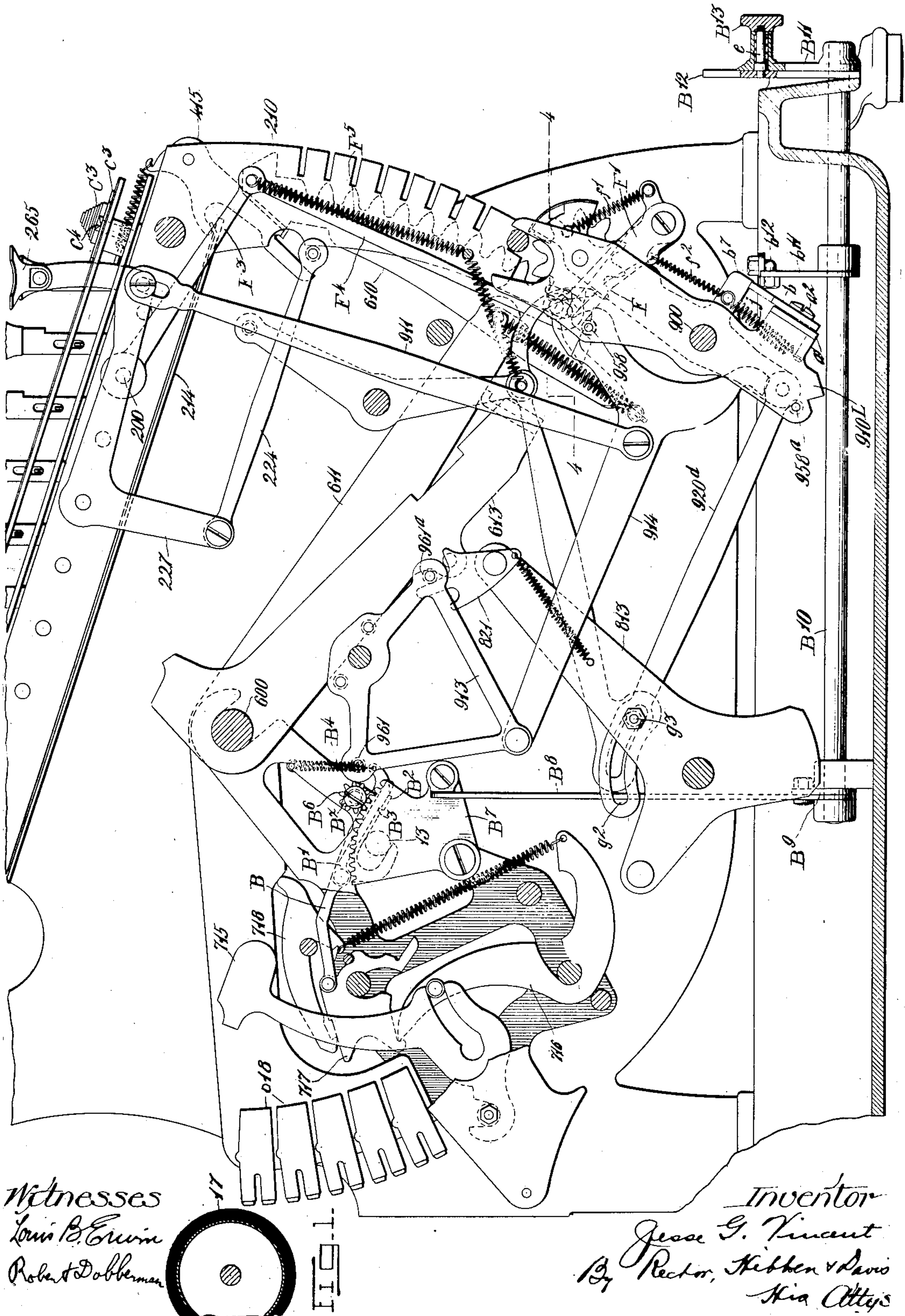


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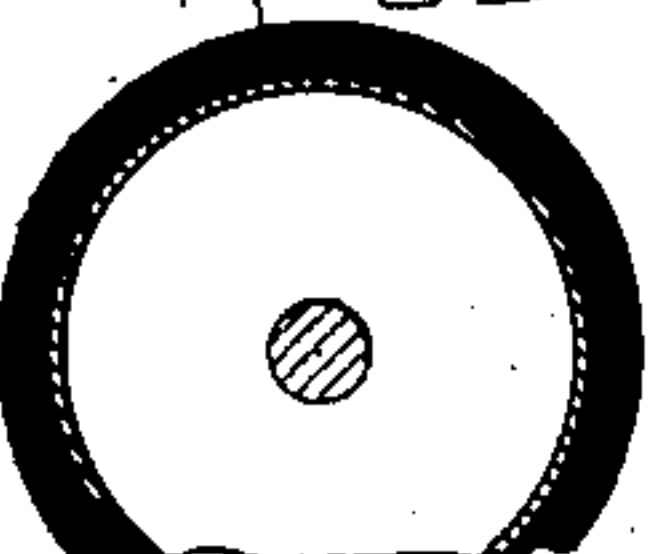
J. G. VINCENT.
 ADDING AND LISTING MACHINE.
 APPLICATION FILED SEPT. 21, 1908.

Patented July 25, 1911.

5 SHEETS—SHEET 1.



Witnesses
 Louis B. Erwin
 Robert Dobberman



FILED

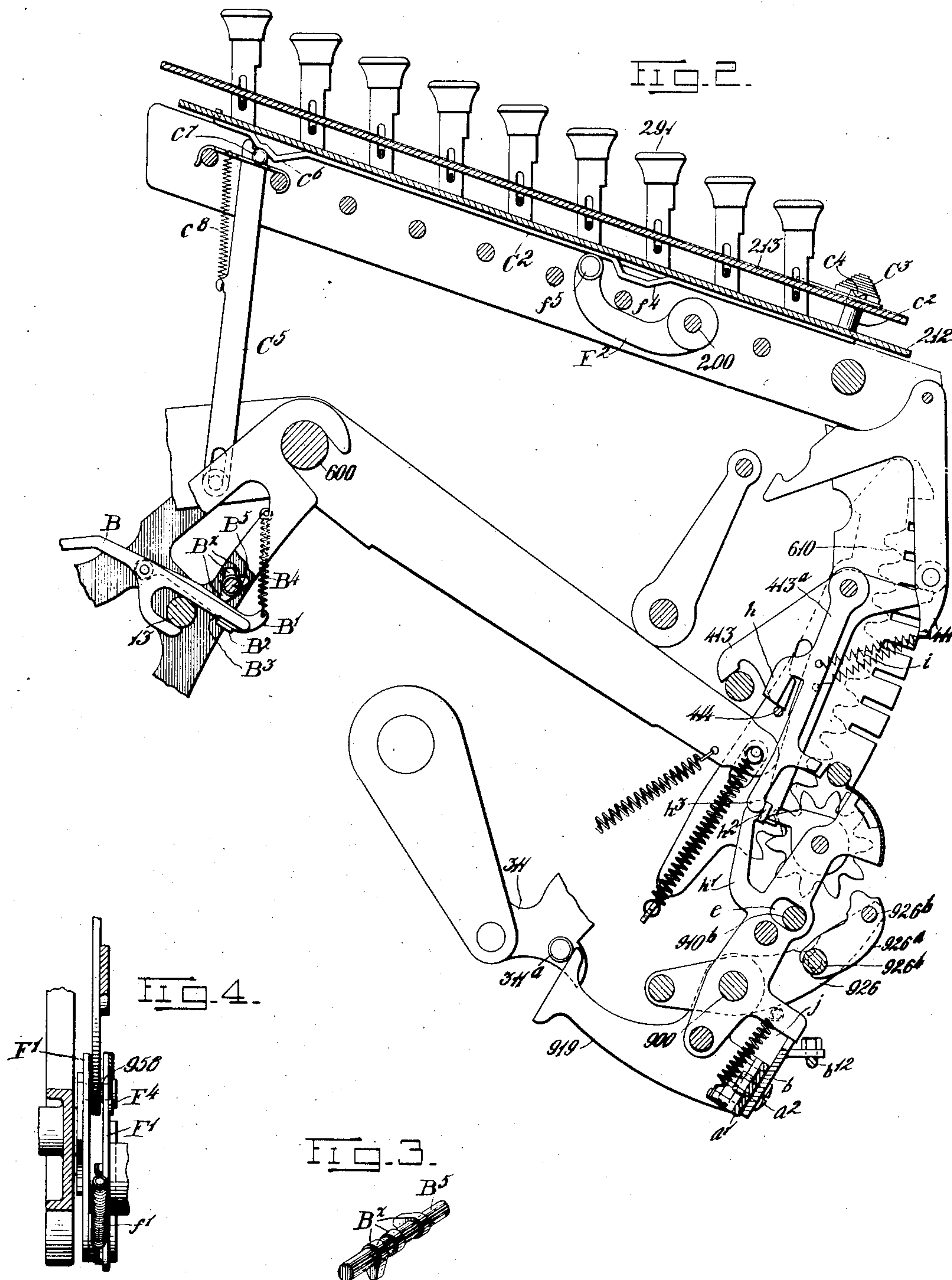
Inventor
 Jesse G. Vincent
 By Rector, Kibben & Davis
 His Attys

