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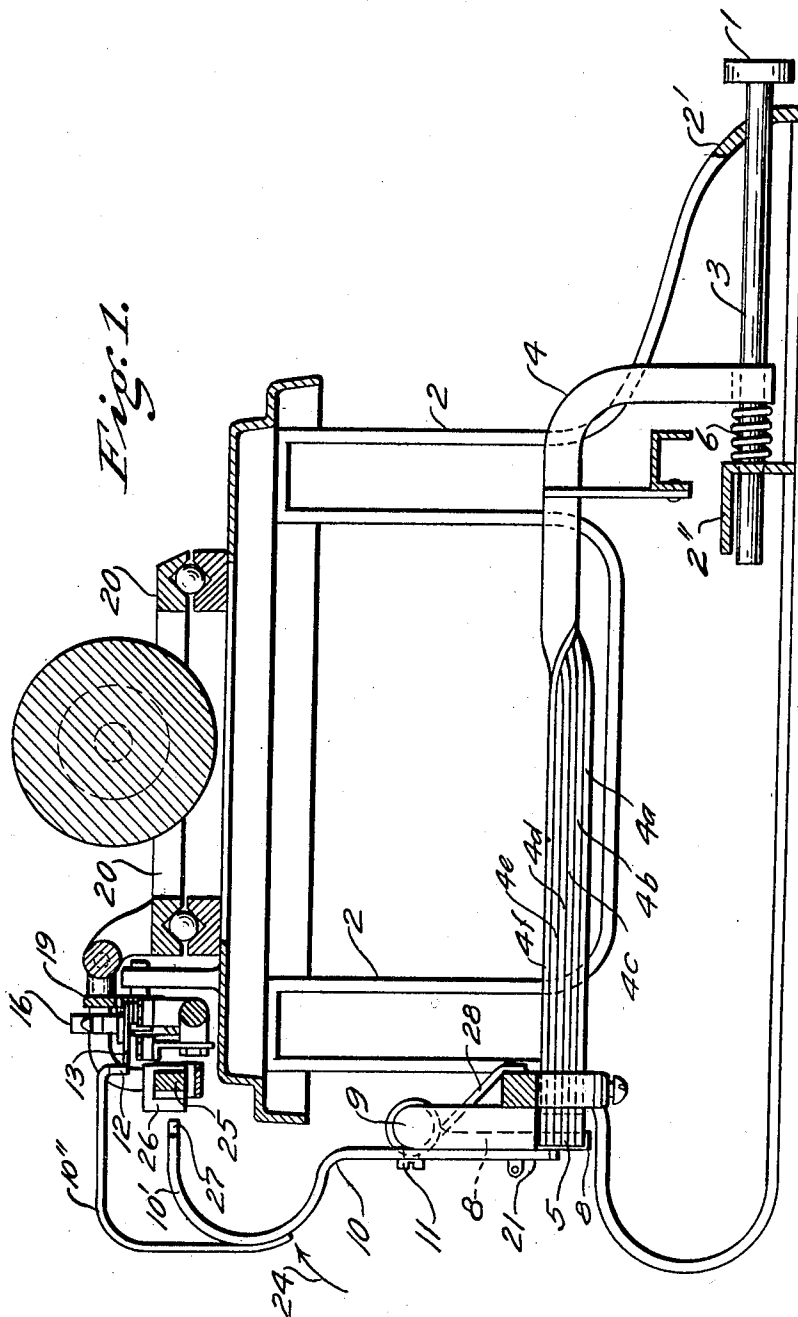
PATENTED JUNE 30, 1908.

H. K. HENRY.

TABULATING ATTACHMENT FOR TYPE WRITING MACHINES.

APPLICATION FILED AUG. 7, 1903.

