

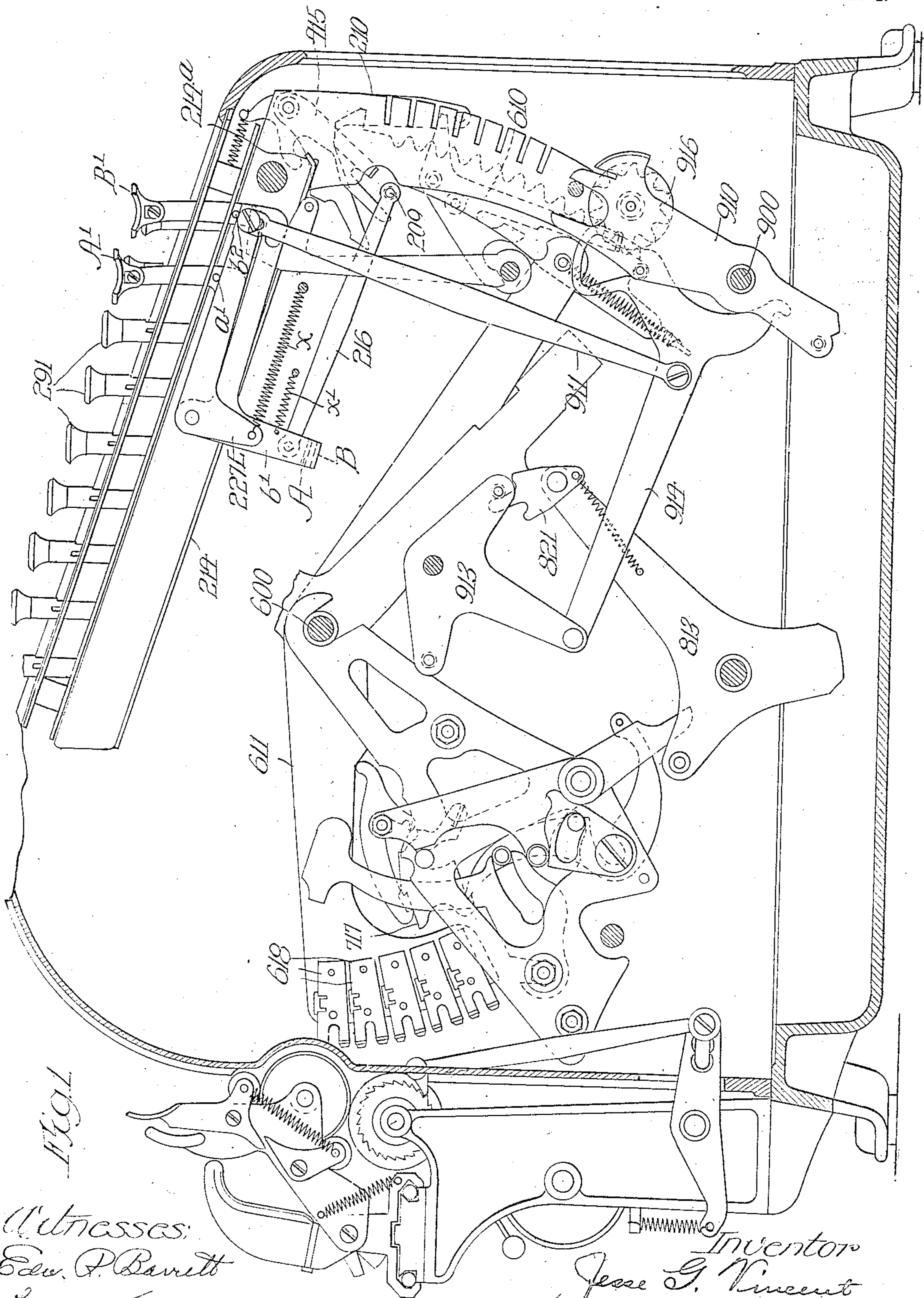
No. 897,941.

J. G. VINCENT.
ADDING MACHINE.

APPLICATION FILED JAN. 15, 1906.

PATENTED SEPT. 8, 1908.

3 SHEETS—SHEET 1.



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Fig. 2.

