

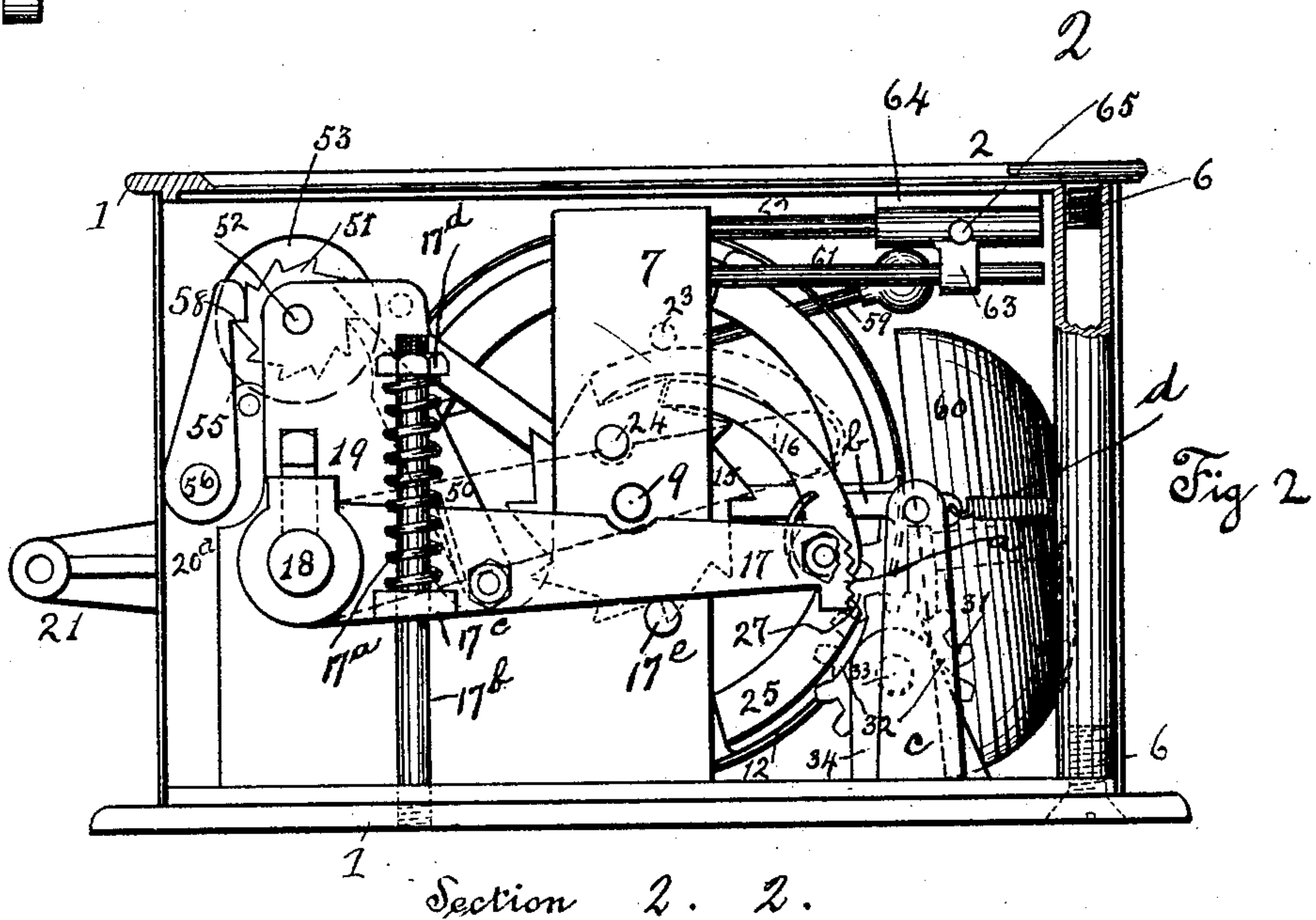
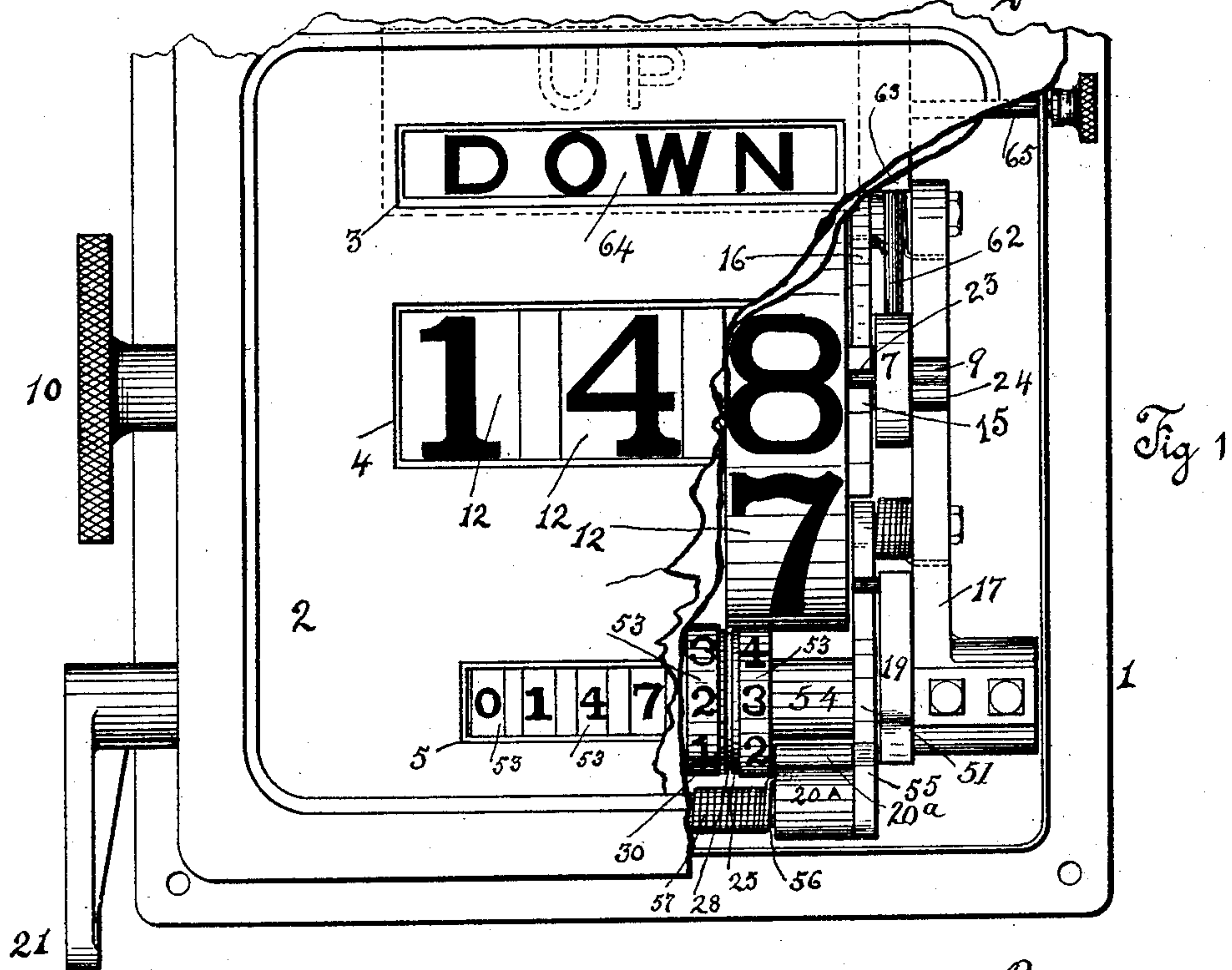
(No Model.)

