating the tabulating devices by power so as to facilitate materially the work of the typist on the tabulating key or keys.

Power means are employed and are effective, in response to depression of a tabulating key, to move a tabulating stop to effective position and concomitantly to release the carriage for a tabulating movement which is limited by the effectively positioned stop.

In the present instance, a letter-feed escapement mechanism normally restrains the carriage, the latter being urged, as by a spring motor, to advance in letter-feed direction which is also the direction of the tabulating movements of the carriage. The release of the carriage may be, therefore, a release from the escapement mechanism for a resulting tabulating movement of the carriage by such spring motor.

An object of the invention is to provide a structurally simple, inexpensive and reliably operative organization whereby, in response to operation of a tabulating key, power means render the tabulating stop effective and release the carriage.

The invention may be employed to tabulate denominationally by means of denominational tabulating stops and corresponding denominational tabulating keys.

The organization may be arranged so that restoration of the actuated tabulating stop and restoration of the carriage to the control of the escapement mechanism are determined by release of the depressed tabulating key. To this end the typist's finger may keep the tabulating key depressed until the tabulating jump of the carriage is completed and thereupon release the key. Inasmuch as the typist is thus occupied in keeping the tabulating key depressed until the tabulating jump of the carriage is completed, it conduces to prevent the fault of operating the type keys during tabulating movement of the carriage.

Another feature of the invention resides in mechanism-and-operation-simplifying provision whereby restoration of the tabulating stop and restoration of the carriage to control of the escapement mechanism are effected independently of the power drive. Thus the power drive is active mainly in response to depression of the tabulating key and substantially does not function upon the release of the key.

The invention also deals with provision whereby one of the denominational stops may be used for ordinary column tabulating. A column

tabulating key may be therefore provided and it supplements the denominational tabulating key associated with the denominational stop that is used for column tabulating. Arrangement may be made whereby either the operation of said latter tabulating key or of the column tabulating key determines the power actuation of such one denominational stop and concomitant release of the carriage. The above mentioned manner of effecting restoration of the stop and restoration of the carriage to the control of the escapement result from release of the column tabulating key.

The foregoing and other objects, features and advantages will be apparent from the following description of a preferred embodiment of the invention.

In the accompanying drawings:

Figure 1 is a perspective illustrating details of supporting means for a member of the mechanism.

Figure 2 is a perspective illustrating structure whereby a column tabulating key may control one of the denominational stops.

Figure 3 is a cross sectional side view of mechanism embodying the invention in a typewriter.

Figure 4 is a perspective of the mechanism embodying the invention.

Figure 5 is a plan view diagram of the tabulating key levers and tabulating stops.

Figure 6 is a cross sectional side elevation showing a tabulating key depressed and showing the consequent relative positions of the parts before the power drive functions.

Figure 7 is a side view illustrating the functioning of the latching device for keeping a tabulating stop in effective position.

Figure 8 is a cross sectional side elevation showing the relative positions of the parts when the power drive has functioned to project a tabulating stop and release the carriage.

Referring now more particularly to the drawings, a typewriter-frame member 15 has suitably secured to the rear thereof a tabulator-stop magazine or frame 16. This frame 16 may be a casting to the top of which is secured a plate 17 having a series of slots which slidably receive the upper ends of stop blades or reeds 19. The blades 19 are guided intermediate their ends by a pin 20 supported in opposite uprights of the frame 16 and passing through slots 21 in the blades. This pin-and-slot connection serves to limit the upper and lower positions of the blades in the frame 16. The lower ends of the blades 19 are disposed within slots 22 in the frame 16

and are held in position therein over the rear ends 23 of levers 25 which have their forward ends 26 guided in a comb plate 27 which serves also as a limiting stop for downward movement of the forward ends of the key levers by their keys 28.

