

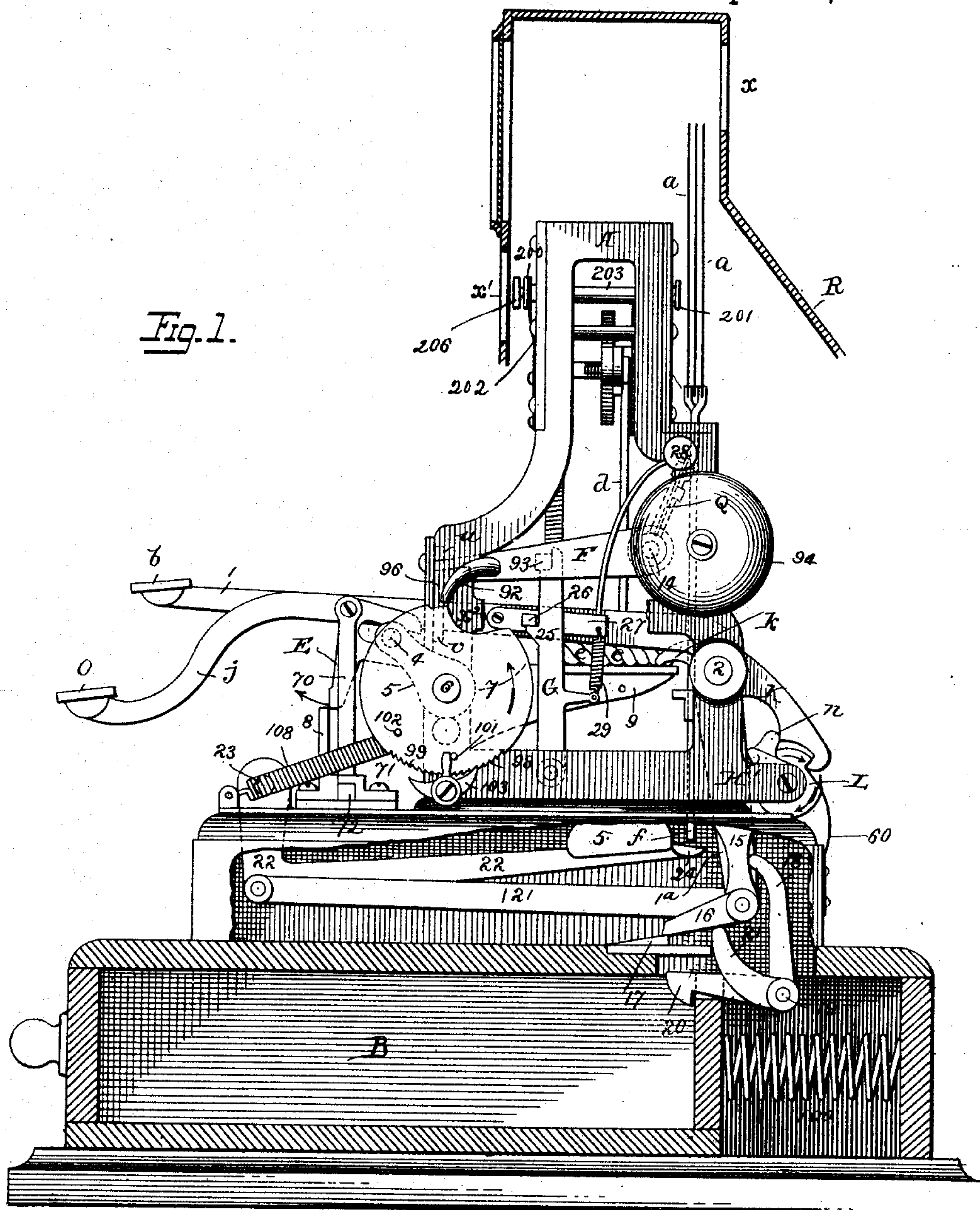
(No Model.)

8 Sheets—Sheet 1.

J. T. COWLEY.
CASH REGISTER.

No. 505,194.

Patented Sept. 19, 1893.



Witnesses

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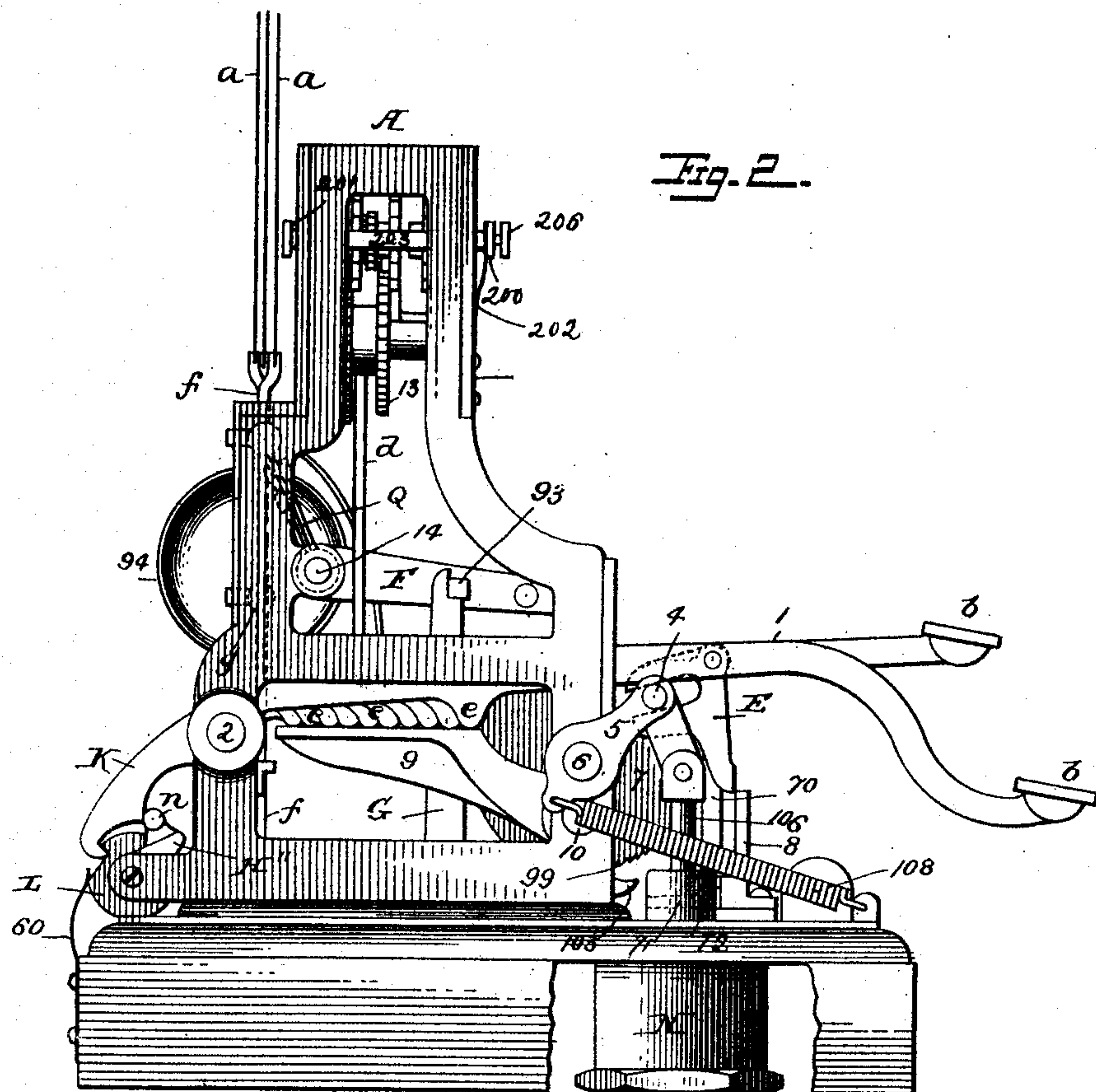
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8 Sheets—Sheet 2.