3 Sheets—Sheet 1.

S. M. BALZER.
FARE REGISTER.

No. 556,955.

Patented May 24, 1896.



Witnesses
Arthur Thayer.
O. M. Fort.

Inventor
Stephen M. Balzer
By his Attorney
T. J. Bourne.

(No Model.)

3 Sheets—Sheet 2.

S. M. BALZER.
FARE REGISTER.

No. 556,955.

Patented Mar. 24, 1896.

Fig 3

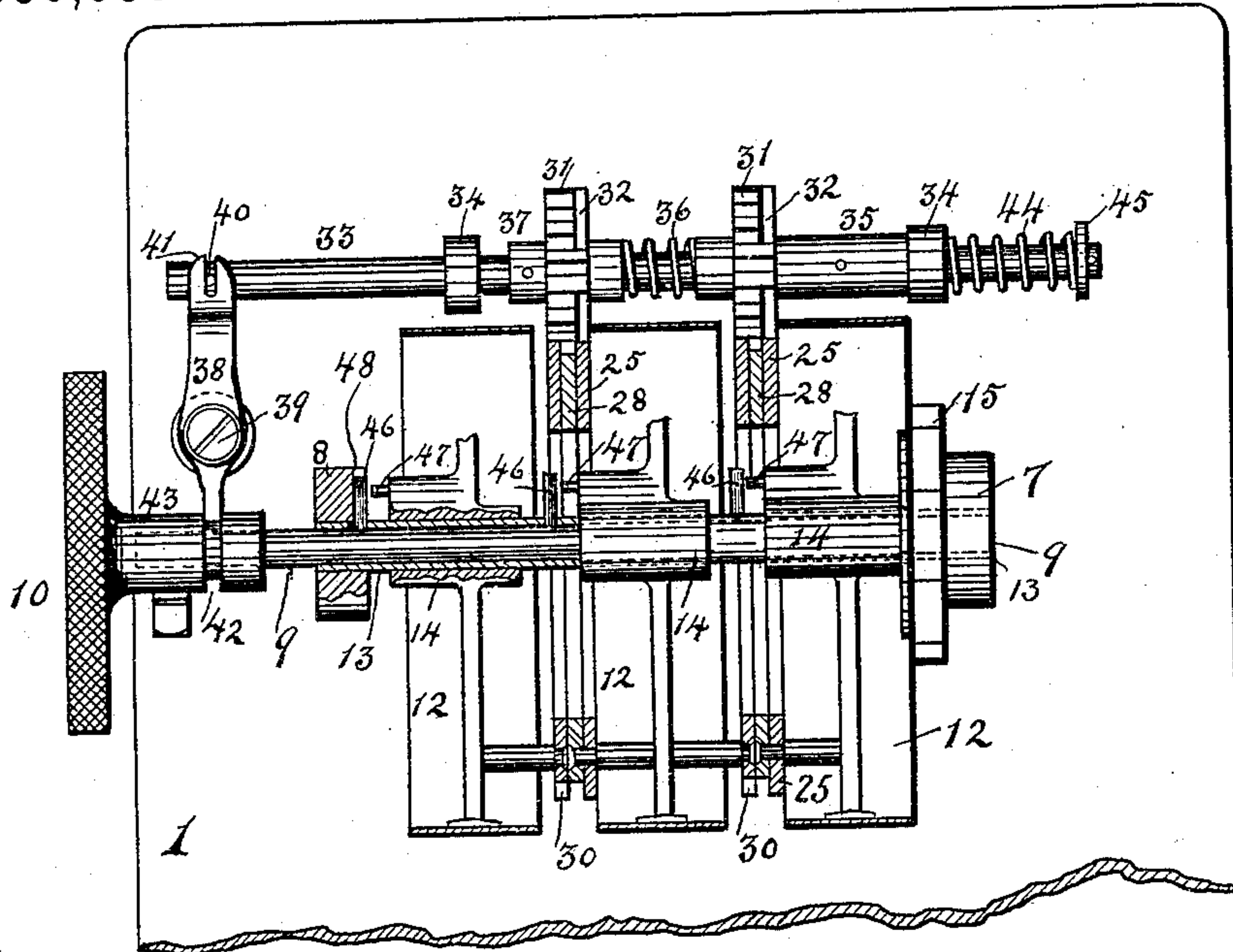


Fig 4

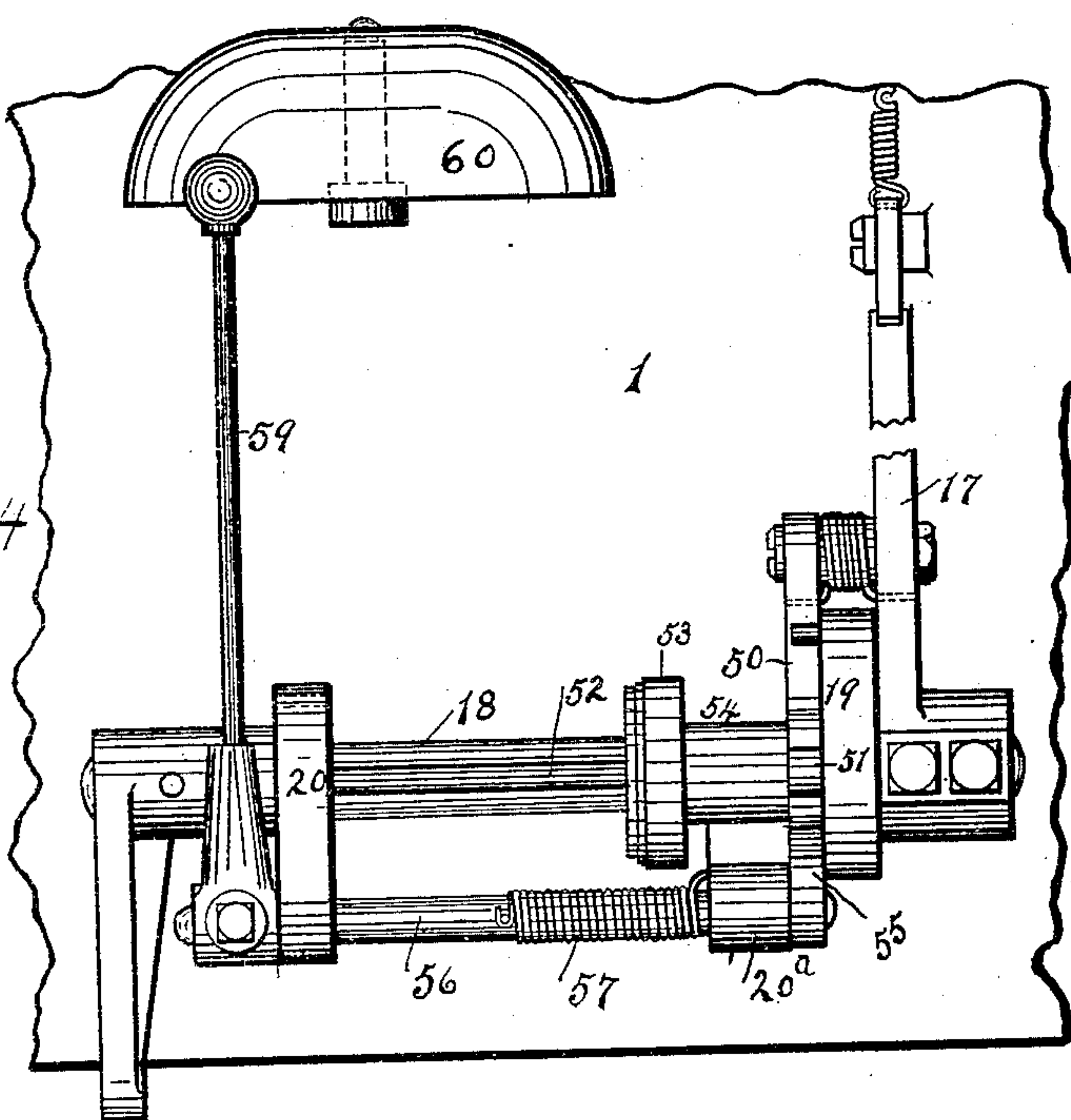
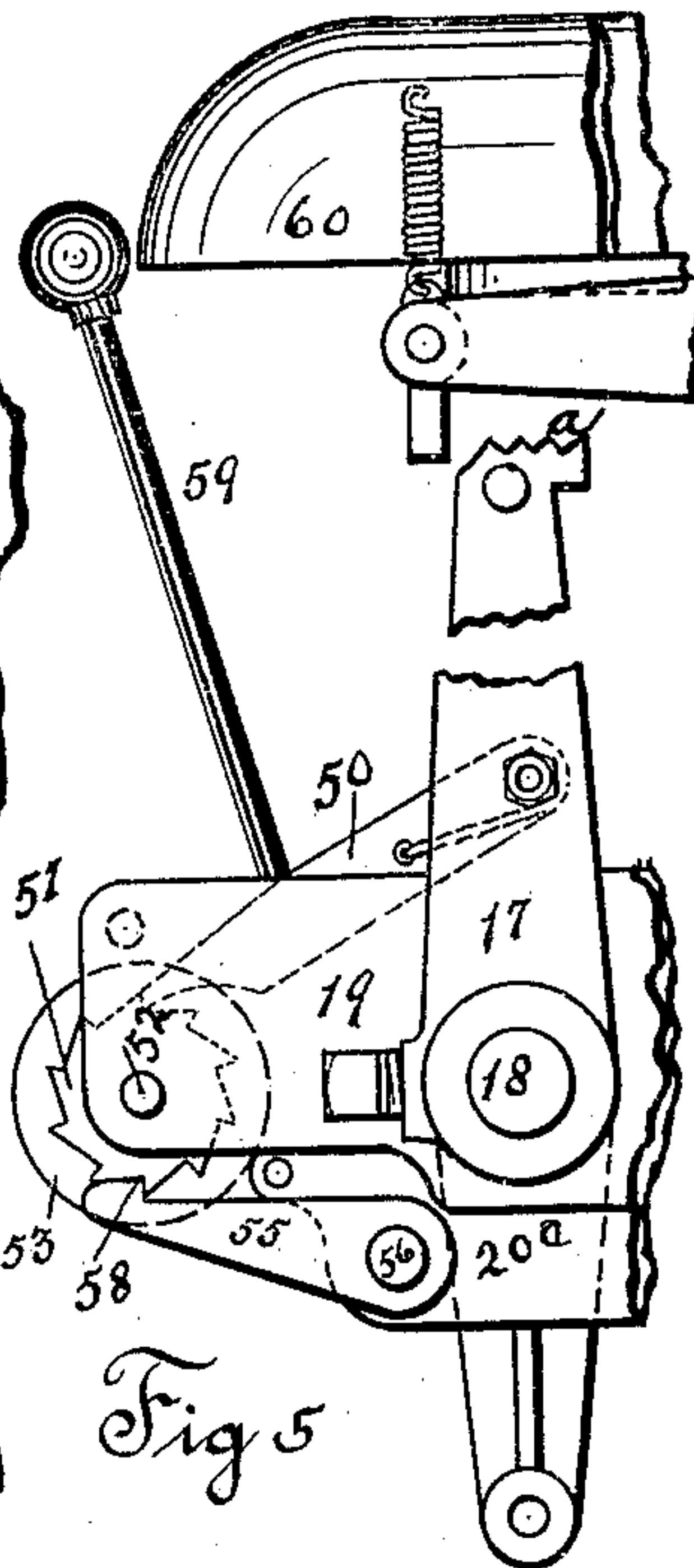