4 SHEETS—SHEET 1.



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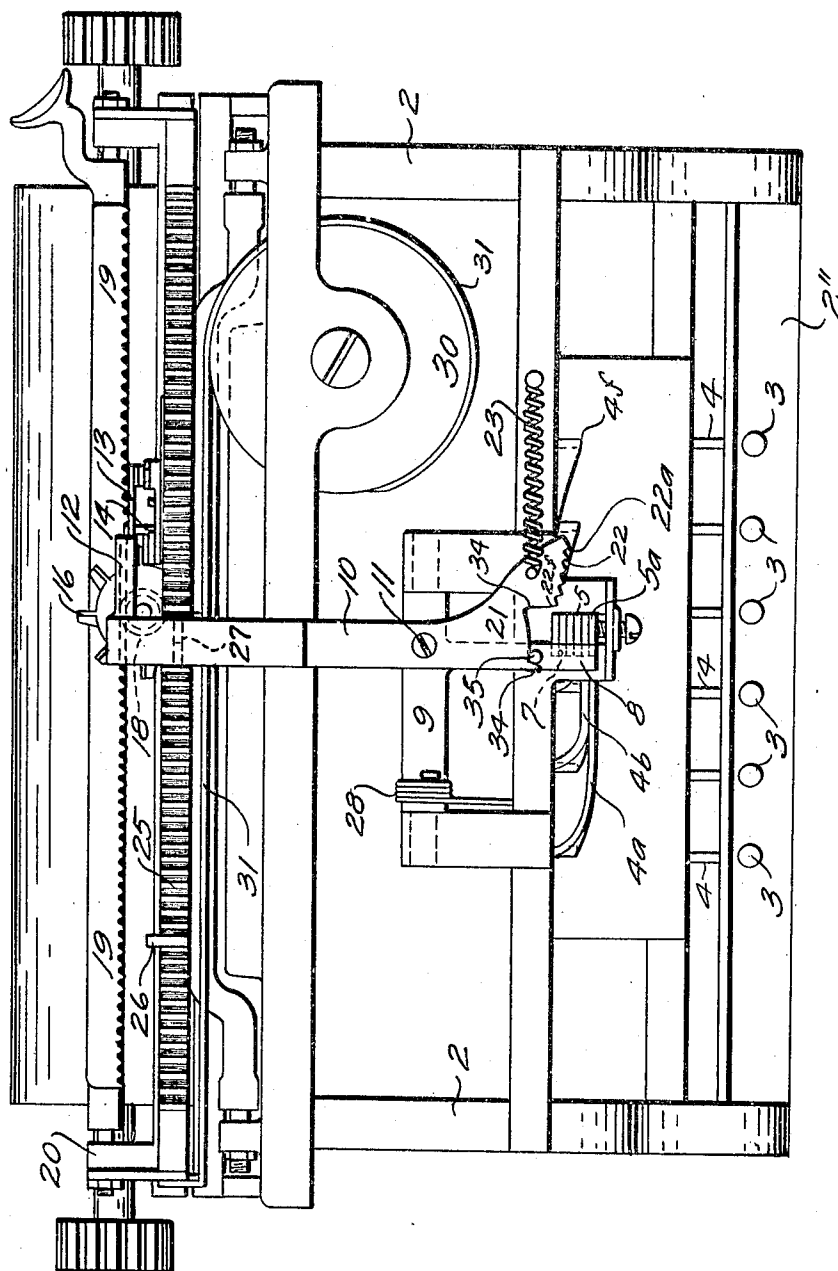
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4 SHEETS—SHEET 2.

Fig. 2.