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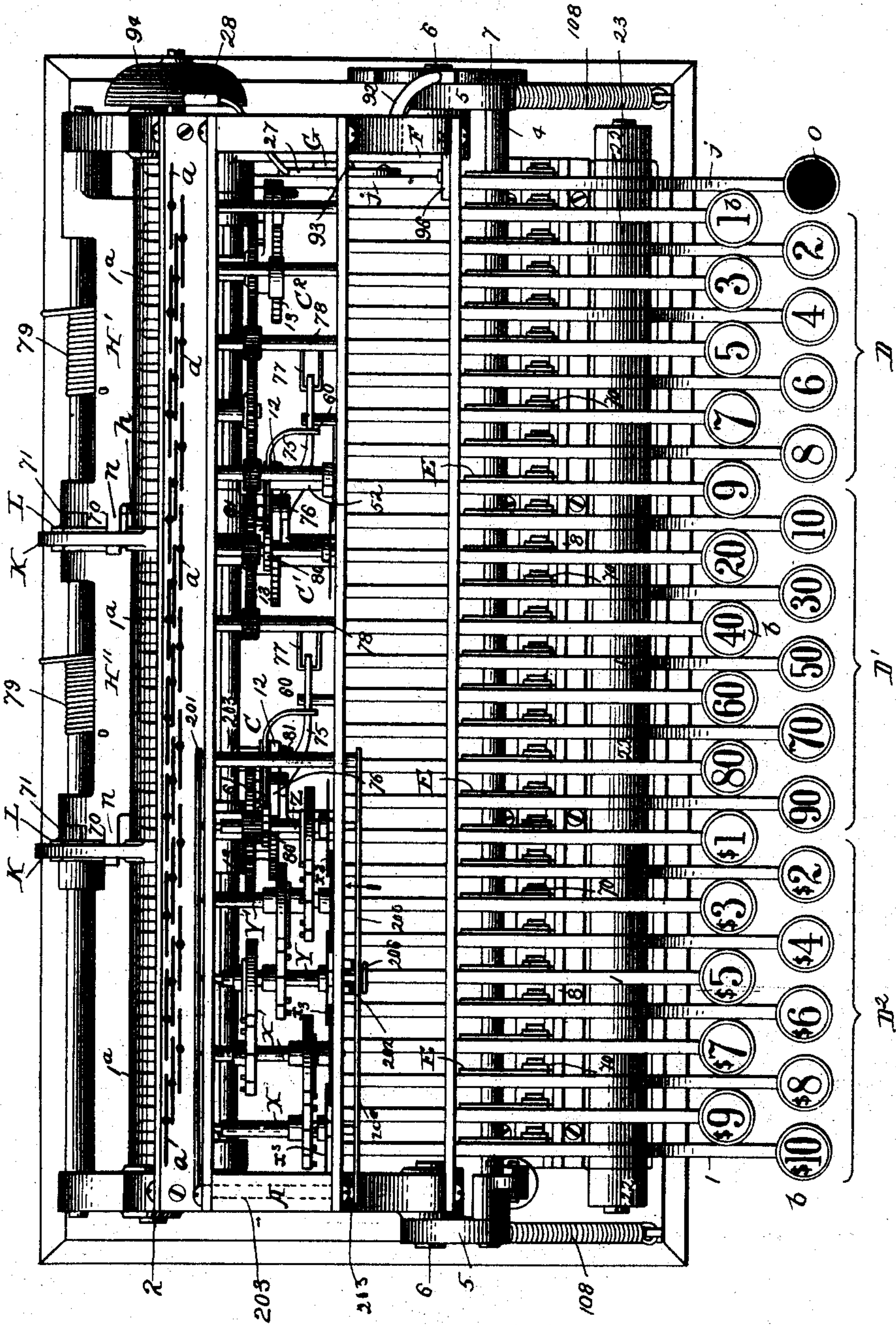
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Fig. 3.



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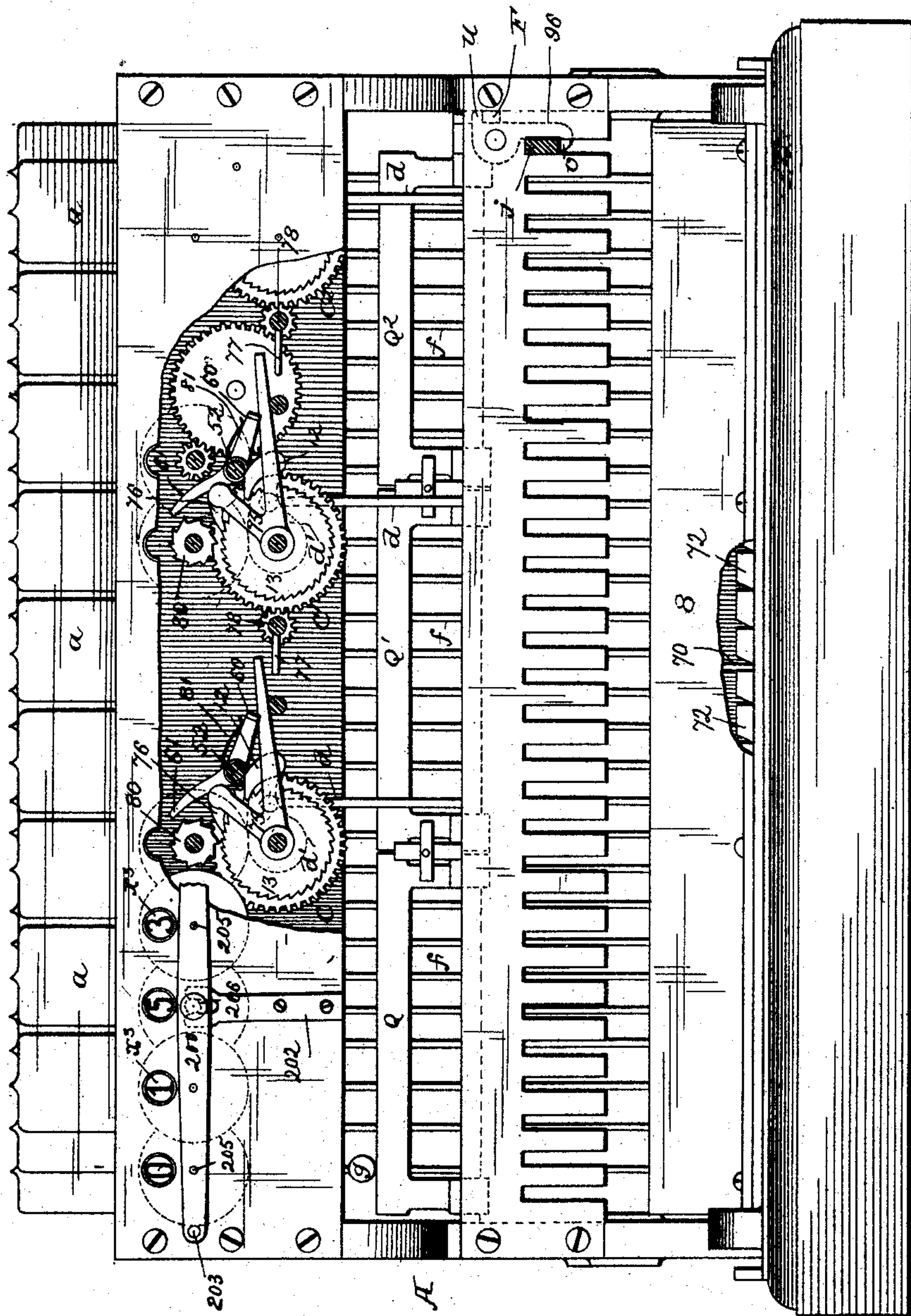
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8 Sheets—Sheet 4.

