

J. G. VINCENT & R. E. BENNER.

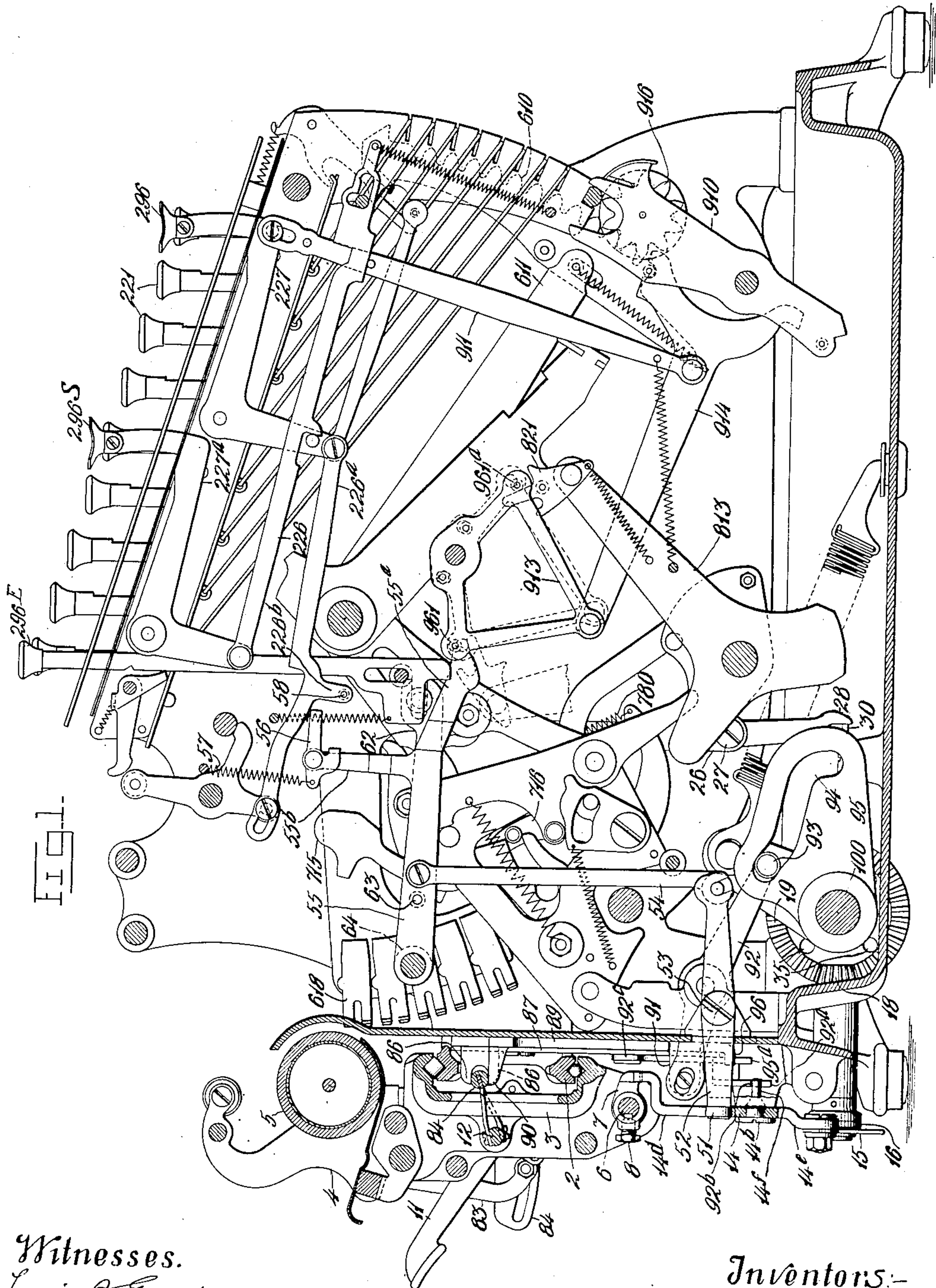
ADDING AND LISTING MACHINE.

APPLICATION FILED FEB. 23, 1909.

924,118.

Patented June 8, 1909.

4 SHEETS—SHEET 1.



Witnesses.
Louis B. Erwin
Robert Dobberman

Inventors:
Jesse G. Vincent
Russell E. Benner
by Reuben Hibbard & Co., Attys.

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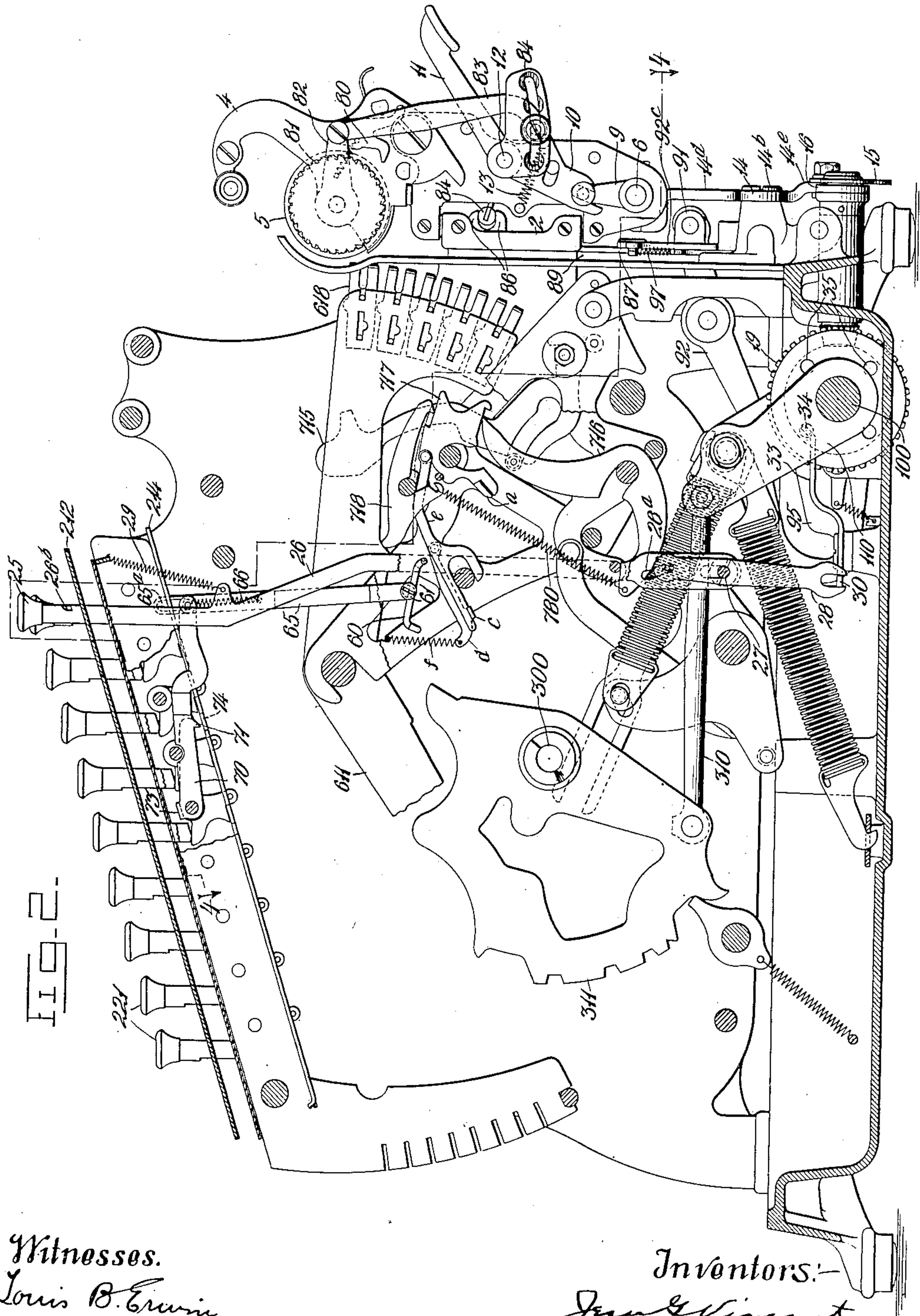


FIG. 2.