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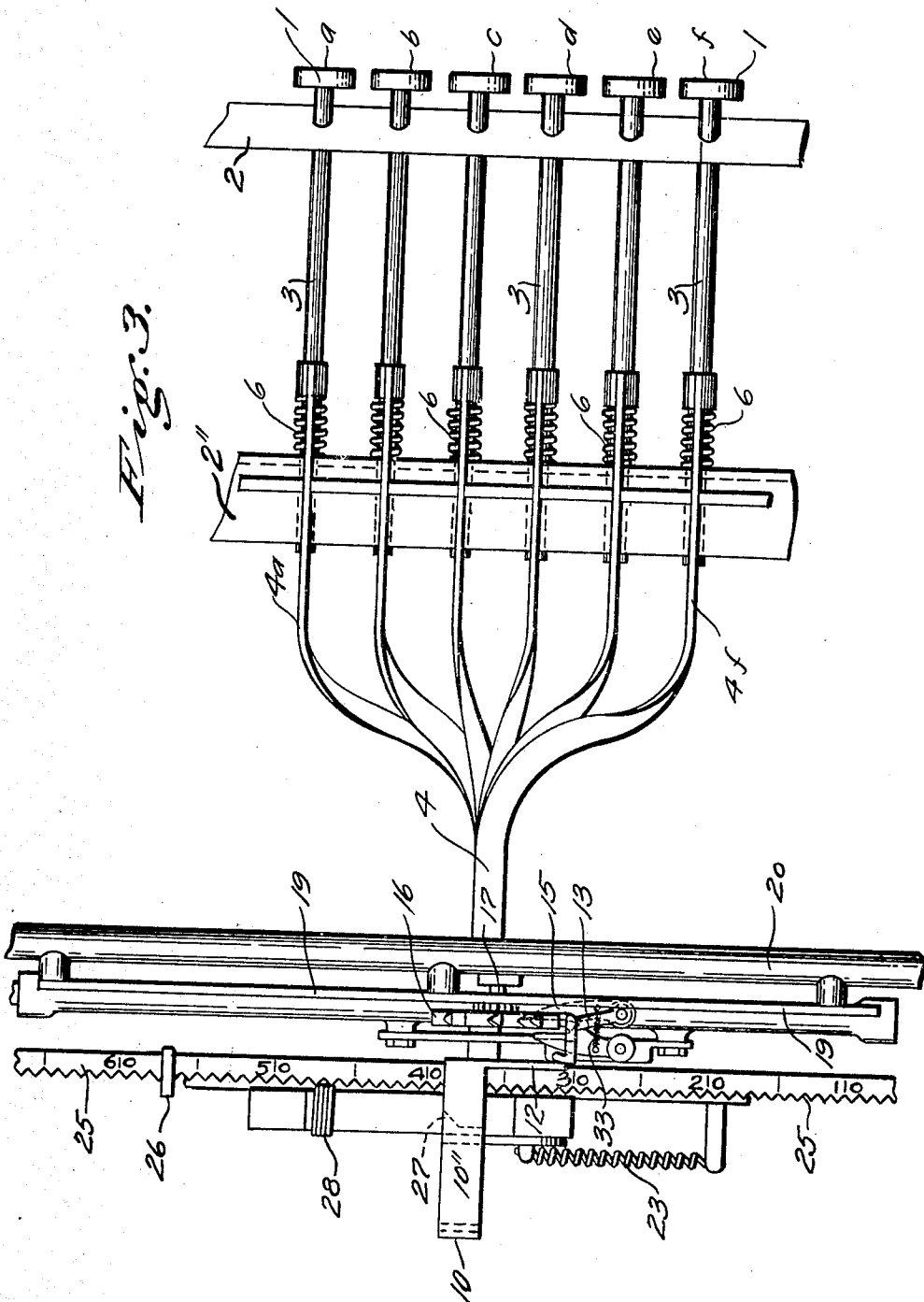
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4 SHEETS--SHEET 3.



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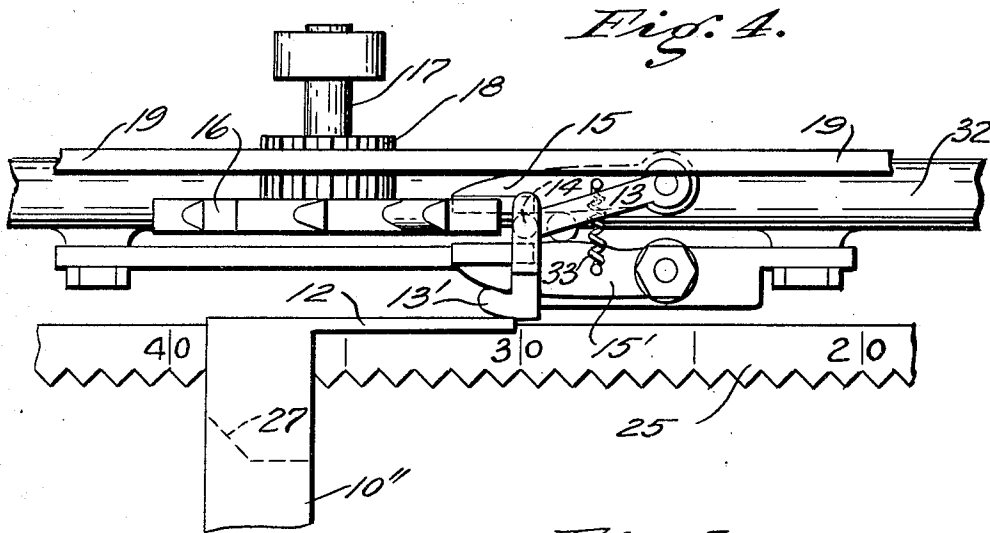
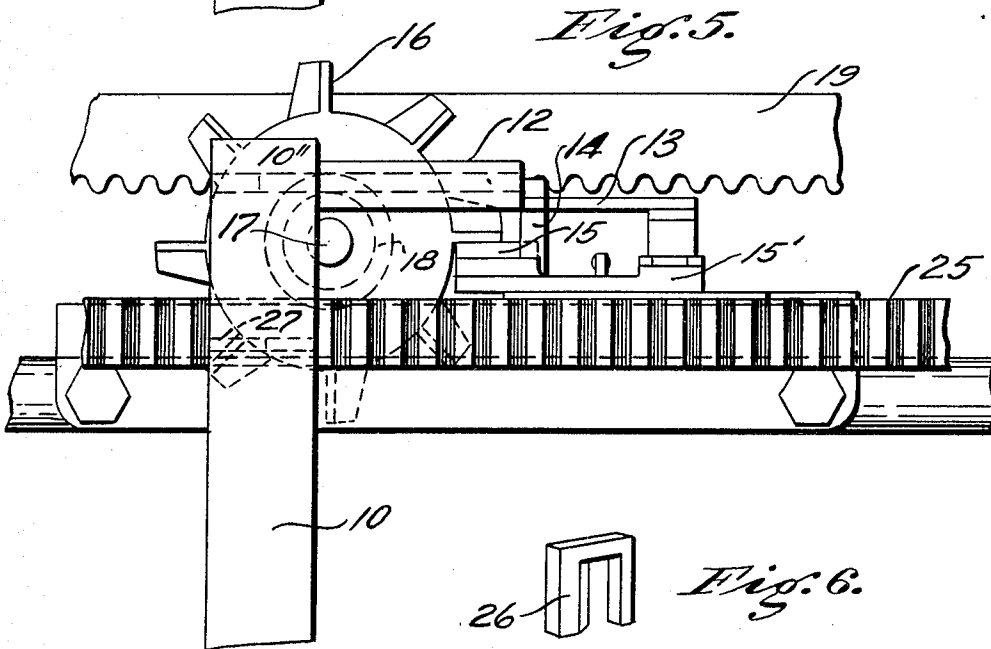
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4 SHEETS—SHEET 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