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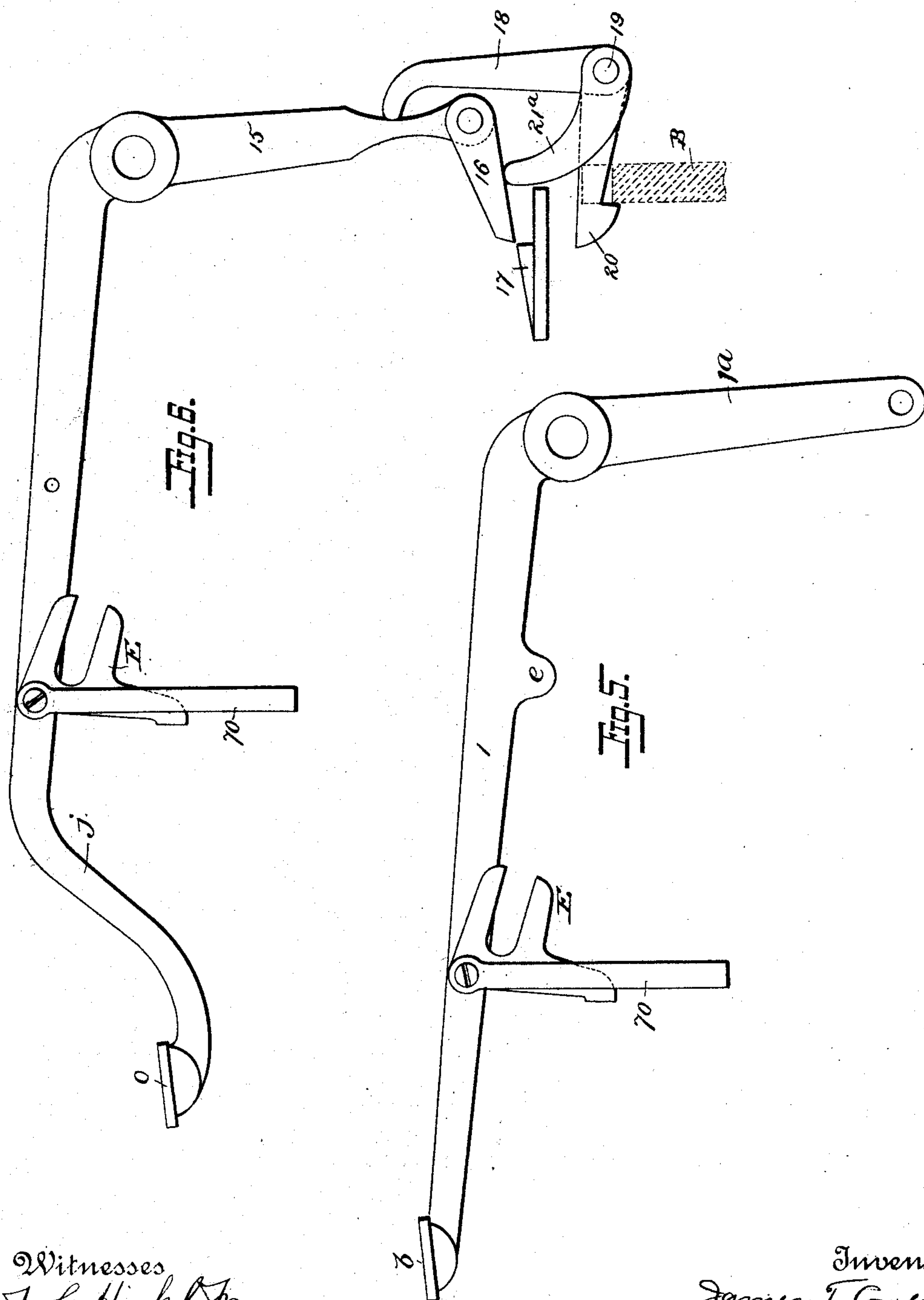
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8 Sheets—Sheet 5.

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No. 505,194.

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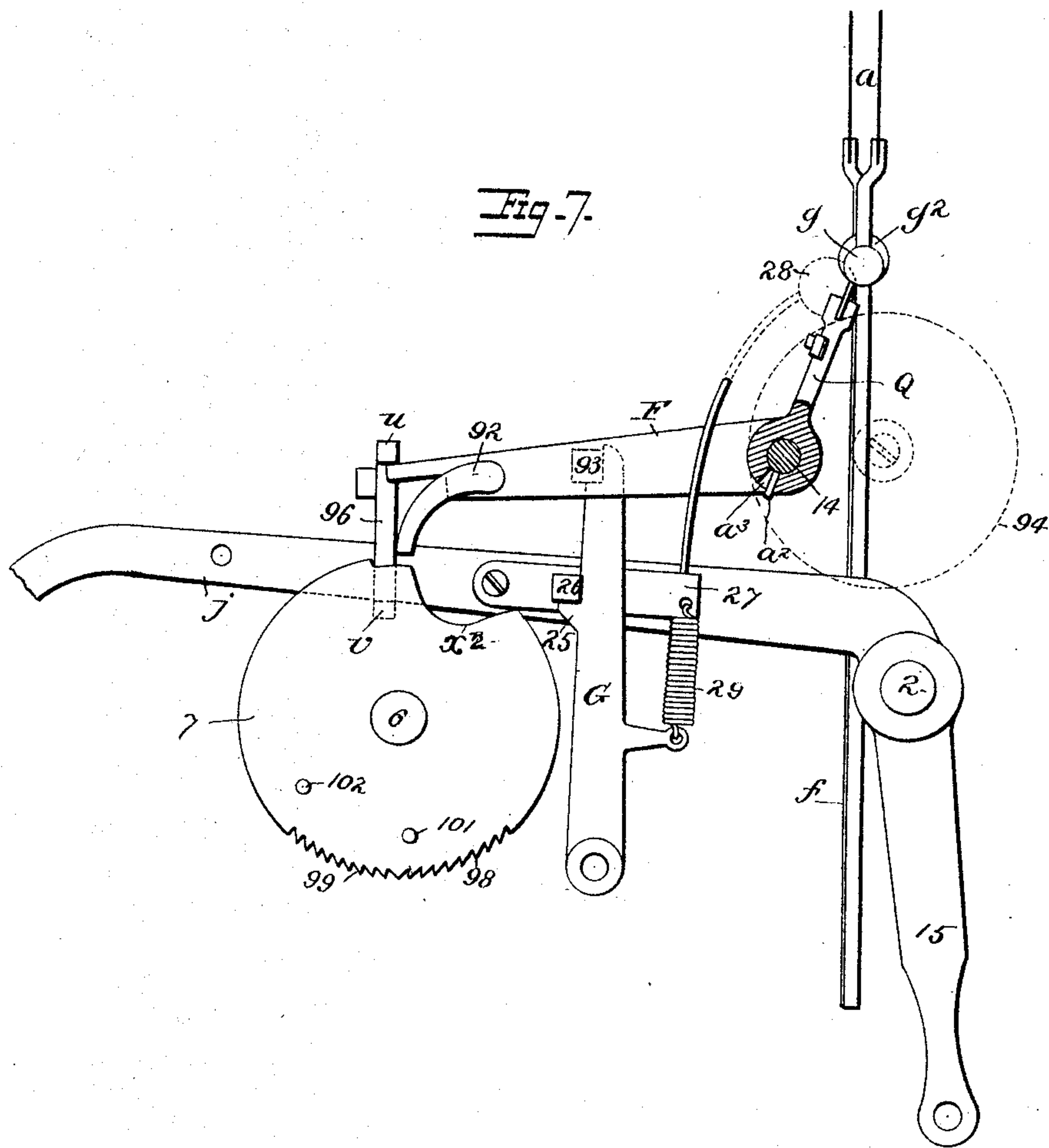
(No Model.)