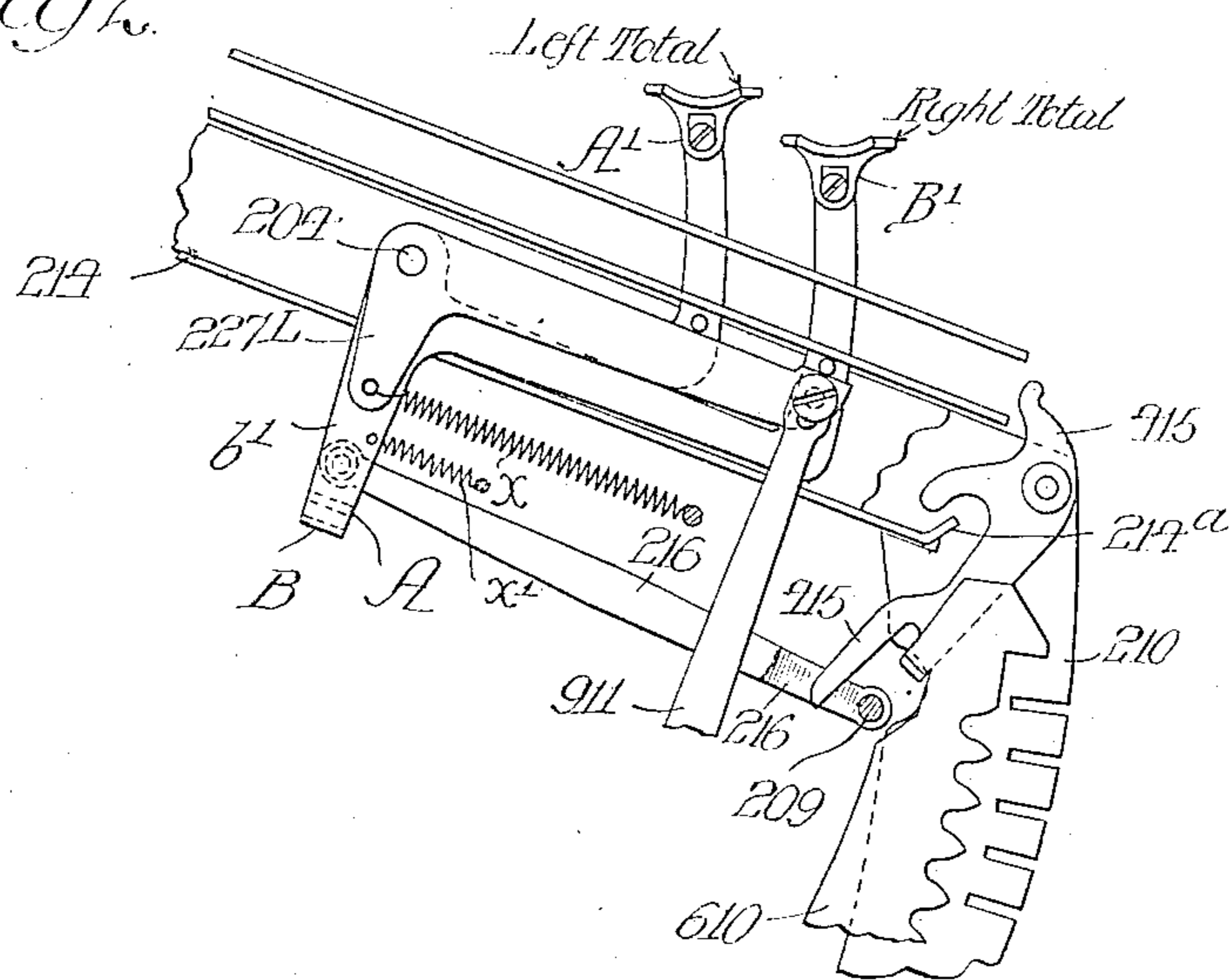
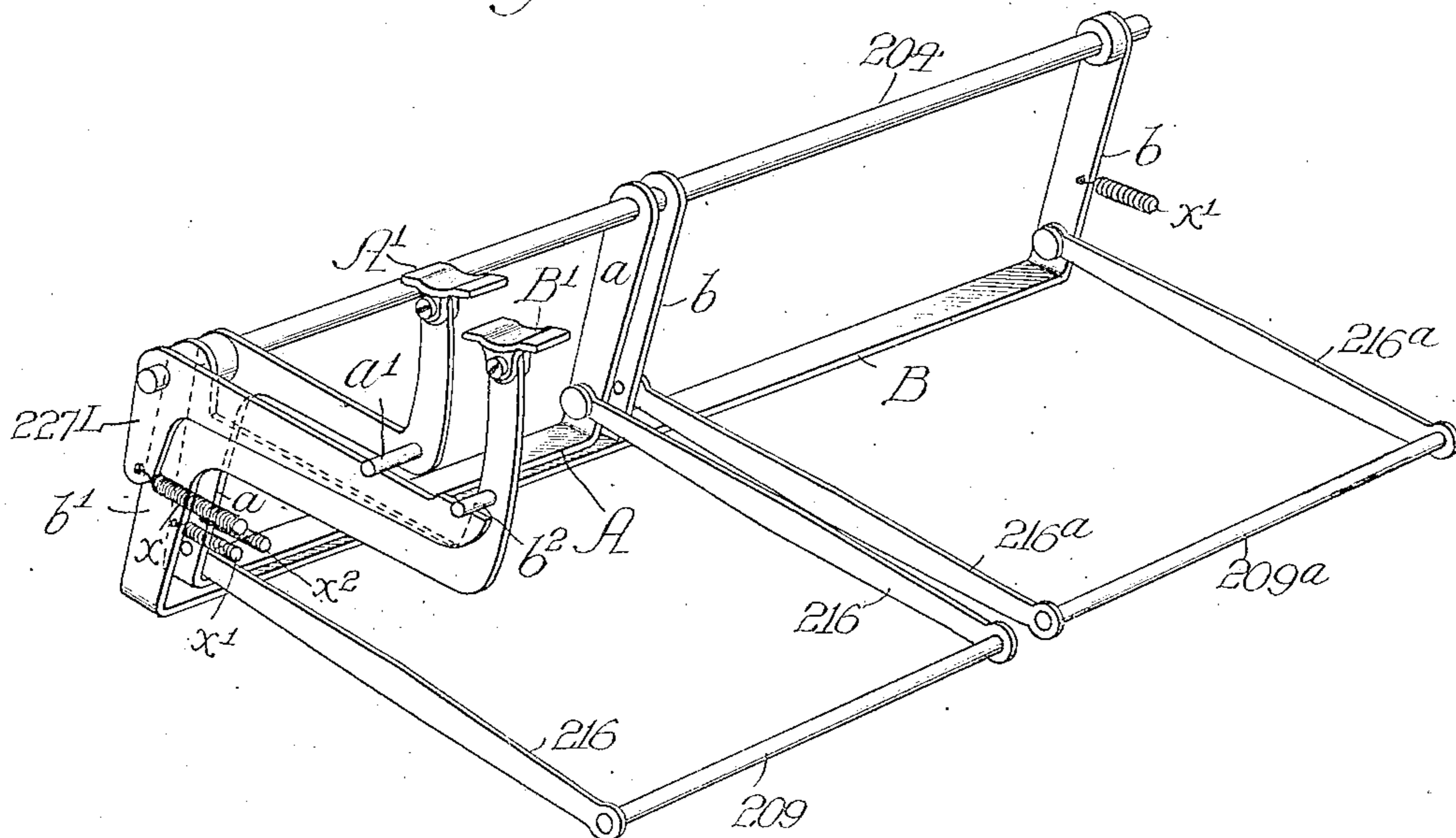


Fig. 3.