HUBERT K. HENRY, OF CHICAGO, ILLINOIS, ASSIGNOR TO UNDERWOOD TYPEWRITER COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

TABULATING ATTACHMENT FOR TYPE-WRITING MACHINES.

No. 892,050.

Specification of Letters Patent.

Patented June 30, 1908.

Application filed August 7, 1903. Serial No. 168,621.

To all whom it may concern:

Be it known that I, HUBERT K. HENRY, a citizen of the United States of America, and a resident of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Tabulating Attachments for Type-Writing Machines, of which the following is a specification.

The main objects of my invention are to provide simplified and improved tabulating mechanism for typewriting machines; to provide such construction for said tabulating mechanism that same may be readily applied to machines already in use, with little modification to the parts of such machines; to provide means whereby the carriage of a typewriter may be shifted for printing columns of matter in any one of a plurality of positions by a single movement of a key by the operator; and to provide simplified means for stopping the carriage at positions corresponding to units, tens, hundreds, etc., for any setting of the column positions. I accomplish these objects by the device shown in the accompanying drawings, in which:

Figure 1 is a transverse vertical section of a typewriting machine fitted with a tabulating device constructed according to my invention, some of the parts of the machine being omitted for the sake of clearness; Fig. 2 is a rear elevation of the same. Fig. 3 is a top plan of the tabulating device and such parts of the machine as coact or are connected directly therewith, the other parts of the machine being removed. Fig. 4 is an enlarged top plan of the spacing mechanism and the adjacent parts of the tabulating device. Fig. 5 is a rear elevation of the parts shown in Fig. 4. Fig. 6 is a perspective view of the clip which serves as a stop for the carriage in connection with the tabulating device.

In the construction shown the frame 2 of the typewriter has slidably mounted thereon the usual carriage 20 which carries the platen roll. Extending along the rear side of the carriage 20 and secured thereto in the usual manner is a feed-rack 19, having a series of rack-teeth along its lower edge. A pinion 18 meshes with the teeth on the rack 19 and is rigidly secured to the shaft 17 which is journaled in the frame of the machine. The shaft 17 has also rigidly secured thereon and disposed at the rear of the rack

19 a ratchet-wheel 16. The teeth on the ratchet-wheel 16 are so placed that a rotation of said ratchet-wheel through one tooth space corresponds to the advance of the carriage through one type space. The carriage 20 is urged along the frame by the usual spiral spring 30 and tape 31, shown in Fig. 2. A dog 15 is pivotally mounted on the bar 32 of the frame 2 and is normally urged into engagement with the ratchet wheel 16 by means of a spring 33. The advance of the carriage 20 is effected by moving the dog 15 out of engagement with the ratchet-wheel 16. A lever 13 is pivotally mounted on the bar 32 on the same axis with the dog 15 and has a rearwardly extending arm 13'. A lug 14 on the lower side of the lever 13 engages the dog 15 and moves same out of engagement with the ratchet-wheel 16 when the lever 13' is moved forward.