Fig 5



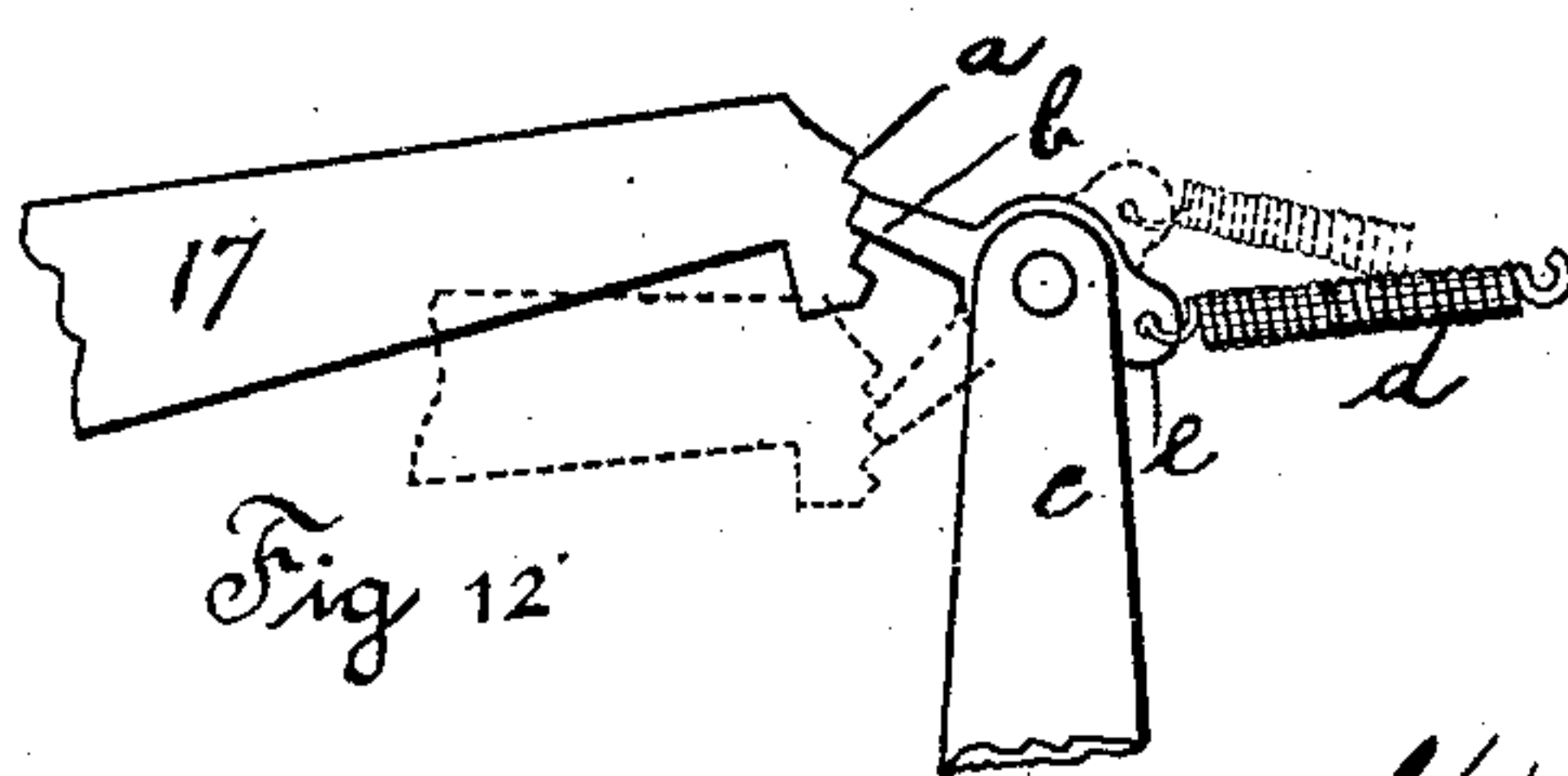