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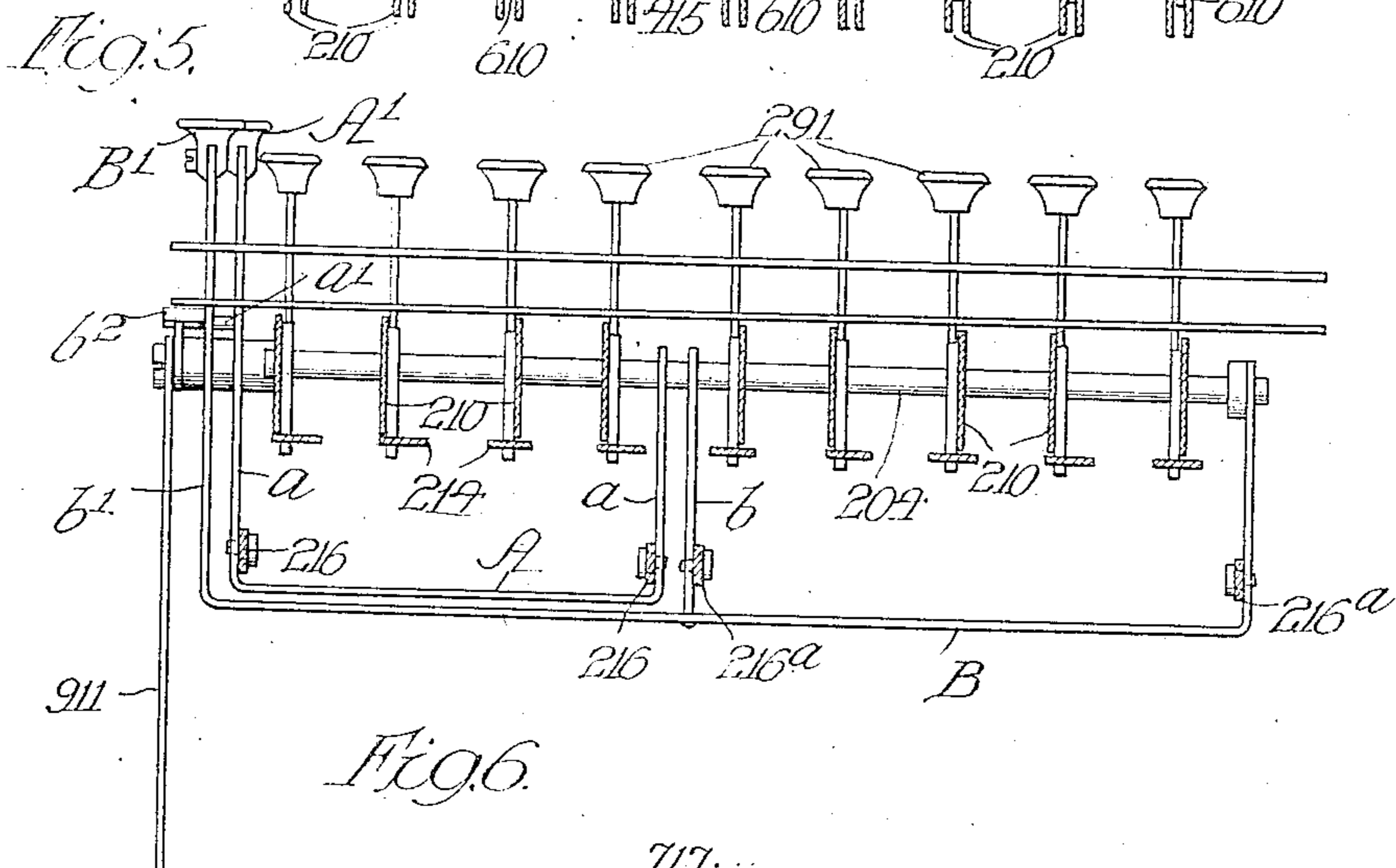