The keys 1 which control the operation of the tabulating device described, are located in front of the lower part of the frame 2, in convenient position to be pressed by the thumbs of the operator. The keys 1 are carried by the rods 3 which are slidably mounted in the bars 2' and 2'' of the frame; and each has rigidly secured thereto a flat bar 4, which bars extend upwardly and rearwardly as shown in Fig. 1. The rods 3, together with their connections are normally urged forward by means of spiral springs 6. The rear ends 5 of the bars 4 are brought into vertical alinement and each is constructed to engage a downwardly projecting arm 8; the latter being in the path of the side portions 7 of the ends of the bars. The arm 8 is pivotally mounted in the frame that is, it swings on a horizontally disposed arbor 9. A vertically disposed lever 10 extends along the arm 8 and is pivotally mounted at 11 on the arbor 9. It will be seen that the lever 10 and the arm 8 together have a limited rotary movement around the arbor 9, while the lever 10 is also laterally rotatable around the fulcrum 11. The upper arm of the lever 10 is forked to form two horizontally disposed parts 10' and 10''. The lower arm 21 of the lever 10 is provided with a plurality of shoulders 22, (22^a, 22', etc.) each respectively arranged to engage one of the ends 5 of the bars 4, when such bar is pushed rearwardly as will be hereinafter described. A stop 35 projecting from the arm 8 is adapted to engage the

shoulders 34 on the lever 10 and thereby limit the movement of said arm about its fulcrum 11. The end portions 7 are so located as to permit each bar 4 to be moved rearwardly sufficiently to bring its end 5 into the path of the lever 10, before the shoulder 7 bears upon and moves the arm 8. The lever 10 is normally urged into the position shown in Fig. 2 by the spring 23. The part 10'' of the lever 10 is provided with a laterally extending part 12 which is of sufficient length to be opposed to the part 13' of the lever 13 throughout the entire range of movement of the lever 10 about the fulcrum 11.

Rigidly secured along the rear side of the carriage, 20 and movable with said carriage, is a horizontally disposed bar 25. The bar 25 is graduated to correspond with the scale of the machine and has a series of notches extending along its entire length and adapted for securing a removable stop 26 to the bar 25 as indicated in the drawing. The arm 8 and the lever 10 are urged into their normal position, shown in Fig. 1, by means of a spring 28 which is coiled around the arbor 9 and bears on an adjacent part of the frame 2. The end 27 of the part 10' of the lever 10 is located immediately in the rear of the bar 25 and sufficiently far from the bar 25 to permit free passage of the stop 26 when the lever 10 is in its normal position, as shown in Fig. 1.

The operation of the device shown is as follows: Suppose that the operator desires to write a column of numbers and assume, for example, that it is desired to print the decimal point at the part of the sheet corresponding to number 57 of the scale. Then the stop 26 would be placed upon the bar 25 at the notch 57 as shown in Fig. 3. If now the first of the keys 1 (that is, the one indicated by the letter *a* in Fig. 3) is pressed inwardly by the operator, the bar 4^a which corresponds to the key *a*, will be pushed rearwardly against the action of the spring 6, the end 5 of the bar 4^a will move across the path of the lever 10, and the shoulder 7, bearing upon the arm 8, will cause the lever 10 to rotate about the fulcrum 9 in the direction of the arrow 24 (Fig. 1). This movement of the lever 10 will move the end 27 of the part 10' into position for engaging the stop 26 and will simultaneously cause the extension 12 of the part 10'' to push the lever 13 forward and release the dog 15 from engagement with the ratchet-wheel 16, thus freeing the carriage 20. The spring 30 will now advance the carriage until the stop 26 strikes the end 27 of the lever 10. The carriage now tends to cause the lever 10 to rotate on its pivot 11, against the pull of the spring 23, until such rotation is checked through the engagement of the bar 4^a with the shoulder 22^a which corresponds to such bar. When the pressure 65 is now released from the key *a*, the spring 6

will return said key, together with the bar 4, to their normal position and the springs 23 and 28 will simultaneously return the lever 10 to its normal position. Since the pressure of the extension 12 upon the lever 13 is thus also released, the spring 33 will now return the dog 15 into engagement with the ratchet-wheel 16, and hold the carriage in readiness for receiving an impression. The stop 26 projects rearwardly from the bar 25 sufficiently to remain in contact with the end 27 of the lever 10 and hold the carriage until after the dog 15 has been returned to a position of engagement with the ratchet-wheel 16.