Each of the blades 19 has a forwardly reaching arm 29 to which the upper end of a return spring 30 is attached. The lower ends of the springs 30 are attached to a cross bar 31 secured to the side uprights of the frame 16. Said springs 30 serve to hold the blades 19 normally depressed with the upper ends of their slots 21 abutting the pin 20. The key levers 25 tend to turn by gravity counter-clockwise about their fulcrum pin 32 to keep their rear ends 23 in abutment with the lower ends of the blades 19, the rear ends 23 of said levers being also guided in the slots 22 of the frame 16. The key lever fulcrum pin 32 may be supported at its opposite ends in a suitable part of the framework as at 33, Figure 5. The rear portions 23 of the key levers are substantially parallel. The forward portions 26 of the key levers diverge in varying degree in accordance with the lateral spacing of the row of denominational tabulating keys 28, as in Figure 5, it being noted that Figure 5 shows only those key levers that are to the right of the center of the machine, the key levers to the left being similar and therefore not shown.

A carriage 35, Figure 3, mounts a revoluble platen 36 for type bars 37 and runs along a front rail, not shown, and a rear rail 38 on the typewriter framework which is further represented by fragmentary portions F. A spring motor 39 mounted on the framework urges the carriage leftward in letter feed and tabulating direction. A rack 40 on the carriage normally engages a pinion 41 having an escapement wheel 42 controlled by an escapement dog rocker 43 for letter feeding the carriage by the spring motor 39. The pinion 41 and its escapement wheel 42 are rotatably supported on the framework of the machine and the dog rocker 43 is rockably mounted on said framework. The feed-rack 40 has side arms 44 turnable about pivots 45 on the carriage. A lever 48 fulcrumed on the framework at 49 has a rack-engaging roller 50 and is operable, as will later appear, for lifting the feed rack 40 to disengage it from the pinion 41 to let the carriage be tabulated by the spring motor 39. A spring 51 yieldably holds the rack 40 in pinion-engaging position determined by a stop 52.

The carriage 35 has a tabulating rack 53 in which one or more column stops 54 are set as in Figure 3 so that their lower ends, and hence the carriage, are interceptable by any stop blade 19 that may be lifted to bring its upper end into the path of said stops 54.

A rock shaft 55 has a thickened middle portion journaled in ears 56 of the uprights of the tabulator stop frame 16. An angular plate secured to said shaft 55 by screws 57 forms a universal lifting bar 58 for the stop blades 19, each of the latter having a spur 59 engageable by said lifting bar 58. In the normal or unelevated position of any blade 19, Figure 3, its spur 59 is just below and thus clear of the arcuate path swept by the edge of the lifting bar 58 when the shaft 55 is rocked clockwise of Figure 3.

By depressing any one of the tabulating keys 28 its lever 25 is rocked counter-clockwise from the normal dotted line position to the comb-plate-stopped full line position, Figure 6, and

thus its rear portion 23 raises the corresponding stop-blade 19 sufficiently to bring its spur 59 into the path of the universal lifting bar 58 as in Figure 6, and thus effect selection of the stop-blade.

A power-controlling universal element in the form of a plate 60 has a transverse bottom edge 61 universally engageable by the rear ends 23 of the key levers 25 so that operation of any key lever 25 to lift the corresponding stop-blade 19, as aforesaid, also lifts said plate 60. Opposite vertical edges 62 at the lower portion of the plate 60 work slidably in guide grooves formed by two shouldered studs 63 and headed screws 64 removably threaded into said studs, the latter being attached to the front of the stop frame 16 as in Figure 1. For further slidable support of the plate 60, a side flange 65 thereof extends upwardly and adjacent the outer side of the left upright of the stop frame 16 and an upper forked end 66 of said flange slidably embraces the left reduced end-portion of the rock shaft 55 and slidably fits between a shoulder 67 and an arm 68 on said rock shaft 55, as in Figure 4.

A bracket 69 is fixed to the plate 60 and has pivoted thereto at 70 a depending elbow link 71 which is also pivotally connected at 72 to a transverse lever 73 fulcrumed at 74 on a bracket 75 secured to the framework. Said lever 73 is operatively articulated at 76, Figure 4, to a fore-and-aft extending lever 77 fulcrumed on a stud 78 on the framework. A lateral tab 79 of said lever 77 underlies a heel 80 of a power actuable draw link 81 pivoted at 82 to a lever 83 fulcrumed at 84 in the framework. A link 85 connects said lever 83 to an arm 86 fixed to a transverse rock shaft 87 journaled in brackets 88, Figure 3, on the framework. Another arm 89 of said rock shaft 87 is connected by a link 90 to an arm 91 fixed to the rock shaft 55 that carries the universal lifting bar 58.