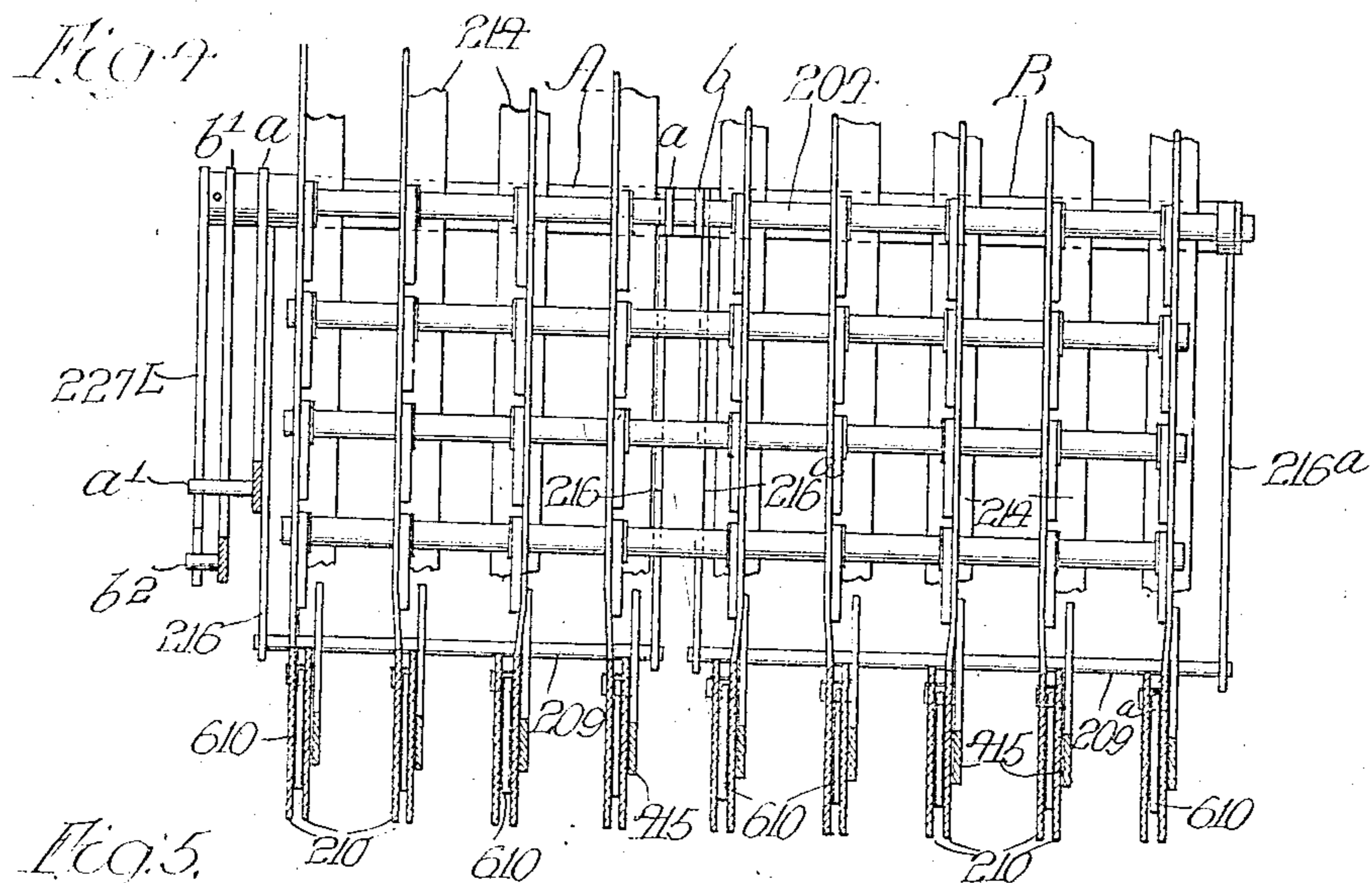
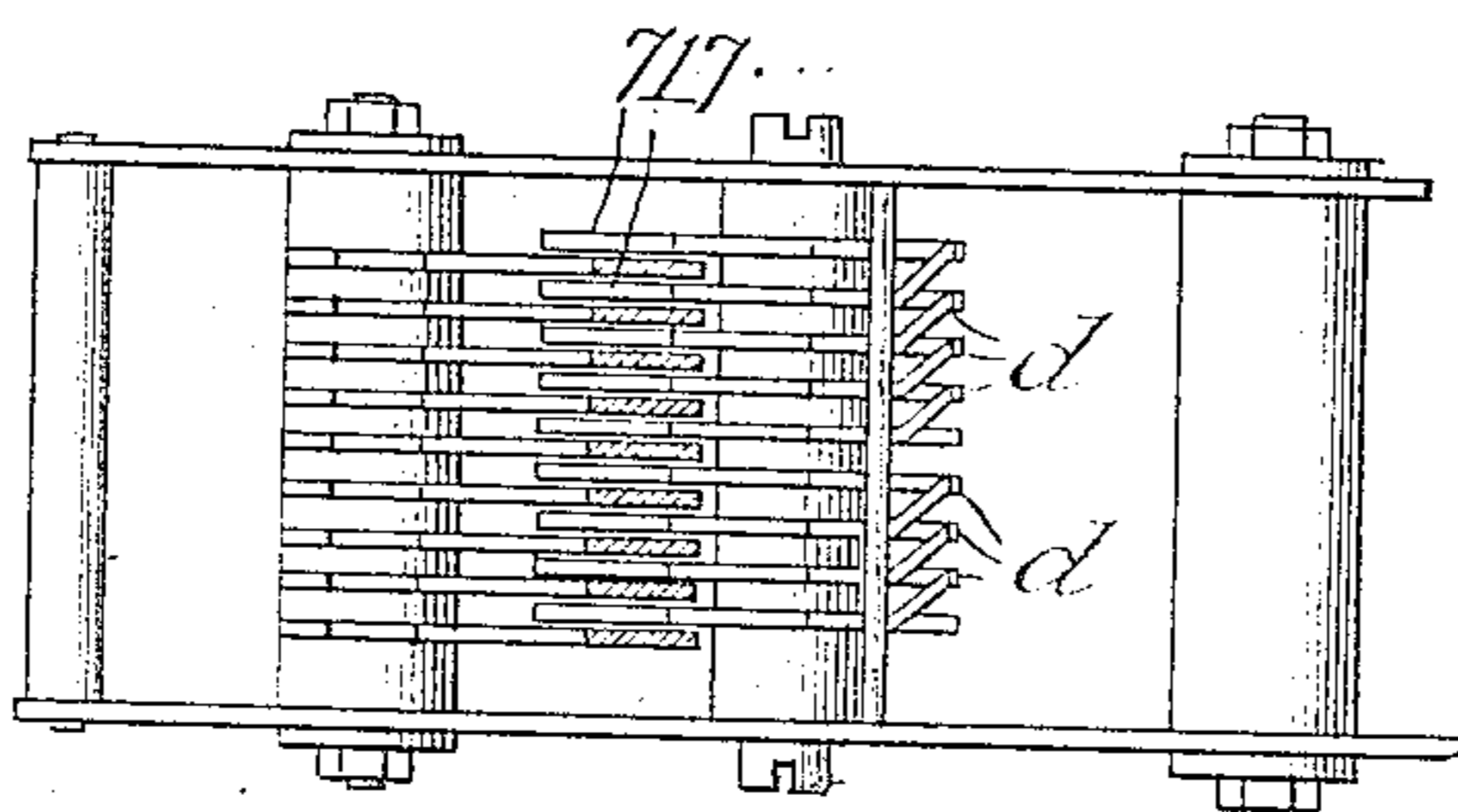