Witnesses.
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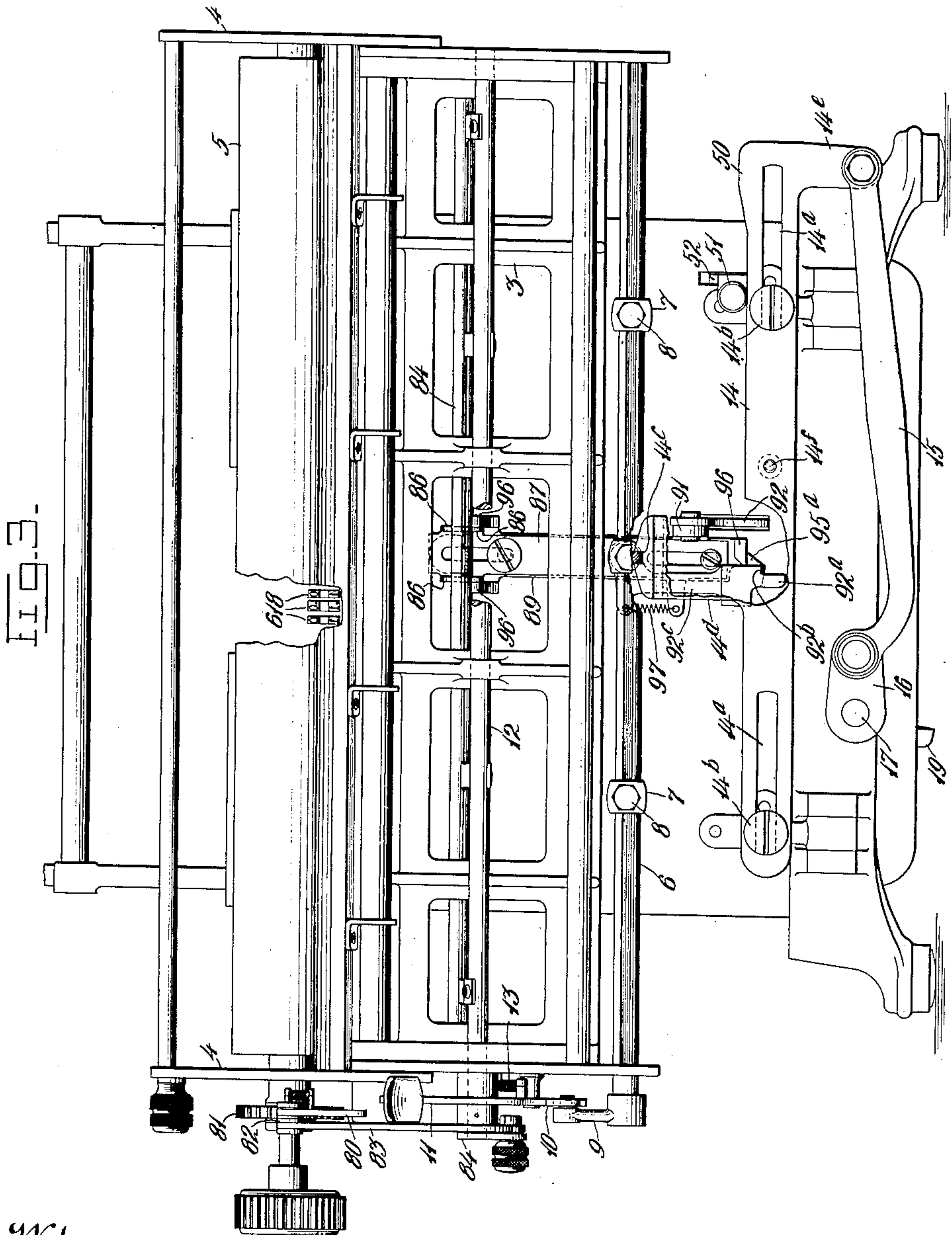
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4 SHEETS—SHEET 3.



Witnesses.

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J. G. VINCENT & R. E. BENNER.