It will be perceived now that the aforementioned lifting of the plate 60 by depression of any tabulating key 28 rocks the transverse lever 73 counter-clockwise of Figure 4 and thereby rocks the lever 77 clockwise so that the latter lifts the draw link 81 to bring a toothed pawl 92 on the latter into engagement, as in Figure 6, with a power driven snatch roll 93, journaled in the framework and rotating continuously in the direction of the arrow. The resulting rearward stroke of the draw link 81 operates through the lever 83, link 85, rock shaft 87 and link 90 to turn the rock shaft 55 clockwise from the Figure 6 position to the Figure 8 position. Said rock shaft 55 being thus turned, the edge of its blade lifting bar 58 sweeps under the spur 59 of the previously sufficiently elevated stop blade 19 and cams against said spur so as to fully raise the stop blade 19 to its position, Figure 8, for intercepting one or another of the carriage column stops 54.

The described power-actuated clockwise rocking of the shaft 55 also lifts the carriage feed rack 40 from the escapement pinion 41 in that an arm 94 fixed to said shaft 55 depresses the rear end 95 of the rack-lifting lever 48 to rock the latter clockwise.

The selected stop blade 19 having been lifted to effective position and the carriage having been concomitantly released from the escapement device by means of the rearward power-stroke of the draw link 81, the latter automatically becomes disconnected from the snatch roll

93 by striking the rounded head of a knock-off screw 96 suitably fixed on the framework.

The typist's finger keeps the key lever 25 in the full line operated position, Figure 8, and thus keeps the plate 60 lifted to render a latch device effective to maintain the rock shaft 55 in the operated position, Figure 8, for sustaining the blade 19 in effective position and for keeping the feed rack 40 disengaged from the pinion 41 until the tabulating movement of the carriage by the spring motor 39 is completed. Said latch device comprises the arm 68 fixed to the rock shaft 55 and carrying a downwardly-spring-pressed latch plate 98. Said latch plate 98 is attached to said arm 68 by two pin-and-slot connections 99 so as to be slidable vertically on said arm. The latch plate 98 is thus resiliently yieldable relatively to a latch stud 100 on the lifted plate 60 so as to pass over, and finally snap downwardly into interlock with said stud as in Figures 7 and 8, when the shaft 55 and its arm 68 and latch plate 98 become rocked clockwise to the Figure 8 position. This blade-lift and carriage-release sustaining interlock is maintained as long as the typist keeps the key lever 25 in the Figure 8 operated position, that is, until the lifted stop blade 19 intercepts one or another of the column stops 54 on the carriage.

As soon as the carriage is thus intercepted, the typist releases the operated lever 25. This permits the plate 60 to drop by gravity or under the urge of a spring 101 which may be anchored to the bar 31, thereby to withdraw the latch stud 100 downwardly from the latch plate 98 to release the rock shaft 55 for counter-clockwise restoration from the Figure 8 to the Figure 3 position. This counter-clockwise restoration of the shaft 55 may be effected by means of a spring 102 anchored to a framework cross bar 103 and attached to the draw link 81 to draw the latter forwardly back to its Figure 3 normal position. This restoration of the rock shaft 55 withdraws the lifting bar from and thereby releases the elevated blade 19 so that the latter drops back to normal position under the urge of its spring 30. This restoration of the rock shaft 55 also releases the rack lifting lever 48 to permit the carriage rack 40 to drop into re-engagement with the escapement pinion 41 to check the carriage as the blade 19 drops to relinquish its control of the carriage.

Said spring 102 is biased to tend to turn the draw link 81 clockwise about its pivot 82 and thereby tend to keep it resting normally upon a cross bar 104 of the framework. At its forwardly extending arm 105, the draw link 81 is guided in a guide slot of a plate 106 on the framework.