8 Sheets—Sheet 6.

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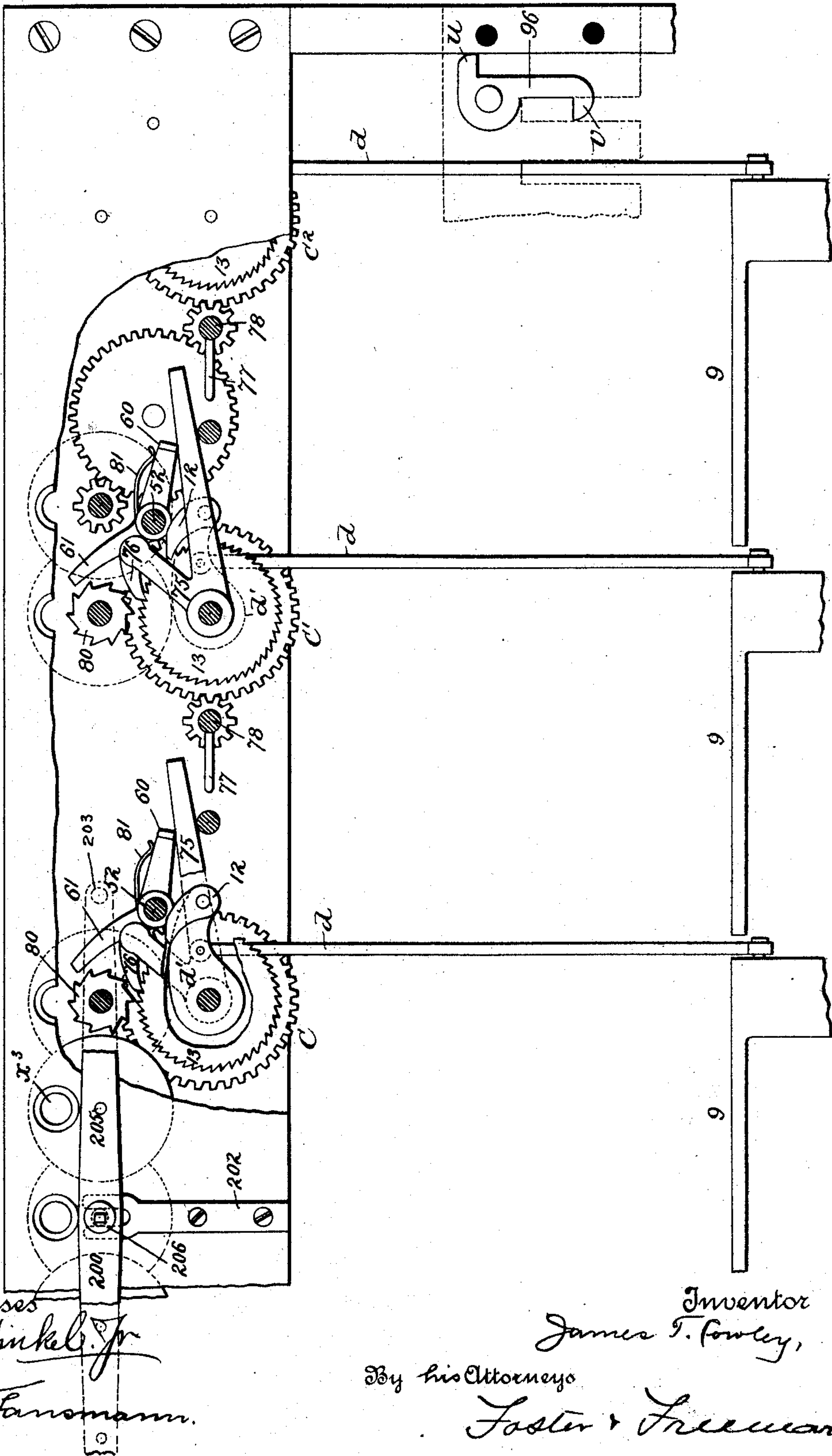
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Fig. 8.