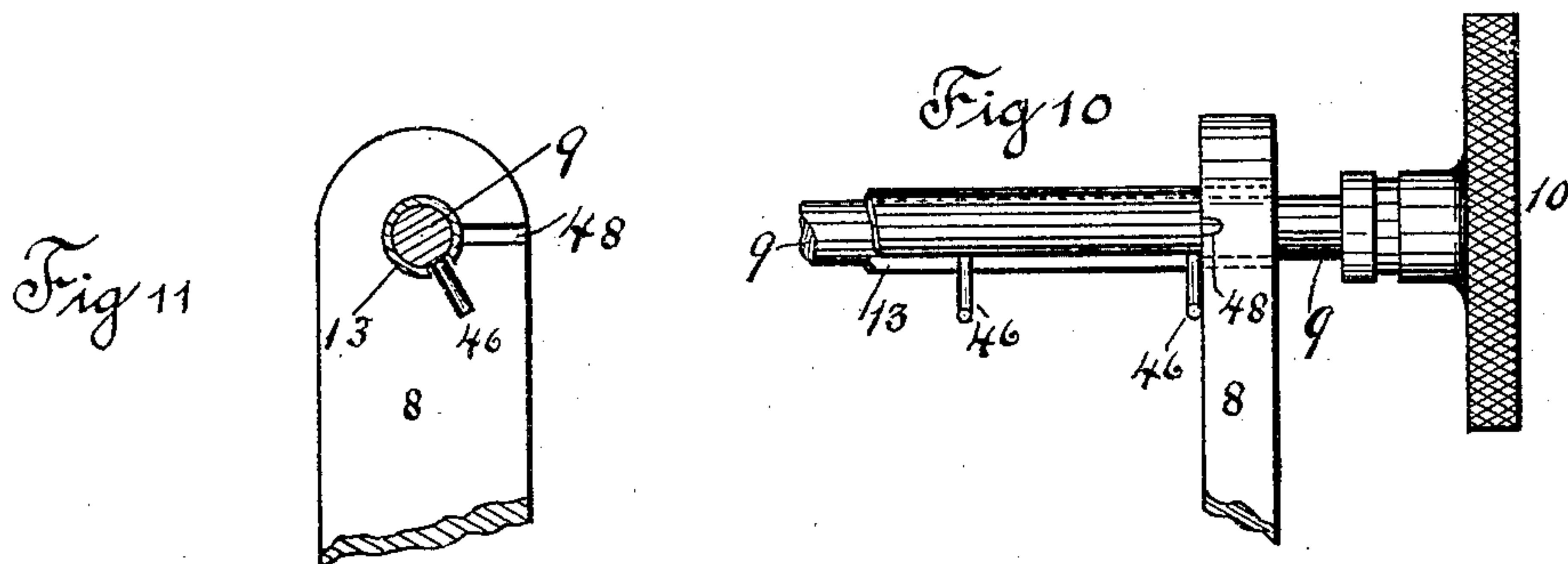
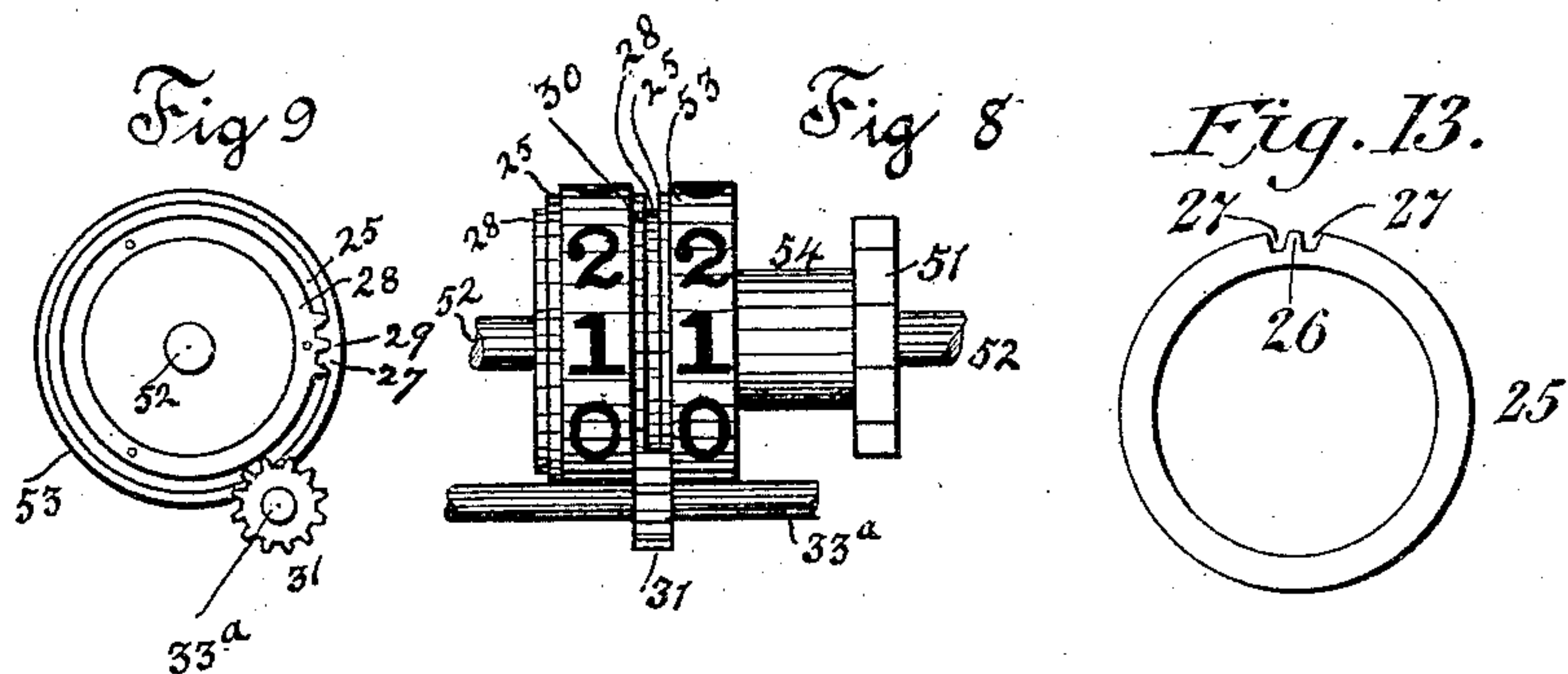
