

H. S. DUKES & W. H. CLAYTON.
 TABULATING APPLIANCE FOR TYPE WRITING MACHINES.
 APPLICATION FILED FEB. 7, 1903.

908,220.

Patented Dec. 29, 1908.

2 SHEETS—SHEET 1.

Fig. 1.

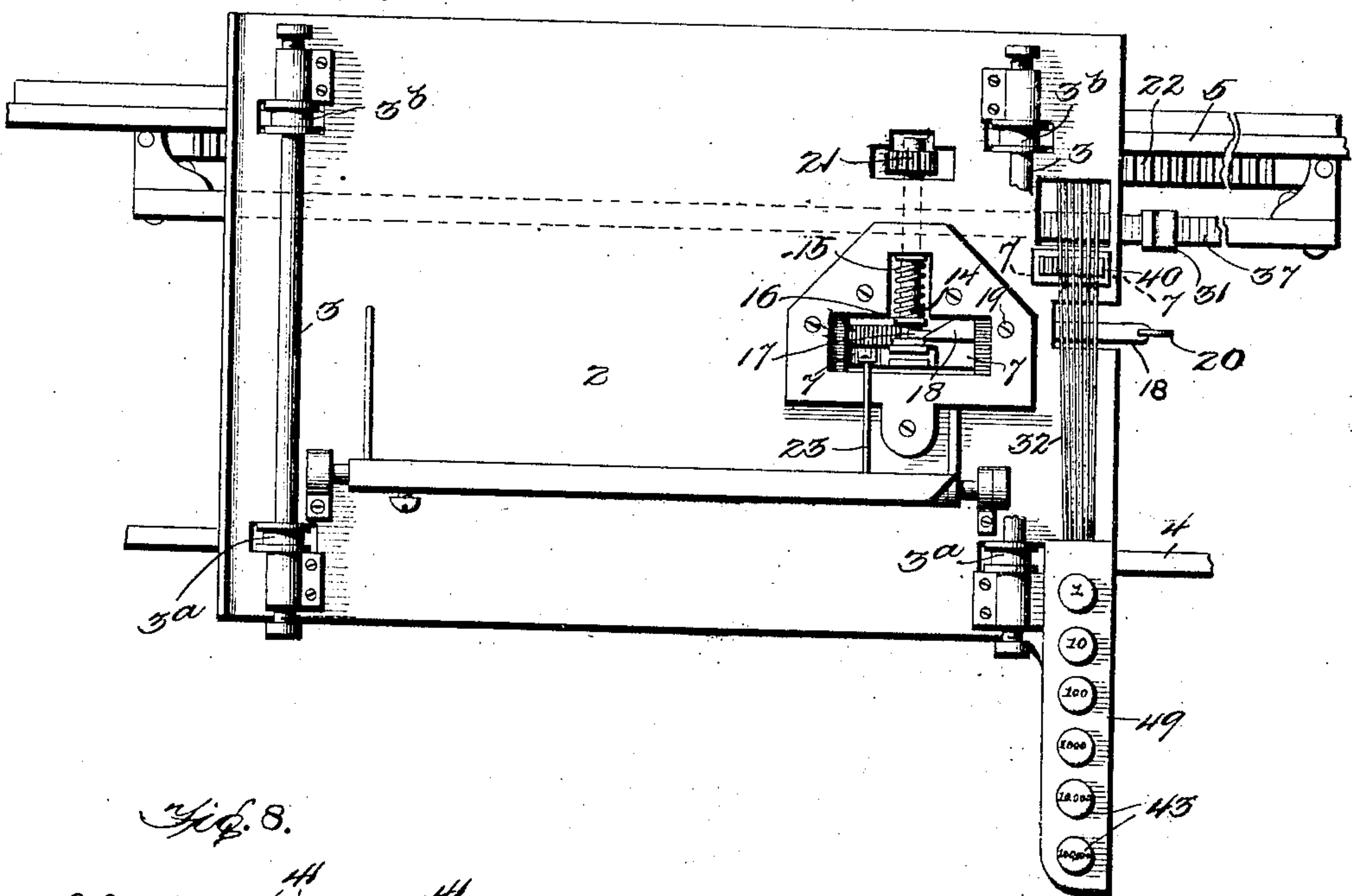


Fig. 8.