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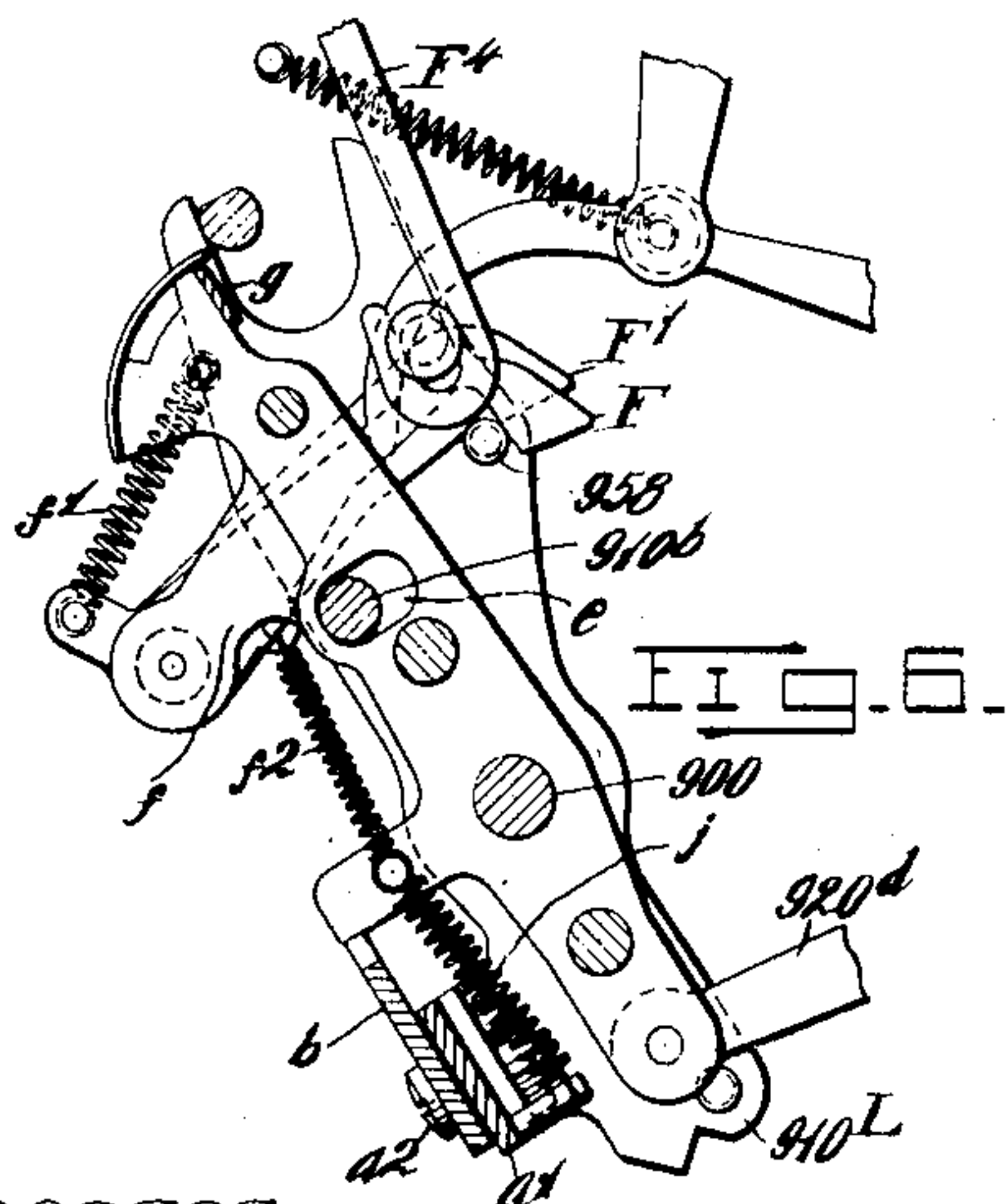
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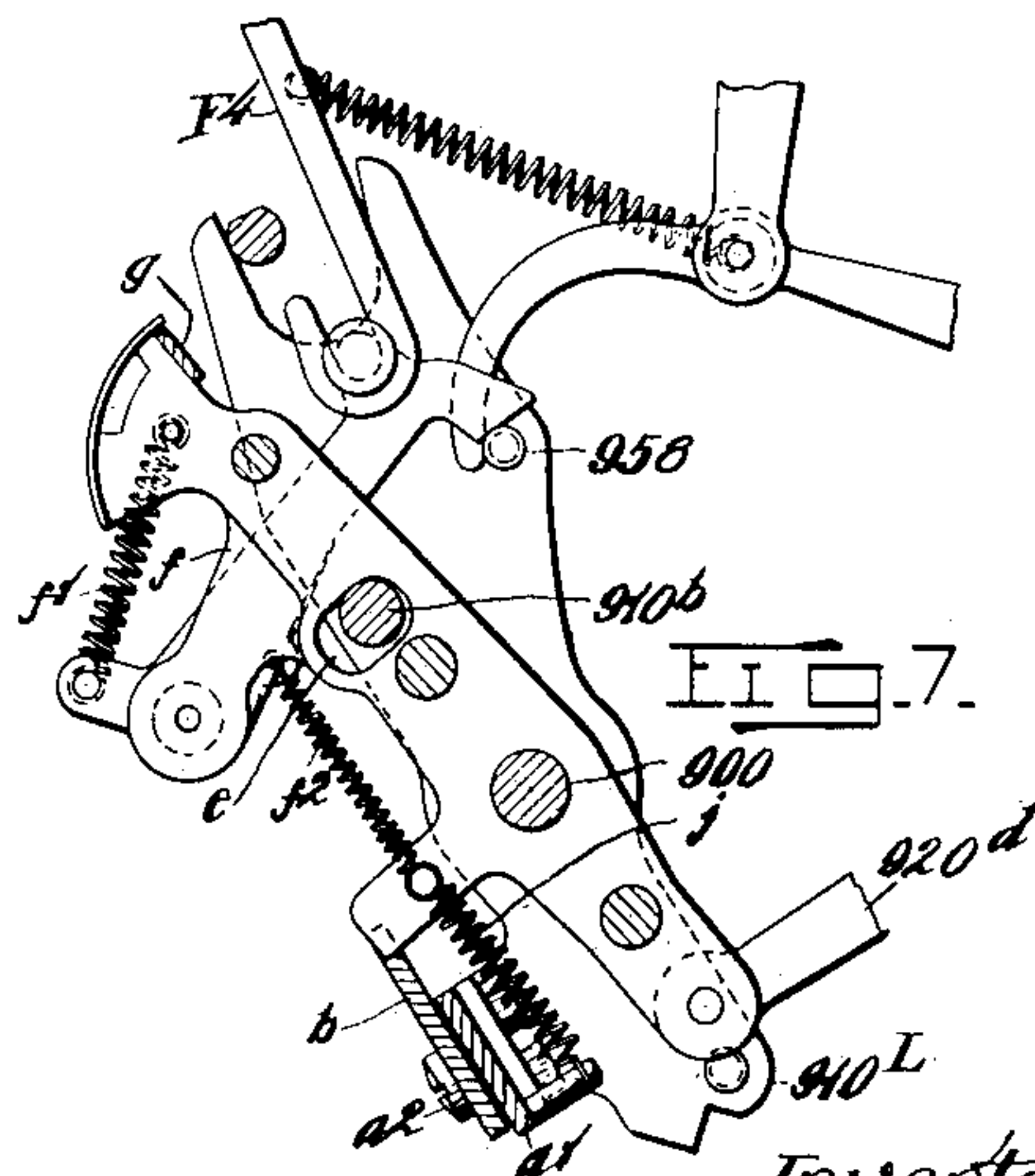
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5 SHEETS—SHEET 3.



Louis B. Ewing
Robert Dobberman



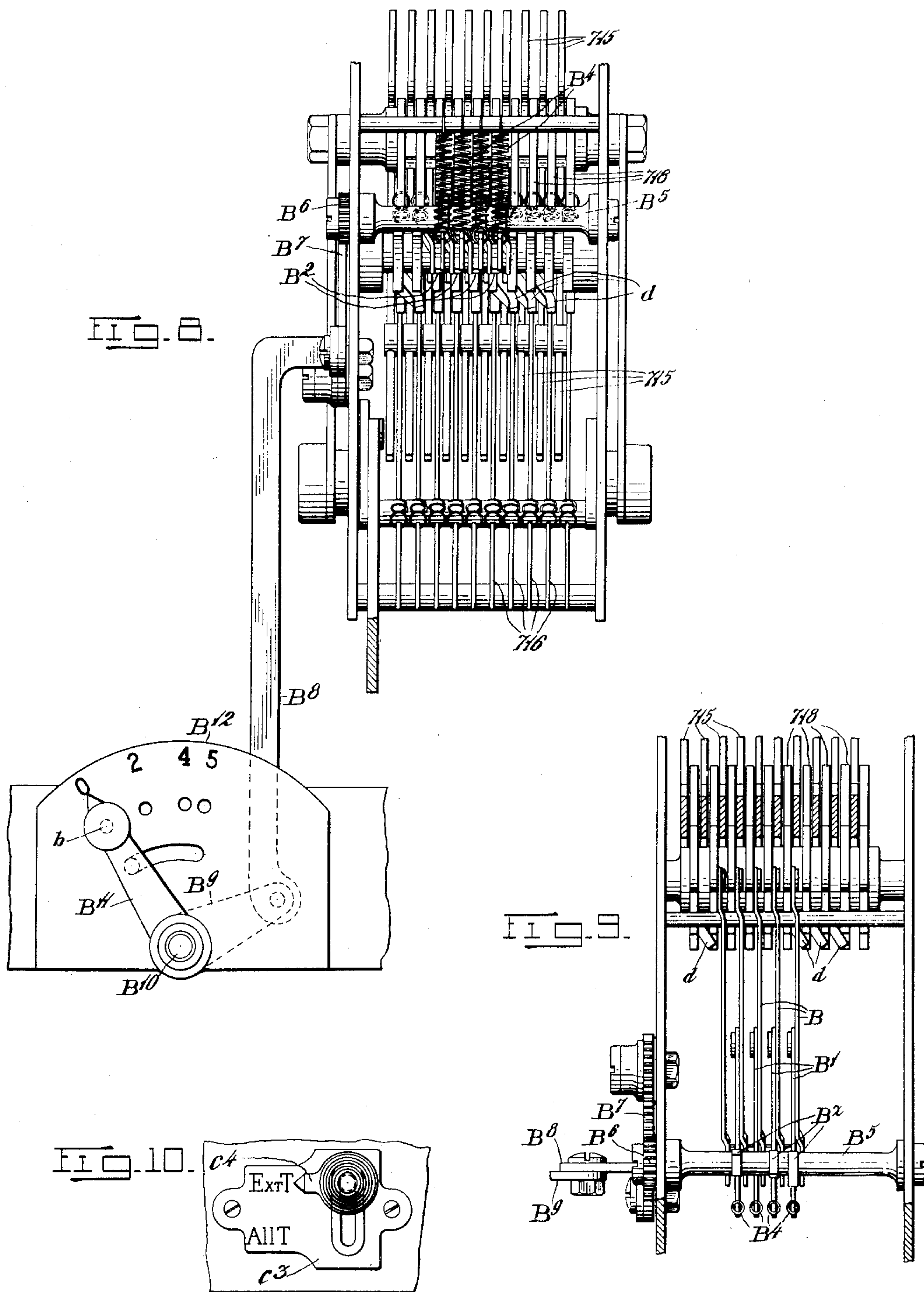
Jesse G. Vincent
 B₁ Rector, Kibben & Davis
 This Atty's

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5 SHEETS—SHEET 4.