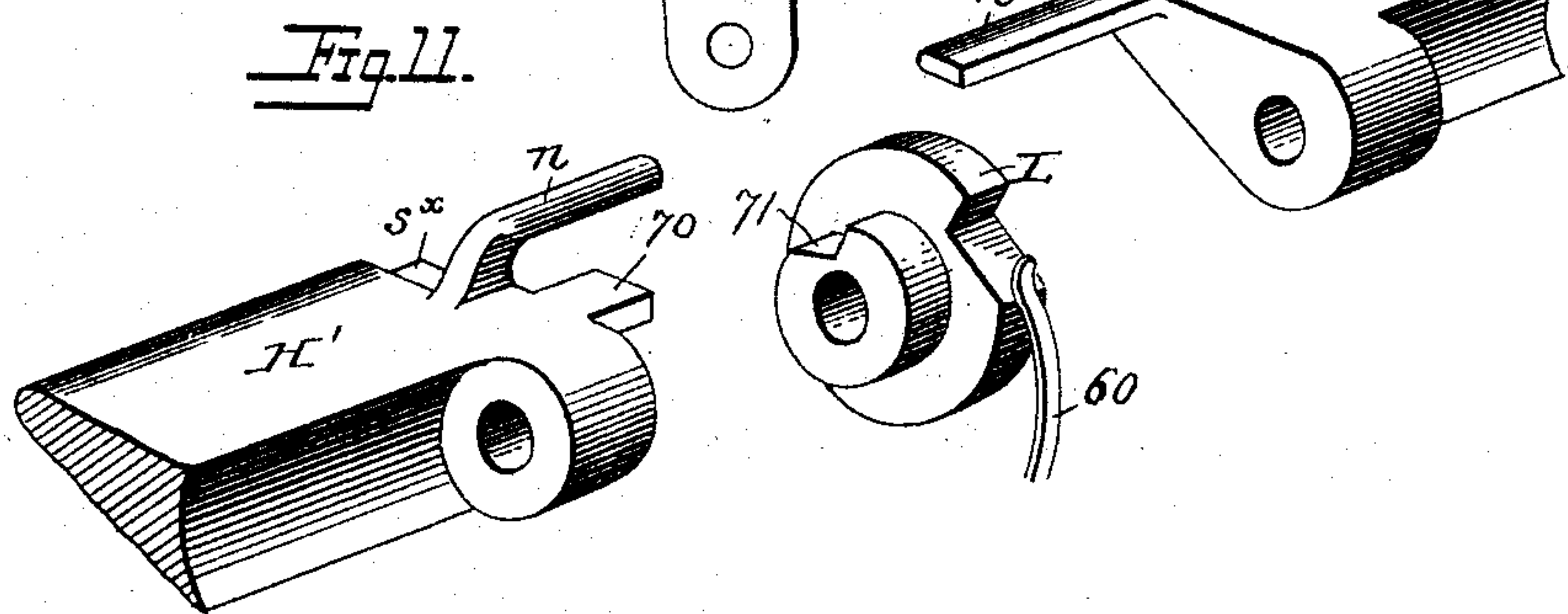
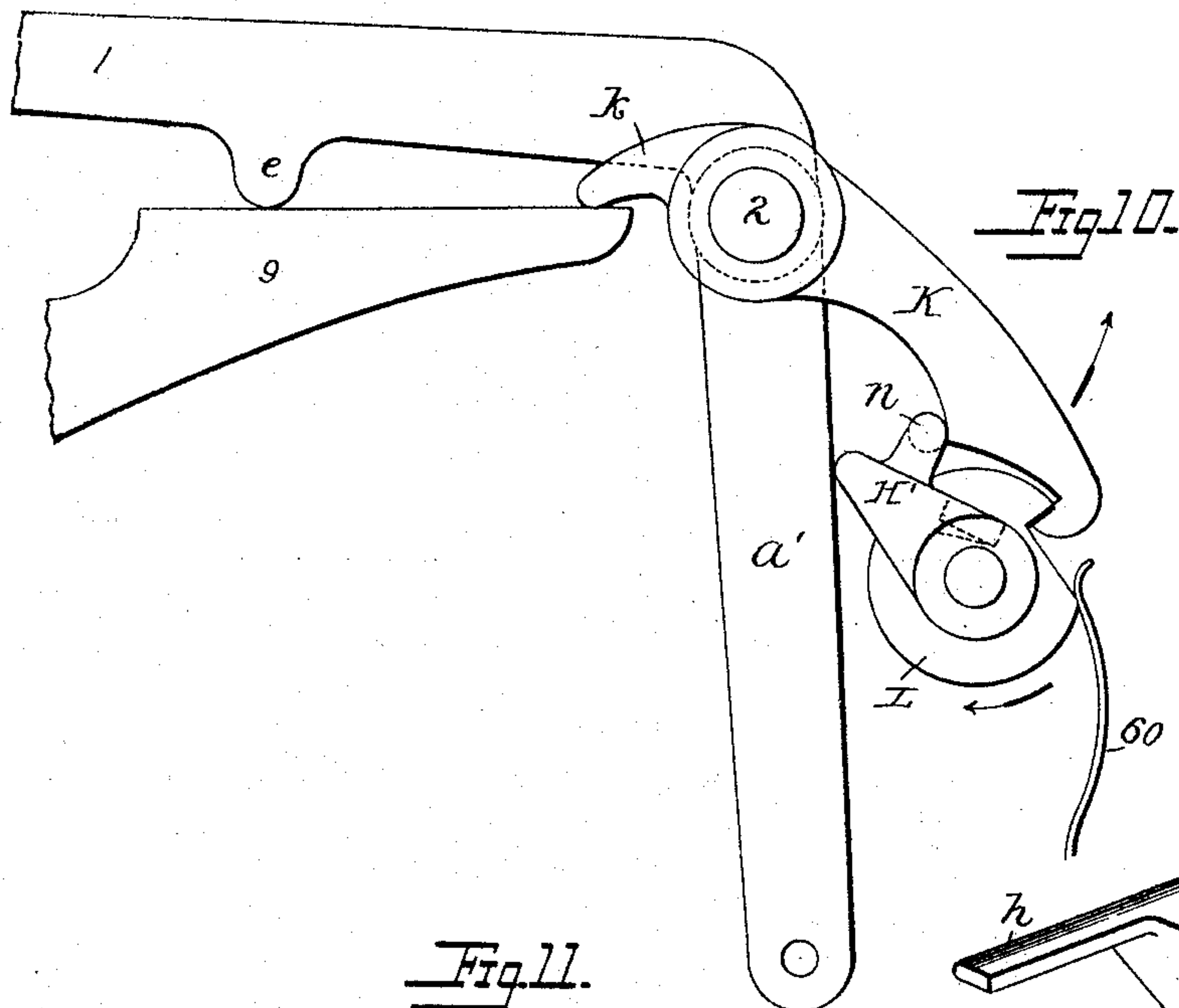
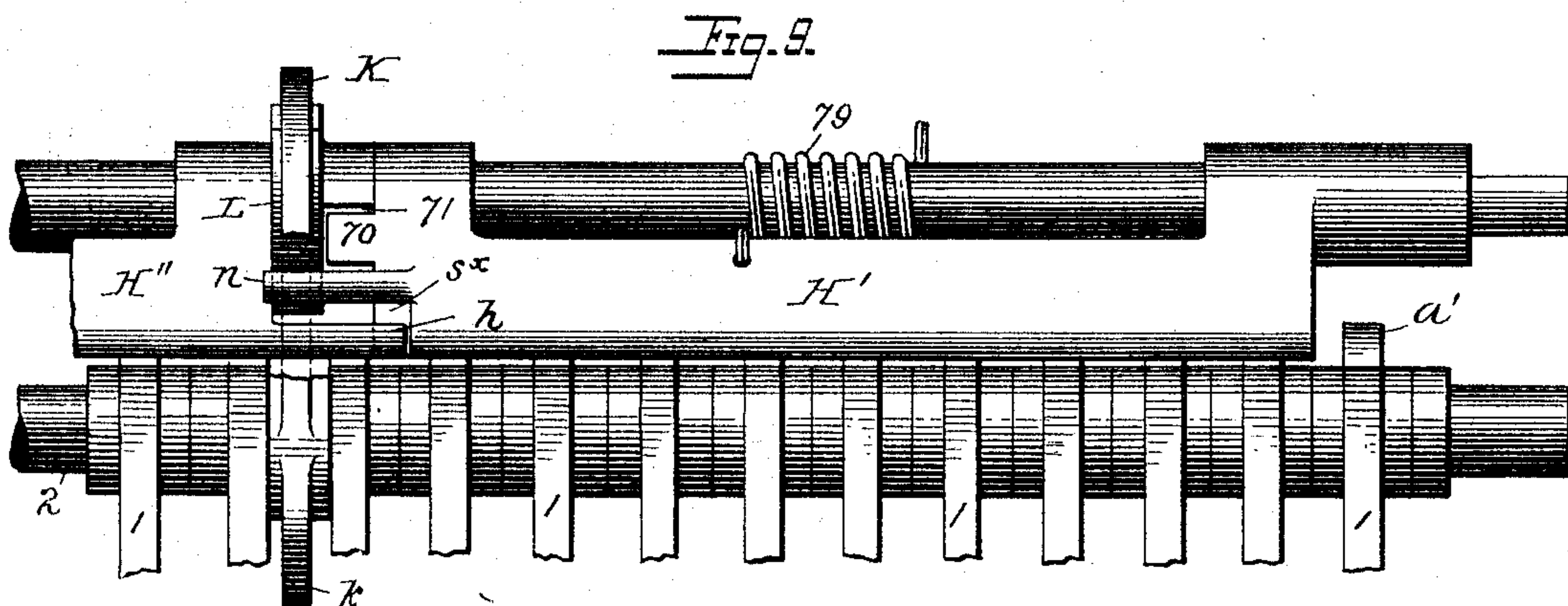
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UNITED STATES PATENT OFFICE.

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CASH-REGISTER.

SPECIFICATION forming part of Letters Patent No. 505,194, dated September 19, 1893.

Application filed September 4, 1889. Serial No. 322,916. (No model.)

To all whom it may concern:

Be it known that I, JAMES T. COWLEY, a citizen of the United States, residing at Lowell, county of Middlesex, and State of Massachusetts, have invented certain new and useful Improvements in Cash-Registers, of which the following is a specification.

My invention relates to that class of registering apparatus used for recording receipts or disbursements in stores, banks, &c., and my invention consists of certain improvements in the construction of such apparatus fully set forth hereinafter, and illustrated in the accompanying drawings, in which—

Figure 1 is an end elevation of my improved registering apparatus, the case in section. Fig. 2 is a view of the opposite end showing part only of the apparatus the case removed. Fig. 3 is a plan, the case being removed. Fig. 4 is a front elevation showing mainly the frame and counter. Fig. 5 is an enlarged detached view of a key lever. Fig. 6 is a similar view of the drawer catch, operating lever and adjuncts; Fig. 7 an enlarged sectional elevation of part of the target and actuating mechanism; Fig. 8 an enlarged elevation of the counter and adjuncts; Fig. 9 a detached view of part of the transfer devices; Fig. 10 an end view of the parts shown in Fig. 9; Fig. 11 a perspective view of parts of the transfer devices.