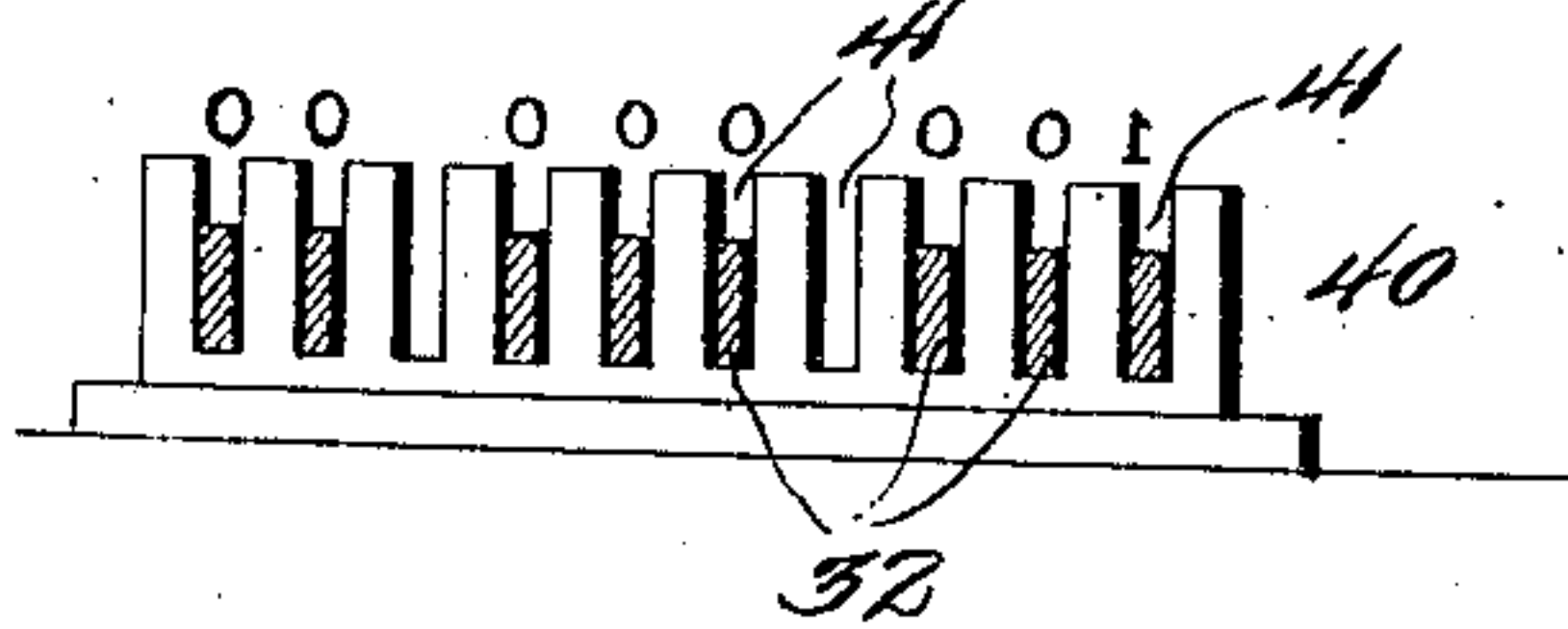


Fig. 7.

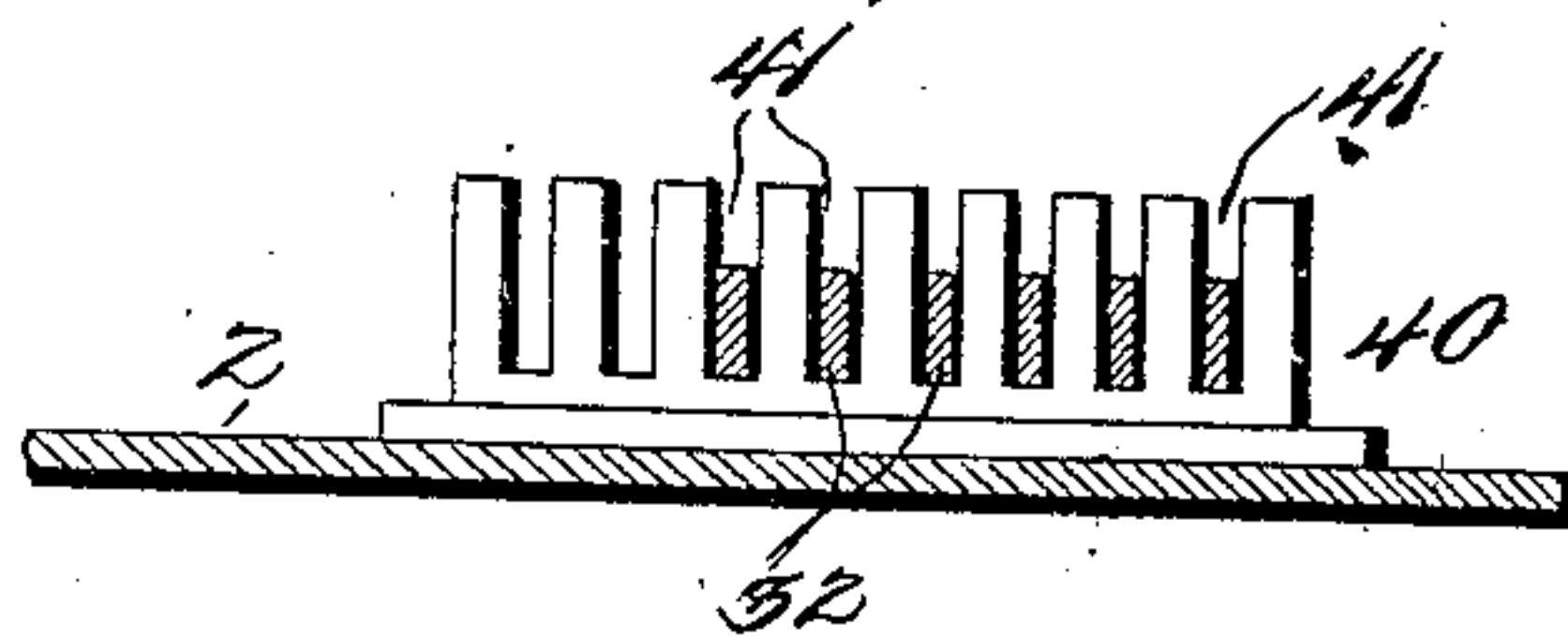


Fig. 6.