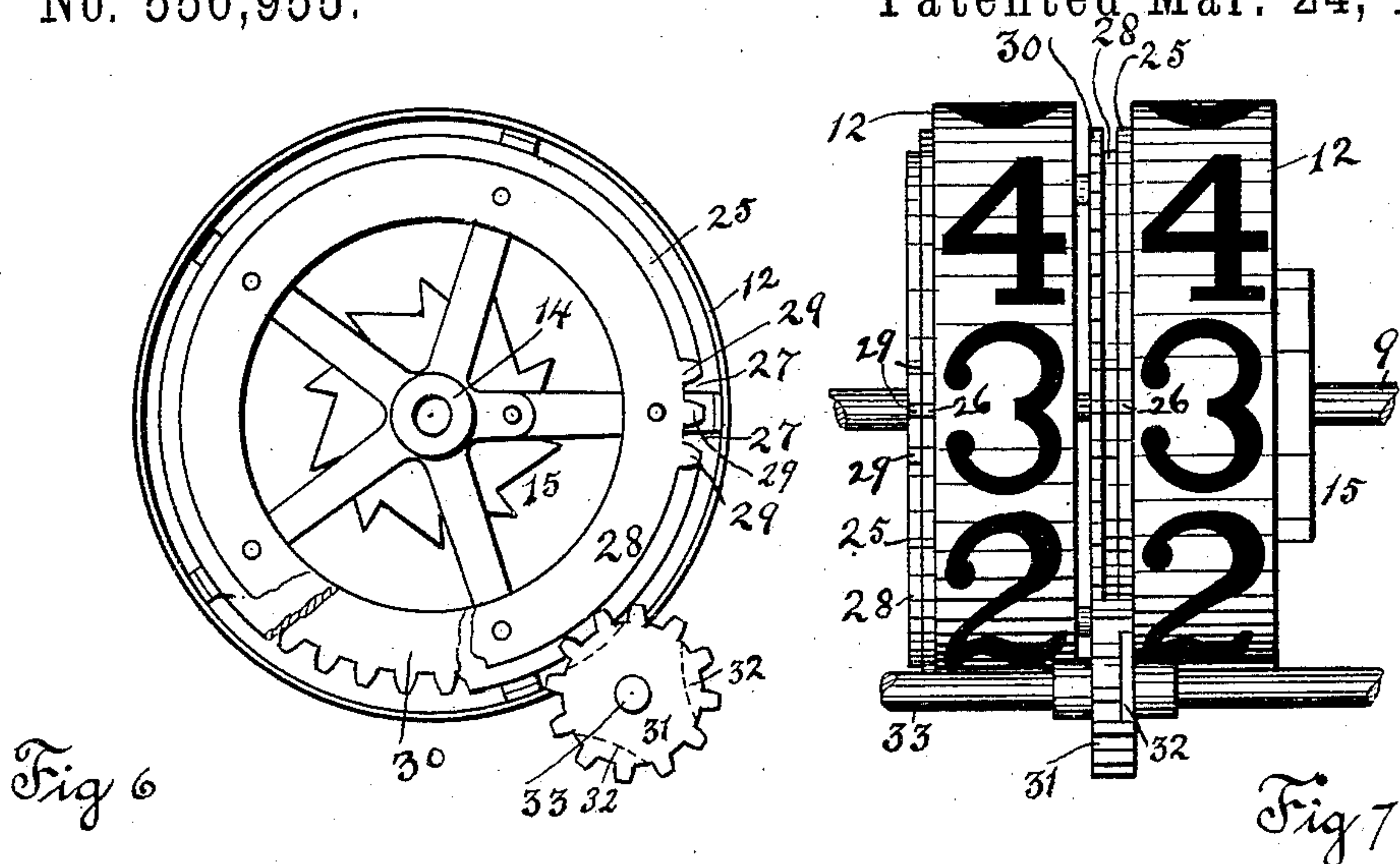
Witnesses
Arthur Thayer
S. M. Fort