Fig. 6.



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UNITED STATES PATENT OFFICE.

JESSE G. VINCENT, OF DETROIT, MICHIGAN, ASSIGNOR TO BURROUGHS ADDING MACHINE COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

ADDING-MACHINE.

No. 897,941.

Specification of Letters Patent.

Patented Sept. 8, 1908.

Application filed January 15, 1906. Serial No. 296,190.

To all whom it may concern:

Be it known that I, JESSE G. VINCENT, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Adding-Machines, of which the following is a specification.

My invention relates to adding machines of that class adapted to print and list individual items and to accumulate the total thereof and also to print such total or accumulation at the will of the operator and my invention concerns that particular type of such adding machines commonly referred to as "split" machines, which are so arranged or modified as to separately list and accumulate different items at the same time and to print separate totals of the different sets or characters of items.

The object of my invention is to provide such split machine with means whereby the separate totals, instead of being taken simultaneously, may be taken at separate times and independently of each other at the will of the operator, with the result that a total which is accumulated in one particular section of the machine may be taken at one time or at one particular point in the accountant work and the total or totals in another section or sections of the machine may be taken or printed at another time or any other place in the accountant work.

The class of machines to which my invention is particularly applicable is exemplified by the well known Burroughs adding machine constructed and operating in substantial accordance with Burroughs patents, Nos. 504,963 and 505,078, issued on September 12, 1903, and for convenience in illustration and description of my invention I have shown the same incorporated therein, although, as will be understood, my invention is not limited to this particular application thereof, inasmuch as the same may be used in adding machines of the same general character and used for the same general purposes.

In the drawings Figure 1 is an elevation of the left hand side of a Burroughs machine illustrating certain parts which are more or less directly concerned in the description of my invention; Fig. 2 a detail view of the upper forward part of the machine with my improvements incorporated therewith; Fig. 3 a perspective of certain of the parts consti-

tuting my improvements; Fig. 4 a sectional elevation of the machine on line 4—4 of Fig. 1; Fig. 5 a sectional elevation on the line 5—5 of Fig. 1; Fig. 6 a plan view of a portion of the printing mechanism illustrating the splitting of the machine at a point between the fifth and sixth denominations counting from the right hand side of the machine.

Inasmuch as the Burroughs machine is so well known and is also described in the Burroughs patents aforesaid, only those parts thereof which are directly concerned and cooperate with the devices constituting my improvements or attachments, need be described or referred to in detail.

The Burroughs machine is provided with a plurality of rows of keys 291 representing different denominations increasing from right to left, the keys in each row representing the digits 1 to 9. The capacity of the machine is of course increased by increasing the number of the denominations but in the present instance the machine is shown as provided with nine rows of keys, with the result that the trains of mechanism are in series of nine, Figs. 4, 5 and 6.

As is well known, the Burroughs machine is provided with a series of main levers or sectors 611, mounted to oscillate upon a main cross shaft 600 and corresponding in number to the number of the denominations represented on the keyboard. Each sector 611 carries at its forward end a rack 610 and at its rearward end a series of movable type plates 618, each plate bearing two type and the entire series of type representing the figures 0 to 9. Each rack 610 operates in a vertical plane between the two plates 210 and the same is normally held in its elevated position by means of its retainer 415, Fig. 1, it being understood that each one of the series of racks is provided with its own independent retainer. When an item is set up on the keyboard the retainer or retainers corresponding to the rows or denominations in which keys have been set or depressed are swung in a clockwise direction, Fig. 1, by the contact therewith of the lugs 214^a at the ends of those sliding bars or strips 214 corresponding with such operated keys, with the result that such retainers are swung rearwardly as to their lower ends and the corresponding racks are permitted to descend

(upon the operation of the machine) distances corresponding with the value of the operated keys.

The accumulating pinions 916 of a Burroughs machine are mounted in a swinging frame 910 arranged to rock upon the axis 900, whereby such pinions, which correspond in number with the racks, are adapted to be rocked into and out of mesh with their racks at the proper times. This rocking or swinging movement of the accumulating pinions is under the control of the pitman 914, whose forward end is bifurcated and adapted to cooperate with the rocking frame in the usual and well known manner and whose rearward end is operatively connected with the three-armed lever 913, which is in turn rocked by the main rocking lever 813, through the medium of the wipe plate 821. For the purpose of taking a total, either a grand total or a sub-total, the usual operation of the pitman 914 is interfered with and to this end a total key is provided on the keyboard and is connected by a link with the pitman.

In the operation of printing and accumulating items the adding wheel pinions, which are normally in mesh with their racks, are swung out of mesh or engagement with their racks upon the initial movement of the operating handle or main shaft of the machine, whereupon those racks corresponding to the operated keys descend freely distances corresponding with the values represented by the operated keys. After the item has been printed and just before the racks begin their ascent upon the return movement of the operating handle or main shaft of the machine, the accumulating pinions are swung rearwardly into mesh with their racks so that upon the ascent of the latter the amount is transferred to the pinions.

In the operation of taking a total, the total key is depressed and the forward end of the pitman 914 is held in a depressed condition through the medium of the substantially vertical link 911, with the result that the accumulating pinions, instead of being swung out of mesh with their racks upon the initial movement of the operating handle or main shaft, are left in their normal position of engagement therewith, so that the racks will descend distances determined by the accumulation on said pinions and the amount of the accumulation will be printed. If the total being taken is a grand total, the total key is kept in depressed condition upon the return movement of the operating handle or main shaft, with the result that immediately before the ascent of the racks the accumulating pinions will be swung out of mesh therewith so that the racks will return to normal position without any effect upon the accumulating pinions and the latter will remain at their zero position to which they have been turned in the operation of taking

the total. If, however, a sub-total is to be taken, the total key is released and permitted to ascend at the end of the forward stroke of the operating handle, with the result that the pitman 914 will be returned to its normal position and the accumulating pinions will be left in mesh with their racks which, in their ascent, will re-transfer thereto the accumulation which had been transferred to them by the accumulating pinions.