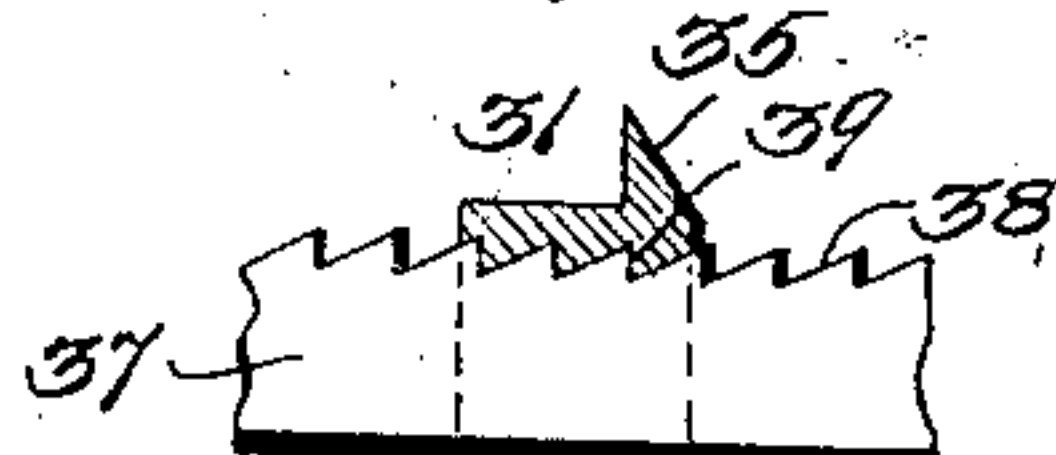
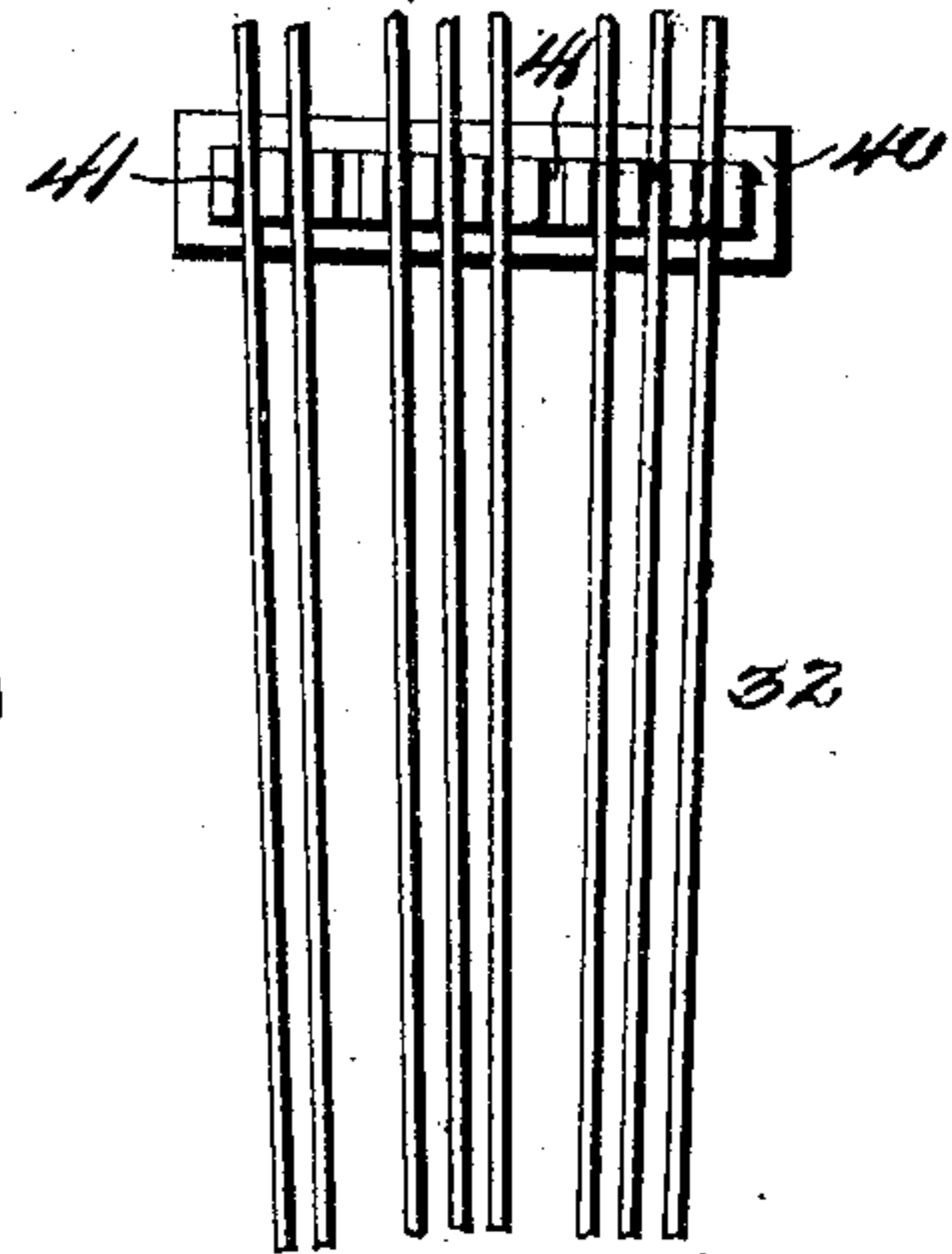


Fig. 9.



Witnesses:

G. L. Meekman

G. L. Roy.

Inventors
 Harry S. Dukes and
 William H. Clayton,

by

S. J. Holmsted

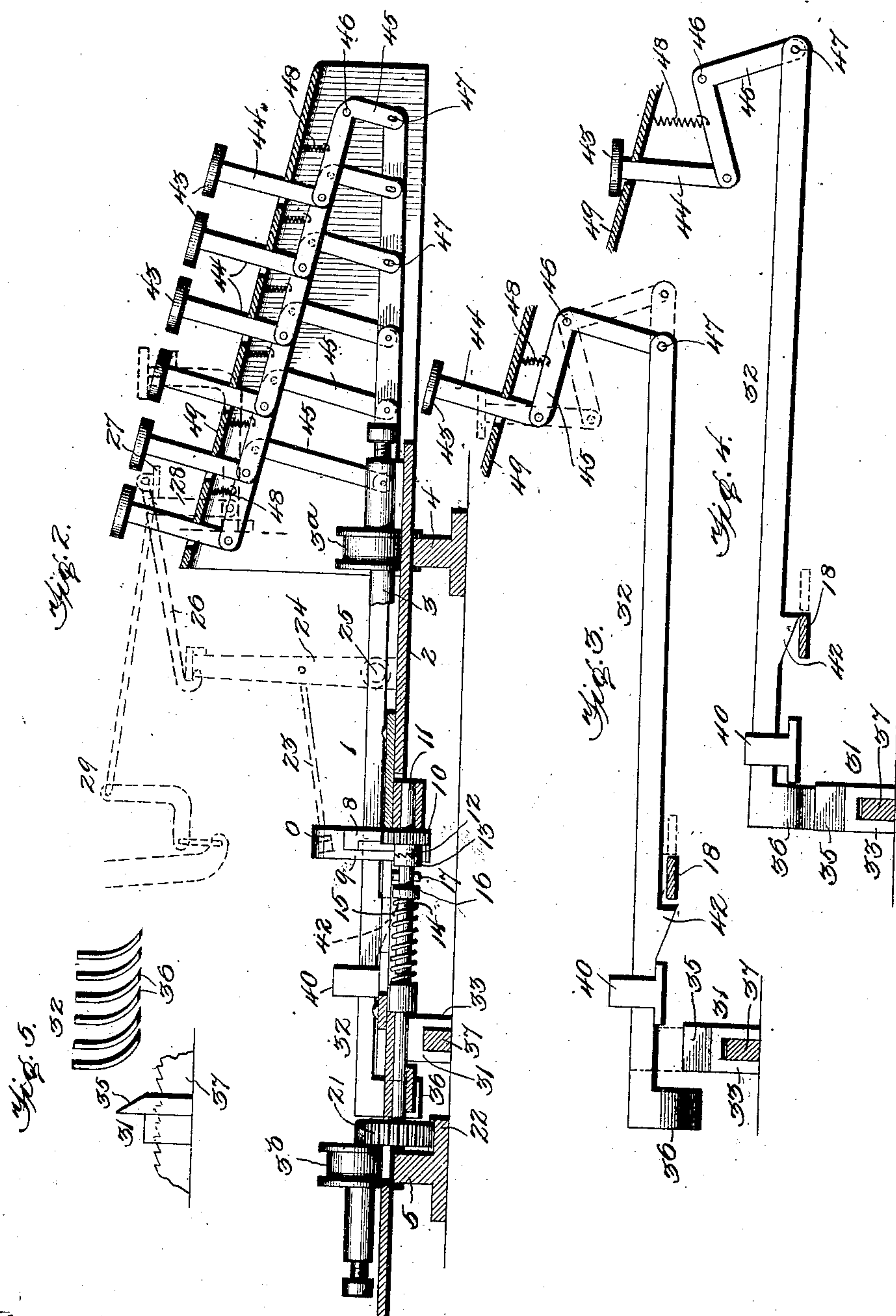
Attorney

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2 SHEETS—SHEET 2.



Witnesses:
 J. L. Meacham
 G. S. Roy

Inventors
 Harry S. Dukes and
 William H. Clayton
 by *S. P. Walchman*
 Attorney

UNITED STATES PATENT OFFICE.

HARRY S. DUKES AND WILLIAM H. CLAYTON, OF LITTLE ROCK, ARKANSAS.

TABULATING APPLIANCE FOR TYPE-WRITING MACHINES.

No. 908,220.

Specification of Letters Patent.

Patented Dec. 29, 1908.

Application filed February 7, 1903. Serial No. 142,278.

To all whom it may concern:

Be it known that we, HARRY S. DUKES and WILLIAM H. CLAYTON, citizens of the United States, residing at Little Rock, in the county of Pulaski and State of Arkansas, have invented certain new and useful Improvements in Tabulating Appliances for Type-Writing Machines, of which the following is a specification.

10 This invention relates to tabulators for typewriting machines and has in view primarily the provision of a tabulating attachment embodying a construction which dispenses entirely with the use of impact stops of any form to arrest the carriage at the desired point; stops of this character being employed in the usual types of tabulators.

15 In contradistinction to tabulators of the stop type the present invention utilizes the carriage feed or letter spacing mechanism as the means for arresting the motion of the carriage at the given point. To accomplish this there is associated with the ordinary releasing device of the feeding mechanism, a suitable means for disengaging and reengaging the feeding mechanism. Hence, the invention in its generic aspect comprises the letter spacing mechanism of the machine, means for releasing such mechanism, and 20 means for automatically reengaging it at a predetermined point. In a preferred form these means are embodied in a trip mechanism, or trip device, designed to be controlled by selectors or keys for disengaging the feeding mechanism, and which is automatically operable to provide for reengaging such mechanism to arrest the carriage at the desired point.

25 Another object of the invention is to provide an appliance which does not interfere with the independent control and operation of the carriage feeding or letter spacing mechanism, and yet includes the latter as the release and arresting device for the carriage in the tabulating operation.

30 A further object is to employ, in conjunction with the carriage feeding mechanism, a suitable brake for controlling the speed of the carriage when released, and which is under control of the same selectors which operate the release.

35 With these and many other objects in view, which will more readily appear as the nature of the invention is better understood, the same consists in the novel construction,

combination and arrangement of parts as will be hereinafter more fully described, illustrated and claimed.

The essential features of the invention, above indicated, are susceptible to a wide range of modification, and also adaptable to different varieties of typewriting machines, but for illustrative purposes there is shown in the drawings an adaptation of the invention to a machine for writing upon flat surfaces.

40 In these drawings Figure 1 is a skeletonized plan view of a book typewriting machine, illustrating a sufficient portion thereof to show an operative arrangement of the tabulating appliance. Fig. 2 is a skeletonized sectional view of the same construction, illustrating in dotted lines the type action which coöperates with the carriage feeding or letter-spacing mechanism that also constitutes the device for arresting the carriage at the desired point. Fig. 3 is a diagrammatic view of the trip mechanism, showing in full lines the elements thereof in normal position, and in dotted lines said elements in set positions. Fig. 4 is a similar diagrammatic view, illustrating the position assumed by one of the individual releasing elements when automatically tripped from the disengaging member or release lever of the carriage feeding mechanism. Fig. 5 is a detail view illustrating more plainly the operative relation between the tappet or contact member of the individual denominational releasing elements, and the bearing or camming face of the adjustable column locating element. Fig. 6 is a detail sectional view showing one of the proposed ways of constructing a column locating element, and the manner of holding the same locked in an adjusted position at any desired point within the machine scales or line. Fig. 7 is a detail sectional view on the line 7—7 of Fig. 1, showing more plainly the mounting of the individual releasing elements of the trip mechanism, and the column-arranging guide therefor. Fig. 8 is a view similar to Fig. 7, and further exemplifying the construction and utility of the column-arranging guide, particularly in connection with a greater number of denominational releasing elements than shown in the other figures of the drawings, whereby a variable spaced relation may be provided for the individual denominational releasing elements. Fig. 9 is an en-

larged detail plan view more clearly showing the grouping of the individual denominational releasing elements.

Like reference numerals designate corresponding parts throughout the several figures of the drawings.

As already indicated, the tabulating appliance or attachment, constituting the present invention, is applicable to any form of typewriting machine whether of the common commercial type, or of the type known as book typewriters, and also to machines in which the printing mechanism may or may not be carried by the traveling carriage. Whatever may be the particular adaptation of the invention to any special form of typewriting machine, the fundamental features thereof remain the same, as herein described.

A simple form of the tabulating appliance or attachment possesses special utility in connection with a book typewriting machine of the character such as exemplified in the former patent of H. S. Dukes, No. 671,186, April 2, 1901, so for illustrative purposes this embodiment of the invention is shown in the accompanying drawings, to which reference is now made.