It will be noticed that the lever 10 forms a yielding detent, adapted to limit the movement of the carriage and at the same time, through the action of the spring 23 absorb the momentum of the carriage and avoid a shock due to the sudden stopping of same. Further the ends 5 of the bars 4 form stops for limiting the movement of the lever 10 on its pivot 11, after same is struck by the carriage.

It will be understood that the fulcrum 11 and the lever 10 are so located with respect to the printing point of the machine that when the key *a* of the tabulating mechanism is pressed, the carriage 20 will be stopped in such position that the paper on the platen roll will receive an impression at a point corresponding to the location of the stop 26 on the bar 25. The remaining shoulders 22^b, 22^c, etc., on the lever 10 are so arranged that each will permit a correspondingly less movement of the lever 10 and will respectively cause the stopping of the carriage at 1, 2, etc., type spaces in front of the space corresponding to the position of the stop 26.

It will now be understood that, if the stop 26 is placed at the point corresponding to the type space in which it is desired to print the decimal point of the column of figures, then by pressing the key *a*, the carriage will be stopped in suitable position for printing such decimal point. Similarly by pressing the key *b* the carriage will be stopped in suitable position for printing figures in the units column; and in like manner the keys *c*, *d*, *e*, and *f* correspond respectively to the figures in the columns of 10's, 100's, 1000's and 10,000's. Since upon the release of the tabulating key the lever 10 is released from engagement with the stop 26 and the carriage is free to continue along the frame, any number of such stops may be placed along the bar 25 for the purpose of successively stopping the carriage in positions for printing a series of rows of columns.

It will be seen that numerous details of the construction shown may be altered without departing from the spirit of my invention. I therefore do not confine myself to such details except as hereinafter limited in the claims.

What I claim as my invention and desire to secure by Letters Patent, is:—

1. In a device of the class described, the combination of a frame; a carriage slidably mounted on said frame; means normally urging said carriage along said frame; a stop on said carriage; a lever pivotally mounted on said frame, being movable transversely into and out of the path of said stop and rotatable in a plane parallel to said path; a key for moving the lever into the path of said stop and limiting the rotation of said lever on its pivot; and mechanism for releasing the carriage when said lever is in suitable position for engaging said stop, substantially as described.

2. In a device of the class described, the combination of a frame; a carriage slidably mounted on said frame; means normally urging said carriage along said frame; a stop on said carriage; a lever mounted on said frame, being movable transversely into and out of the path of said stop and rotatable in a plane parallel to said path; a plurality of keys each adapted to move said lever into the path of said stop and each adapted to limit the rotation of said lever to a different degree after same has been engaged by said stop; and mechanism for releasing said carriage, when said lever is in suitable position for engaging said stop, substantially as described.

3. In a device of the class described, the combination of a frame; a carriage slidably mounted on said frame; means normally urging said carriage along said frame; a feed-dog for controlling the movement of said carriage along said frame; a stop on said carriage; an arm pivotally mounted on said frame; a lever pivotally mounted on said arm and rotatable in a plane parallel with the path of said stop, said lever being movable into and out of the path of said stop through the turning of said arm on its pivotal axis, and being movable along the path of said stop through rotation on its own pivotal axis; a key movably mounted in said frame; and suitable mechanism connected with said key for moving said lever into the path of said stop, limiting the movement of said lever along the path of said stop, and releasing said feed-dog from engagement with the carriage, substantially as described.

4. In a device of the class described, the combination of a frame; a carriage slidably mounted on said frame; means normally urging said carriage along said frame; a feed-dog for controlling the movement of said carriage along said frame; a lever pivotally mounted on said arm and rotatable in a plane parallel with the path of said stop, said lever being movable into and out of the path of said stop through the turning of said arm on its pivotal axis, and being movable along the path of said stop through rotation on its own pivotal axis; a spring adapted to yieldingly re-

sist the movement of said lever along the path of said stop; a key movably mounted in said frame; and suitable mechanism connected with said key for moving said lever into the path of said stop, limiting the movement of said lever along the path of said stop, and releasing said feed-dog from engagement with the carriage, substantially as described.