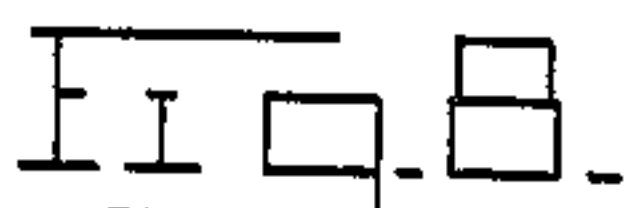
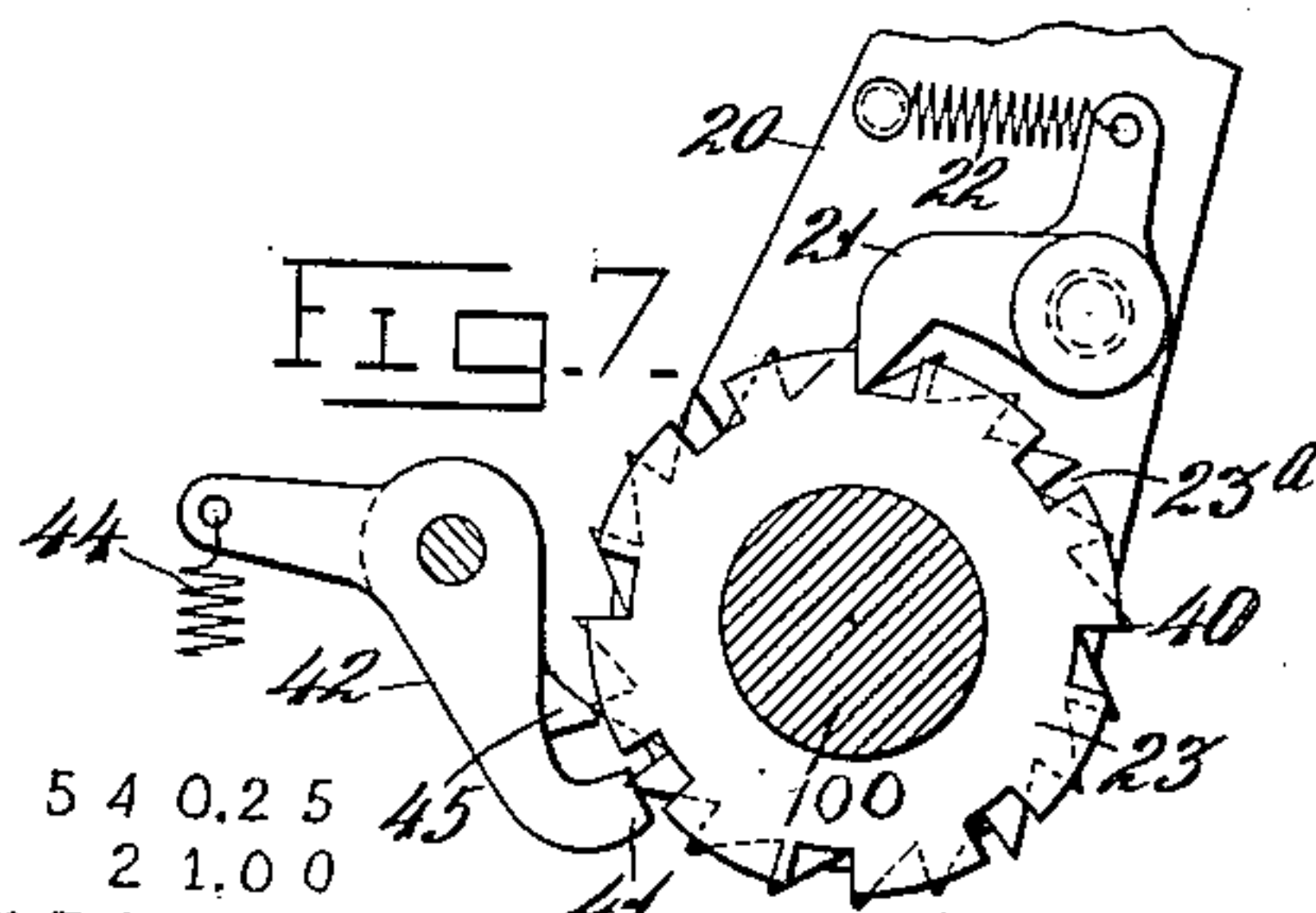
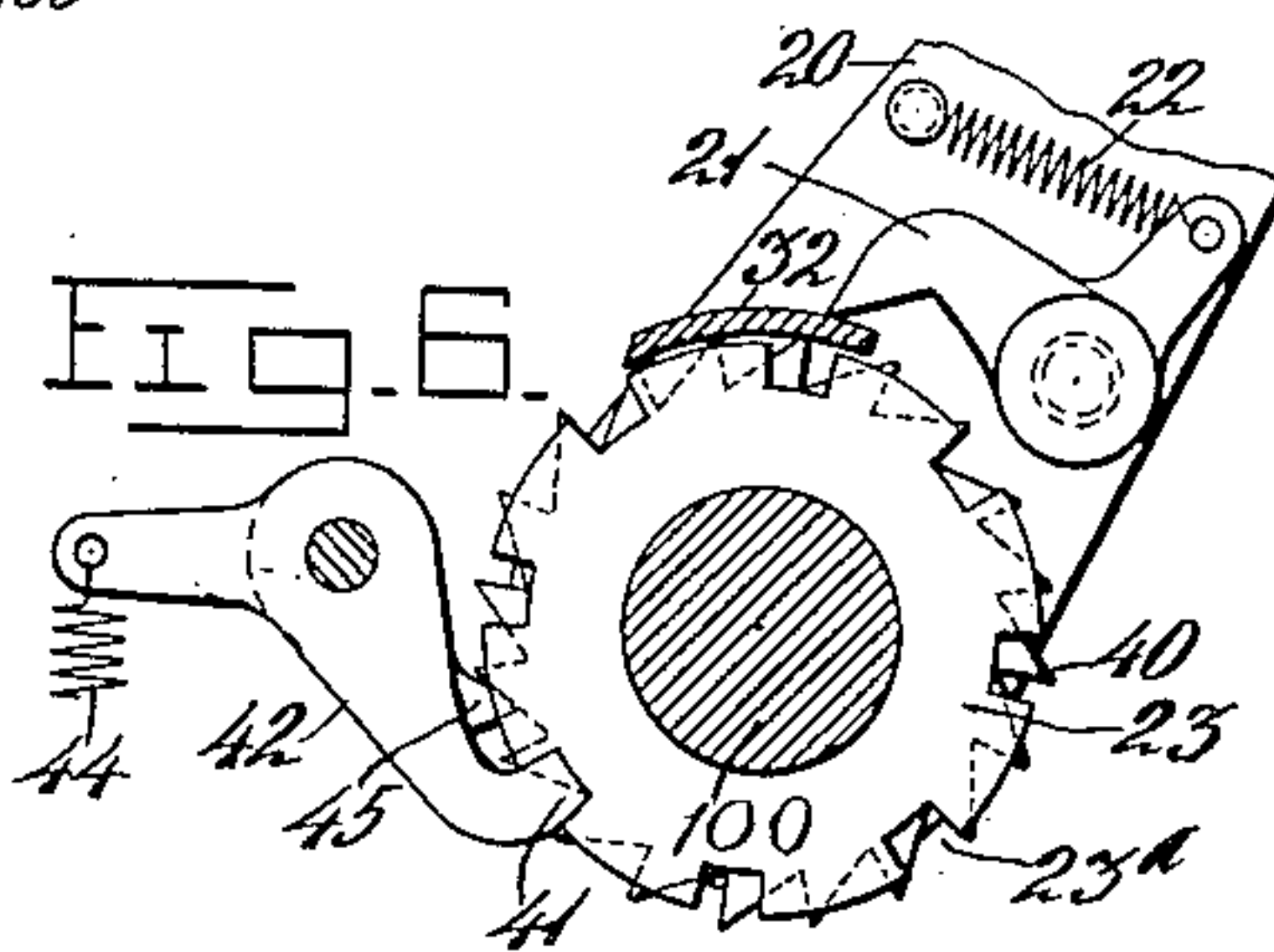
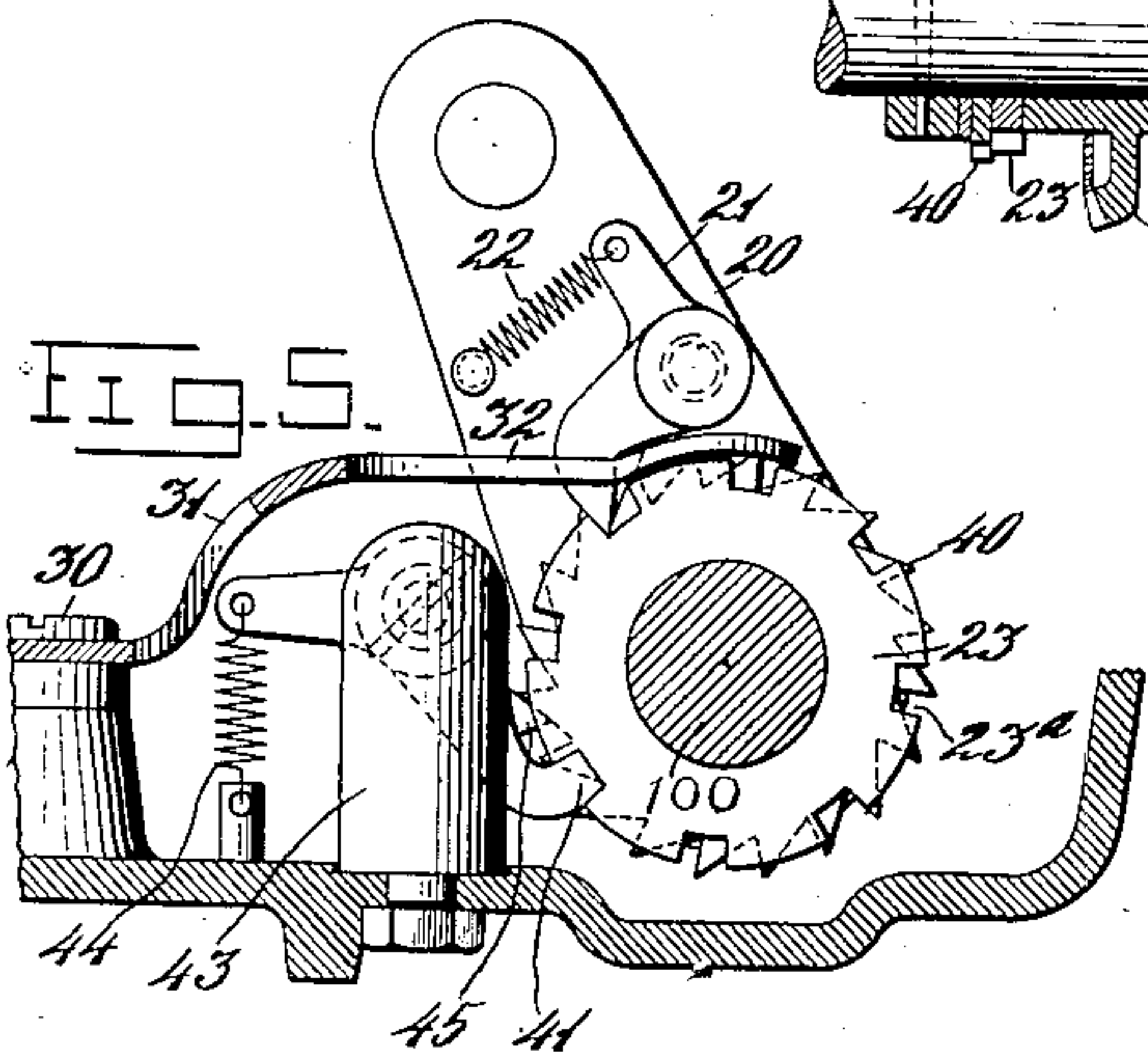
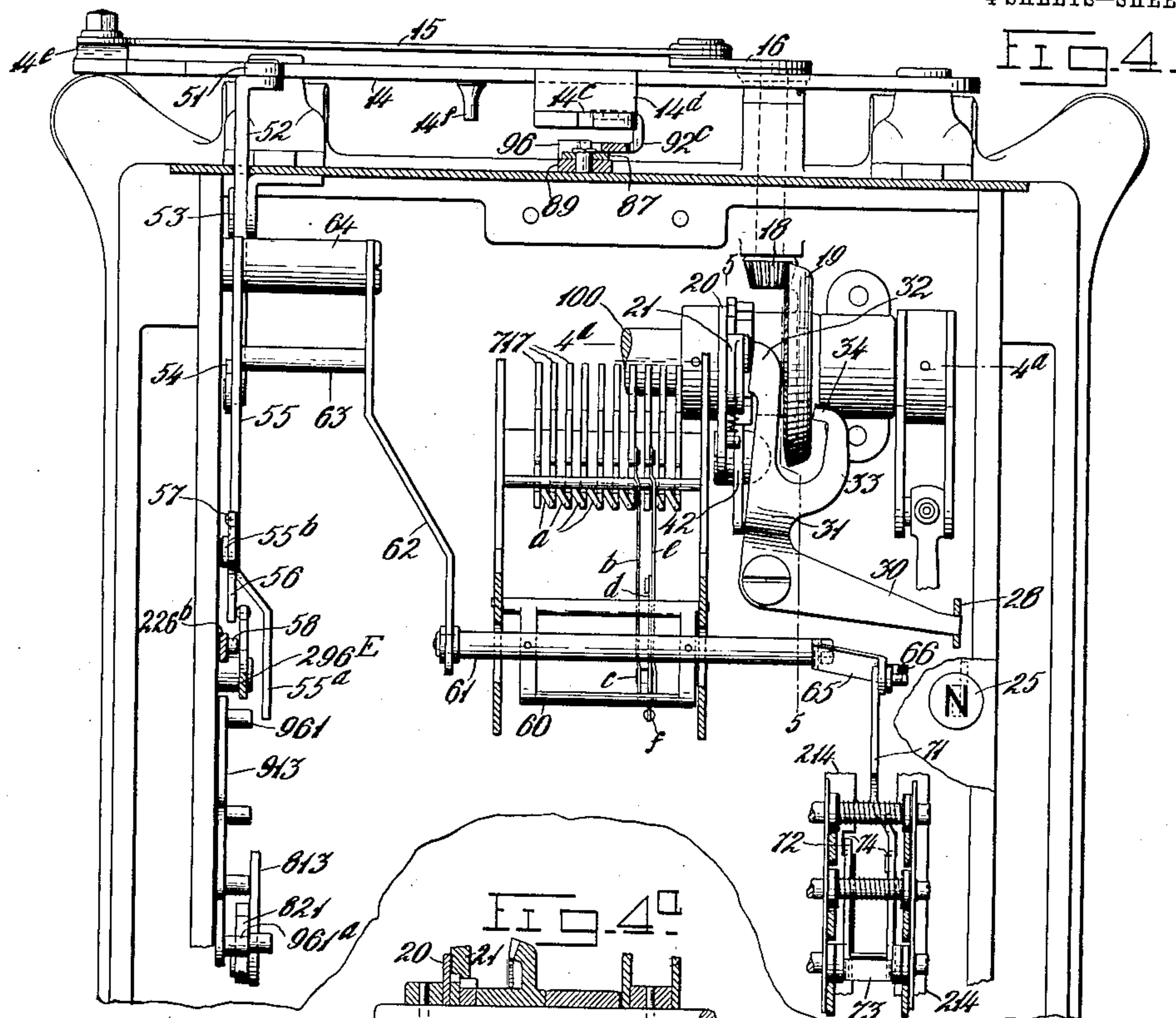
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4 SHEETS—SHEET 4.