The numeral 1 designates the bottom portion of the traveling carriage of a book typewriting machine such as disclosed in the patent referred to. This carriage includes a casing containing the printing mechanism (embodying the type and key actions), and which casing is provided with a bottom or bottom plate 2 carrying certain instrumentalities which provide for the traveling support of the carriage, and also for the feeding movement in the direction of printing under the influence of the escapement mechanism.

In the construction shown, the bottom plate 2 of the carriage casing has suitably mounted thereon the oppositely arranged supporting axles 3 carrying the front and rear grooved traveling wheels, 3^a and 3^b, which respectively ride on the front and rear track rails 4 and 5 of the track frame constituting a part of the support upon which the carriage is arranged for movement. The detail construction of this track frame is unimportant to the present invention, so only a sufficient portion thereof is illustrated to show the mounting of the adjustable column locating element hereinafter referred to.

As indicated, the carriage feeding or letter-spacing mechanism is designed to constitute the means for arresting the carriage in the tabulating operation, and in this arresting action acts independently of its ordinary functions in providing the step-by-step or escapement movement for letter and word spacing. It is therefore desirable in the carrying out of the invention to employ a carriage feeding or releasing mechanism whose parts are sufficiently strong to act ef-

fectively as the arresting medium for the entire carriage without damage to any part of the machine, although practically any substantial form of carriage feeding mechanism may be employed by reason of the fact that the invention contemplates means for perfectly controlling the speed of the carriage, after release, through the medium of the same selectors used to set the trip mechanism into operative position. However, a form of carriage feeding mechanism of a strong construction well adapted to carry out the objects hereinbefore stated, is shown in the drawings, and which is carried as an entirety by the base 2 of the machine carriage. This form of carriage feeding mechanism embodies in its organization an upright swinging dog lever 6 having at or near its lower end the oppositely located pivotal supports 7, and carrying the usual pawls or dogs 8 and 9 adapted to be moved, in a lateral direction, into and out of engagement with the teeth of a star wheel 10 loosely mounted on the feed shaft 11. The star wheel is provided at one side thereof with a clutch member or face 12, with which coöperates a companion clutch member or face 13, carried at one end of a slidable clutch or clutch sleeve 14 feathered on the feed shaft 11 and having arranged thereon a clutch or pressure spring 15 designed to exert its tension in a direction for normally holding the clutch face 13 in engagement with the clutch face 12 of the star wheel. The said clutch or clutch-sleeve 14, which is slidably mounted on, but rotatable with the feed shaft, is further provided with a grooved collar portion 16 (see Figs. 1 and 2) which is loosely engaged by the inner end 17 of the disengaging or releasing member 18 for the carriage feeding mechanism. This disengaging member 18 is preferably in the form of a lever having a fixed pivotal support, as at 19, and provided at its outer end with a finger piece 20 exposed to the operator at one side of the carriage, whereby the carriage feeding mechanism may be controlled for releasing and braking purposes by the operator, entirely independent of the tabulating operation.

The feed shaft 11 carries at one extremity a spacing pinion 21 coöperating with a stationary rack 22, which, in the form of machine illustrated, is preferably fast with the rear track rail 5, as plainly shown in Fig. 2 of the drawings. This specific construction of carriage feeding or letter-spacing mechanism is substantially the same as fully disclosed and described in the patent aforesaid, and as the escapement action of this mechanism for letter and word spacing is the same as set forth in said patent, special reference need not be made herein thereto. But, an important feature to note in connection with the construction of feeding mechanism described, is the fact that the disen-

gaging member or release lever 18 provides for a braking action for controlling the momentum of the carriage after release. As explained, the inner end 17 of the said disengaging member or release lever 18 has a loose engagement with the clutch or clutch sleeve 14 through the medium of the collar construction 16 so that when the pressure of the finger is placed upon the outer end 20 of said member or lever to provide for disengaging the clutch from the loose star wheel 10, to release the carriage, the degree of pressure of the lever against the clutch or clutch sleeve 14 may be readily controlled. This provides for a braking action which controls the speed or momentum of the carriage as it advances, after release, under the influence of the carriage actuator which is usually in the form of a spring actuated drum carrying a pull tape having connection with the carriage in the ordinary way. The frictional engagement of the inner end 17 of the release lever 18 against collar 16 of the clutch sleeve 14 when pressure is placed upon said lever partly provides for the braking action. In further explanation of this action it is to be noted that the clutch or clutch sleeve 14 has a limited movement upon the shaft 11, and when it has reached its extreme distance from the clutch surface 12, the tendency, of a continued pressure upon the said release lever 18, will be to push the shaft 11 endwise through its journals, but as the mounting of the shaft is such that it is held against endwise movement or displacement, such pressure thereon necessarily tends to bind the journal mountings of the shaft, and the consequent friction at such points provides the braking action which may be controlled more or less according to the degree of pressure applied to the operating portion of the lever 18. Hence by associating a tabulating appliance with the said disengaging member or release lever 18 of the carriage feeding mechanism the braking or speed controlling feature of the traveling part of the machine is made a part of the tabulator and acts in conjunction therewith, or independently. This point becomes of great value in using the release lever 18 as an adjunct to the tabulating device, inasmuch as the operator cannot only throw the carriage feeding mechanism out of engagement so as to permit the free traveling of the carriage, but can also absolutely control its momentum by a pressure upon the release key or lever. It will also be obvious that the braking action provided for through the medium of the release lever and its related parts is a feature of the carriage feeding mechanism proper, so that the braking action is of utility in the ordinary uses of the typewriter to which the particular letter-spacing or carriage feeding mechanism may be applied.

In the book typewriting machine of the

type suggested in the drawings, the upright swinging dog lever 6 of the carriage feeding mechanism has a rod connection 23 with an upright swinging yoke lever 24 carried by a motion transmitting element 25 mounted in the base of the carriage, such yoke lever being engaged at the top by suitable latch connections 26 cooperating with the universal bar 27 of the type action, with which universal bar cooperates the key lever 28 having suitable operating connections 29 with the type bar, as indicated by dotted lines in Fig. 2 of the drawings. These connections are illustrated to show the dual function of the feeding mechanism, namely for the usual escapement purposes, and secondly, as the carriage arresting device for tabulating purposes.