Inventor
Stephen M. Balzer
By his Attorney
T. F. Bourne

S. M. BALZER.
FARE REGISTER.

No. 556,955.

Patented Mar. 24, 1896.



Witnesses
Arthur Thayer
E. M. Fox

Inventor
Stephen M. Balzer
By his Attorney
T. F. Bourne

UNITED STATES PATENT OFFICE.

STEPHEN M. BALZER, OF NEW YORK, N. Y., ASSIGNOR OF ONE-HALF TO
WILLIAM H. HUMPHREY, OF NORFOLK, CONNECTICUT.

FARE-REGISTER.

SPECIFICATION forming part of Letters Patent No. 556,955, dated March 24, 1896.

Application filed March 22, 1894. Serial No. 504,648. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN M. BALZER, a resident of New York city, county and State of New York, have invented certain new and
5 useful Improvements in Fare-Registers, of which the following is a specification.

My invention relates more particularly to the class of registers used for registering the number of passengers riding in railway-cars; and it has for its object to provide devices for
10 registering the number of passengers that ride in a given direction on a trip, and also devices that coact therewith for registering continuously the collective number of pas-
15 sengers that ride in the car to any desired extent.

The invention consists in the novel details of improvement and the combinations of parts that will be more fully hereinafter set
20 forth and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part hereof, wherein—

Figure 1 is a partly-broken plan view of my improved register complete. Fig. 2 is a
25 cross-section on the plane of the line 2 2 in Fig. 1. Fig. 3 is a partly-sectional detail view showing the devices for resetting the trip-register wheels. Fig. 4 is a plan view of the device for ringing the bell as each fare is
30 registered. Fig. 5 is a side view thereof. Fig. 6 is a detail side view, partly broken, of a number-wheel and its pinion, also showing parts connected with said wheel. Fig. 7 is an edge or face view thereof. Fig. 8 is an
35 edge or face view of two of the total-registering wheels and their pinion. Fig. 9 is a side view thereof. Fig. 10 is a detail view of the shaft and its pins for resetting the trip-register wheels. Fig. 11 is a detail section thereof.
40 Fig. 12 is a detail view of means for locking the main operating-lever against reverse action, as hereinafter explained; and Fig. 13 is a face view of the rim 25.

Referring now to the accompanying drawings, the numeral 1 indicates a suitable casing to contain the mechanism of my register, which casing may be of any desired construction and it is provided in its front 2 with open-
45 ings 3, 4, and 5, as hereinafter explained. The front 2 of the casing 1 may be removable,

and can be held in place by screws 6 (see Fig. 2) or otherwise as desired. Within the casing 1 are standards or uprights 7 8, in which is journaled a shaft 9 that is provided with a hand-wheel 10, located on the outside
55 of the casing 1. The shaft 9 is capable of an endwise motion, as hereinafter explained. On the shaft 9 are loosely mounted several trip-register or number wheels 12, that are provided on their peripheries with the nu-
60 merals "1, 2, 3, 4, 5, 6, 7, 8, 9, and 0." On the shaft 9 I preferably place a loose slotted sleeve 13 that passes freely through the hubs 14 of the wheels 12. To the units-wheel 12 is secured a ratchet-wheel 15 (see Figs. 1, 2, 3, 65
and 7) that is acted upon by a pawl 16 pivotally carried by a lever 17 secured to a rock-shaft 18. The shaft 18 is journaled in suitable supports or bearings 19 20 carried by
70 the casing 1.

17^a is a spring shown coiled on a rod 17^b, carried by the casing 1, said spring pressing at one end on a lug 17^c on the lever 17 and abutting against a nut 17^d on rod 17^b, the
75 rod 17^b passing through the lug 17^c, whereby by moving the nut 17^d the tension of said spring can be adjusted. (See Fig. 2.) The spring 17^a acts to hold the lever 17 in the normally-depressed position and against a
80 stop 17^e on the standard 7; but the spring for this purpose may be arranged as desired.

21 is a lever connected to the shaft 18 and arranged to be connected with a suitable pull-cord or other operating means for rock-
85 ing the shaft 18.

23 is a pin on the standard 7 to limit the throw of the pawl 16 and to lock said pawl in the ratchet-wheel 15, and 24 is a pin also on the standard 7 to limit the upward move-
90 ment of the lever 17, as shown in Fig. 2. By the above arrangement as the shaft 18 is rocked the first wheel 12 will be intermittently rotated a tooth at a time.

The wheel 12, to which the ratchet 15 is secured, is the units-wheel, the next wheel is
95 the tens-wheel, and the wheel 12 on the left in Figs. 1 and 3 is the hundreds-wheel. It is therefore designed that for each rotation of the units-wheel the tens-wheel will be turned one number-space, and for each rota-
100

tion of the tens-wheel the hundreds-wheel will be turned one step, and so on for as many wheels as are used.

In order to carry from one wheel 12 to another, I have provided the following arrangement: On the side of the units-wheel 12 opposite the ratchet-wheel 15 I place a rim 25, having a tooth 26 and corresponding depressions 27. (See Figs. 6, 7, and 13.)

28 is a smaller rim on the wheel 12 by the side of the rim 25, the rim 28 having three teeth 29, the center one of which aligns with the tooth 26. Corresponding rims 25 and 28 are on the tens-wheel 12 also. On the tens-wheel and hundreds-wheel 12 are spur-wheels 30, that are adjacent to the rims 28 of the next wheel of lower order, as shown in Figs. 3, 6, and 7.

31 are pinions that mesh with the spur-wheels 30, and these pinions have cut-away portions 32, that form curved recesses in which the rims 25 fit. (See Fig. 6.) By this means part of each pinion has a wide face and part a narrow face. When the part 32 of the pinion is against the rim 25, the pinion cannot turn and the wheel 12 is free to turn in the forward direction; but as soon as the wheel 12 has turned far enough to bring the tooth 26 up to the pinion the teeth 26 and 29 will act to turn said pinion a space sufficient to cause it to turn the spur-wheel 30 of the wheel next to the left a proper distance to expose a numeral on said wheel. When the units-wheel has thus made one rotation, it will cause the corresponding pinion to turn the tens-wheel one space, and so on through the series as the ratchet-wheel 15 is turned.