Witnesses.

Louis B. Erwin
Robert Dobberman

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

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

Inventors:

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UNITED STATES PATENT OFFICE.

JESSE G. VINCENT AND RUSSELL E. BENNER, OF DETROIT, MICHIGAN, ASSIGNORS TO
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ADDING AND LISTING MACHINE.

No. 924,118.

Specification of Letters Patent.

Patented June 8, 1909.

Application filed February 23, 1909. Serial No. 479,398.

To all whom it may concern:

Be it known that we, JESSE G. VINCENT and RUSSELL E. BENNER, citizens 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.

The present invention relates to machines which employ a laterally shifting paper carriage and are so arranged that parallel columns of imprints can be made on the paper by causing the carriage to shift back and forth automatically, the line-spacing mechanism being disabled in every other printing operation so that two imprints may be made on the same horizontal line in two successive operations of the machine. Such an arrangement is useful where it is desired to print a column of designating numbers and a parallel column of amounts.

Objects of the present invention are as follows: to provide improved means for reciprocating the paper carriage through operation of the prime mover of the machine, such means acting to positively shift the carriage to and fro and being of such character as to insure exact and uniform movement in this connection; to provide improved means whereby the carriage may be shifted back and forth between any two adjacent columnar positions of a plurality of such positions; to provide convenient means such as a special key to disable the carriage reciprocating means whenever it is desired to do single column work, such key being operable only when the carriage occupies a position suitable for the listing of amounts to be added and when operated effecting positive locking of the reciprocating mechanism; to provide improved means whereby when the carriage occupies a position in which designating numbers are printed and the adding mechanism disabled, the total controlling devices, such as total and subtotal keys, will be locked against manipulation; to provide for positively locking the reciprocating mechanism except when it is in action, such mechanism being self-releasable; to provide means for distinguishing on the printed record between designating numbers and added amounts when two columns are produced by automatic reciprocation of the carriage; and to provide improved means whereby upon the

shifting of the carriage to the non-adding position the line-spacing mechanism will be disabled and so held through connections of a positive character.

With the above and incidental objects in view, the invention consists in certain novel features of construction and combination of parts the essential elements whereof are recited in the appended claims and a preferred form of embodiment of which is described in detail hereinafter and illustrated in the accompanying drawings forming part of this specification.

Of said drawings, Figure 1 represents in left side elevation an adding and listing machine of a well-known type having incorporated therein improvements of the present invention, certain parts of the supporting frame-work of the machine and the paper carriage and connections at the rear appearing in section; Fig. 2 is a right side elevation of the machine with some of the familiar parts omitted and with some parts broken away to disclose others; Fig. 3 is a rear elevation of the machine with some parts broken away and others in section; Fig. 4 is a horizontal section taken substantially on the line 4—4 of Fig. 2; Fig. 4^a is a section on line 4^a—4^a of Fig. 4; Fig. 5 is a detail sectional view taken on the line 5—5 of Fig. 4 showing the parts at normal with the special key operated for disabling the carriage reciprocating mechanism; Fig. 6 is a similar view but represents the relative positions of parts in the middle of an operation of the machine under the same conditions; Fig. 7 is a sectional view similar to Fig. 6 but representing the parts as when the said special key has not been operated and the carriage is about to be shifted; and Fig. 8 represents an example of two-column work done on the machine.

The invention is here shown adapted to the well-known Burroughs adding and listing machine exemplified in numerous prior patents, of which it will suffice to mention for the present those issued September 12, 1893, Nos. 504,963 and 505,078, and that issued December 21, 1897, No. 595,864, the latter showing a laterally shifting paper carriage applied to the machine disclosed in the first mentioned patents. In view of the disclosures in these and other prior patents it will not be necessary to describe in detail the mechanism of the adding and listing ma-

chine, though some of the familiar parts thereof will be specifically pointed out in order to make clear the mode of coöperation therewith of the added devices of the present invention.