The tabulator proper is practically simply an attachment for the release lever of the letter spacing mechanism, and in the form of the invention shown includes a trip mechanism or device designed to release the letter spacing mechanism, and then automatically reengage it at a predetermined point. This trip mechanism, as shown, includes an adjustable column locating element 31, and a group or series of tripping denominational elements 32, which latter cooperate directly with the release member 18 of the carriage feed mechanism. The column locating element is in no sense a stop or abutment, as it simply constitutes the initiating medium of the tripping action which is not completed till after the column locating element is reached by a selected denominational element. It is thus distinguished from the ordinary column stops of the ordinary tabulators.

One or more of the column locating elements 31 may be employed in carrying out the invention according to the number of columns which may be printed upon a sheet or page, but as the action of each in a succession of column locating elements would necessarily be the same, a description of one will suffice for any others that might be used in carrying out the tabulating operation. Each adjustable column locating element 31 may be of any preferred construction and presenting what may be properly termed a camming surface which serves to impart a movement to the denominational element coming in contact therewith, thus effecting the tripping action for the release member or lever 18.

In the suggested construction shown in the drawings, the column locating element 31 essentially consists of a collar or block member 33 provided with a beveled, inclined, or deflected face 35 adapted to be engaged by a corresponding laterally deflected, beveled, or inclined tappet or contact member 36 pendant from the interfering or rear end portion of each of the individual elements 32 controllable from the selectors or keys. The column locating element may be mounted for

adjustment to various positions by any suitable means, but a simple expedient is shown in the drawings and consists in forming the collar or block member of an approximate open or "U" form, whereby the same may slidably engage with, and be placed astride of, a holding bar 37 carried by the track frame, and which may be conveniently supported rigidly from the rear track rail 5 and held in parallelism thereto, as plainly illustrated in Fig. 2 of the drawings. This holder or holding bar 37 is of a length equaling the full travel of the carriage, and in the construction shown is provided in one face thereof with a series of locking notches, teeth, or ratchets 38, corresponding in spacing to the machine scales, and adapted to be engaged by one or a plurality of catch teeth 39, provided within the collar or block member. This construction permits the column locating element to be adjusted to any position within the extent of the machine scales to provide for locating the column at any desired point, and at the same time to be locked against movement in a direction that would interfere with the same performing the function of lifting the denominational element which comes into engagement therewith.

Any desired number of the individual denominational elements 32 may be employed, each of said elements ordinarily representing one space in the column of matter to be entered, and in numerical work, for which tabulators are usually employed, the said group of denominational elements will respectively represent the units, tens, hundreds, thousandths, tens-thousandths, hundred-thousandths spaces, etc., and by additional denominational elements the decimal point and decimal spaces may be represented in the tabulator, as suggested by the arrangement shown in Fig. 8 of the drawings. Ordinarily, in close work, the individual denominational elements 32 are arranged side by side at a letter-space distance apart, although the invention contemplates the mounting of these elements in such a way as to provide for varying the spaced relation thereof. This may be accomplished in various ways, but preferably through the medium of a stationary column-arranging guide 40.

As shown in the drawings, the column-arranging guide 40 essentially consists of a block provided with a plurality of open guiding slots 41 in which slidably work the individual denominational elements 32. The open formation of the slots 41 permits each of the denominational elements to be lifted out of one slot and placed in another, or any spaced arrangement of the denominational elements provided for that may be desired, for which purpose there are usually a greater number of the guiding slots 41 than of the elements 32, as may be plainly seen from Figs. 7 and 8 of the drawings. In

further explanation of the special function of the column-arranging guide 40 it will be obvious that the denominational elements or bars may be arranged so as to tabulate columns with a space omitted at any desired point, such as the space reserved for the decimal period, or commas, or, in case it is not desired to use the periods or commas, but to omit a corresponding space for perpendicular ruling, etc. For instance, as suggested in Fig. 8 of the drawings, with the denominational elements or bars arranged, as illustrated therein, provision is made for leaving spaces at the decimal and comma points in an entry of one hundred thousand thus: 100 000 00. The indicator upon each selector or key would therefore be correct for the value of the column just as it would in the use of the device in making the entries solid without intervening spaces.

From the foregoing it is obvious that provision is made for readily changing or setting the tabulator for different uses by varying the spaced relation of the key selected elements representing denominational values.

Referring more particularly to the individual denominational elements 32, it will be observed that the same are preferably in the form of sliding bars having a longitudinal reciprocatory movement, and also having a vertical play within their guides to permit of the tripping action out of engagement with the disengaging member or release lever 18, with which they cooperate. Each of the said elements or bars 32 is provided, in addition to the tappet member 36 thereof, with a trip catch 42 preferably in the form of a shoulder or suitable projection which normally lies at one side of and within the horizontal plane of the disengaging member or release lever 18 of the carriage feeding mechanism so that when the element or bar 32 is drawn forward, in a direction for setting, the catch projection 42 moves against the member or lever 18 in a direction for disengaging the clutch 14 from the clutch of the star wheel 10, thereby releasing the carriage so that it may advance forward under the impulse of its actuator. The same movement which accomplishes this result draws the member 36 of the said denominational bar or element into a path of interference with the column locating element 31. Hence, when the carriage advances to the point where the entry of the item is to commence, the said member 36 of the denominational bar will engage with and ride upward upon the camming face of the column locating element 31, with the consequence of moving the denominational bar or element to an elevation which carries the trip catch 42 out of engagement with the member or lever 18, thus permitting the clutch spring 15 to automatically restore the carriage feeding mechanism to its

engaged condition, and thereby arresting further movement of the carriage, except under the influence of the usual escapement action transmitted from the type action keys. In this connection it will be observed that this entire action takes place with the tabulator key depressed, and even though still held depressed after the carriage has been arrested at the column position, the feeding or letter spacing mechanism is perfectly free to be operated in the usual printing operation.