5. In a device of the class described, the combination of a frame; a carriage slidably mounted on said frame; a feed rack secured to said carriage and extending longitudinally of same, a shaft revolubly mounted on said frame and having thereon a pinion meshing with said feed-rack; a ratchet-wheel secured to said shaft and revoluble with said pinion; a movable dog mounted on said frame and adapted to be moved into and out of engagement with said ratchet-wheel for controlling the movement of said carriage along said frame; a stop on said carriage; a detent movable into and out of the path of said stop and adapted to yield along said path when engaged by said stop; and means for moving said dog out of engagement with said ratchet-wheel, and simultaneously moving said detent into the path of said stop and limiting the movement of said detent along the path of said stop, substantially as described.

6. In a device of the class described, the combination of a frame; a carriage slidably mounted on said frame; a feed rack secured to said carriage and extending longitudinally of same; a shaft revolubly mounted on said frame and having thereon a pinion meshing with said feed-rack; a ratchet-wheel secured to said shaft and revoluble with said pinion; a movable dog mounted on said frame and adapted to be moved into and out of engagement with said ratchet-wheel for controlling the movement of said carriage along said frame; a stop on said carriage; an arm pivotally mounted on said frame; a lever pivotally mounted on said arm and rotatable in a plane parallel to the path of said stop, said lever being movable into and out of the path of said stop through the turning of said arm on its pivotal axis, and being movable along the path of said stop through rotation on its own pivotal axis; an arm secured to said lever and adapted to engage said dog and move same out of engagement with said ratchet-wheel when said lever is moved into the path of said stop; means for moving said lever into the path of said stop and means for limiting the movement of said lever along the path of said stop, substantially as described.

7. In a device of the class described, the combination of a frame; a carriage slidably mounted on said frame; means for normally urging said carriage along said frame; a feed-dog for controlling the movement of said carriage along said frame; a stop on said car-

riage; an arm pivotally mounted on said frame; a lever pivotally mounted on said arm on a transverse axis and rotatable in a plane parallel with the path of said stop; a
 5 key movably mounted in said frame; a bar connected with said key and adapted to move across the plane of the pivotal movement of said lever and simultaneously move
 10 said lever into the path of said stop; means connected with said lever for releasing said feed-dog when said lever is moved into the path of said stop; and a shoulder on said lever adapted to engage said arm and limit the movement of said lever on its pivotal
 15 axis, substantially as described.

8. In a device of the class described, the combination of a frame; a carriage slidably mounted on said frame; means for normally urging said carriage along said frame; a feed-dog for controlling the movement of said carriage along said frame; a stop on said carriage; an arm pivotally mounted on said frame; a lever pivotally mounted on said arm on a transverse axis and rotatable in a plane
 25 parallel with the path of said stop; a plurality of keys movably mounted in said frame; a bar connected with each of said keys and adapted to move across the plane of the pivotal movement of said lever and simultaneously move said lever into the path of
 30 said stop; means connecting with said lever for releasing said feed-dog when said lever is moved into the path of said stop; and a series of shoulders on said lever each adapted to engage one of said arms and limit the movement of said lever on its pivotal axis, said shoulders being arranged so that each of
 35 same will permit of a different degree of movement of said lever, substantially as described.

9. A tabulating mechanism for a typewriting machine, comprising a series of denomination keys at the front of the keyboard, rods extending back from said keys
 45 and mounted on the framework, offsets extending up from said rods and above the base portion of the machine, bars extending rearwardly from said offsets and converging at the rear end of the machine where they lie
 50 one upon another, and a lever controlled by said bars for releasing and variably arresting the carriage; said lever movable into position to arrest the carriage, and being variably arrested by said bars.

10. A tabulating mechanism for a typewriting machine, comprising a series of denomination keys at the front of the keyboard, rods extending back from said keys and mounted on the framework, offsets extending
 60 up from said rods and above the base portion of the machine, bars extending rearwardly from said offsets and converging at the rear end of the machine where they lie one upon another, and means controlled by said bars
 65 for releasing and variably arresting the car-

riage; said means including a stop lever movable by any of said keys into the path of a column stop upon the carriage, means for releasing the carriage, and means for enabling the operated bar to limit the throw of the
 70 lever effected by said column stop.