On the back panel of the machine there is mounted as usual an elongated bracket 2 which supports the frame 3 of the paper carriage with interposed ball bearings. In a cradle 4 mounted upon the top part of this carriage frame there is journaled as usual a roller platen 5. In the lower part of said carriage frame there is journaled a rock rod 6 on which any desired number of column locating fingers 7 are adjustably secured by set screws 8 engaging a groove of the rod. The latter, as shown in Fig. 2, has on its right-hand end an arm 9 carrying a pin engaged in a slot of the lower arm 10 of a lever whose upper arm 11 extends conveniently for manipulation when the rod 6 is to be rocked to release the carriage from any certain columnar position. Said lever is loosely mounted upon a shaft 12 journaled in the sides of the carriage frame and a spring 13 normally holds the lower arm of the lever forward and its upper arm rearward and the positioned finger 7 engaged not with a fixed stop-piece, as usual, but with a member of the carriage reciprocating mechanism. The above-mentioned member of the carriage reciprocating mechanism takes the form of a bar 14 set on edge and extending horizontally across the back of the machine, being longitudinally slotted as shown at 14^a to receive guiding screws 14^b which engage tapped bosses on the back plate or panel of the machine casing. Each of the fingers 7 is square in cross-section at its engaging portion as shown in Fig. 3 and adapted to engage in a square notch or socket 14^c formed in the upper double-beveled edge of an upstanding portion 14^d of said bar 14. It will be obvious that by manipulating the lever 11 the finger can be disengaged from the notch or socket and the carriage can then be shifted by hand and any other finger on the rod 6 engage with said notch or socket. Thus the carriage can be positioned so as to provide for reciprocation between any two columnar positions within the range of its total movement, the columns being spaced apart according to the throw of the carriage reciprocating bar 14. Said bar has a depending lug 14^e at one end, as shown in Fig. 3, to which lug is jointed a link or pitman 15, the latter at its opposite end being wrist-pinned to a crank 16 secured to a shaft 17 journaled in bearings in the base of the machine. This shaft at its forward end within the base of the machine carries a bevel pinion 18 as shown in Fig. 2 and there is loosely journaled upon a shaft 100, which extends crosswise of the base of the machine as usual,

a crown bevel wheel 19, Fig. 4, in mesh with said bevel pinion.

The shaft 100 is the familiar shaft of the Burroughs adding machine which carries arms 110 connected by a link or pitman 310 with a full stroke sector 311 secured to handle shaft 300. In operations of the adding machine, when said shaft 300 is rocked forward and back the shaft 100 is rocked backward and forward and in the present instance this motion is availed of to reciprocate the paper carriage, the return movement of the shaft 100 being caused to carry the crank 16 through a half rotation. To this end an arm 20 secured to said shaft 100 carries a pivoted pawl 21, Figs. 5 to 7, pressed by a spring 22 toward a notched disk or ratchet wheel 23 secured to the hub of the crown bevel gear wheel 19 and loose upon the shaft 100. The throw of the arm 20 is such, and the relation between the said pawl and the notches of the disk 23 and the relative number of teeth in the gear pinion 18 and gear wheel 19, that a forward rocking of the arm 20 will half rotate the crank 16 through the medium of said pawl, said ratchet wheel and said gears.

It will be seen from the above that the handle of the adding machine having been pulled forward and printing having taken place in the usual manner, upon the return of said handle and corresponding rocking of the shaft 100 the paper carriage will be shifted either from right to left or left to right, according to what position it was in when the operation started, and that this performance will be repeated each time the machine is operated so long as the operating connections described are not disturbed. Hence double column work can be done automatically, the mere pull of the operating handle after manipulation of amount keys resulting not only in the usual printing but also in the shifting of the carriage.

The usual depressible amount keys 221 are employed, the same extending in parallel rows from front to rear and each row being inscribed with numerals from 1 to 9. Conveniently located, preferably at the right of the assemblage of amount keys and at the upper part of the keyboard, is a special key 25, Fig. 2, having an elongated angular stem 26 extending down through the machine and slotted at its lower end to embrace a guiding stud 27 and at a slight distance above the slot formed with an oblique slot 26^a embracing a stud on the upper end of a lever 28 pivoted upon said stud 27. The key 25 is used when it is desired to disable the carriage reciprocating mechanism and arrange the machine for single column work only. The key is normally upheld by a spring 29, but when depressed may be so held by engagement of a notch 26^b with the upper keyboard plate 212.

Depression of the key rocks the lever 28 through coöperation of the cam slot 26^a with the stud of said lever. The lower end of the latter is bifurcated to embrace one arm 30 of a bell crank lever horizontally disposed and pivoted upon a boss rising from the base of the machine as shown in Fig. 2. The rearwardly extending arm 31 of said bell crank lever has a laterally projecting blade 32 at its rear end beveled on the forward edge as shown in Figs. 5 to 7, which blade, when the key is depressed and the bell-crank lever rocked, moves above the notched disk or ratchet wheel 23 as shown in Figs. 5 and 6 so that upon rearward rocking of the arm 20 the pawl 21 will ride upon such blade or shield and consequently not turn the notched disk when the arm 20 rocks forward, from which it of course follows that the carriage is not shifted. In order to positively lock the shifting mechanism when the said special key has been depressed, the bell crank lever is further formed with a branch 33 on its rearwardly extending arm, which branch at the rear end has a laterally turned projection 34 adapted to enter one or another of a series of apertures or sockets 35 in the web of the gear wheel 19. In the construction here shown this can only take place, however, when the carriage has been previously shifted to the left-hand position, it being intended that the right-hand one of two parallel columns shall be made up of added amounts, so that only when the carriage is in position for listing any such column would it be desirable to disable the carriage shifting mechanism. As the parts are here shown, an eighth of a rotation of the gear wheel 19 serves to half-rotate the crank 16. Hence by providing but four equi-distant sockets or apertures 35 the special key 25 can only be manipulated to disable the reciprocating mechanism when the carriage is in the left-hand position, an operation of the shifting mechanism to put the carriage in the other position bringing a solid portion of the wheel 19 opposite the locking projection 34, which obviously has the effect of blocking movement of the bell crank lever and consequently of the key.

It is desirable to lock the reciprocating mechanism against accidental movement so that the carriage cannot be shifted except by disconnection from such mechanism in the manner already described or by the regular operation of the reciprocating mechanism. To this end the latter is locked except when being regularly operated, self-releasing devices being provided of the following character: Alongside the notched disk 23 and loose upon the shaft 100 is a ratchet disk 40, Figs. 5 to 7, formed with a complete circumferential series of teeth such as a ratchet wheel usually has, that is to say teeth coming to a point with beveled backs and radial

faces. The disk 23 does not take the form of the usual ratchet wheel, but has a series of square notches 23^a and intervening peripheral surfaces of an extent slightly less than the bases of two of the teeth of the disk 40. In the present instance there are eight of these notches 23^a equi-distant from each other and there are 20 teeth on the disk 40. Normally a square terminal portion 41 of a dog 42 engages one of the notches 23^a to lock the disk 23 and connected parts against movement. This dog is pivoted in a suitable bracket 43 on the base of the machine and its engagement with said disk enforced by a spring 44, but the dog has a beveled projection 45 spaced from the terminal portion 41 and adapted to be acted upon by one or another tooth of the ratchet disk 40, the beveled back of such tooth coacting with the beveled back of the projection to cam the dog out of engagement with the disk 23. The terminal portion 41 of the dog and the beveled projection 45 are off-set so that while the former is seated in a notch 23^a of the disk 23 the projection may extend behind said disks as the parts appear in Fig. 5, ready to be acted upon by the overlying tooth of the ratchet disk 40. The relative arrangement of parts is such that the backward swing of the arm 20 carries the pawl 21 over three of the teeth of the said ratchet disk or to the position shown in Fig. 6, it being assumed for the present that the blade or shield 32 is not in effective position. This backward swing of the arm 20 in so moving the pawl 21 carries its point to the back portion of a notch 23^a of the disk 23. The face of the third of the teeth of the ratchet disk 40 over which said pawl passes is about opposite the middle of such notch. The point of the pawl drops in behind said tooth and the first effect of forward rocking of the arm 20 is to cause the arm 21 to turn the ratchet disk 40 slightly or until the pawl comes up against the front wall of the notch 23^a as shown in Fig. 7. This turning of said ratchet disk independently of the disk 23 (the latter having meantime been held from movement by the dog 42) causes its tooth which has been overlying the beveled projection 45 of the dog to act with a camming effect thereon, disengaging the dog from said disk 23 as also shown in Fig. 7 so that the continued forward rocking of the arm 20 will be accompanied by rotary movement of the said disk 23 and gear 19, the latter transmitting its movement to the carriage in the manner hereinbefore described.