The frame A of the machine is of any suitable construction to support the operating mechanism in any form in which it may be embodied, and the mechanism is inclosed in a suitable case R, provided with a drawer B, and with two sight openings x x' , the latter exhibiting the numbers upon the counter, and the former those upon the elevated targets or tablets. The tablets a , are shown arranged to move vertically and are elevated to display them opposite the opening x , and the indicator at the front is in the form of a counter having any suitable number of sections, three sections $CC'C^2$ being shown. There are three banks or sets of keys b , each key being carried by an L-shaped lever 1, the first bank D of keys bearing numbers from 1 to 9, the second bank D' being numbered from 10 to 90, in multiples of ten, and the third bank

D² being numbered from \$1 to \$10, as illustrated in Fig. 3. Each key b operates one of the tablets a through any suitable connections. As shown the pendent end or arm 1^a of each key lever 1 is connected by a rod 121 to a bent lever 22 pivoted at its forward end 23, and at the inner end of each lever 22 is a bearing 24 below one of the shafts f of the targets, and when a key is depressed the bearing 24 is raised lifting with it one of the targets, a weight 5, carried by the lever returning the latter and the key to their normal positions. On each shaft f is a lug g which as it rises forces back an inclined wing Q on a transverse shaft 14, the wing then falling below the lug and holding the shaft and tablet in an upward displayed position. When another shaft rises its lug g throws back the wing Q and the shaft first raised is thus released and descends. There is a separate wing to each bank of keys, each wing turning on the shaft 14, to a limited extent permitted by a pin a^2 on the shaft entering a slot a^3 in the wing.

To prevent two or more key levers from being depressed at one time, I make use of any suitable stop device. For instance I connect to each lever a pendent arm 70 which extends through a slotted guide 71 having a longitudinal channel for a series of blocks 72 with beveled ends, the blocks being so proportioned that they will fill the channel longitudinally, except a space sufficient for the passage of one of the arms 70. When, therefore, a lever and one arm 70 are depressed and the arm passes between two blocks, the blocks are all pushed close together and no other arm 70 can descend till that already in the channel is raised.

To the side of each key lever, near the forward end is hung a lock or detent consisting of a slotted dog E, and through the slots of all the dogs extends a transverse rod 4 supported to swing vertically or in a circle. As shown, the bar 4 is supported by two pivoted arms 5 5, the pivot 6 of one of which carries a notched wheel or disk 7. Across the front of the machine extends a plate 8 in such position that when the dogs are swung forward in the direction of the arrow, Fig. 1, their

lower ends will pass the edge of the plate 8. It will be seen that if one of the key levers is depressed, the dog E of that lever will be caused to bear upon the cross bar 4, and the dog will be held out of contact with the plate 8 so that the downward movement of the key lever is not interfered with, but this downward movement also carries down the cross bar 4 and the latter swings forward all the dogs of the remaining key levers while the dog attached to the key depressed insures a continued contact between said key and the bar 4 until the key lever is restored to its normal position.

In addition to the keys *b* there is a supplemental key O carried by a lever *j* turning upon the cross shaft 2, which also supports the other key levers, and provided like the other key levers with a pendent arm 15 which carries a pawl 16 adapted to engage with a bearing 17 on the frame, so as to hold the lever *j* in a slightly depressed position. The arm 15 also engages with an arm 18 upon a transverse rock-shaft 19 which carries at about the middle of the machine a beveled edged catch 20 arranged to engage with a part of the drawer B and hold it locked. A loose arm 21 carried preferably by the shaft 19 is arranged in position to be struck by part of the drawer as the latter is closed and to make contact with and lift the pawl 16. The depressing of the key O throws back the arm 18 and lifts the catch 20 so that the drawer may be drawn or thrown outward by a spring 100, and the key O cannot again be raised so long as the drawer is out because of the engagement of the pawl 16 with the bearing 17, but as soon as the drawer is pushed in the pawl is raised as described and the key released. So long also as the key O is depressed and the drawer is open none of the key levers 1 can be operated, because the pendent arm 70 connected to the lever *j* moves the blocks 72 as stated thus preventing the passage of another arm 70 and locking the key-levers. The targets therefore cannot be set after the drawer is released and opened until it is again shut. The depression of the key O is made the means through any suitable connections of ringing the bell. Thus, the bell hammer arm 27 is hung to the side of the lever *j* and carries the hammer 28 for striking the bell 94. At one side of the arm 27 is a lug 26 which normally bears upon the edge of the lug 25 of an upright pivoted arm or detent G, the lug 25 having an inclined lower face and a spring 29 extending between a projection of the arm G and the bell hammer arm 27. On depressing the lever *j*, the lug 26 bearing upon the lug 25, the arm 27 is raised until the lug 26 slips from the lug 25 when the hammer will descend and strike the bell.

To the shaft 14 carrying the wing Q is connected a lever F from one side of which a horn 92 extends over the edge of the notched disk 7, and at the inner side of the lever F is

a lug 93 which normally bears upon a shoulder of the arm G, the spring 29 tending to maintain the two in contact. To the frame of the machine is hung a catch 96 having lugs *u*, *v*, Fig. 4, at opposite sides, the lug *v* to catch beneath and support the lever *j* and the lug *u* in position to be struck by the lever F, when it rises, the catch being therefore swung away from below the lever *j* to release the latter. When the lever *j* is depressed its depending arm 70 causes the blocks 72 to slide together and lock all the key levers; it also rings the bell, releases the drawer and is itself locked by the pawl 16 engaging the bearing 17. When the lever *j* is released and its pawl 16 freed by the closing of the drawer and rises to its normal position, the lug 26 by contact with the lug 25 forces back the detent or arm G until the latter passes from below the lug 93, so that the lever F falls until the horn 92 bears upon the edge of the disk 7. The descent of the lever F also releases the catch 96 which then swings below and locks the lever *j* in its elevated position. If now one of the key levers is depressed, the disk 7 will be turned in the direction of its arrow, the horn 92 will descend into the notch α^2 , swinging the lever F and shaft 14 so as to carry all the wings Q away from all of the lugs *g*, releasing all of the targets or tablets so that they may descend to their concealed positions, while a new target may be raised by the descent of any one of each of the banks. In order that each wing Q may be restored to position to engage and retain the newly raised target or targets, the notch α^2 is so proportioned that the further rotation of the disk 7 will lift the lever F until it again passes the shoulder of the arm G when all the wings Q will be placed in position to engage with the lug of the shaft which is being elevated. During these operations the lever *j* is located that the drawer cannot be opened or the bell sounded, thus compelling the opening and closing of the drawer after each operation or series of operations of the targets to indicate any single sale. The limited movement of the wing Q independent of the shaft 14 necessary to permit it to swing forward when a staff and lug *g* are lifted is permitted by the slot α^3 and pin α^2 . Upon the shaft of the ten dollar tablet there is a lug g^2 so large that such tablet will not drop upon the elevation of the other targets of the dollar series, so that the ten dollar tablet may remain in position displayed to combine with the numbers upon other tablets of the series to indicate sums greater than ten dollars. The movement of the lever F, however, swings the wing Q sufficiently to release all the tablets. The wheel 7 has two series of ratchet teeth 98, 99, on opposite sides of the lowest point when the wheel is in the position shown in Fig. 1, and also two pins 101, 102, adapted to make contact with the arm of a double pawl 103, which engages with one set or the other of the ratchet teeth accord-

ingly as it is swung by the contact of the pins. Thus as the disk has completed its movement and attained the position shown in Fig. 1, the pawl engages the teeth 98, and if a key lever is now partly depressed the disk is turned in the direction of the arrow and cannot be turned back until the key lever is depressed to its full extent. The pin 102 then makes contact with and reverses the pawl so that the key lever can be raised, but this upward movement must be fully completed before the position of the pawl is reversed by the contact of the pin 101. I thus provide means whereby after a movement of a key lever is begun in either direction it must be completed before it can be reversed. Beneath each set of levers extends a plate 9 which is pivoted at 10 so that it will swing vertically under the downward movement of any one of the levers of the set, and each lever is provided with a lug *e*, and all of the lugs of each set are arranged upon a diagonal line so that the extent to which the plate 9 will be depressed will vary according to the lever operated, and as the levers having the smallest numbers have their lugs or bearings *e* nearest the fulcrum 2 of the levers and farthest from the fulcrum of the plates 9, the extent to which the plate is depressed will increase in proportion to the increased value of the numbers on the levers. Each plate 9, is connected with the operating lever *d'* of one of the counter sections through the medium of a connecting rod *d*, and this lever carries the actuating pawl 12 which engages with the finely cut ratchet wheel 13 of the counter, and thereby on its return movement turns the counting mechanism to an extent proportionate to the value of the figure upon the key struck, in its relation to the other keys of the set.