An electric motor and driving connections therefrom to the snatch roll 93 for power driving the latter continuously may be suitably provided in the machine in various ways and the motor and connections are therefore not shown.

Column-tabulating may be practiced by uniformly using a particular one of the stop blades 19 and providing therefor in addition to its denominational key lever 25, 28 a supplemental or column-tabulating key lever 108 as in Figure 5. This column-tabulating key lever 108 may be generally similar to the other key levers 25 and may be fulcrumed on the pin 32 and disposed to one side of the set of denominational key levers 25 so that its key 109 is in a prominently accessible position offset from the other keys, Figure 5.

In Figure 2, 19<sup>a</sup> represents the stop blade employed for column tabulating and this blade has

the features of the other blades 19 including the forwardly reaching arm 29 presenting the spur 59 that is engageable with the power actuatable blade-lifting bar or mover 58.

An intermediate plate 111 is supported for vertical edgewise movement and to this end may have vertical slots 112 slidably fitting headed guide studs 113 on the plate 60. The horizontal top edge 114 of said plate 111 underlies a depending tongue 115 of the blade 19<sup>a</sup>. A depending tab 116 of said plate 111 connects the latter operatively only to the column tabulating key lever 108, the latter having a rear portion 117 underlying said tab. It will be apparent now that the intermediate plate serves to operatively connect the column tabulating key lever 108 to the blade 19<sup>a</sup> irrespective of the lateral position of the latter so that any one of the denominational positions encompassed by the set of blades 19 may be used for disposing or placing the column tabulating blade 19<sup>a</sup>.

The operation of the parts for column tabulating is as follows. Depression of the column tabulating key 109 rocks its lever 108 so that the rear portion 117 of the lever, by engaging the tab 116 of the intermediate plate 111, lifts said plate to lift the blade 19<sup>a</sup> merely sufficiently to bring its spur 59 into the path of the blade lifting bar 58. Said rear portion 117 of the thus operated key lever 108 also engages and lifts the plate 60 to effect connection of the draw link 81 to the snatch roll 93 for resultant clockwise power actuation of the rock shaft 55 and its blade-lifting bar 58 to lift the column tabulating blade 19<sup>a</sup> fully into position to intercept one of the column stops 54 on the carriage. At the same time, the feed rack 40 is lifted clear of its pinion 41 to effect the necessary release of the carriage. The column tabulating key 109 is kept depressed to keep the latch device 98, 100 effective to maintain the rock shaft 55 in operated position and thereby maintain the blade 19<sup>a</sup> in lifted position and the feed rack 40 lifted until the carriage is intercepted by means of the lifted blade 19<sup>a</sup>. Upon release of the depressed column tabulating key 109 following the arrest of the carriage in the tabulated-to position, the stop blade 19<sup>a</sup> and the plates 60 and 111 become restored. The spring 30 acting on the blade 19<sup>a</sup> cooperates to restore the plate 111 to its normal position. The restoration of the shaft 55 by means of the draw link spring 102 following release of the depressed column tabulating key 109 is effected in the same manner as described above with reference to operation of any of the denominational keys 28.

Variations may be resorted to within the scope of the invention and portions of the improvements may be used without others.

What is claimed is:

1. In a typewriting machine; a tabulating mechanism including, in combination, a tabulating carriage, a stop movable from a normal carriage-clearing position to a carriage-intercepting position, a mover actuatable in a path for moving said stop, said stop having a spur normally out of the mover path, a key operatively connected to said stop to move the latter to bring the spur into said mover path, power-operable mechanism responsive to said key to actuate said mover to engage said spur and thereby move said stop to carriage-intercepting position, and carriage-driving means rendered effective, concomitantly with operation of said key, to move said carriage to said stop.

2. In a typewriting machine; a tabulating mechanism including, in combination, a tabulating carriage, a series of denominational stops selectively movable from a carriage-clearing position to a carriage-intercepting position, a universal mover actuatable in a path for moving said stops, each stop having a spur normally out of the mover path, a series of denominational keys each operatively connected to a corresponding stop to move the latter to bring its spur into the mover path, power operable mechanism responsive to any key to actuate said mover to engage said spur and thereby move the stop to carriage-intercepting position, and carriage-driving means rendered effective, concomitantly with operation of any key, to move the carriage to said stop.