As it is the purpose, when using a machine to do double columnar work, that the left-hand column shall be made up of designating numbers a total including which would mean nothing, the adding mechanism of the machine is automatically disabled when the carriage reciprocating mechanism operates

in such manner as to move the carriage to the right. To this end the before-mentioned bar 14 is formed at one end with a cam rise 50, Fig. 3, adapted when such bar shifts to the left as the parts appear in Fig. 3 or to the right as the machine is viewed from the front, to act upon a roller 51 carried on the rear end of a lever 52, Fig. 1, the latter pivoted intermediate its ends as at 53 on a suitable bracket of the main framework. The forward end of said lever is jointed to a link 54 which extends upward and is in turn jointed to an arm 55 pivoted to the framework and having an off-set forward end portion 55^a in the form of a blade adapted when the arm is drawn down to intercept the usual wipe pawl 821 and prevent it from acting to engage the adding wheel pinions 916 with the racks 610. The latter are as usual mounted upon forward ends of levers 611 and said adding pinions are carried in a rocking frame 910 actuated by a forked pitman 914, the latter coupled at its rear end to a swinging member 913 of generally triangular form. Said wipe plate or pawl 821 is as usual carried upon an oscillating arm 813 and is adapted to alternately act upon studs 961 and 961^a to rock said member 913. In the case of itemizing this, as usual, results in first moving the pinions 916 out of mesh with the racks and then moving them into mesh after the racks have descended distances determined by the amount keys. It is the coaction of the wipe plate 821 with the rear stud 961 which thus reengages the pinions with the racks and it will be obvious that with the plate 55^a positioned to prevent the engagement of said wipe plate with said stud the pinions will remain disengaged. It will be seen that when the carriage reciprocating mechanism operates to shift the carriage to the right the cam-rise 50, acting upon the roller 51, will lower the blade 55^a with the result above explained. On the other hand, when such mechanism operates to shift the carriage to the left regular operations of the wipe plate 821 are not interfered with and an item set up on the key-board will be added upon the pinions 916, unless of course the elimination key 296^b is depressed. The latter has a stem which extends adjacent to the blade 55^a and terminates in a portion adapted to produce the same effect upon the wipe plate 821.

It is desirable to prevent the printing of a total with the carriage in the right-hand or non-adding position. Any total then printed would be that of the amounts listed in the right-hand column and should of course appear at the foot thereof. To block the total and subtotal keys 296 and 296^s the arm 55 has an upstanding portion 55^b carrying a pivoted abutment piece 56, a spring 57 applied to the rear portion of which not only acting to hold it projecting at right angles to

said upstanding portion 55^b but also serving to elevate the arm 55. The total and subtotal keys as usual surmount bell-crank levers 227 and 227^a, the former connected by a link 911 with the pitman 914 and the other bell-crank lever coupled to a bar 226 which is shouldered to engage a pin on the lever 227. The latter is coupled to a rearwardly extending link 226^a which, as usual, operates a key-releasing bail. In the present instance said link has a depending lug 226^b with a laterally projecting stud 58 adapted to co-operate with the abutment piece 56. When the arm 55 is lowered, this abutment piece is brought into line with said stud 58, from which it will be obvious that neither the total nor subtotal key can be then depressed. Should either happen to be depressed when the reciprocating mechanism acts to shift the carriage to the right, the tappet piece will yield when it encounters the stud 58, and then be carried in line therewith when the key is released as the operation of the machine concludes, it being here assumed that the operation is one for printing a total or subtotal under the right-hand column with the reciprocating mechanism in action.

The rack levers 611 carry type plates 618 at their rear ends as usual, which type plates are adapted to be driven against the platen to do the printing. It is customary to form the faces of the type plates of the second or third series from the right with decimal point printing portions so that in printing amounts dollars and cents will be properly indicated. However, when designating numbers are being printed a decimal point is objectionable as not a proper attribute of designating numbers and furthermore as calculated to create confusion between the two columns. It is desirable to have the printed record clearly distinguish between designating numbers and amounts and the present invention provides for automatically accomplishing this result. In the present form of embodiment of the invention this is brought about by preventing printing to the right of the decimal point. Thus, when the carriage reciprocating mechanism has operated to shift the carriage to the right the two right-hand rows of amount keys will be locked against depression and the customary successive tripping of impression devices for cipher printing purposes will be interrupted. The type plates 618 are driven against the platen by the usual hammers 715 operated by driving levers 716 under the impulse of springs 780, the latter also serving to enforce engagement between pawls 718 and latches 717 which normally restrain the hammer drivers and hammers. In Fig. 4 these latches appear in plan view and six of them counting from the left have the usual tails, *a*, which overlie neighboring latches and thus provide for the successive tripping of latches and au-

automatic cipher printing in the usual manner. The seventh latch from the left, while overlapped by the tail of the sixth latch, does not itself have a tail to overlie the eighth latch, but instead has pivotally attached to it a pitman, *b*, shouldered as shown in Fig. 2 for engagement with the rear edge of a laterally turned lip or flange, *c*, on a coupler, *d*. The latter is pivoted upon a pitman, *e*, which is pivoted to the eighth latch counting from the left. A spring *f* normally upholds said coupler so that when the seventh latch rocks, its pitman *b* acting against the lip or flange *c* will thrust the pitman *e* forward and rock the eighth latch which has a tail *a* overlying the ninth latch. It will be obvious, however, that by depressing the coupler *d* the seventh and eighth latches will be disconnected. For the purpose of depressing such coupler a bail 60 is employed, the same being pivoted at its rear side in the framework of the machine and having a downturned forward cross-bar adapted when the bail is lowered to depress said coupler. The bail is normally elevated, as shown in Fig. 2, so that the successive tripping of latches will take place as usual, but when the carriage shifting mechanism operates to move the carriage to the right the bail will be lowered so as to displace the coupler and interrupt the successive tripping of latches.

A flattened rod or round bar 61 is secured across the top of the bail as shown in Fig. 4 and at its right-hand end coupled to an arm 62 which is a companion of the arm 55, being rigidly united therewith by a cross-bar 63 and by a pivot sleeve 64. Hence it follows that when the arm 55 is lowered in the manner already described, the arm 62 goes with it and the bail will be lowered and the seventh and eighth latches uncoupled or a "split" effected. Therefore no ciphers will be printed to the right of the decimal point when the carriage is in the non-adding position.

For the purpose of preventing depression of amount keys in the first two banks the flattened rod 61 is extended as shown in Fig. 4 and coupled at its right hand end to an upstanding bar or link 65 as shown in Fig. 2, which link is connected by a spring 66 with a latch structure adapted to prevent depression of said amount keys. This last structure comprises an arm 70 pivoted on a convenient cross-rod of the keyboard and having at its rear end a stud occupying a slot 65^a of the link or bar 65, the spring 66 being attached at one end to said stud. The arm 70 has a latch projection 71 and a companion arm 72 has a similar projection, the two arms being united by a cross-bar 73 (Fig. 4). The numeral 214 designates the usual detent slide strips which are forced rearwardly by depression of amount keys and in the present instance the two strips associated with the two

right-hand rows of amount keys have openings 74 (Fig. 2) adapted to be entered by the latch projections when the bail 60 is lowered. The purpose of the spring 66 is to provide for the continued downward movement of the link 65 when the latch projections strike on top of the slide strips with the latter in their rearward positions, as when keys are still depressed representing an added amount. It will be understood that depressed keys are not ordinarily released in the Burroughs machine until near the close of the operation and hence the carriage might shift to the right far enough to operate the detent strip latch prior to release of keys. Of course upon the conclusion of the adding operation, when the strips return to normal, the latch projections will be drawn to effective position by the spring 66.