In the usual Burroughs machine the retainers 415 are simultaneously rocked rearwardly as to their lower ends and the racks 610 thereby unlocked by a universal rod marked 209 in said Burroughs Patent No. 504,963, which rod is under the control of the total key connections. As shown in said last named Burroughs patent and as is the case in the usual Burroughs machine, the total key 265 is connected with a bell crank 227, which is secured to a transverse rock shaft 204 carrying at the other or right hand side of the machine a depending arm somewhat similar to the bell crank 227. This bell crank 227 and the similar arm on the other side of the machine are connected by parallel links 216, with the opposite ends of said universal rod 209. It will be understood that when the total key of the usual Burroughs machine is depressed the said universal rod is by that act drawn rearwardly and all of the retainers 415 from side to side of the machine are rocked in a clockwise direction to unlock their racks 610, the lower end of the retainers projecting in the path of movement of said universal rod or bail. My present invention concerns this particular construction and so modifies the same that in a "split" machine the total of the accumulations of the different sections of the machine may be printed at different times at the will of the operator, instead of being printed simultaneously.

The manner of splitting a Burroughs machine is now well known in the art, but for the purpose of a clear understanding thereof in this specification, I have, in Fig. 6, illustrated a portion of the printing mechanism of such machine which has been so modified as to cause a splitting of the machine, in the present instance at a point or along the line between the fifth and sixth denominations counting from the right hand side of the keyboard, with the result that the machine will be divided into two sections, the right hand section having, in the present instance, a capacity of five denominations and the left hand section a capacity of four denominations. However, it will be understood that the number of the denominations in the machine is optional and also that the number thereof in one or the other sections or the relative number thereof in the different sections is likewise optional. Furthermore, the machine may be "split" at a

plurality of points instead of at one point or line. In the present instance, this splitting of the machine is accomplished by omitting one of the tails *d* of one of the latches 717 which control the hammer action. In the present instance, as clearly shown in Fig. 6, it is the sixth latch from the right hand side of the keyboard which is unprovided with a tail *d*.

Before describing my improvements in detail, I will state that my invention contemplates the employment of as many universal rods or bails 209 as there are sections in the particular "split" machine and as many total keys as there are rods or bails 209, so that the series of retainers 415 may be operated in separate groups instead of all together or in unison. Furthermore, the bell crank 227 is deprived of one of its functions, that is of controlling the retainers 415, so that its only function is that of controlling the pitman 914 through the medium of the link 911. In the present instance, in which the split machine is one having only two sections, I provide two special total keys and consequently two special rods or bails 209, although, as is evident, the number of these total keys and bails depends upon the particular number of sections into which the machine is split.

Referring now to the present embodiment of my invention, the usual bell crank 227^L instead of being directly connected with a total key, is an ordinary bell crank whose depending arm which has heretofore been connected with the universal rod or bail 209 is simply of sufficient length to form an attachment for the spring *x* and whose other arm is operatively connected in the usual manner with the link 911. Instead of having a single universal rod extending from side to side of the machine and controlling all of the retainers 415 in unison, I provide two separate and independently operable universal rods marked 209 and 209^a, as clearly indicated in Fig. 3. The rod 209 is connected by means of the parallel links or arms 216 with a swinging bail A, whose parallel arms *a* are hung upon the usual transverse rod or shaft 204. As shown in Fig. 3, the left hand arm *a* is made in the form of a bell crank whose upper arm extends forwardly and thence upwardly through the keyboard and terminates in a special total key A¹ which is hereinafter referred to and also marked in the drawing as the "Left total", inasmuch as it is employed in the taking of a total or accumulation of the left hand section of the machine. This bell crank is provided at its forward end with a projecting pin or stud *a*¹ which projects to the left and intersects the plane of movement of the bell crank 227^L. It is evident that when the left total key A¹ is depressed the bell crank 227^L will be rocked in a clockwise direction

and the pitman 914 put in the proper position for the taking of a total and that at the same time the bail A will also be rocked in a clockwise direction and the universal rod 209 moved rearwardly, with the result that the retainers 415 belonging to the left hand section of the machine will be swung to inoperative position. Thus, the racks 610 belonging to such left hand section of the machine are unlocked, whereas all of the racks 610 of the right hand section of the machine will remain in their locked condition. For the purpose of taking a grand total or a sub-total of the accumulation in the left hand section of the machine, the total key A¹ is operated in the same manner as the usual total key of a Burroughs machine in the taking of a grand total of a sub-total. When the total key A¹ is released the spring *x* restores its bell crank as well as the bail A to normal position.

The other universal rod 209^a is, in the present instance, of slightly greater length than the other rod, 209 inasmuch as it accommodates or operates five of the retainers 415 instead of four; as in the case of the rod 209, but the mode of operation is the same as such latter rod. As herein shown, more particularly in Fig. 3, the universal rod 209^a is operatively connected by means of the links or arms 216^a, with a swinging bail B, which is provided with the two similar parallel arms *b*, which are swung from the transverse rod or shaft 204. The lower member of the bail B extends from side to side of the machine for the purpose of affording an operating connection with a special total key B¹. This total key B¹, also marked in the drawing as the "Right total" forms a part of or is connected to the lower member of the bail B and is mounted to oscillate upon the cross shaft 204.