Each of the elements or bars 32 has its own controlling means in the form of a selector or key preferably operable at the keyboard of the machine. Any suitable selector connections may be provided for the elements or bars 32, but in the construction shown each of said elements or bars has associated therewith a selecting key 43 having a stem 44 pivotally connected with one arm of a bell crank lever 45 pivotally hung at its angle, as at 46, and whose pendent arm has a pivotal connection 47 with the forward end of the releasing bar or element 32. With this controlling or actuating means there may be associated a retracting or resetting spring 48, conveniently connected with the upper arm of the bell crank at a fixed point of attachment. The entire series or group of selecting keys 43, and their stems, may be conveniently arranged in a row in connection with a flanged guiding bracket 49 projected from one corner of the carriage casing and designed to occupy a position at one end of the key-board so that the selecting keys will practically constitute a part of the key-board. The connections with the individual selecting keys are necessarily arranged so that there is no interference between them, and each individual denominational element under perfect control of the operator.

The spaced, side by side, relation of the individual elements or bars 32 necessarily disposes the separate bars respectively at different distances from the projection 31 or column locating element, and it is therefore by reason of this arrangement that the carriage may be arrested at variable distances from a given point according to the number of characters in the item to be entered in the column. In connection with the selecting keys it will be understood from the foregoing that the pressure of the finger on a tabulator key not only provides for releasing the carriage and setting the trip mechanism but at the same time provides means, according to the pressure imposed on the key, for braking or controlling the momentum or speed of the carriage through the medium of the disengaging or release member 18 of the carriage feeding mechanism.

As herein indicated, the appliance or attachment constituting the present invention is applicable to any form of typewriting ma-

chine, whether of the common commercial type or the type known as book typewriters, and also to machines in which the printing mechanism may or may not be carried by the traveling carriage. In the application of the invention illustrated in the drawings, the column locating element or cam projection 31 remains stationary after adjustment, while the denominational elements or bars 32 travel with the carriage. It will be readily understood that this relation of the co-acting elements may be exactly reversed in the use of the invention upon some types of machines, that is, the column locating element or cam projection 31 would be carried by the traveling carriage, while the individual denominational bars or elements, as well as the letter-spacing mechanism, would be mounted in fixed positions in connection with the stationary printing mechanism. This would be the case in the use of the invention with a commercial attachment such as suggested in the former patent to one of the present applicants, H. S. Dukes, No. 587,431, dated August 3, 1897. However, the action of the parts would be exactly the same in purpose and result, irrespective of whether the column locating element was carried by the carriage or arranged stationary after adjustment, as suggested in the drawings of this application.

From the foregoing it is thought the construction, operation and many advantages of the herein described tabulating appliance will be readily understood without further description, and it is also understood that various changes in the form, proportion and minor details of construction may be resorted to without departing from the spirit of the invention or sacrificing any of the advantages thereof.

Having thus described the invention, what is claimed and desired to be secured by Letters-Patent, is:—

1. A tabulator for typewriting machines comprising the letter spacing mechanism, key operated means for releasing such mechanism, and means cooperating with said other means for causing the automatic reengagement of said mechanism at a predetermined point to effect by such reengagement alone the stopping of the carriage.

2. A tabulator for typewriting machines comprising the letter spacing mechanism, key operated means for releasing the same, and means adapted to be engaged by said first mentioned means for causing the automatic reengagement of said mechanism at variable distances from a predetermined point to effect by such reengagement alone the stopping of the carriage.

3. A tabulator for typewriting machines comprising the carriage feeding mechanism, key operated means independent of the type action, for releasing said mechanism, and

means independent of the type action and adapted to engage said first mentioned means for causing the automatic reengagement of the feeding mechanism to effect by such reengagement alone the stopping of the carriage at a predetermined point.

4. A tabulator for typewriting machines comprising the carriage feed mechanism, a tabulator key operated means for releasing said mechanism, and means independent of the type action, cooperating with said first mentioned means, for causing the automatic restoration at a predetermined point of the feeding mechanism to its engaged condition without the release of the tabulator key to effect the stopping of the carriage by such reengagement alone.

5. A tabulator for typewriting machines comprising the letter spacing mechanism, and a selective device comprising key operated means for releasing the letter spacing mechanism, and means cooperating with said first mentioned means for causing the automatic reengagement of said mechanism at variable distances from a predetermined point to effect by such reengagement, the stopping of the carriage.

6. A tabulator for typewriting machines comprising the letter spacing mechanism, key operated means for releasing such mechanism, and means coacting with said other means and operated through the movement of the carriage for causing the automatic reengagement of the letter spacing mechanism at a predetermined point to effect by such reengagement, the stopping of the carriage.

7. A tabulator for typewriting machines comprising the letter spacing mechanism, and a separate device associated with the release of said mechanism and comprising tabulator key controlled means for releasing said spacing mechanism, and means adapted to engage said first mentioned means for causing the automatic reengagement of said mechanism at variable distances from a predetermined point without release of the tabulator key.

8. A tabulator for typewriting machines comprising the letter spacing mechanism, and a trip mechanism including a column locating element, and a key controlled denominational element cooperating with the release of the feeding mechanism and tripped by said column locating element to cause the automatic reengagement of said mechanism to effect thereby the stopping of the carriage.

9. A tabulator for typewriting machines comprising the letter spacing mechanism, and a trip mechanism including a column locating element and a plurality of denominational elements cooperating with the release of the spacing mechanisms and tripped by the column locating element to cause the

automatic reengagement of said mechanism to effect thereby the stopping of the carriage.

10. A tabulator for typewriting machines comprising the letter spacing mechanisms, and a trip mechanism including a column locating element, and a key controlled denominational element normally out of operative relation to the column locating element and having a tripping engagement therewith, said denominational element also having a tripping connection with the release of the spacing mechanism to effect the stopping of the carriage by the reengagement alone of said mechanism.

11. A tabulator for typewriting machines comprising the letter spacing mechanism, and a trip mechanism including a column locating element, and a plurality of denominational elements arranged in spaced relation and each having an individual selector and a tappet member adapted to be moved in and out of tripping relation to the column locating element, each of said denominational elements also having an operative tripping connection with the release for the spacing mechanism to effect the stopping of the carriage by the reengagement alone of said mechanism.

12. A tabulator for typewriting machines comprising the letter spacing mechanism, and a trip mechanism comprising an adjustable column locating element having a camming surface, and a series of key controlled slidable denominational bars having a tripping engagement with the release of the spacing mechanism, and each having a contact adapted to be moved in and out of operative relation to the camming surface of the column locating element.