The platen 5 is turned for line-spacing by a pawl 80 (Fig. 2) acting upon a ratchet wheel 81 secured to the journal of the platen, said pawl being carried by an arm 82 loose on said journal and said arm being connected by a link 83 with a slotted plate 84 secured to the shaft 12. The slotting of the plate 84 is for purposes of varying the extent of the feed movement or line-spacing. There is also secured to the shaft 12 a bail 84 which has a round cross-rod embraced above and below by jaws 86 formed on a slide plate or strip 87 mounted upon the back of the machine, Figs. 1 and 3. Reciprocations of this plate or strip will obviously rock the bail and effect the line spacing. Said slide strip or plate is not mounted directly against the back of the machine but there intervenes a similar slide plate or strip which has jaws 90 extending on the under side of the bail rod. This plate 89 has near its lower end an ear 91 to which is coupled a lever 92 (Fig. 1), the latter having a roller 93 occupying a cam slot 94 in a plate 95 secured to the shaft 100. As the latter oscillates in any operation of the machine, necessarily said lever and said slide plate 89 reciprocate in every operation of the machine, but the jaws 90 of the slide plate can only operate to raise the bail and not to lower the same. In order to effect the line spacing it is necessary that the plate or strip 87 shall accompany the plate 89 in the latter's reciprocations. Said plate 87 has pivoted on its rear side a dog 92 with a beveled projection 95 adapted to engage under a somewhat similar projection 96 on the lower end of the slide plate 89. When the square or straight edges of these projections are engaged, as in Fig. 3, it is obvious that the two slides will move together. A spring 97 connecting the dog 92 with the slide plate 89 tends to enforce engagement between the beveled projections, but when the bar 14 is thrown to the left as the parts are seen in Fig. 3, a stud 14^f which it carries strikes a depending lug 92^a of the dog and swings the

latter so as to disengage the projection 95 from the projection 96 and hold it disengaged, with the result that in the next operation of the machine no line spacing takes place. Said stud 14^f when so acting moves under a shoulder 92^b of the dog so as to positively lock the slide 87 in the upper position and so prevent any accidental line spacing. Of course at the conclusion of such non-adding operation the bar 14 is moved to the right as the parts are seen in Fig. 3 so that the dog swings back ready to interlock with the projection 96 of the slide 89. The beveled sides of the projections 95 and 96 provide for the latter passing the former in the rise of the plate or bar 89 and the projection 95 then passing under the projection 96.

It will now be seen that the above described construction is well calculated to fully attain all of the objects stated. But the invention is not to be considered as necessarily limited to the combined employment of all of the various features explained, nor to the particular forms of embodiment thereof herein disclosed which are susceptible of modification within the scope of the invention.

What we claim is:

1. In a machine of the character described, the combination with a laterally shiftable paper carriage, of a rotary crank linked to said carriage, and means for intermittently half rotating the crank to shift the carriage first one way and then the other.

2. In a machine of the character described, the combination with a laterally shiftable paper carriage, of a rotary crank linked to said carriage, a reciprocating driving element, and a one-way connection between the same and the crank for intermittently half rotating the latter to shift the carriage first one way and then the other.

3. In a machine of the character described, the combination with a laterally shiftable paper carriage, of a rotary crank linked to said carriage, a wheel geared to said crank and carrying a ratchet, and an oscillating driving arm carrying a pawl engaging said ratchet.

4. In a machine of the character described, the combination with a laterally shiftable paper carriage; of driving means, carriage reciprocating means operable thereby, and locking means for said carriage reciprocating means, said locking means adapted to be disabled by said driving means.

5. In a machine of the character described, the combination with a laterally shiftable paper carriage; of a rotary crank linked to said carriage, driving means, connections between the latter and said crank, and locking means for said connections, said locking means adapted to be disabled by the driving means.

6. In a machine of the character described,

the combination with a laterally shiftable paper carriage; of a rotary crank linked to said carriage, a reciprocating driving element connections between the latter and said crank, and locking means for said connections, said locking means adapted to be disabled by said driving element.

7. In a machine of the character described, the combination with a laterally shiftable paper carriage, of a rotary crank linked to said carriage, a wheel geared to said crank and carrying a notched disk, a loose ratchet, an oscillating driving arm carrying a pawl engaged with the notched disk and the ratchet, and a locking dog normally engaging a notch of the disk and adapted to be displaced by the ratchet.

8. In a machine of the character described, the combination with a laterally shiftable paper carriage; of normally locked self-releasing means for automatically reciprocating said carriage, said means including a notched disk, a loose ratchet, an oscillating driving arm carrying a pawl engaged with the notched disk and the ratchet, and a locking dog normally engaging a notch of the disk and adapted to be displaced by the ratchet.

9. In a machine of the character described, the combination with a laterally shiftable paper carriage, of a rotary crank linked to said carriage, means for intermittently half rotating the crank to shift the carriage first one way and then the other, and a manipulative device for disabling said means at will.

10. In a machine of the character described, the combination with a laterally shiftable paper carriage, of a rotary crank linked to said carriage, means for intermittently half rotating the crank to shift the carriage first one way and then the other, and a manipulative device for disabling said means at will with provisions for locking said device when the carriage is in one of its two positions.

11. In a machine of the character described, the combination with a laterally shiftable paper carriage; of means for automatically reciprocating the same, and a manipulative device for disabling said means with provisions for locking said device against operation when the carriage is shifted to one of two positions as distinguished from the other.

12. In a machine of the character described, the combination with a laterally shiftable paper carriage; of means for automatically reciprocating the same, and a manipulative device for disabling and locking said means with provisions for locking said device against operation when the carriage is shifted to one of two positions as distinguished from the other.

13. In a machine of the character de-

scribed, the combination with a laterally shiftable paper carriage; of means for automatically reciprocating the same comprising driving and driven members, and a manipulative device for disabling the driving member and locking the driven member.

14. In a machine of the character described, the combination with a laterally shiftable paper carriage; of means for automatically reciprocating the same comprising driving and driven members, and a manipulative device for disabling the driving member and locking the driven member with provisions for locking said device when the carriage is in one of its two positions.

15. In a machine of the character described, the combination with a laterally shiftable paper carriage; of means for automatically reciprocating the same comprising a driving pawl and a driven ratchet, and a manipulative pawl-disabling and ratchet-locking device.

16. In a machine of the character described, the combination with a laterally shiftable paper carriage; of means for automatically reciprocating the same comprising a driving pawl and a driven ratchet and a manipulative pawl-disabling and ratchet-locking device in the form of a lever having a shield for the pawl to ride upon and a projection to engage the ratchet.

17. In a machine of the character described, the combination with a laterally shiftable paper carriage; of means for automatically reciprocating the same comprising a driving pawl and a driven ratchet and a manipulative pawl-disabling and ratchet-locking device in the form of a lever having a shield for the pawl to ride upon and a projection to engage the ratchet with provisions for preventing such engagement except when the carriage is in one of two opposite positions.

18. In a machine of the character described, the combination with a laterally shiftable paper carriage, of a rotary crank linked to said carriage, an equidistantly socketed wheel geared to said crank and carrying a ratchet, an oscillating driving arm carrying a pawl engaging said ratchet, and a manipulative lever having a shield for the said pawl to ride upon and a projection to engage the sockets of the said wheel.

19. In a machine of the character described, the combination with a laterally shiftable paper carriage, of a rotary crank linked to said carriage, an equidistantly socketed wheel geared to said crank and carrying a ratchet, an oscillating driving arm carrying a pawl engaging said ratchet, and a manipulative lever having a shield for the said pawl to ride upon and a projection to engage the sockets of the said wheel, an oscillation of said arm adapted to turn the wheel half the distance between sockets.