Intermediate the length of the upwardly extending arm of the bell crank *b*¹ which carries the total key or button B¹ is located a pin or stud *b*² which extends laterally to the left and intersects the plane of movement of the upper arm of the bell crank 227^L, with the result that when such total key or button B¹ is depressed the bell crank 227^L is rocked in a clockwise direction, for the purpose of operating the pitman 914 and placing the same in position for the taking of a total. At the same time the bail B is rocked in a clockwise direction, with the result that the universal rod 209^a is moved rearwardly and the group of five retainers 415 belonging to the right hand section of the machine are rocked to an inoperative position so as to release or unlock their corresponding racks 610. Thus, when the total key B¹ is operated the racks of the right hand section of the machine are unlocked and permitted to descend when the machine is operated, whereas the racks 610

belonging to the left hand section of the machine remain in locked condition. A grand total or a sub-total may be taken of the accumulation on the right hand section of the machine by operating the right hand total key B¹ in the same manner as the usual total key of a regular Burroughs machine is operated in the taking of such totals. In this manner and by these means I am enabled to print and list separate series or sets of items and to accumulate the separate totals at different times so that a total may be printed of the accumulation of one section of the machine without, at the same time, taking a total of the accumulation of the other section. It is obvious, however, that if it should be desired to take such totals simultaneously, the same may be accomplished by depressing both of the two special total keys A¹ and B¹ at the same time which will cause the simultaneous rocking or oscillation of the two bails A and B and the consequent lifting or unlocking of the retainers 415. My invention will be found useful for a variety of different accountant work, for instance it may be conveniently used in a wide machine split at different points where it is often desirable to print the total which is accumulated in a particular section of the machine and to then move the carriage before printing the total or totals accumulated in another section of the machine.

The spring x which is attached to the bell crank 227¹ may be made of sufficient tension to restore both of the bails and their universal rods in case either one or both of them are operated. However, if desired each bail may be provided with its own spring or springs as indicated in Figs. 1 and 3 wherein the bail B is shown as provided with light springs x' and the other bail A with a light spring x^2 .

I claim:

1. In a machine of the character described, the combination with an accumulator, setting up devices and type-carriers coöperatively related for the successive accumulation of items and the listing thereof and for the setting up of totals through turning of the accumulator to zero; of means for causing one section of the accumulator to effect the setting up of a total independently of another section of said accumulator.
2. In a machine of the character described, the combination with an accumulator, setting up devices and type-carriers coöperatively related for the successive accumulation of items and the listing thereof and for the setting up of totals through turning of the accumulator to zero; of means for causing different sections of the accumulator to effect the setting up of totals independently of each other.
3. In a machine of the character described,

the combination with an accumulator, setting up devices and type-carriers coöperatively related for the successive accumulation of items and the listing thereof and for the setting up of totals through turning of the accumulator to zero; of key-controlled means for causing different sections of the accumulator to effect the setting up of totals independently of each other.

4. In an adding machine, the combination of accumulating and printing mechanism divided in sections arranged to print and accumulate separate sets of individual items, means for independently printing the totals or accumulations of the different sections, and a series of total keys, one for each section, for controlling said means.

5. In an adding machine the combination with accumulating and printing mechanism divided in sections arranged to print and accumulate separate sets of individual items and to print separate totals, the accumulating mechanism including pinions and sets of racks corresponding with said sections, of means for permitting the operation of the racks, one set at a time, in the totaling operation.

6. In an adding machine the combination with accumulating and printing mechanism divided in sections arranged to print and accumulate separate sets of individual items and to print separate totals, the accumulating mechanism including pinions and sets of racks corresponding with said sections, of means for permitting the operation of the racks, one set at a time, in the totaling operation and special keys corresponding with the sections and arranged to be separately operable.

7. In an adding machine the combination with accumulating and printing mechanism divided in sections arranged to print and accumulate separate sets of individual items and to print separate totals, the accumulating mechanism including pinions and sets of racks corresponding with said sections, of means coöperating with the totalizing mechanism and with said racks for the independent printing of the accumulations of the different sections.

8. In an adding machine the combination with accumulating and printing mechanism divided in sections arranged to print and accumulate separate sets of individual items and to print separate totals, the accumulating mechanism including pinions and sets of racks corresponding with said sections, of key controlled means coöperating with the totalizing mechanism and with said racks for the independent printing of the accumulations of the different sections.

9. In an adding machine the combination with accumulating and printing mechanism divided in sections arranged to print and accumulate separate sets of individual items

and to print separate totals, the accumulating mechanism including pinions and sets of racks corresponding with said sections, of means cooperating with the totalizing mechanism and with said racks for the independent printing of the accumulations of the different sections and a series of total keys, one for each section, for controlling said means.

10. In an adding machine the combination with accumulating and printing mechanism divided in sections arranged to print and accumulate separate sets of individual items and to print separate totals, the accumulating mechanism including pinions and sets of racks corresponding with said sections, of devices for locking said racks in their normal position, and a separate means for controlling the devices of each set of racks to permit their operation independently of the other sets of racks.

11. In an adding machine the combination with accumulating and printing mechanism divided in sections arranged to print and accumulate separate sets of individual items and to print separate totals, the accumulating mechanism including pinions and sets of racks corresponding with said sections, of devices for locking said racks in their normal position, and a separate means for controlling the devices of each set of racks to permit their operation independently of the other sets of racks and a series of total keys, one for each said controlling means for operating the latter.

12. In an adding machine the combination with accumulating and printing mechanism divided in sections arranged to print and accumulate separate sets of individual items and to print separate totals, the accumulating mechanism including pinions and sets of racks corresponding with said sections, of devices for locking said racks in their normal position, and separate means for controlling the devices of each set of racks and each cooperating with the totalizing mechanism.

13. In an adding machine the combination with accumulating and printing mechanism divided in sections arranged to print and accumulate separate sets of individual items and to print separate totals, the accumulating mechanism including pinions and sets of racks corresponding with said sections, of a series of retainers one for each rack for locking the racks in normal position, and a plurality of universal rods corresponding in number with the sections of the machine and cooperating with the retainers to operate them separately in groups or sets.