Witnesses;
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 Robert Dobberman.

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 5 SHEETS—SHEET 5.

Fig. 11.

7 0 0, 0 0 3.3 3
 1 0 0, 0 5 5.5 5
 2 0 3, 3 3 3.3 0
 1, 0 0 3, 3 9 2.1 8 *

Fig. 12.

9 | 4, 0 5 5.0 0
 1, 0 1 | 9, 9 6 0.4 3
 3, 1 | 4 0.6 6
 2, 2 | 7, 0 0 0.9 0
 3 | .6 6
 1, 4 | 8 0 9.8 9
 8, 9 3 1, 8 6 7 5 4 *

Fig. 13.

1, 1 | 9 8, 7 6 5.4 3
 1, 2 | 9 3, 0 0 4.4 4
 1, 3 | 1, 5 5 0.0 5
 1, 4 | 2, 2 0 7.7 7
 1, 5 | 8 7, 7 0 0.4 4
 2 8 3, 2 2 8.1 3 *

Fig. 14.

1, 0 2 3, 7 9 9.9 0
 3, 0 4 0, 1 5 0.7 9
 4, 0 3 2, 2 6.8 9
 3 0 2, 3.4 4
 8, 3 9 7, 9 8 1.0 2 *

Fig. 15.

2, 0 3 0, 5 0 6.6 0
 2, 3 4 0, 9 9 0.0 9
 2, 5 5 5, 9 0 9.9 9
 5, 6 7 0, 9.9 9
 5, 3 4 0, 6 7.0 7
 7, 5 4 0, 9 9 9.9 9
 5, 6 7 0, 9 9.9 9
 6, 5 5 0, 9 9.0 9
 7, 3 4 0, 9 9.9 9
 7, 0 2 0, 9 9 9.9 9
 7, 5 7 0, 9 9.9 9
 4, 3 4 0, 7 7 7.7 0
 5, 2 2 0, 8 8 8.8 0
 6, 1 2 0, 9 9 0.9 9

7, 5 4 0.2 7 *

Fig. 15.

1, 1 0 2 2 | 3 4
 2, 0 0 4 3 | 7 0 9
 2, 4 3 4 3 | 3 4 5 5
 3, 0 2 5 5 | 1 1 1 1
 8 5 6 6 3 5 3 0 9 *

Fig. 17.

1, 2 0 0, 5 | 5 4.4 0
 2, 3 0 0, 9 | 9 9.9 9
 6, 4 0 0, 8 | 8 9.9 9
 4, 5 0 0, 9 | 9 9.9 9
 5, 4 0 0, 9 | 9 9.9 9
 3, 7 0 0, 5 | 7 0.0 6
 3, 4 0 0, 7 | 8 0.8 8
 4, 6 0 0, 8 | 9 0.9 9
 3, 3 0 0, 6 | 7 7
 2, 3 0 0, 6 | 7.0 7
 2, 2 0 0, 6 | 7 7.7 7
 5, 5 0 0, 8 | 9 9.0 8
 6, 5 0 0, 4 | 5.5 5
 2, 3 0 0, 9 | 9 0.9 9
 6 | 7 0.7 0

1, 0 3 8.2 2 *

Witnesses:

Louis B. Erwin

Robert Dobberman

Inventor

Jesse G. Vincent

By Rector, Hibben & Davis

His Attys

UNITED STATES PATENT OFFICE.

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

ADDING AND LISTING MACHINE.

998,727.

Specification of Letters Patent.

Patented July 25, 1911.

Application filed September 21, 1908. Serial No. 453,962.

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 and Listing Machines, of which the following is a specification.

In adding and listing machines of that type in which a plurality of rows of amount keys are employed and a corresponding number of registering wheels together constituting the accumulator, and a corresponding number of type carriers, it is customary to provide for so-called "splitting" of the machine, which means interrupting the cooperation between the impression-making devices whereby automatic printing of ciphers is accomplished. It is also old to provide for changing the point of split at will to vary the number of decimal places on opposite sides of the split. Thus two or more columns of imprints can be run in the same series of operations of the machine, one column representing for example dates and the other amounts opposite those dates. Or the one column may represent designating numbers as of checks or vouchers, while the other represents the amounts of such checks or vouchers. Or the one column may represent measures as for instance car loads while the other represents amounts opposite such numbers. In the latter case the totals of both columns will ordinarily be desired, whereas when the first column represents dates or mere designating numbers no total need appear as a footing of such column. As these machines are usually constructed, however, the total of the date or designating numbers would be accumulated upon the wheels corresponding with the columns of keys set apart for the date or designating number printing. The capacity of the balance of the accumulator for running up a total of amounts is under such circumstances necessarily limited more or less, according to the point of split. In other words, a total exceeding the capacity of those wheels would not be taken care of by the wheel or wheels to the left associated with the column or columns of keys used for date or designating number printing purposes because that wheel or those wheels would contain the total of the date or designating numbers. As a total of date or designating numbers

is useless, addition might just as well be dispensed with on the wheels corresponding to the rows of keys used for dates or designating numbers, and those wheels reserved for extension of the total being accumulated on the balance of the wheels.

The object of the present invention is to provide improved means for accomplishing this extending of the total whereby when the machine is operated under any one of a number of possible split adjustments for the printing of dates or other numbers not to be accumulated, the total of the amounts accumulated as a result of depression of keys in the balance of the rows and operations of the machine with such keys depressed as well as keys in the row or rows devoted to dates, may exceed the capacity of the wheels associated with the amount rows of keys, to the full capacity of the machine when operating at normal or without a split. It follows that two columns of imprints having been run off, one representing dates and the other amounts, a total of the latter can be printed, which total may run to the left below the column of dates, thus

11	9876543	
12	9300444	
13	155005	
14	220777	85
15	8770044	

28322813*

Or, in the case of designating numbers, thus

12005	54.40	
13009	99.99	
64008	89.99	
45009	99.99	95
54009	99.99	
57005	70.06	
34007	80.88	
46008	90.99	
33006	.77	10
23006	7.07	
22006	77.77	
55008	99.08	
65004	5.55	
23009	90.99	10
6	70.70	

1038.22*

In machines of the above described general type it is customary to employ reciprocal

cating racks and adding pinions engageable therewith and disengageable therefrom, and type carriers movable with the racks for setting up in type numbers and amounts
 5 corresponding with the degrees of movement imparted to the pinions by the racks. Ordinarily, when the impression devices which operate upon the type are uncoupled for producing double column work such as
 10 above referred to, the coöperative action of racks and pinions is not affected. The present invention provides for subdividing the accumulator which is made up of the series of pinions and preventing pinions of one
 15 division from being turned by racks which have advanced as a result of depression of keys to one side of a selected point of split. At the same time coöperation for transfer or carrying purposes is preserved between all
 20 of the racks and all of the pinions. Manipulative devices are provided whereby anyone of a number of points of split can be selected and at the same time an adjustment made which will cause a correspond-
 25 ing number of pinions to remain unacted upon by their racks while at the same time such pinions are available for registering any extension of the total being accumulated upon the balance of the pinions.
 30 The accompanying drawings which form part of this specification illustrate the invention as embodied in an adding and listing machine of the well known Burroughs type exemplified in William S. Burroughs's
 35 Patents No. 504,963 and No. 505,073, issued September 12, 1903, but it is to be understood that the invention is not necessarily limited to employment in this particular type of adding and listing machine.
 40 Of said drawings, Figure 1 represents in sectionalized left side elevation the major portion of the machine under normal conditions, *i. e.* prepared to list and accumulate items to the full capacity of the keyboard;
 45 Fig. 2 is a somewhat similar view taken on a section line farther to the right and showing a changed condition in which the machine is adjusted for operating with a split in the printing mechanism but without
 50 affecting the accumulating mechanism; Fig. 3 is a perspective view of a cam finger shaft for controlling the split; Fig. 4 is a section on the line 4—4 of Fig. 1; Fig. 5 is a sectionalized front elevation of a portion of the
 55 machine; Fig. 6 is a section on the line 6—6 of Fig. 5; Fig. 7 is a similar view illustrating a changed relation of parts at an intermediate stage in an operation of the machine, due to an adjustment which provides
 60 for extending the total; Fig. 8 is a sectionalized front elevation of part of the machine showing certain indexing devices and the impression mechanism; Fig. 9 is a sectionalized top plan view of part of the impres-
 65 sion mechanism; Fig. 10 is a fragmentary

top plan view of the keyboard; Figs. 11 to 17 show various examples of work performed by the machine.