It is most desirable to prevent the "throwing" of the counting mechanism by the movements of the keys, resulting where the keys are struck violently or more rapidly, and I therefore arrange a bar 52 so that the tapering end of each pawl 12, will pass beneath and in contact with said bar as it enters a notch and moves the wheel, and will be held therein so that the wheel cannot be carried by impetus farther than the pawl can move.

Each counter section must be moved one step as the preceding section completes a revolution to carry one to the next higher denomination. This may be done by any of the usual transfer means. As shown, there is a two armed lever 75 which carries a second pawl 76, and which is vibrated by the action of a finger 77 on a shaft 78 that lifts one of the branches of the lever 75 whenever the counter section geared with said shaft 78 completes a revolution to thereby turn the wheel 13 sufficiently to move the indicating disks α^3 and shafts carrying ratchet wheels 80 geared therewith one or more tenths of a complete revolution. To prevent the throw of the lever 75 from feeding the registering mechanism forward

more than one step at a time in the act of transferring, a catch lever 60 is hung to the bar 52 above and in position to be vibrated by said arm as it rises, thereby moving the end 61 of the catch lever into engagement with the toothed wheel 80, the shaft of which is suitably geared to the shaft of the wheel 13. By this means when the wheel 13 has been turned the distance of one step, the parts are locked against further movement by the contact of the catch lever with the wheel 80, a spring 81 secured to the bar 52 being arranged to bear on and depress the lever and hold it normally in the position shown in Figs. 4 and 8.

It will be evident that if the pawl 12 remains locked in contact with the wheel 13 at all times after moving said wheel, the pawl 76 cannot act to rotate said wheel. I therefore provide means for unlocking said pawl 12 whenever a key of a lower bank is struck. Thus on the plate 9 of each bank of keys bears one end *k*, of a pivoted lever K, that is combined with any suitable devices to rock the lever K and thereby slightly depress the plate when any one of the next lower bank of keys is struck. This depressing of the plate swings the arm *d'* sufficiently to draw back the pawl 12 and leave the wheel 13 free to move under the action of the pawl 76, but not enough to feed the wheel by the action of the pawl 12. It will thus be seen that while the movements of the pawl 12 are limited to turn and lock the wheel 13 when said pawl is operated by any one of the keys of the bank with which it is connected, the movement of any one of the keys of the next lower bank will unlock or move back the pawl slightly and leave the wheel 13 so that it can if necessary be moved by the transfer mechanism.

The devices for operating each lever K from the movements of the keys of the next lower bank, as shown, consist of wings *H' H''*, Figs. 3, 9 and 11 each pivoted at the rear of the frame, the wing *H'* bearing against the pendent ends 1^a of the levers 1 of all of the keys of the bank D, except of the highest key the wing being cut away at *s*, *z*, Fig. 11 to avoid contact with this key, and the wing *H''* bearing on the arms of the key levers of the next bank D', and a finger *n* of each wing *H' H''* extends under the adjacent lever K. A spring 79 tends to hold each wing against the arms 1^a of the levers, and when any lever 1 is moved by depressing its key, the wing bearing against said arm is raised, the adjacent lever K is vibrated in the direction of the arrow Fig. 10, and the plate 9 of the next higher bank of keys is depressed slightly, with the result before described.

As a transfer may at times take place from two sections simultaneously, it is necessary that all the pawls 12 shall be loosened upon the striking of the key of any lower bank. Each wing therefore has a finger or portion *h* overlapping the wing below so that if the lower wing is lifted, the next succeeding wing (or wings if there are more than one) will be

moved also. But the movement of any wing by a key of its bank will not actuate the preceding wing.

Each lever K has a shouldered end that rests on a notched disk L against the flat face of which bears a flat spring 60 which tends to turn the disk in the direction of the arrow, Figs. 1 and 10. The shoulders of the disk and lever normally engage, as shown in said figures, but when the lever is lifted by the finger *n* on the wing, as occurs when the wing is thrown out by any of its keys the higher part of the disk turning under the end of the lever holds it up and thus holds the plate 9 down and the pawl 12 loose until the transfer is completed. As soon, however, as the key lever returns to its place and the wing swings in, a part 70 of the wing bears on a shoulder 71 of the disk and turns it back to the position shown in Fig. 1, thereby bringing the recessed part of the disk below the end of the lever K, permitting the latter to fall and at once releasing the plate 9 and the pawl 12.

In order to prevent the racking of the machine from pounding or a too rapid movement downward or return of the keys, the shaft 4 is connected by a link to the rod 106 of the piston of a dash pot N, containing an oil or other suitable fluid, the dash pot being constructed as usual to retard the downward movement of the piston but permit it to rise freely.

While I have described the wing Q for retaining the sliding target shafts any other suitable form of detent or friction device may be employed for this purpose, and the targets may swing or rotate instead of sliding. The detent for the lever F may be also differently constructed so as to release the lever upon the proper movement of the lever *j*, and any other suitable form of catch or detent for retaining the drawer B may be employed.

The disk 7 may be weighted so as to normally assume the position shown in Fig. 1, but I prefer to connect a spring 108 thereto for this purpose.

Any suitable means may be employed for resetting the registering mechanism at zero when desired. As shown, the shafts X Y Z thereof, are provided with elongated end journals working loosely through bearings in the frame A, so as to slide longitudinally and are geared to intermediate shafts X' Y' in the usual manner, and the shafts carrying indicating dials α^3 . A supplemental frame, composed of parallel bars 200, 201, connected by cross-pieces 203, is adjustably supported horizontally in the main frame, and is so arranged that said bars are adjacent to and in contact with the extended ends of the shafts X Y Z, a spring 202 tending to throw the frame and the shafts X, Y, Z, in the forward position shown in Fig. 3, in which case the train of gearing is maintained in working order. By pushing back the movable frame the longitudinal movable shafts X, Y, Z, are moved back and the gears carried thereby thrown

out of gear with those of the shafts X' Y' so that each shaft may be turned independently to set it to zero. This may be done by a key the bar rod having openings 205 through which the key may be passed to the angular end of each shaft.

I have shown an ordinary form of counter in sections for the purpose of illustrating my invention, but it will be apparent that other forms may be employed with corresponding changes in the connections between each section and the corresponding bank of keys, and the different forms of connections from those described may be employed for imparting movement from one bank of keys to the locking device of the section of the counter operated by the succeeding bank of keys.

Without limiting myself to the precise construction and arrangement of parts shown, I claim—

1. The combination of the tablets and staves *f*, keys *b*, levers 1 having pendent arms 1^a, movable bearings 24 below the staves and intermediate connections between the latter and the arms 1^a, substantially as set forth.