14. In an adding machine the combination with accumulating and printing mechanism divided in sections arranged to print and accumulate separate sets of individual items and to print separate totals,

the accumulating mechanism including pinions and sets of racks corresponding with said sections, of a series of retainers one for each rack for locking the racks in normal position, a plurality of universal rods corresponding in number with the sections of the machine and cooperating with the retainers to operate them separately in groups or sets and a corresponding plurality of total keys for controlling said rods.

15. In an adding machine the combination with accumulating and printing mechanism divided in sections arranged to print and accumulate separate sets of individual items and to print separate totals, the accumulating mechanism including pinions and sets of racks corresponding with said sections, of a series of retainers one for each rack for locking the racks in normal position, a plurality of universal rods corresponding in number with the sections of the machine and cooperating with the retainers to operate them separately in groups or sets, and a corresponding plurality of total keys controlling said rods and cooperating with the totalizing mechanism.

16. In an adding machine the combination with accumulating and printing mechanism divided in sections arranged to print and accumulate separate sets of individual items and to print separate totals, the accumulating mechanism including pinions and sets of racks corresponding with said sections, of a series of retainers one for each rack for locking the racks in normal position, a plurality of universal rods one for each section of the machine and cooperating with the retainers to operate them separately in groups, and means for operating said rods independently in the operation of taking a total.

17. In an adding machine the combination with accumulating and printing mechanism divided in sections arranged to print and accumulate separate sets of individual items and to print separate totals, the accumulating mechanism including pinions and sets of racks corresponding with said sections, of a series of retainers one for each rack for locking the racks in normal position, a plurality of universal rods one for each section of the machine and cooperating with the retainers to operate them separately in groups, and key controlled means for operating said rods independently in the operation of taking a total.

18. In an adding machine the combination with accumulating and printing mechanism divided in sections arranged to print and accumulate separate sets of individual items and to print separate totals, the accumulating mechanism including pinions and sets of racks corresponding with said sections, of a series of retainers one for each rack for locking the racks in normal po-

sition, a plurality of universal rods one for each section of the machine and cooperating with the retainers to operate them separately in groups, separate bails, one for each rod, 5 for operating such rods, and means for operating said bails in the operation of taking a total.

19. In an adding machine the combination with accumulating and printing mechanism 10 divided in sections arranged to print and accumulate separate sets of individual items and to print separate totals, the accumulating mechanism including pinions and sets of racks corresponding with said sections, of a 15 series of retainers one for each rack for locking the racks in normal position, a plurality of universal rods one for each section of the machine and cooperating with the retainers to operate them separately in groups, separate bails, one for each rod, for operating 20 such rods, and separate keys operatively connected with the bails.

20. In an adding machine the combination with accumulating and printing mechanism 25 divided in sections arranged to print and accumulate separate sets of individual items and to print separate totals, the accumulating mechanism including pinions and sets of racks corresponding with said sections, of a 30 series of retainers one for each rack for locking the racks in normal position, a plurality of universal rods one for each section of the machine and cooperating with the retainers to operate them separately in groups, separate bails one for each rod, links connecting 35 the bails and their respective rods, and means for swinging the bails independently.

21. In an adding machine the combination with accumulating and printing mechanism 40 divided in sections arranged to print and accumulate separate sets of individual items and to print separate totals, the accumulating mechanism including pinions and sets of racks corresponding with said sections, of a 45 series of retainers one for each rack for locking the racks in normal position, a plurality of universal rods one for each section of the machine and cooperating with the retainers to operate them separately in groups, separate bails one for each rod, links connecting 50 the bails and their respective rods, and separate keys operatively connected with the bails respectively.

22. In an adding machine the combination 55 with accumulating and printing mechanism divided in sections arranged to print and accumulate separate sets of individual items and to print separate totals, the accumulating mechanism including pinions and sets of 60 racks corresponding with said sections, of a series of retainers one for each rack for locking the racks in normal position, a plurality of universal rods one for each section of the machine, and a plurality of total keys operatively connected, independently of each 65

other, with the totalizing mechanism and with the universal rods respectively.

23. In an adding machine the combination with accumulating and printing mechanism 70 divided in sections arranged to print and accumulate separate sets of individual items and to print separate totals, the accumulating mechanism including pinions and sets of racks corresponding with said sections, of a 75 series of retainers one for each rack for locking the racks in normal position, a plurality of universal rods one for each section of the machine, a bell crank for operating the totalizing mechanism, and a plurality of total 80 keys operatively connected, independently of each other, with the bell crank and with the universal rods respectively.

24. In an adding machine the combination with accumulating and printing mechanism 85 divided in sections arranged to print and accumulate separate sets of individual items and to print separate totals, the accumulating mechanism including pinions and sets of racks corresponding with said sections, of a 90 series of retainers one for each rack for locking the racks in normal position, a plurality of universal rods one for each section of the machine, a bell crank for operating the totalizing mechanism, and a plurality of total 95 keys operatively connected with the universal rods respectively and each provided with laterally extending pins or studs arranged to be depressed against said bell crank to swing the latter and set the totalizing mechanism 100 when any one of the total keys is operated.

25. In an adding machine the combination with accumulating and printing mechanism 105 divided in sections arranged to print and accumulate separate sets of individual items and to print separate totals, the accumulating mechanism including pinions and sets of racks corresponding with said sections, of a 110 series of retainers one for each rack for locking the racks in normal position, a plurality of universal rods one for each section of the machine, a corresponding plurality of bails 115 operatively connected with said rods, a bell crank for operating the totalizing mechanism, a plurality of total keys operatively connected with said bails respectively and each arranged, when operated, to actuate the bell 120 crank, and a spring for restoring the bell crank, keys, bails and rods to normal position after an operation.

26. In a machine of the character described, the combination with accumulating and printing mechanism, of means for taking totals independently of each other from different denominational sections of said mechanism.

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