Before proceeding to describe the special devices employed for carrying out the present invention, some of the usual parts of a Burroughs adding machine will be pointed out. Amount keys 291 arranged in several rows on the keyboard operate as usual when depressed to set stops guided by slots in the upright plates 210 at the front of the machine and the depression of these keys also trips the usual latches 415 through the medium of sliding strips 214, said latches releasing the racks 610. The latter are as usual mounted through slot-and-pin connections upon levers 611 loosely mounted independently of each other upon a central rock shaft 600 to which is fastened the restoring bail 613. The rear ends of the levers 611 carry the usual segmental series of type plates 618 to be driven against the roller platen 17 by hammers 715. The numeral 716 designates the usual hammer drivers, 717 the latches which normally restrain said drivers and 718 the usual pawls which trip said latches, the heels of said pawls coöperating as usual with inclined shoulders on the levers 611 so as to be disabled unless the latter move past the zero position. However, the latches 717 trip each other from left to right for the filling in of ciphers through the medium of the usual overlapping tails *d* and certain coupling devices of the following description. A group of latches beginning in the present instance with the second latch to the right and including all latches to the right up to the seventh from the left are specially constructed, the same having pivotally connected with their upper portions pitmen B, Figs. 1, 2 and 9, which are widened and bifurcated at their forward ends to embrace a rod 13 and which carry pivoted catch arms or couplers B'. The latter have laterally turned lips or flanges B² which normally engage shoulders B³ on adjacent pitmen, the engagement being enforced by springs B⁴ connecting the catch arms or couplers with a suitable fixed support. It will be seen that with this arrangement the shoulder B³ on the pitman of one latch so equipped will operate against the lip or flange B² of the pitman on the next adjacent latch to the right to displace that latch when the first mentioned latch is displaced and this action will be carried through the group of specially constructed latches. The overlapping tails are omitted on all except the last latch to the left of this group and therefore the coöperative action depends entirely upon the above described couplers. It will be seen that displacement of any one of these couplers will interrupt such coöperative action.

The means for displacing the couplers to

effect a split comprise a shaft B⁵ mounted to turn in bearings or supporting side frames of the printing mechanism, said shaft being equipped with cam fingers B^x spirally arranged on the shaft (Fig. 3). In the present instance three cam fingers are shown for displacing respectively the catch arms or couplers of the second, fourth and fifth pitmen counting from the left, thus effecting the split between the second and third, fourth and fifth or fifth and sixth latches. The shaft B⁵ carries a gear wheel B⁶ in mesh with a gear segment B⁷ pivoted on the left hand side piece of the printer frame, and this segment is connected by a lever B⁸ with a crank arm B⁹ on a rock shaft B¹⁰. The latter is journaled in suitable bearings in the base of the machine and protrudes from the front thereof where it carries an operating handle B¹¹ working over a scale plate B¹². Said plate is suitably inscribed to register with the pointer on said operating arm and the latter is equipped with a handle B¹³ having a spring pin *e*, to engage apertures in the plate. By moving the operating arm from the zero position to one or another position where its spring pin will enter an aperture of the index plate, the shaft B⁵ will be turned to displace the corresponding coupler and effect the split.

The reference numeral 910^L designates a plate somewhat similar to that ordinarily constituting the left hand side piece of a rocking frame carrying the accumulator pinions which coöperate with the racks 610. There is also a right hand plate 910^R corresponding with that usually employed and these two plates are mounted upon the pivot shaft 900 such as ordinarily employed and they are connected by a cross rod 910^b. However, according to the present invention this rocking frame does not carry a single series of pinions extending from side to side, one for each rack, and all movable together out of and into engagement with the racks. The right hand portion of the frame does carry such a series of pinions designated 916 and journaled as usual between tie plates 910 which embrace the shaft 900 and the cross rod 910^b. This group of pinions with their numbered wheels 912 operate the same as the pinions and wheels which ordinarily extend from side to side of the rocking frame in the regular Burroughs machine, such pinions being normally engaged with their racks and disengaged at the outset of an accumulating operation and reengaged for the return movement of the racks, whereas in the taking of a total the pinions remain engaged with the racks during the first part of the operation of the machine and in the case of a subtotal throughout the operation of the machine. The controlling devices employed in this connection comprise the usual total key 265 surmount-

ing a bell crank lever 227 which operates a bail 224 for displacing all of the latches 415 and to which lever the slotted upper end of a link 911 is attached, the lower end of said link being connected to the usual pitman 914, branched or forked at its forward end to engage either of two studs 958 or 958^a. The rear end of the pitman is coupled to a triangular frame 913 carrying studs 961 and 961^a adapted to be alternately acted upon by a wipe plate or pawl 821 on the upper end of a rock arm 813. The balance of the adding pinions are divided into three sections and carried by separate sub frames in the main rocking frame. The first of these sections has but a single pinion 916^a journaled between plates 910^c (Fig. 5) which are mounted to rock upon the shaft 900 and are connected by cross rods 910^d. The next of the sections comprises two pinions 916^b journaled between plates 910^e which are mounted to rock upon the shaft 900 and are connected together by cross rods 910^f. The third section also comprises two pinions 916^c, these being journaled between plates 910^g which are mounted to rock upon the shaft 900 and are connected together by cross rods 910^h. The cross rod 910^b of the main frame extends through the side plates of all of the sub-frames, these sub-frames being slotted as shown at *e* in Figs. 6 and 7 to provide for movement of the main frame independently of the sub-frames. Normally, with all of the pinions in mesh with their racks, the cross rod 910^b would be occupying the forward ends of the slots *e* and consequently when the main frame rocks forwardly all of the pinions would be disengaged from the racks, the same as though the accumulator did not have the sectional construction above described. However, one, two or three of the sub-frames may remain forward when the main frame rocks back, so that all of the pinions would not be reengaged with the racks as in the regular Burroughs machine. Normally all sections of the accumulator operate in unison, to which end the left hand sub-frame carries pivotally mounted upon a forward extension *f* of its left hand side piece a latch F drawn by a spring *f'* into engagement with the stud 958 which is made a little longer than usual. It will be obvious that the engagement of this latch over the rear side of said stud will cause the left hand sub-frame to be rocked rearward with the main frame. The right hand side piece of this sub-frame overlies a laterally turned lip or flange *g* of the left hand side piece of the adjoining sub-frame, Fig. 5, and the right hand side piece of the latter sub-frame overlies a similar lateral lip or flange *g'* of the left hand side piece of the next sub-frame. It follows that when the left hand sub-frame rocks rearwardly the other two sub-

frames must move with it. At the same time either one or both of said other two sub-frames might return with the main frame without the left hand sub-frame returning.

Means are provided for so controlling the sub-frames that one or more of the same will remain forward according to the location of the split in the printing mechanism. Forward extensions a of the opposite side pieces of the main rocking frame carrying a cross bar a' , Fig. 5, against the front of which lies a slide plate b longitudinally slotted as at b' to embrace screws a^2 secured in the bar a' . This plate projects above the bar and has a series of raised edges b^2 , b^3 and b^4 of increasing length separated by depressions b^5 and b^6 in the plate. The left side piece of the left hand rocking sub-frame has a forwardly projecting arm b^7 which normally engages the raised edge b^2 of said plate. The left side piece of the adjoining sub-frame has a forwardly projecting arm b^8 which engages the raised edge b^3 of the plate and the remaining sub-frame has an arm b^9 projecting forward from its left side piece and engaging the raised edge b^4 of the plate. These forwardly projecting arms engage the several raised edges at increasing distances from the left hand terminals of the raised edges as clearly shown in Fig. 5, the arms b^7 being nearest to the terminal. It follows that the plate may be slid to the right far enough to become disengaged from said arm b^7 without becoming disengaged from either of the arms b^8 or b^9 and further that the plate can be slid to the right far enough to become disengaged from both the arm b^7 and the arm b^8 without becoming disengaged from the arm b^9 . The extreme movement of the plate to the right will disengage it from all three arms. So long as the plate is engaged with the three arms it is obvious that the sub-frames cannot remain forward while the main frame rocks rearward, but that so far as the slide plate is concerned one, two or all three of the sub-frames may remain forward when the said plate is moved to the right. The plate is controlled by the same devices which control the split. Thus the rock shaft B^{10} carries a crank arm b^{11} which is connected by a link b^{12} with the right hand end of the slide plate. It will be obvious that when the handle B^{11} is moved the plate will be moved and the arrangement is such that the sub-frames will be released from constraint of the slide plate according to the selection of the point of split. Thus if the handle is moved to the first position, locating the split between the second and third decimal places only the left hand sub-frame will be so released, whereas if the handle is moved to the second position, locating the split between the fourth and fifth decimal places, then the next adjacent sub-frame will also

be released, and if the handle is moved to the third position, locating the split between the fifth and sixth decimal places, all three sub-frames will be released. Even so the sub-frames would continue to work as one with the main frame so long as the latch F is not displaced, from which it follows that accumulations of the different columns can be preserved whenever desired and the totals printed, as in the examples of work shown by Figs. 12, 14 and 16.

The latch F is engaged by the hook-shaped lower end of a link F^4 which at its upper end is connected to an arm F^3 (Fig. 1) secured to and projecting forward from a rock shaft 200. There is also secured to this rock shaft a rearwardly extending arm F^2 , Fig. 2, carrying a roller stud f^5 which bears against a slide strip or bar C^2 underlying the lower keyboard plate 212. This slide strip or bar has a cam rise f^4 normally just forward of the roller stud f^5 . A pin c^2 projecting from the strip up through slots in the keyboard plate 212 and 213 is surmounted by a knob C^3 and when that knob is pushed rearwardly the cam rise f^4 takes effect upon the roller stud f^5 with the result that the latch F is lifted out of engagement with the stud 958 through the connections above described. The said knob C^3 works over an index plate c^3 , Fig. 10, which is suitably slotted to accommodate the pin c^2 and suitably inscribed to guide the operator in manipulating the knob. In the present instance the plate is shown inscribed "Ext.", indicating extended total, and "AllT.", indicating totals for both columns, and the knob is formed with a pointer c^4 to register with these inscriptions. A spring F^5 connects the arm F^3 with a fixed stud, this spring thus normally holding the arm down and permitting the latch to maintain its engagement with the stud 958.