13. In a tabulator for typewriting machines, a carriage feeding mechanism, the trip mechanism comprising an adjustable column locating element, a series of denominational key controlled bars arranged in spaced relation side by side and provided with members adapted to be moved in and out of interfering relation with reference to the column locating element and tripped thereby, said bars having an operative tripping connection with the feeding mechanism and means for varying the spaced relation of said releasing bars.

14. In a tabulator for typewriting machines, a carriage feeding mechanism, and a trip mechanism comprising a column locating element, a series of key controlled slidable bars cooperating with both the column locating element and the carriage feeding mechanism, said bars being tripped by said column locating element and a guide comprising means for holding the bars in variable spaced relation.

15. In a tabulator for typewriting machines, a carriage feeding mechanism, and a trip mechanism comprising a column located

element, a series of key controlled slidable bars cooperating with both the column locating element and the carriage feeding mechanism, said bars being tripped by said column locating element and a column-arranging guide consisting of a block having a plurality of slots receiving the bars and providing means for holding the latter in variable spaced relation.

10 16. A tabulator for typewriting machines comprising the letter spacing mechanism having a brake, key operated means for releasing said mechanism and setting the brake, and means co-acting with said other
15 means for causing the automatic reengagement of said mechanism at a predetermined point to effect by such reengagement the stopping of the carriage.

20 17. A tabulator for typewriting machines comprising the letter spacing mechanism having a brake, a common key controlled means for releasing said mechanism and setting the brake, and means coacting with said
25 other means for causing the automatic reengagement of said mechanism at a predetermined point to effect by such reengagement, the stopping of the carriage.

30 18. In a tabulator for typewriting machines, a carriage feeding mechanism, and a trip mechanism having key operated means controllable by selectors for releasing the feeding mechanism, and means also controllable by said selectors and adapted to engage said first mentioned means for causing
35 the automatic reengagement of the feeding mechanism at a predetermined point to effect by such reengagement, the stopping of the carriage.

40 19. A tabulator for typewriting machines comprising the letter spacing mechanism having a release member and embodying braking means controllable by the latter, and an automatically tripping tabulating mechanism having key controlled denominational elements co-acting with said release
45 member to effect the stopping of the carriage by the reengagement of the letter spacing mechanism.

50 20. A tabulator for typewriting machines comprising the letter spacing mechanism having a release lever and embodying braking means controllable by the latter, and an automatic trip device embodying key controlled denominational elements having tripping engagement and disengagement with
55 said release lever to effect the stopping of the carriage by the reengagement of the letter spacing mechanism.

60 21. In a tabulator for typewriting machines, a carriage feeding mechanism embodying a clutch and a disengaging member for the clutch in the form of a lever, and a trip mechanism, said trip mechanism comprising a column locating element and a plurality of longitudinally slidable and verti-

cally movable releasing bars having individual selecting keys for actuating the same, and provided with a pendent member cooperating with the column locating element and with a trip catch shoulder cooperating with said disengaging member of the clutch. 70

22. In a tabulator for typewriting machines, the combination with the carriage feeding mechanism, of a column locating element, a plurality of denominational elements co-acting with said carriage feeding mechanism and tripped by said column locating element, and means for changing the spacing between the denominational elements to vary the distance from a predetermined point at which any one of said denominational elements will come into play for arresting purposes. 75 80

23. In a tabulator for typewriting machines, the combination with the carriage feeding mechanism, of a column locating element, a plurality of denominational elements co-acting with said carriage feeding mechanism and tripped by the column locating element, and means for changing the spaced relation between said denominational elements. 85 90

24. In a tabulator for typewriting machines, a carriage feeding mechanism, a trip mechanism embodying a column locating element, and a plurality of denominational releasing elements co-acting with the feeding mechanism and having an operative tripping connection with the latter, said releasing elements being tripped by the column locating element, and means for changing the spaced relation between said releasing elements. 95 100

25. In a typewriting machine, a carriage feeding mechanism provided with a clutch, and a disengaging lever for said clutch, said lever combining with the clutch to form a brake and constituting the controlling member for the latter. 105

26. The combination with a typewriter carriage, of a plurality of stops arranged thereon, a plurality of cooperating members, means for supporting and operating said members to engage the stops, and a spaced support in the spaces of which the members lie when they engage the stops, the spaces in the support being so arranged that the members may be arranged in separated groups. 110 115

27. The combination with a typewriter carriage, of a plurality of stops arranged thereon, a plurality of cooperating members, means for supporting and operating said members to engage the stops, a spaced support in the spaces of which the members lie when they engage the stops, the spaces in the support being so arranged that the members may be arranged in separated groups, and a spring for returning the members. 120 125

28. The combination with a typewriter carriage, of a plurality of stops arranged 130

thereon, a plurality of coöperating levers, means for supporting and operating said levers to engage the stops, and a spaced support in the spaces of which the levers lie when they engage the stops, the spaces in the support being so arranged that the levers may be arranged in separated groups.

29. In a typewriting machine and tabulating mechanism, the combination of a plurality of denominational stops, and means which may be regulated at will to render said denominational stops contiguous or to provide a space between any desired pair of said stops or between different pairs of said stops.

30. In a typewriting machine and tabulating mechanism, the combination of a plurality of movable denominational stops, and means for changing at will the paths of movement of said stops and for changing the relations of said stops one to another.

31. In a typewriting machine and tabulating mechanism, the combination of a plurality of denominational stops that are shiftable relatively to and laterally of one another, and means for maintaining said stops fixed against lateral movement in the lateral positions to which they are adjusted.

32. In a typewriting machine and tabulating mechanism, the combination of a stop frame, a plurality of denominational stops mounted in said frame, means for affording a relative lateral adjustment between said stops in said frame in the direction of the travel of the carriage, and means for locking said stops against lateral movement in their adjusted positions.

33. In a typewriting machine and tabulating mechanism, the combination of a stop frame, a plurality of denominational stops mounted in said frame and adjustable therein to different positions relatively to one another and in the direction of the travel of the carriage in order to vary the spacing between the stops for changing the punctuation that may be employed, and means for preventing a lateral displacement of the stops from the positions to which they are adjusted.

In testimony whereof we affix our signatures in presence of two witnesses.

HARRY S. DUKES.

WILLIAM H. CLAYTON.

Witnesses:

J. F. WILLS,

PALMER DANAHER.