3. In a typewriting machine having a carriage; a tabulating mechanism therefor including, in combination, a series of denominational tabulating stops, keys corresponding to said stops, a power operable driver, motion-transmitting means connectible, in response to movement of any key to an operated position, to the corresponding stop and to said driver whereby the latter moves said stop from a carriage-clearing position to a carriage-intercepting position, means automatically disconnecting the motion-transmitting means from said driver, said motion-transmitting means and said stop tending to return to normal positions, and a latch device universally controlled by any key to maintain the motion-transmitting means, together with said stop, in operated positions so long as said key is held in its operated position and to release said motion-transmitting means and said stop for return to normal positions concomitantly with restoration of the key.

4. A tabulating stop mechanism for a typing machine carriage including, in combination, a carriage-intercepting stop having a spur engageable to move said stop from a normal carriage-clearing position to a carriage-intercepting position, a mover power-operable in a path to move said stop by means of said spur, said spur in the normal position of said stop being out of said mover path, and a key operable to displace said stop to bring its spur into the path of said mover.

5. A carriage-tabulating mechanism including, in combination, a series of denominational tabulating stops, a universal stop mover rockable about an axis so that an edge of said mover describes a path, each stop having a spur and being normally positioned with said spur out of said path, stop-selecting keys each movable to an operated position to move a corresponding stop to bring its spur into said path, and power operable means cooperating to actuate said stop mover to engage the spur of any key-moved stop and move the latter to carriage-intercepting position.

6. A tabulating mechanism for a typing machine carriage including, in combination, a series of denominational carriage-intercepting stop blades, a universal stop mover rockable about an axis so that an edge of said mover describes a path, each stop blade having a spur and being normally positioned with said spur out of said path, stop-selecting key levers, each rockable to an operated position to move, and thereby select, the corresponding stop to bring its spur into said path, a power operable snatch roll, a universal member displaceable by any key lever when the latter is moved to operated position, and means

operated by the displacement of said universal member to connect said stop mover to said snatch roll for a resulting stroke of said mover to move the selected stop blade by means of its spur to carriage-intercepting position.

7. A tabulating mechanism for a typing machine carriage including, in combination, a series of denominational carriage-intercepting stop blades, a universal stop mover rockable about an axis paralleling the series of blades so that an edge of said mover describes a path, each stop blade having a spur and being normally positioned with said spur out of said path, stop-selecting key levers, each rockable to an operated position to move, and thereby select, the corresponding stop to bring its spur into said path, a power operable snatch roll, a universal member displaceable by any key lever when the latter is moved to operated position, means operated by the displacement of said universal member to connect said stop mover to said snatch roll for a resulting stroke of said mover to move the selected stop blade by means of its spur to carriage-intercepting position, means automatically disconnecting said mover from said snatch roll at the end of said stroke whereupon said mover and stop tend to return to normal positions, and means controlled by the displaced universal member to sustain said mover to prevent its return so long as the key lever is held in operated position.

8. In a typewriting machine having a tabulating carriage, the combination of a key, a carriage-intercepting stop having a spur, a mover power-actuatable for moving said stop to carriage-intercepting position, said spur, in the normal position of said stop, being out of the path of said mover, and said stop being initially movable by said key to present said spur in the path of said mover, and means controlled by said key for sustaining said stop in carriage-intercepting position as long as said key is in operated position.

9. In a typewriting machine having a tabulating carriage, the combination of a carriage-intercepting stop in the form of an elongate blade having a spur, and a mover power-actuatable to engage said spur to move said stop to carriage-intercepting position, said blade having a normal position in which its spur is out of the path of said mover and key-operated means to displace said blade from said normal position to bring its spur into the path of said mover.