In order to operate for extending the total it is of course essential that pinions which have remained out of mesh during the rearward rocking of the main frame shall return to mesh with their racks in time to take transfer or carrying movements. It will be understood in this connection that transferring or carrying is done as in the regular Burroughs machine, the pinions having the usual transfer projections which displace pawls 413 normally engaging over studs or pins 414 on the racks and adapted when displaced to be so held by latches 411. Extra upward movement of the racks allowed by the slot and pin connections with the levers 611 produces the carrying movement of pinions, but this cannot ensue until the restoring frame 613 is raised beyond a position sufficient to restore the racks to their normal home positions, for until then the spring studs of the levers 611 are at the lower ends of the slots in the

racks. It is when the restoring frame is moved far enough to return the racks to their normal home positions and before said frame moves farther that any pinions which remained forward are rocked rearward into mesh with their racks. This is accomplished through the medium of a link 920^a, Fig. 1, which is coupled to a downward extension of the left hand side piece of the outside sub-frame, Figs. 6 and 7. The rear end of this link is curved and formed with an arc-shaped slot g^2 which is engaged by a stud g^3 on the rock arm 813. When the restoring frame reaches the position above defined said stud comes to bear against the front end of the slot and thereupon thrusts the link 920^a forward, rocking the said sub-frame and restoring its pinions to mesh with their racks, and if one or both of the other sub-frames remained forward in the accumulating operation they also will be rocked rearward by reason of the one-way connection between the sub-frames previously pointed out.

In order to prevent accidental rearward rocking of the sub-frame, spiral springs j are employed connecting the arms b^7 , b^8 , b^9 respectively with studs on the inner side of the cross bar a' .

As the extended total wheels may be out of mesh at the time the transfer pawl is tripped by the adjacent wheel of the regular set, it is necessary to provide means for preventing the transfer or carrying movement of the rack for the right-hand one of the extended total wheels, until that wheel comes into mesh with the rack. By referring to Fig. 2 it will be observed that there is swung from the same stud that supports the transfer pawl 413 another pawl 413^a having a finger h separated from its main portion a little more than the diameter of the usual stud 414 on the rack which coöperates with the regular transfer pawl. This finger h normally stands in rear of that stud as shown in Fig. 2 so that it does not obstruct the same. There is one of these auxiliary pawls for each section of extended total wheels and each pawl is drawn forward by a spring i but is normally held rearward by the associated sub-frame, the right hand side plate of which is formed with a rearwardly and upwardly projecting arm h' having a forwardly-turned upper end portion with a laterally projecting flange h^2 standing in front of the lower rounded extremity h^3 of the auxiliary transfer pawl as clearly illustrated in Fig. 2. When the sub-frame rocks forward the auxiliary transfer pawl follows it by reason of the action of the spring i and the finger h is then brought to position over the stud 414. The rocking back of the regular frame of course has no effect upon this auxiliary pawl. It continues to restrain the rack until the sub-frame rocks

back and its pinions are engaged with its racks. Then the restrained rack is released by the auxiliary pawl and the transfer may take place.

Of course it will be understood that in order to print the extended total all of the pinions must remain in engagement with their racks during the forward stroke of the operating handle. Now the springs j as well as the weight of the sub-frames and their pinions and wheels will tend to disengage these pinions from their racks as the arm 813 starts rearward, relieving the link 920^a of the restraint imposed upon it by the stud g^3 . As before explained the extended total adjustment of the knob C^3 keeps the latch F raised and it is preferable to avoid the necessity of changing the adjustment of the knob when the total is to be printed, as very likely the operator would be continuing a similar character of work. Therefore an additional latch is provided which comes into play when the total key is depressed. This latch is designated by the reference letter F' and it is pivoted on the same stud that supports the previously described latch F and furthermore it is of similar form and adapted to engage the stud 958 in a similar manner, being actuated by a spring f^2 in a direction to produce such engagement. Normally this latch is upheld so as not to engage such stud, this being effected by the contact with the latch of an edge of the upper branch of the pitman 914, which edge extends in rear of the notch of said branch which normally engages the stud 958, all as illustrated in Fig. 1. It will be obvious that upon depression of the total key and consequent lowering of the pitman the said latch F' will follow the pitman and become engaged with the rear side of said stud 958, thus preventing any of the sub-frames from rocking forward independently of the main frame.

The return of the accumulator wheels to mesh with the racks at the conclusion of a grand totaling operation is effected through the usual means employed in a Burroughs machine, the same comprising a rearwardly projecting arm 919 secured to the rock shaft 900 near its right-hand end and having a cam edge acted upon by a roller 311^a on the full stroke sector 311, all as illustrated in Fig. 2.

The usual form of locking means is employed to prevent turning of the pinions when disengaged from their racks, said locking means comprising a frame journaled on the shaft 900 and composed of side plates 926 intermediate plates 926^a, with locking noses, and cross rods 926^b. Said frame coöperates with the usual locking lever such as illustrated in Burroughs's Patent 504,963. It will be understood that whenever the accumulator wheels to the right of the split

move out of mesh with their racks the wheels to the left of the split must necessarily be moved out of mesh with their racks also and to just the same extent, by reason of the engagement of the tie-rod 910^b against the front ends of the slots *e*. Consequently the extended total pinions are locked against turning just the same as though they were mounted in the ordinary way and not in a support capable of independent movement.

Figs. 12, 14 and 16 have been before referred to as illustrating work of the machine under different split adjustments with accumulation and total printing in each column. Figs. 13, 15 and 17 show examples of work under corresponding split adjustments but without accumulation in the left hand column and with printing of extended totals for the right hand column. Whether or not the items of the left hand column are accumulated depends upon the position of the knob C³. In order to insure complete movement of that knob in either direction and to prevent its being accidentally moved, the slide-strip C² is formed with a V-shaped portion *c*⁶ engaged by a roller-stud *c*⁷ in the upper end of a bar C⁵ slidingly mounted on the frame-work and upheld by a spring *c*⁸.

What is claimed is:

1. In a machine of the class described, the combination of reciprocating racks, accumulator wheels engageable therewith and disengageable therefrom, and means for timing the engagement and disengagement of varying numbers of said wheels differently from the timing of engagement and disengagement of the correspondingly varying balance of the wheels, the greater including the lesser varying number of wheels.

2. In a machine of the class described, the combination of reciprocating racks, accumulator wheels engageable therewith and disengageable therefrom, carrying mechanism, and means for timing the engagement and disengagement of varying numbers of said wheels differently from the timing of engagement and disengagement of the balance of the wheels whereby the last-mentioned wheels may be turned varying distances by their racks while the other wheel or wheels remain disengaged except for carrying purposes.

3. In a machine of the class described, the combination of reciprocating racks, and a sectional accumulator structure comprising a main support or frame movable toward and from said racks, sub-supports or frames movable back and forth by said main support, pinions certain of which are carried by the latter and the others by the sub-supports in separate groups and means for disconnecting one or more of the sub-supports from the main support to cause one or more of said groups of pinions to remain dis-

gaged from the racks while the pinions of the main support move into engagement therewith.

4. In a machine of the class described, the combination of reciprocating racks, a sectional accumulator structure comprising a main support or frame movable toward and from said racks, sub-supports or frames movable back and forth by said main support, pinions certain of which are carried by the latter and the others by the sub-supports in separate groups, means for disconnecting one or more of the sub-supports from the main support to cause one or more of said groups of pinions to remain disengaged from the racks while the pinions of the main support move into engagement therewith; carrying mechanism between all the pinions; and means for reengaging with their racks for carrying purposes any pinions whose supports have been disconnected from the main support.

5. In a machine of the class described, the combination of reciprocating racks, a sectional accumulator structure comprising a main support or frame movable toward and from said racks, sub-supports or frames movable back and forth by said main support, pinions certain of which are carried by the latter and the others by the sub-supports in separate groups, means for disconnecting one or more of the sub-supports from the main support to cause one or more of said groups of pinions to remain disengaged from the racks while the pinions of the main support move into engagement therewith; carrying mechanism between all the pinions; means for reengaging with their racks for carrying purposes any pinions whose supports have been disconnected from the main support; and means for preventing carrying movement of the rack for whichever one of the pinions is next the pinion of highest denomination of those accumulating amounts, until the non-accumulating pinions become reengaged with their racks.

6. In a machine of the class described, the combination of reciprocating racks; and a sectional accumulator structure comprising a main support or frame mounted to rock toward and from said racks, sub-supports or frames mounted to be rocked back and forth by said main support, pinions certain of which are carried by the latter and the others by the sub-supports in separate groups, and means for disconnecting one or more of the sub-supports from the main support to cause one or more of said groups of pinions to remain disengaged from the racks while the pinions of the main support move into engagement therewith.

7. In a machine of the class described, the combination of reciprocating racks; and a sectional accumulator structure comprising

a main support or frame mounted to rock toward and from said racks, sub-supports or frames mounted to be rocked back and forth by said main support, pinions certain of which are carried by the latter and the others by the sub-supports in separate groups, means for disconnecting one or more of the sub-supports from the main support to cause one or more of said groups of pinions to remain disengaged from the racks while the pinions of the main support move into engagement therewith; carrying mechanism between all the pinions; and means for reengaging with their racks for carrying purposes any pinions whose supports have been disconnected from the main support.

8. In a machine of the class described, the combination of reciprocating racks; and a sectional accumulator structure comprising a main support or frame movable toward and from said racks, sub-supports or frames movable by said main support away from the racks with provisions for return of the main support independently of the sub-supports, an adjustable member carried by the main support and adapted to cause return of one or more of the sub-supports with the main support, and pinions some of which are carried by the latter and others by the sub-supports in separate groups.

9. In a machine of the class described, the combination of reciprocating racks; and a sectional accumulator structure comprising a main support or frame mounted to rock toward and from said racks, sub-supports or frames mounted to be rocked by said main support away from the racks with provisions for return of the main support independently of the sub-supports, an adjustable member carried by the main support and adapted to cause return of one or more of the sub-supports with the main support, and pinions some of which are carried by the latter and others by the sub-supports in separate groups.

10. In a machine of the class described, the combination of reciprocating racks; and a sectional accumulator structure comprising a main support or frame movable toward and from said racks, sub-supports or frames movable by said main support away from the racks with provisions for return of the main support independently of the sub-supports, an adjustable slide-piece on the main support and having raised edges to engage the sub-supports for returning the same with the main support, said slide-piece having terminal edges or shoulders graduated in normal distances from the points of engagement of the sub-supports with the raised edges of the slide-piece; and pinions some of which are carried by the latter and others by the sub-supports in separate groups.