11. In a tabulating mechanism for a typewriting machine, a lever having at one end both a carriage releasing device and a detent which is movable into engagement with a
 75 column stop on the carriage, and having at the other end a set of denomination facets, a carriage-releasing device operable by said lever, a set of denomination stops, and key operated means for moving the detent into
 80 engagement with the column stop and effecting a carriage releasing movement of said lever and for causing said denomination stops to cooperate with the facets on the lever to arrest the carriage.

12. In a tabulating mechanism for a typewriting machine, a carriage-releasing device, a carriage-releasing lever having a detent to engage a column stop mounted upon the carriage, said lever movable by said column
 90 stop, and means for variably arresting the lever; the lever having means for holding the carriage released, while the lever is being moved by said column stop.

13. In a typewriting machine, a tabulating
 95 mechanism including push rods having keys at their forward ends below the keyboard, and extending upwardly in rear of the keyboard and then backwardly, and carriage releasing mechanism and also mechanism for
 100 variably arresting the carriage both controlled by said levers, and including a lever movable into position to arrest the carriage, and being variably arrested by said bars.

14. In a tabulating mechanism for a typewriting machine, the combination with an arm, a series of key controlled bars for pushing the arm, of a lever swiveled upon said arm in a direction to travel with the carriage, carriage releasing means operated by
 110 said lever, a stop upon said lever to be engaged by a column stop mounted upon the carriage, and means for variably arresting said lever when driven by the carriage.

15. In a tabulating mechanism for a typewriting machine, the combination of a carriage-releasing device, a lever pivoted to swing in two directions at right angles to each other, and having a detent to be engaged by a column stop upon the carriage,
 120 and also having an elongated part to release the carriage, and a series of stops for variably arresting said lever; said lever movable in one direction by the keys to release the carriage, and in the other direction by the
 125 carriage.

16. In a tabulating mechanism for typewriting machines, the combination of a carriage-releasing device, a lever swinging in one direction to release the carriage, and in an-
 130

other direction to travel with the carriage, said lever being arrested at different points according to the key operated, and being returned by two springs to normal position; said lever movable in one direction by the keys to release the carriage, and in the other direction by the carriage.

17. The combination of a series of denomination keys, a series of thrust rods carrying said keys and ranging side by side and converging at their rear ends, carriage releasing devices engageable by the rear ends of the rods, and a carriage detent moved into effective position by the rearward movement of any of said rods, and connected to means to engage the operated rod to arrest the carriage at the corresponding denominational position.

18. The combination with a carriage having a column stop thereon, of horizontal stems provided with keys, rods fixed to said stems and extending upwardly and rearwardly and converging at their rear ends, and a carriage detent movable into engagement with the column stop by said rods, the detent being movable by the column stop, and the rods having means to arrest the detent and carriage variably.

19. The combination with a carriage having a column stop thereon and a lever having a series of stops at one end and a carriage detent at the other end, of a spring on said lever, means against which the lever rests, keys to swing said lever in one direction substantially as set forth to cause the detent to engage the column stop to arrest the carriage, the lever being movable by the column stop, and means operable by the keys to arrest the lever variably.

20. In a typewriting and tabulating mechanism, a denomination stop mechanism including a series of rearwardly-extending push-rods mounted at the lower portion of the keyboard, and bars rising from said rods

and bent back and converging between their forward and rear ends into a single tier or row, and formed at their rear ends with denomination-determining stops.

21. In a typewriting and tabulating mechanism, a denomination stop mechanism including a series of rearwardly extending push-rods mounted at the lower portion of the keyboard, and flat bars rising from said rods and bent back and converging between their forward and rear ends, and formed at their rear ends with denomination stops; each of said bars given a quarter turn at the converging portion to cause it to lie flatwise against other bars to form a single tier at their rear ends.

22. In a typewriting and tabulating mechanism, the combination of a carriage, a series of forwardly and rearwardly moving key-operated rods, a frame which may be rocked forwardly and rearwardly by any of said rods, a lever pivoted upon said rocking frame to vibrate transversely or in the direction of the run of the carriage, a carriage-releasing device operated by said lever, a detent upon said lever to be engaged by a stop upon the carriage, and means for enabling said push rods to arrest said lever variably.

23. In a typewriting and tabulating mechanism, the combination with a rocking frame, of a lever pivoted upon said frame to rock in the direction of the travel of the carriage, a detent upon said lever, a series of independently movable key-operated devices to operate said frame, and means upon said lever engageable by said devices to variably arrest the carriage.

Signed at Chicago, this 30th day of July, 1903.

HUBERT K. HENRY.

Witnesses:

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