2. The combination of the targets and staves *f*, having lugs *g*, wing Q, keys *b*, lever F, recessed disk 7, and connections between the latter and the keys whereby said disk is moved by the movement of any key, substantially as set forth.

3. The combination with the key levers 1, of locking dogs E hung to the levers, cross plate 8, and movable bar 4, bearing on the dogs, substantially as set forth.

4. The combination of the horizontal key levers, arms 70 hanging loosely therefrom and series of sliding blocks below the end of the arms 70, substantially as set forth.

5. The combination with the key levers of arms 70 hung loosely thereto and blocks 72, and locking devices for retaining the other levers in their normal positions after any lever is depressed, substantially as set forth.

6. The combination of the receptacle, catch for holding the same in its closed position, and key O independent of the registering machine for operating said catch, and targets and operating keys *b*, locking devices for said keys, and connections between said locking devices and the key O whereby all the keys *b* are locked when the key O is depressed and the drawer open, substantially as set forth.

7. The combination with the key levers, of an independent lever *j*, drawer or receptacle and catch therefor connected to be actuated by said lever *j*, and key lever locking devices operated by the lever *j*, substantially as set forth.

8. The combination of the key levers, lever *j*, drawer, drawer-catch connected to be operated by the lever *j*, and series of locking devices for the key levers also connected to be operated by the lever *j*, to retain the key levers after the drawer is released and until the lever *j* is in its usual raised position, substantially as set forth.

9. The combination of the tablets, keys *b*, separate therefrom, intermediate connections whereby a tablet is raised upon depressing any one of the keys, and an independent key *O* and locking devices for the keys *b* and connections between said locking devices and the key *O*, whereby the keys *b*, are locked except when the key *O* is in its normal position, substantially as set forth.

10. The combination of the tablets, tablet operating keys *b*, drawer, drawer-catch, lever *j* and connections between the latter and the catch whereby the catch is released on depressing the lever *j* and connections between the lever *j* and the keys *b* whereby the latter are locked until the lever *j* recovers its normal position, substantially as set forth.

11. The combination of the drawer, lever *j*, and pawl 16 for holding the lever depressed arranged in position to be released by the drawer as the latter is closed, substantially as set forth.

12. The combination of the lever *j*, pawl 16, bearing 17, the drawer and catch 20 and the arm 21 arranged to make contact with the drawer and with the pawl, substantially as set forth.

13. The combination of the lever *j*, having a pendent arm 15 and pawl 16, the shaft 19 carrying a catch 20, arm 18 and loose arm 21, the bearing 17 and the drawer, substantially as set forth.

14. The combination of the key levers, bar extending beneath all of the levers, disk 7 connected with said bar and having two reversed series of ratchet teeth, double acting pawl 103 and contacts 101, 102, substantially as set forth.

15. The combination with the staves, retaining wing *Q* and key levers of the bar 4 recessed disk 7 and arm *F* connected with said wing, retainer for said arm *F*, lever *j* and connections for releasing said retainer by the action of said lever, substantially as set forth.

16. The combination of the two or more banks of keys, target staves, a wing for each bank for engaging a lug on the elevation of a staff on depressing a key, and connections between all the wings and each key whereby said wings as any key is depressed is first positively retracted to release all the staves before elevated, and then restored to position for such wing to engage the staff being raised by the said key, substantially as set forth.

17. The combination of the lever *j*, wing *Q*, target staves lever *F* connected therewith, arm *G* having a bearing for the lever *F*, and connections between the lever *j* and arm *G* whereby the latter is swung by the upward movement of the lever *j*, to retain the lever *F* substantially as set forth.

18. The combination of the levers 1, *j*, plate 8, dogs *E* pivoted to the levers 1, swinging bar 4, notched disk 7, lever *F* and detent therefor and connections for operating the detent from the lever *j*, and a series of targets

and target detent or wing *Q* connected with the lever *F*, substantially as set forth.

19. The combination with the series of movable targets, detent therefor and lever *F* of a notched disk 7 connected to be moved by the key levers, a detent for the lever *F* and a lever *j* and connections for operating the latter detent, substantially as set forth.

20. The combination with the series of tablets of a series of staves having lugs *g*, the lug *g*² of the \$10 tablet being larger than the others, and a movable wing *Q*, substantially as and for the purpose set forth.

21. The combination of a series of key levers, arranged in banks or sections, a totalizing counter in sections having wheels with numbers 0 to 9 with transfer devices between the sections, each section of the counter connected to be operated by one of the banks, substantially as set forth.

22. The combination with the series of banks of keys, a counter in sections, transfer devices between the sections, and two or more movable plates one connected to operate each section of the counter, and each extending beneath one of the banks of key levers, with bearings for the latter at different distances from the fulcrum of the levers, substantially as set forth.

23. The combination with the banks of keys and counter in sections, and transfer devices, of connections for operating each section of the counter from one of the banks of keys, a locking device for each section of the counter, and connections between each locking device and the preceding bank of keys whereby the operation of any key of such bank will unlock the next higher section of the counter, substantially as and for the purpose set forth.

24. The combination with different banks of keys and with the counter sections, of a reciprocating pawl 12, for operating each section, a locking bar 52 above each pawl, a second reciprocating pawl 76 and transfer connections for operating it from the preceding counter section, and connections between each pawl 12 and one of the banks of keys, substantially as set forth.

25. The combination of two or more banks of keys and a counter section and pawl for operating each section from one of the banks of keys, of a locking bar for each pawl, transfer devices between the counter sections, and connections between each pawl and the keys of the preceding bank of keys for unlocking said pawl when any one of said keys is depressed, substantially as set forth.

26. The combination of the banks of keys, plate 9, counter in sections each section connected to be operated by one of the plates, transfer devices, and a lever *K* bearing on each plate and connections between the lever and the keys of the preceding bank for vibrating said lever on the movement of any one of said keys, substantially as set forth.

27. The combination with the plates 9,

counter in sections transfer devices, actuating pawls 12 and locking bars 52, end levers K and wings H', H'', substantially as and for the purpose set forth.

5 28. The combination with the different banks of keys counter and transfer and locking devices of wings H', H'' arranged to be moved by the different banks of keys and each connected to operate the locking devices
10 of the succeeding section of keys, substantially as set forth.

29. The combination with the banks of keys, plates 9, and counter sections, of levers K, wings H', H'', having bearing for said levers,
15 and bearings for one wing upon the preceding wing, substantially as and for the purpose set forth.

30. The combination of the wings and shouldered levers K, of the notched disks L, springs
20 60, and bearings for the wings, on the disks, substantially as and for the purpose set forth.

31. The combination of the key levers, swinging cross bar 4, and dash pot N, substantially as and for the purpose set forth.

25 32. In a registering mechanism, the combination of the adjustable shafts, the intermediate fixed shafts, dials on all the shafts, gearing connecting the latter, and a movable frame for throwing the shafts into and out of
30 engagement, substantially as described.

33. In a registering mechanism, the combination of the adjustable shafts, the intermediate fixed shafts, dials and gear wheels on the shaft, a movable frame contacting with the opposite ends of the adjustable shafts, and
35 a spring for holding the gear wheels normally in engagement, substantially as described.

34. The combination with the key levers of locking devices composed of the dogs E, rod 4 and plate 8 for locking the remaining levers
40 in elevated positions as the one is depressed and a stop device consisting of the arms 70 and 72 for preventing more than one lever being depressed at one time, substantially as set forth.

35. The combination with the key levers, of locking device composed of the dogs E, rod 4 and plate 8 for locking the remaining levers
45 in their elevated positions as the one is depressed, and a stop device for preventing 50 more than one lever being depressed at one time substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES T. COWLEY.

Witnesses:

FRANK COBURN,
GEO. E. COBURN.