11. In a machine of the class described, the combination of reciprocating racks; and a sectional accumulator structure comprising a main support or frame movable toward and from said racks, sub-supports or frames movable by said main support away from the racks with provisions for return of the main support independently of the sub-supports, the latter being interlocked to provide for return movement together, a latch on one of the sub-supports normally engaging the main support, and pinions some of which are carried by the latter and others by the sub-supports in separate groups.

12. In a machine of the class described, the combination of reciprocating racks; and a sectional accumulator structure comprising a main support or frame movable toward and from said racks, sub-supports or frames movable by said main support away from the racks with provisions for return of the main support independently of the sub-supports, the latter being interlocked to provide for return movement together, a latch on one of the sub-supports normally engaging the main support, an adjustable member carried by the main support and adapted to cause return of one or more of the sub-supports with the main support, and pinions some of which are carried by the latter and others by the sub-supports in separate groups.

13. In a machine of the class described, the combination of reciprocating racks; and a sectional accumulator structure comprising a main support or frame movable toward and from said racks, sub-supports or frames movable by said main support away from the racks with provisions for return of the main support independently of the sub-supports, the latter being interlocked to provide for return movement together, a latch on one of the sub-supports normally engaging the main support, an adjustable slide-piece on the main support and having raised edges to engage the sub-supports for returning the same with the main support, said slide piece having terminal edges or shoulders graduated in normal distances from the points of engagement of the sub-supports with the raised edges of the slide-piece; and pinions some of which are carried by the latter and others by the sub-supports in separate groups.

14. In a machine of the class described, the combination of reciprocating racks; a sectional accumulator structure comprising a main support or frame movable toward and from said racks, sub-supports or frames movable back and forth by said main support, pinions certain of which are carried by the latter and the others by the sub-supports in separate groups, means for disconnecting one or more of the sub-supports

from the main support to cause one or more of said groups of pinions to remain disengaged from the racks while the pinions of the main support move into engagement therewith, and totaling means operating to prevent disconnection of the sub-supports from the main support.

15. In a machine of the class described, the combination of reciprocating racks, a sectional accumulator structure comprising a main support or frame movable toward and from said racks, sub-supports or frames movable back and forth by said main support, pinions certain of which are carried by the latter and the others by the sub-supports in separate groups, means for disconnecting one or more of the sub-supports from the main support to cause one or more of said groups of pinions to remain disengaged from the racks while the pinions of the main support move into engagement therewith; carrying mechanism between all the pinions; means for reengaging with their racks for carrying purposes any pinions whose supports have been disconnected from the main support; and totaling means operating to prevent disconnection of the sub-supports from the main support.

16. In a machine of the class described, the combination of reciprocating racks; and a sectional accumulator structure comprising a main support or frame movable toward and from said racks, sub-supports or frames movable by said main support away from the racks with provisions for return of the main support independently of the sub-supports, an adjustable member carried by the main support and adapted to cause return of one or more of the sub-supports with the main support, pinions some of which are carried by the latter and others by the sub-supports in separate groups, and totaling means operating to prevent movement of main and sub-supports independently of each other.

17. In a machine of the class described, the combination of reciprocating racks; and a sectional accumulator structure comprising a main support or frame movable toward and from said racks, sub-supports or frames movable by said main support away from the racks with provisions for return of the main support independently of the sub-supports, the latter being interlocked to provide for return movement together, a latch for preventing movement of main and sub-supports independently of each other, totaling means bringing said latch into play, and pinions some of which are carried by the main support and others in separate groups by the sub-supports.

18. In a machine of the class described, the combination of reciprocating racks; and a sectional accumulator structure comprising a main support or frame movable toward

and from said racks, sub-supports or frames movable by said main support away from the racks with provisions for return of the main support independently of the sub-supports, the latter being interlocked to provide for return movement together, a latch for preventing movement of main and sub-supports independently of each other, totaling means bringing said latch into play, pinions some of which are carried by the main support and others in separate groups by the sub-supports, and an adjustable member carried by the main support and adapted to cause return of one or more of the sub-supports with the main support.

19. In a machine of the class described, the combination of reciprocating racks; a sectional accumulator structure comprising a main support or frame movable toward and from said racks, sub-supports or frames movable by said main support away from the racks with provisions for return of the main support independently of the sub-supports, the latter being interlocked to provide for return movement together, a latch for preventing movement of main and sub-supports independently of each other, totaling means bringing said latch into play, pinions some of which are carried by the main support and others in separate groups by the sub-supports, and an adjustable slide-piece on the main support and having raised edges to engage the sub-supports for returning the same with the main support, said slide-piece having terminal edges or shoulders graduated in normal distances from the points of engagement of the sub-supports with the raised edges of the slide-piece.

20. In a machine of the class described, the combination of reciprocating racks; and a sectional accumulator structure comprising a main support or frame movable toward and from said racks, sub-supports or frames movable by said main support away from the racks with provisions for return of the main support independently of the sub-supports, the latter being interlocked to provide for return movement together, a latch on one of the sub-supports normally engaging the main support, pinions some of which are carried by the latter and others by the sub-supports in separate groups, a second latch on said sub-support normally disengaged from the main support; and totaling means which operate to bring said latter latch into play.

21. In a machine of the class described, the combination of reciprocating racks; a sectional accumulator structure comprising a main support or frame movable toward and from said racks, sub-supports or frames movable by said main support away from the racks with provisions for return of the main support independently of the sub-supports, the latter being interlocked to provide

for return movement together, a latch on one of the sub-supports normally engaging the main support, pinions some of which are carried by the latter and others by the sub-supports in separate groups, a second latch on said sub-supports normally disengaged from the main support; totaling means which operate to bring said latter latch into play, and an adjustable member carried by the main support and adapted to cause return of one or more of the sub-supports with the main support.

22. In a machine of the class described, the combination of reciprocating racks; a sectional accumulator structure comprising a main support or frame movable toward and from said racks, sub-supports or frames movable by said main support away from the racks with provisions for return of the main support independently of the sub-supports, the latter being interlocked to provide for return movement together, a latch on one of the sub-supports normally engaging the main support, pinions some of which are carried by the latter and others by the sub-supports in separate groups, a second latch on said sub-support normally disengaged from the main support; totaling means which operate to bring said latter latch into play, an adjustable member carried by the main support and adapted to cause return of one or more of the sub-supports with the main support, and an adjustable slide-piece on the main support and having raised edges to engage the sub-supports for returning the same with the main support, said slide-piece having terminal edges or shoulders graduated in normal distances from the points of engagement of the sub-supports with the raised edges of the slide-piece.

23. In a machine of the class described, the combination of printing mechanism adapted to be split at different points, accumulating mechanism of sectional construction to correspond with the points of split of the printing mechanism, and means for establishing the split at any one of said points and discontinuing cooperative action between the printing mechanism to one side of such point and a corresponding portion of the accumulating mechanism while permitting transfer actuation of such portion of the accumulating mechanism.

24. In a machine of the class described, the combination of plural printing means whose component units are cooperatively related for cipher-printing with provisions for discontinuing the cooperative action at one or another point, plural accumulating means whose component units are cooperatively related for carrying purposes, and which means are subdivided at points corresponding with those at which discontinuance of cooperative action between units of the printing means may be had, and con-

trolling devices for effecting such discontinuance at will at one point or another and disabling a corresponding section of the accumulating means, with provisions for preserving cooperative relationship between all units of the accumulating means for carrying purposes.

25. In a machine of the character described, the combination of reciprocating racks, keys for regulating the movements thereof, a main accumulator frame carrying adding pinions and movable to engage the same with and disengage them from said racks, type-carriers movable with the racks, impression devices to act upon the type and cooperatively related for the printing of ciphers with provisions for suspending the cooperative action at different predetermined locations, supports on the accumulator frame carrying pinions which cooperate with the racks and type-carriers to one side of such locations, said supports being capable of movement independently of the accumulator frame and independently of each other, means for controlling said supports to hold the pinions of one or more of the same out of engagement with their racks during movement of the latter in both directions while the balance of the pinions return to engagement with their racks for the return movement thereof, carrying mechanism between all the pinions, and means for engaging the pinions of the independent supports with their racks for carrying purposes.

26. In a machine of the character described, the combination of reciprocating racks, keys for regulating the movements thereof, a main accumulator frame carrying adding pinions and movable to engage the same with and disengage them from said racks, type-carriers movable with the racks, impression devices to act upon the type and cooperatively related for the printing of ciphers with provisions for suspending the cooperative action at different predetermined locations, supports on the accumulator frame carrying pinions which cooperate with the racks and type-carriers to one side of such locations, said supports being capable of movement independently of the accumulator frame and independently of each other, means for controlling said supports to hold the pinions of one or more of the same out of engagement with their racks during movement of the latter in both directions while the balance of the pinions return to engagement with their racks for the return movement thereof, carrying mechanism between all the pinions, means for engaging the pinions of the independent supports with their racks for carrying purposes, and means for varying the order of engagement and disengagement of racks and pinions to effect the taking of totals, including provisions for preventing movement of the independent

pinion supports relatively to the accumulator frame to disengage the pinions from their racks.

27. In a machine of the character described, the combination of reciprocating racks, keys for regulating the movements thereof, a rocking accumulator frame carrying adding pinions and movable to engage the same with and disengage them from said racks, type-carriers movable with the racks, impression devices to act upon the type and coöperatively related for the printing of ciphers with provisions for suspending the coöperative action at different predetermined locations, rocking supports on the accumulator frame carrying pinions which coöperate with the racks and type-carriers to one side of such locations, said supports being capable of movement independently of the accumulator frame and of each other, means for controlling said supports to hold pinions of one or more of the same out of engagement with their racks during movement of the latter in both directions while the balance of the pinions return to engagement with their racks for the return movement thereof, carrying mechanism between all the pinions, and means for engaging the pinions of the independent supports with their racks for carrying purposes.