10. In a typewriting machine having a tabulating carriage, the combination of a key, a carriage-intercepting stop in the form of an elongate blade, said blade having projecting from one longitudinal edge thereof an arm presenting a hook-shaped spur offset from bu. pointed toward said edge, and a mover rockably disposed adjacent the corner formed by said edge and arm for engaging said spur and moving said stop from normal position to carriage-intercepting position, said spur, in the normal position of said stop, being out of the path of said mover, and said stop being initially movable by said key to present said spur in the path of said mover.

11. In a typewriter-carriage-tabulating mechanism, the combination of a series of denominational stop blades, a frame mounting said blades for individual movements to carriage-intercepting position, a rock shaft journaled in said frame and having a bar presenting a blade moving edge common to said blades, each blade having a spur engageable by said bar edge, the blades being

normally disposed with their spurs out of the path of said edge, key operable levers operatively connected to the corresponding stop blades to move the latter selectively to bring their spurs into the path of said edge, a universal member movable by any one of said key levers, power operable means rendered effective, through the movement of said universal member, to rock said shaft and its bar in a stroke to move a selected blade to carriage-intercepting position, said shaft automatically becoming disconnected from said power means at the end of said stroke, and a latch device interlocking the shaft with the moved universal member at the end of said stroke to sustain said shaft to keep a blade in carriage-intercepting position as long as a key lever is held in operated position.

12. In a typewriting machine having a carriage; a tabulating mechanism therefor including, in combination, a carriage-intercepting stop carrying an element engageable for moving said stop from a normal carriage-clearing position to a carriage-intercepting position, a mover power operable in a path to move said stop by means of said engageable element, said engageable element in the normal position of said stop being out of said mover path, a key operable to primarily displace said stop and thereby cause its said element to become placed into the path of said mover, and means power-operable in response to said key to actuate said mover to move said stop to carriage-intercepting position by means of said element thus placed into the mover path.

13. A denominational-and-column tabulating mechanism for a typing machine carriage including, in combination, a series of denominational stops, a series of denominational keys each operatively connected to its corresponding stop for operating the latter, an extra key constituting a column-tabulating key, and means operatively connecting said column-tabulating key to one of said stops for operating the latter, said means including a universal member operatively connected to said column-tabulating key and having an edge universal to all of said stops, only said one stop having a formation engageable by said edge for operatively connecting said member and said one stop, said one stop being interchangeable with any other stop as to its position in said series whereby said stop is disposable at any desired denominational position in said series and is operable either by means of said extra key and member or by means of the

key corresponding to the denominational position at which said one stop is disposed.

14. In a tabulating mechanism including a tabulatable carriage, the combination of a stop having an element engageable for moving said stop to carriage-intercepting position, said stop being normally in a carriage-clearing position, a mover operable in a path to move said stop by means of said engageable element, said engageable element in the normal position of said stop being out of said mover path, a key operable to displace primarily said stop from said normal position and thereby place said element in the path of said mover, and power means cooperable with said mover to operate said mover to move said stop to carriage-intercepting position by means of said element thus placed into the mover path.

15. In a tabulating mechanism including a tabulatable carriage, the combination of a stop having an element engageable for moving said stop to carriage-intercepting position, said stop being normally in a carriage-clearing position, a mover operable in a path to move said stop by means of said engageable element, said engageable element in the normal position of said stop being out of said mover path, a key operable to displace primarily said stop from said normal position and thereby place said element in the path of said mover, power means cooperable with said mover to operate said mover to move said stop to carriage-intercepting position by means of said element thus placed into the mover path, means for disengaging said mover from said power means when said stop has been moved thereby to carriage-intercepting position, said stop tending to return to normal position upon disengagement of said mover from said power means, and means controlled by said key to keep said stop in carriage-intercepting position, independently of said power means, as long as said key is kept in operated position.

16. In a carriage tabulating mechanism, the combination with the carriage, of a stop movable from a normal retracted position to a carriage-intercepting position, an operatable stop mover, said stop having an element which in the retracted position of the stop is in disengaged relation to said stop mover, and a key operatively connected to said stop and movable to an operated position to primarily move said stop to a position to determine engagement of said element by said mover to enable the mover to move said stop to carriage-intercepting position.

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