20. In a machine of the character described, the combination with a laterally shiftable paper carriage; of means for automatically reciprocating the same comprising a driving pawl and a driven ratchet and a manipulative pawl-disabling and ratchet-locking device in the form of a lever having a shield for the pawl to ride upon and a projection to engage the ratchet, together with a depressible key and connections for shifting said lever.

21. In a machine of the character described, the combination of a prime mover, a reciprocating member adapted to be moved first one way and then the other in successive operations of said prime mover, and a paper carriage engageable with and disengageable from said member and laterally shiftable independently thereof when disengaged and as one therewith when engaged.

22. In a machine of the character described, the combination of a prime mover, a reciprocating member adapted to be moved first one way and then the other in successive operations of said prime mover, and a laterally shiftable paper carriage engageable with said member at varying lateral positions relative thereto for reciprocation therewith.

23. In a machine of the character described, the combination of a prime mover, a reciprocating bar adapted to be moved first one way and then the other in successive operations of said prime mover, and a laterally shiftable paper carriage adapted to be interlocked with said bar at varying lateral positions relative thereto for reciprocation therewith.

24. In a machine of the character described, the combination of a rotary crank, means for intermittently turning the same a half-rotation, a reciprocating bar linked to said crank, and a laterally shiftable paper carriage adapted to be interlocked with said bar at varying lateral positions relative thereto for reciprocation therewith.

25. In a machine of the character described, the combination with printing mechanism, a laterally shiftable paper carriage, means for moving the same alternately in opposite directions between printing operations, and means for differently characterizing imprints made with the carriage in different positions.

26. In a machine of the character described, the combination of type carriers each having a series of numeral types and there being decimal point type faces between certain of the series, a paper carriage laterally shiftable to provide for printing in two parallel columns, and means for preventing printing from type to one side of the decimal point type faces when the carriage is positioned for printing in one of such columns.

27. In a machine of the character described, the combination of type carriers

each having a series of numeral types and there being decimal point type faces between certain of the series, manipulative amount determining means, a paper carriage 5 laterally shiftable to provide for printing in two parallel columns, and means for preventing manipulation of amount-determining means associated with type to one side of the decimal point type faces when the carriage is 10 positioned for printing in one of such columns.

28. In a machine of the character described, the combination of type carriers each having a series of numeral types and there being decimal point type faces between 15 certain of the series, impression devices co-operatively related for cipher printing with provisions for suspending coöperative action where the decimal points occur, a paper carriage laterally shiftable to provide for print- 20 ing parallel columns, and means for automatically suspending the coöperative action of impression devices where the decimal points occur, when the carriage is positioned for printing in a certain column.

29. In a machine of the character described, the combination of type carriers each having a series of numeral types and there being decimal point type faces be- 25 tween certain of the series, impression devices coöperatively related for cipher printing with provisions for suspending coöperative action where the decimal points occur, a paper carriage laterally shiftable to provide for printing parallel columns, and means for 30 automatically suspending the coöperative action of impression devices where the decimal points occur and preventing printing to the right thereof, when the carriage is positioned for printing in a certain column.

30. In a machine of the character described, the combination of type carriers each having a series of numeral types and there being decimal point type faces be- 35 tween certain of the series, manipulative amount-determining means, impression devices coöperatively related for cipher printing with provisions for suspending coöperative action where the decimal points occur, a 40 paper carriage laterally shiftable to provide for printing parallel columns, means for automatically suspending the coöperative action of impression devices where the decimal points occur, when the carriage is positioned for printing in a certain column, and means 45 for preventing manipulation of amount-determining means to the right of the decimal points. 50

31. In a machine of the character described, the combination of type carriers 55 each having a series of numeral types and there being decimal point type faces between certain of the series, depressible amount keys controlling said type carriers, a paper carriage laterally shiftable to provide

for printing parallel columns, and means for 65 preventing depression of amount keys associated with type to the right of the decimal point type faces when the carriage is in position for printing in a certain column.

32. In a machine of the character de- 70 scribed, the combination of type carriers each having a series of numeral types and there being decimal point type faces between certain of the series, depressible amount keys controlling said type carriers, 75 detent slides operated by the keys, a paper carriage laterally shiftable to provide for printing parallel columns, and means for locking the detent slides associated with type to the right of the decimal point type faces 80 when the carriage is positioned for printing in a certain column.

33. In a machine of the character described, the combination of type carriers each having a series of numeral types and 85 there being decimal point type faces between certain of the series, depressible amount keys controlling said type carriers, detent slides operated by the keys, a normally inactive latch device for restraining 90 detent slides associated with type to the right of the decimal point type faces, a paper carriage laterally shiftable to provide for printing parallel columns, and means for 95 yieldingly moving the latch device to acting position when the carriage is shifted to a certain columnar position.

34. In a machine of the character described, the combination of type carriers each having a series of numeral types and 100 there being decimal point type faces between certain of the series, depressible amount keys controlling said type carriers, detent slides operated by the keys, a normally inactive latch device for restraining 105 detent slides associated with type to the right of the decimal point type faces, a paper carriage laterally shiftable to provide for printing parallel columns, and means for 110 yieldingly moving the latch device to acting position when the carriage is shifted to a certain columnar position, said means comprising a cam shifting with the carriage, a lever operated by said cam, and a spring connect- 115 ing the lever and the latch device.

35. In a machine of the character described, the combination of type carriers, hammers for driving the same, latches re- 120 straining the hammers and arranged to successively trip each other, there being a movable coupler between certain adjacent latches to provide for suspending the successive tripping, a bail for displacing the coupler, a paper carriage laterally shiftable to provide for 125 printing parallel columns, a cam shifting with the carriage, and a lever operated by the cam and connected to said bail.

36. In a machine of the character de-

scribed, the combination of type carriers, hammers for driving the same, latches restraining the hammers and arranged to successively trip each other, there being a movable coupler between certain adjacent latches to provide for suspending the successive tripping, a bail for displacing the coupler, a paper carriage laterally shiftable to provide for printing parallel columns, a cam shifting with the carriage, a lever operated by the cam and connected to said bail, depressible amount keys controlling the type carriers, detent slides actuated by the keys, a latch device for restraining certain of the slides, and a yielding connection between said latch device and the said lever.

37. In a machine of the character described, the combination of a laterally shiftable paper carriage; line-spacing mechanism thereon including a vibratory bail; a slide piece engaging above and below said bail, a swinging dog on said slide piece having a catch projection and a shouldered extension, a second slide piece having a catch projection to cooperate with that of the first slide piece, and carriage shifting means including a bar having a stud adapted to displace said dog and engage under the shoulder of the latter's extension.

38. In a machine of the character described, the combination of adding wheels; reciprocating rack and type carriers; keys and connections for controlling the engagement and disengagement of racks and adding wheels including a total key or keys for causing the extent of movement of racks to be determined by backward rotation of the adding wheels; a laterally shifting paper carriage; means for automatically reciprocating said carriage including a member detachably

engaged therewith; and means operated by said member for locking the total key or keys.

39. In a machine of the character described, the combination of adding wheels; reciprocating rack and type carriers; keys and connections for controlling the engagement and disengagement of racks and adding wheels including a total key or keys for causing the extent of movement of racks to be determined by backward rotation of the adding wheels; a laterally shifting paper carriage; means for automatically reciprocating said carriage including a bar with which the carriage is detachably engaged, said bar having a cam; and a lock for the total key operated by said cam.

40. In a machine of the character described, the combination of adding wheels; reciprocating rack and type carriers; keys and connections for controlling the engagement and disengagement of racks and adding wheels including a total key or keys for causing the extent of movement of racks to be determined by backward rotation of the adding wheels; a link or bar operated by said total key, an abutment piece adapted to be moved into position for obstructing said link or bar and thus preventing operation of said key; a laterally shifting paper carriage; means for automatically reciprocating the same including a member detachably engaged therewith; and means operated by said member for moving the abutment piece into effective position.

JESSE G. VINCENT.
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Witnesses:

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ARTHUR W. FRENZEL.