28. In a machine of the character described, the combination of reciprocating racks, keys for regulating the movements thereof, a rocking accumulator frame carrying adding pinions and movable to engage the same with and disengage them from said racks, type-carriers movable with the racks, impression devices to act upon the type and coöperatively related for the printing of ciphers with provisions for suspending the coöperative action at different predetermined locations, rocking supports on the accumulator frame carrying pinions which coöperate with the racks and type-carriers to one side of such locations, said supports being capable of movement independently of the accumulator frame and of each other, means for controlling said supports to hold pinions of one or more of the same out of engagement with their racks during movement of the latter in both directions while the balance of the pinions return to engagement with their racks for the return movement thereof, carrying mechanism between all the pinions, means for engaging the pinions of the independent supports with their racks for carrying purposes, and means for varying the order of engagement and disengagement of racks and pinions to effect the taking of totals, including provisions for preventing movement of the independent pinion supports relatively to the accumulator frame to disengage the pinions from their racks.

29. In a machine of the character described, the combination of reciprocating

racks, keys for regulating the movements thereof, a rocking accumulator frame carrying adding pinions and movable to engage the same with and disengage them from said racks, type-carriers movable with the racks, impression devices to act upon the type and coöperatively related for the printing of ciphers with provisions for suspending the coöperative action at different predetermined locations, rocking supports on the accumulator frame carrying pinions which coöperate with the racks and type-carriers to one side of such locations, said supports being capable of movement independently of the accumulator frame, a latch for preventing movement of said supports independently of the frame, manipulative means for displacing the latch as an incident to interruption of coöperative action between impression devices, carrying mechanism between all the pinions, and means for rocking the independent pinion supports to engage their pinions with their racks for carrying purposes.

30. In a machine of the character described, the combination of reciprocating racks, keys for regulating the movements thereof, a rocking accumulator frame carrying adding pinions and movable to engage the same with and disengage them from said racks, type-carriers movable with the racks, impression devices to act upon the type and coöperatively related for the printing of ciphers with provisions for suspending the coöperative action at different predetermined locations, rocking supports on the accumulator frame carrying pinions which coöperate with the racks and type-carriers to one side of such locations, said supports being capable of movement independently of the accumulator frame and of each other in one direction, a latch pivoted on one of the said supports and spring-drawn into engagement with the frame, manipulative means for displacing the latch as an incident to interruption of coöperative action between impression devices, carrying mechanism between all the pinions, and means for rocking the independent pinion supports to engage their pinions with their racks for carrying purposes.

31. In a machine of the character described, the combination of reciprocating racks, keys for regulating the movements thereof, a rocking accumulator frame carrying adding pinions and movable to engage the same with and disengage them from said racks, type-carriers movable with the racks, impression devices to act upon the type and coöperatively related for the printing of ciphers with provisions for suspending the coöperative action at different predetermined locations, rocking supports on the accumulator frame carrying pinions which coöperate with the racks and type-carriers to

one side of such locations, said supports being capable of movement independently of the accumulator frame and of each other, means for controlling said supports to hold
 5 pinions of one or more of the same out of engagement with their racks during movement of the latter in both directions while the balance of the pinions return to engagement with their racks for the return
 10 movement thereof, carrying mechanism between all the pinions, and means for engaging the pinions of the independent supports with their racks for carrying purposes, the same comprising a link connected at one end to
 15 the supports and slotted at the other end, and a vibrating arm having a stud occupying the slot of the link.

32. In a machine of the character described, the combination of reciprocating
 20 racks, keys for regulating the movements thereof, a main accumulator frame carrying adding pinions and movable to engage the same with and disengage them from
 25 said racks, type-carriers movable with the racks, impression devices to act upon the type and coöperatively related for the printing of ciphers with provisions for suspending the coöperative action at different
 30 predetermined locations, supports on the accumulator frame carrying pinions which coöperate with the racks and type-carriers to one side of such locations, said supports being
 35 capable of movement independently of the accumulator frame and of each other, means for controlling said supports to hold the pinions of one or more of the same out
 40 of engagement with their racks during movement of the latter in both directions while the balance of the pinions return to engagement with their racks for the return
 45 movement thereof, carrying mechanism between all the pinions, means for reengaging with their racks for carrying purposes the pinions of the independent support or sup-
 50 ports after such pinions have been held out of engagement during return of racks, and means for preventing carrying movement of the rack for the first of said latter pinions
 55 while the same is disengaged from the rack.

33. In a machine of the character described, the combination of reciprocating
 60 racks, keys for regulating the movements thereof, a rocking accumulator frame carrying adding pinions and movable to engage the same with and disengage them from
 65 said racks, type-carriers movable with the racks, impression devices to act upon the type and coöperatively related for the printing of ciphers with provisions for suspending
 70 the coöperative action at different predetermined locations, rocking supports on the accumulator frame carrying pinions which coöperate with the racks and type-carriers
 75 to one side of such locations, said supports being capable of movement independently

of the accumulator frame and of each other, means for controlling said supports to hold
 80 the pinions of one or more of the same out of engagement with their racks during movement of the latter in both directions while the balance of the pinions return to
 85 engagement with their racks for the return movement thereof, carrying mechanism between all the pinions, means for engaging with their racks for carrying purposes the
 90 pinions of the independent support or supports after such pinions have been held out of engagement during return of racks, and means for preventing carrying movement of
 95 the rack for the first of said latter pinions while the same is disengaged from the rack comprising a pawl spring-drawn to position for obstructing the rack but normally
 100 restrained by engagement with the rocking support.

34. In a machine of the character described, the combination of reciprocating
 105 racks, keys for regulating the movements thereof, a rocking accumulating frame carrying adding pinions and movable to engage the same with and disengage them from said
 110 racks, type-carriers movable with the racks, impression devices to act upon the type and coöperatively related for the printing of ciphers with provisions for suspending the
 115 coöperative action at different predetermined locations, rocking supports on the accumulator frame carrying pinions which coöperate with the racks and type-carriers to
 120 one side of such locations, said supports being capable of movement independently of the accumulator frame and of each other, means for controlling said supports to hold
 125 the pinions of one or more of the same out of engagement with their racks during movement of the latter in both directions while the balance of the pinions return to
 130 engagement with their racks for the return movement thereof, carrying mechanism between all the pinions, means for reengaging with their racks for carrying purposes the
 135 pinions of the independent support or supports after such pinions have been held out of engagement during return of racks, and means for varying the order of engagement
 140 and disengagement of racks and pinions to effect the taking of totals, including provisions for preventing movement of the independent pinion supports relatively to the
 145 accumulator frame to disengage the pinions from their racks, said provisions including a normally displaced spring-drawn latch on one of the rocking pinion supports adapted
 150 when released to engage the rocking accumulator frame.

35. In a machine of the character described, the combination of reciprocating
 155 racks, keys for regulating the movements thereof, a rocking accumulator frame carrying adding pinions and movable to en-

gage the same with and disengage them from said racks, type-carriers movable with the racks, impression of the accumulator frame and of each other, a latch for preventing movement of said supports independently of the frame, manipulative means for displacing the latch as an incident to interruption of cooperative action between impression devices, carrying mechanism between all the pinions, means for rocking the independent pinion supports to engage their pinions with their racks for carrying purposes, and means for varying the order of engagement and disengagement of racks and pinions to effect the taking of totals, including provisions for preventing movement of the independent pinion supports relatively to the accumulator frame to disengage the pinions from their racks, said provisions including a normally displaced spring-drawn latch on one of the rocking pinion supports adapted when released to engage the rocking accumulator frame.

36. In a machine of the character described, the combination of reciprocating racks, keys for regulating the movements thereof, a rocking accumulator frame carrying adding pinions and movable to engage the same with and disengage them from said racks, type-carriers movable with the racks, impression devices to act upon the type and co-operatively related for the printing of ciphers with provisions for suspending the cooperative action at different predetermined locations, rocking supports on the accumulator frame carrying pinions which cooperate with the racks and type-carriers to one side of such locations, said supports being capable of movement independently of the accumulator frame and of each other, a latch for preventing movement of said supports independently of the frame, manipulative means for displacing the latch as an incident to interruption of cooperative action between impression devices, carrying mechanism between all the pinions, means for rocking the independent pinion supports to engage their pinions with their racks for carrying purposes, and means for varying the order devices to act upon the type and co-operatively related for the printing of ciphers with provisions for suspending the cooperative action at different predetermined locations, rocking supports on the accumulator frame carrying pinions which cooperate with the racks and type-carriers to one side of such locations, said supports being capable of movement independently of the accumulator frame and of each other, means for controlling said supports to hold the pinions of one or more of the same out of engagement with their racks during movement of the latter in both directions while the balance of the pinions return to engagement with their racks for the return

movement thereof, carrying mechanism between all the pinions, means for reengaging with their racks for carrying purposes the pinions of the independent support or supports after such pinions have been held out of engagement during return of racks, means for varying the order of engagement and disengagement of racks and pinions to effect the taking of totals, said means including a transversely shiftable pitman, and a spring-drawn latch on one of the rocking pinion-supports adapted to engage the rocking accumulator frame but normally restrained by said pitman.

37. In a machine of the character described, the combination of reciprocating racks, keys for regulating the movements thereof, a rocking accumulator frame carrying adding pinions and movable to engage the same with and disengage them from said racks, type-carriers movable with the racks, impression devices to act upon the type and co-operatively related for the printing of ciphers with provisions for suspending the cooperative action at different predetermined locations, rocking supports on the accumulator frame carrying pinions which cooperate with the racks and type-carriers to one side of such location, said supports being capable of movement independently of engagement and disengagement of racks and pinions to effect the taking of totals, said means including a transversely shiftable pitman, and a spring-drawn latch on one of the rocking pinion supports adapted to engage the rocking accumulator frame but normally restrained by said pitman.

38. In a machine of the character described, the combination of reciprocating racks, keys for regulating the movements thereof, a rocking accumulator frame carrying adding pinions and movable to engage the same with and disengage them from said racks, type-carriers movable with the racks, impression devices to act upon the type and co-operatively related for the printing of ciphers with provisions for suspending the cooperative action at different predetermined locations, rocking supports on the accumulator frame carrying pinions which cooperate with the racks and type-carriers to one side of such location, said supports being capable of movement independently of the accumulator frame and of each other, a latch pivoted on one of the said supports and spring-drawn into engagement with the frame, manipulative means for displacing the latch as an incident to interruption of cooperative action between impression devices, carrying mechanism between all the pinions, means for rocking the independent pinion supports to engage their pinions with their racks for carrying purposes, means for varying the order of engagement and disengagement of racks and pinions,

and a second latch pivoted on the same rocking support or the first mentioned latch and spring-drawn into engagement with the accumulator frame, said second latch being
5 controlled by said last-mentioned means.

39. In a machine of the character described, the combination of reciprocating racks, means for determining the extent of movement thereof, a rocking frame, pinions
10 carried thereby for actuation by certain of said racks, means for rocking the frame to move the pinions into and out of engagement with the racks, rocking frames
15 mounted concentrically with the first-mentioned frame, one or more pinions carried by each of said concentrically mounted frames for engagement with the balance of the reciprocating racks, means for preventing
20 the return of pinions of one or more of the said frames to mesh with their racks when the balance of the pinions return to mesh with their racks, means for returning to mesh with their racks after the same have
25 prevented from initially reengaging the racks, and carrying mechanism for imparting extra movement to the racks beyond their home position.

40. In a machine of the character described, the combination of reciprocating carriers tending to move in one direction, a reciprocating restoring frame normally restraining said carriers, racks mounted on
30 the latter with provisions for independent movement in the restoring direction and spring-drawn in that direction, pawls normally obstructing the racks, pinions for engaging the latter having projections to trip
35 the pawls, means for holding the pawls tripped, a rocking frame carrying certain of the pinions, means for rocking said frame to effect disengagement and reengagement of
40 said pinions with their racks, rocking frames carrying the balance of the pinions and movable by the first rocking frame to disengage those pinions from their racks, a
45 latch connecting the rocking frames whereby all the pinions may be returned simultaneously to mesh with their respective racks, said latch being displaceable to provide
50 for the pinions of one or more of the second frames remaining disengaged from their racks when the other pinions mentioned return to engagement with their own
55 racks, and means for rocking such second-mentioned frame or frames to reengage their pinions with their racks after the latter have been carried home by the restoring frame.

41. In a machine of the character described, the combination of reciprocating carriers tending to move in one direction, a reciprocating restoring frame normally restraining said carriers, racks mounted on
60 the latter with provisions for independent

movement in the restoring direction and spring-drawn in that direction, pawls normally obstructing the racks, pinions for engaging the latter having projections to trip
70 the pawls, means for holding the pawls tripped, a rocking frame carrying certain of the pinions, means for rocking said frame to effect disengagement and reengagement of said pinions with their racks, rocking
75 frames carrying the balance of the pinions and movable by the first rocking frame to disengage those pinions from their racks, a latch connecting the rocking frames whereby all the pinions may be returned simultaneously to mesh with their respective
80 racks, said latch being displaceable to provide for the pinions of one or more of the second frames remaining disengaged from their racks when the other pinions mentioned return to engagement with their own
85 racks, means for rocking such second-mentioned frame or frames to reengage their pinions with their racks after the latter have been carried home by the restoring frame, and auxiliary pawls adapted to obstruct
90 the racks of the right-hand pinions of the second frames when one or more of the same are unlatched from the first frame and the pinions of the latter alone engage their racks, said pawls being moved from obstructing
95 position by the action of the second mentioned frames when operated upon by the aforesaid rocking means.

42. In a machine of the character described, the combination of reciprocating
100 racks, keys for regulating the movements thereof, a main accumulator frame carrying adding pinions and movable to engage the same with and disengage them from said racks, type-carriers movable with the racks,
105 impression devices to act upon the type and cooperatively related for the printing of ciphers with provisions for suspending the cooperative action at different predetermined locations, supports on the accumulator
110 frame carrying pinions which cooperate with the racks and type-carriers to one side of such locations, said supports being capable of movement independently of the accumulator frame, and interlocked for such
115 movement collectively in a direction to engage their pinions with the racks, means for causing one or more of said supports to move with the frame in that direction, carrying mechanism between all the pinions,
120 and means for imparting the independent movement to a support or supports to reengage their pinions with the racks for carrying purposes.

43. In a machine of the character described, the combination of reciprocating
125 racks, keys for regulating the movements thereof, a rocking accumulator frame carrying adding pinions and movable to engage the same with and disengage them from
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said racks, type-carriers movable with the racks, impression devices to act upon the type and coöperatively related for the printing of ciphers with provisions for suspending the coöperative action at different predetermined locations, rocking supports on the accumulator frame carrying pinions which coöperate with the racks and type-carriers to one side of such locations, said supports being capable of movement independently of the accumulator frame, a slide-piece on the frame having raised edges engaging the rocking supports respectively to move them with the frame in that direction, said slide-piece having graduated terminal edges or shoulders to provide for return movement of the frame independently of one or more of the supports, and means for then independently imparting return movement to such support or supports.

44. In a machine of the character described, the combination of reciprocating racks, keys for regulating the movements thereof, a rocking accumulator frame carrying adding pinions and movable to engage the same with and disengage them from said racks, type-carriers movable with the racks, impression devices to act upon the type and coöperatively related for the printing of ciphers with provisions for suspending the coöperative action at different predetermined locations, rocking supports on the accumulator frame carrying pinions which coöperate with the racks and type-carriers to one side of such locations, said supports being capable of movement independently of the accumulator frame, a slide-piece on the frame having raised edges engaging the rocking supports respectively to move them with the frame in that direction, said slide-piece having graduated terminal edges or shoulders to provide for return

movement of the frame independently of one or more of the supports, manipulative means for determining the point of discontinuance of coöperative action between impression devices and correspondingly adjusting said slide piece, and means for imparting return movement to the support or supports from which said slide piece is disengaged by manipulation of such means.

45. In a machine of the character described, the combination of reciprocating racks, keys for regulating the movements thereof, a rocking accumulator frame carrying adding pinions and movable to engage the same with and disengage them from said racks, type-carriers movable with the racks, impression devices to act upon the type and coöperatively related for the printing of ciphers with provisions for suspending the coöperative action at different predetermined locations, rocking supports on the accumulator frame carrying pinions which coöperate with the racks and type-carriers to one side of such locations, said supports being capable of movement independently of the accumulator frame, a slide-piece on the frame having raised edges engaging the rocking supports respectively to move them with the frame in that direction, said slide-piece having graduated terminal edges or shoulders to provide for return movement of the frame independently of one or more of the supports, a rock shaft and connections for locating the point of discontinuance of coöperative action between impression devices, said rock shaft being operatively connected with said slide-piece and equipped for manipulation.

JESSE G. VINCENT.

Witnesses:

WM. J. KILPATRICK,
R. S. MIELERT.

It is hereby certified that in Letters Patent No. 998,727, granted July 25, 1911, upon the application of Jesse G. Vincent, of Detroit, Michigan, for an improvement in "Adding and Listing Machines" an error appears in the printed specification requiring correction as follows: Page 11, line 126, and page 12, lines 1-103, strike out the claims numbered 35, 36, and 37, and insert the following claims instead:

35. In a machine of the character described, the combination of reciprocating racks, keys for regulating the movements thereof, a rocking accumulator frame carrying adding pinions and movable to engage the same with and disengage them from said racks, type-carriers movable with the racks, impression devices to act upon the type and coöperatively related for the printing of ciphers with provisions for suspending the coöperative action at different predetermined locations, rocking supports on the accumulator frame carrying pinions which coöperate with the racks and type-carriers to one side of such locations, said supports being capable of movement independently of the accumulator frame and of each other, means for controlling said supports to hold the pinions of one or more of the same out of engagement with their racks during movement of the latter in both directions while the balance of the pinions return to engagement with their racks for the return movement thereof, carrying mechanism between all the pinions, means for reengaging with their racks for carrying purposes the pinions of the independent support or supports after such pinions have been held out of engagement during return of racks, means for varying the order of engagement and disengagement of racks and pinions to effect the taking of totals, said means including a transversely shiftable pitman, and a spring-drawn latch on one of the rocking pinion-supports adapted to engage the rocking accumulator frame but normally restrained by said pitman.

36. In a machine of the character described, the combination of reciprocating racks, keys for regulating the movements thereof, a rocking accumulator frame carrying adding pinions and movable to engage the same with and disengage them from said racks, type-carriers movable with the racks, impression devices to act upon the type and coöperatively related for the printing of ciphers with provisions for suspending the coöperative action at different predetermined locations, rocking supports on the accumulator frame carrying pinions which coöperate with the racks and type-carriers to one side of such location, said supports being capable of movement independently of the accumulator frame and of each other, a latch for preventing movement of said supports independently of the frame, manipulative means for displacing the latch as an incident to interruption of coöperative action between impression devices, carrying mechanism between all the pinions, means for rocking the independent pinion supports to engage their pinions with their racks for carrying purposes, and means for varying the order of engagement and disengagement of racks and pinions to effect the taking of totals, including provisions for preventing movement of the independent pinion supports relatively to the accumulator frame to disengage the pinions from their racks, said provisions including a normally displaced spring-drawn latch on one of the rocking pinion supports adapted when released to engage the rocking accumulator frame.

37. In a machine of the character described, the combination of reciprocating racks, keys for regulating the movements thereof, a rocking accumulator frame carrying adding pinions and movable to engage the same with and disengage them from said racks, type-carriers movable with the racks, impression devices to act upon the type and coöperatively related for the printing of ciphers with provisions for suspending the coöperative action at different predetermined locations, rocking supports on the accumulator frame carrying pinions which coöperate with the racks and type-carriers to one side of such locations, said supports being capable of movement independently of the accumulator frame and of each other, a latch for preventing movement of said supports independently of the frame, manipulative means for displacing the latch as an incident to interruption of cooperative action between impression devices, carrying mechanism between all the pinions, means for rocking the independent pinion supports to engage their pinions with their racks for carrying purposes, and means for varying the order of engagement and disengagement of racks and pinions to effect the taking of totals, said means including a transversely shiftable pitman, and a spring-drawn latch on one of the rocking pinion supports adapted to engage the rocking accumulator frame but normally restrained by said pitman. And that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 26th day of September, A. D., 1911.

[SEAL.]

E. B. MOORE,
Commissioner of Patents.