It is designed that the wheels 12 can be reset to zero at any time, and while this is being done the pinions 31 are to remain in mesh with their respective spur-wheels 30, while being taken out of engagement with the rims 25 and 28, by which means the proper and permanent meshing of the pinions with their corresponding spur-wheels is assured, so that they will not lose their relative positions and produce miscounts on the registering-wheels. For this purpose the pinions 31 are loosely mounted on a shaft 33 that is supported in bearings 34, carried by the casing 1, and arranged to slide in said bearings. (See Fig. 3.) On the shaft 33 is secured a sleeve 35 that rests against one pinion 31, and between said pinions 31 is a spring 36 that presses one of the pinions against a collar 37 on the shaft 33. (See Fig. 3.) By this means as the shaft 33 slides longitudinally the pinions will be carried with it, while they are free to rotate on said shaft. The shaft 33 is moved longitudinally simultaneously with the sliding of shaft 9, but in the opposite direction, so as to release the pinions 31 from the rims 25 and 28 to allow the shaft 9 to turn the wheels 12 to reset them, the movement of the shaft 33, however, not being sufficient to disengage the pinions from their corresponding

spur-wheels. For this purpose I have provided a lever 38 that is pivotally carried, as at 39, by the casing 1, said lever being connected at one end with the shaft 33, as by a pin 40 on said shaft entering a slot 41 in said lever. The opposite end of said lever is connected with the shaft 9, as by means of a groove 42 in the shank 43 of the hand-wheel 10, so that the latter and the shaft can turn. A spring 44 acts to hold the shafts 9 and 33 in their normal positions and to return them thereto. Said spring is shown coiled on the shaft 33 and pressing at one end against the bearing 34 and at the other end against a collar or projection 45 on the shaft 33.

The shaft 9 is provided with a pin 46 for each wheel 12, and each wheel 12 is also provided with a pin 47, said pins 46 and 47 extending at right angles to each other and being normally out of engagement. One of the pins 46 is arranged to hold the shaft 9 from spontaneous movement, and for this purpose the bearing 8 is provided with a slot 48, into which this pin 46 can fit.

When it is desired to reset the wheels 12 the shaft 9 is pushed in to bring the pins 46 in line with the pins 47, which motion through the action of the lever 38 moves the shaft 33 to carry the pinions 31 out of line with the rims 25 and 28, the pinions 31 and spur-wheels 30 remaining in mesh, whereby the wheels 12 are left free to turn. The spring 44 will now be under tension. The operator now turns the hand-wheel 10, whereby the shaft 9 will turn the pins 46, which, by encountering the pins 47, will turn the wheels 12. When the wheels 12 have been turned to zero the pin 46 will come in line with slot 48 in the standard 8, whereupon the spring 44 will slide back the shaft 33 to return the pinions 31 and the shaft 9 to their normal positions and press the pin 46 into the slot 48. The wheels 12 will now be free to be turned to register or count fares.

The wheels 12 will be used to register the individual fares received in a car on any one trip, and the devices for registering the total number of fares and their connection with the foregoing devices are as follows:

On the lever 17 is pivotally carried a spring-pressed pawl 50 that engages with a ratchet-wheel 51 mounted loosely on a shaft 52 that lies parallel with the shaft 9, the shaft 52 being supported in the standards 19 and 20 or otherwise. The ratchet-wheel 51 is connected with a number-disk 53, as by a sleeve 54, so that the disk 53 will be turned by and with the ratchet-wheel 51. The arrangement is such that each time the lever 17 is rocked both the units-wheel 12 and the units-wheel 53 will be turned simultaneously a similar distance. There are any desired number of disks 53 loosely mounted on the shaft 52, representing units, tens, hundreds, &c., and the disks 53 are arranged substantially similarly to the disk 12, having corresponding numbers on their peripheries and being provided with

rims 25 and 28, having corresponding teeth 26 29 and depressions 27 and spur-wheels 30, as shown. The disks 53 are in line with the opening 5 in casing 1. Pinions 31, mounted
 5 on a shaft 33^a, supported by standards 19 and 20, mesh with the spur-wheels 30 and rims 25 and 28 similarly to the pinions for actuating the wheels 12, so that the disks 53 will be
 10 turned to add up the consecutive number of fares from one to nine hundred and ninety-nine thousand nine hundred and ninety-nine, or to an amount corresponding to the number of disks 53. It will be observed that the disks 53 are not arranged to be reset, but only count
 15 or add in consecutive order, while the disks 12 can be reset at any time, and that the counting or adding of the two sets of disks 53 and 12 takes place simultaneously. By this means the conductor of a street-railway car can register the number of fares collected on a trip—say
 20 on the way “down” town—on the large disks 12, while simultaneously therewith said fares will be registered on the disks 53. When the end of the trip has been reached the conductor can reset the disks 12 to zero, as before explained;
 25 but the disks 53 remain without resetting. On the return trip, or on the way “up,” the conductor again registers on the disks 12 the new fares collected, which are simultaneously
 30 registered on and added to the disks 53. Thus during each trip the fares collected are registered on the large wheels 12 of the trip-register, so that the conductor and others can see how many passengers were carried at any
 35 time on a given trip, and the officer or other clerk can observe the number of fares registered on the wheels 53 for any given time, as for a round trip or a whole day, by keeping
 40 “tally” of the disks 53. This gives the company great protection, as a dishonest conductor cannot reach the total-numbering disks 53 to reset them or to tamper with them, and therefore he must account for the exact number of fares collected.

45 In order to prevent a conductor from moving the lever 17 part way and then allowing it to return to the normal position, so as to appear to have registered a fare collected when he did not move the lever far enough
 50 to register a new number on the disk 12, I have provided a locking device to prevent the return of the lever 17 to its normal position until it has been moved fully far enough to register a number on the disk or wheel 12.
 55 This locking device is more clearly shown in Figs. 2 and 12, and it is arranged as follows:

On the end of the lever 17 are teeth *a*, that are arranged to engage a dog *b*, pivotally carried on a support or standard *c* in casing 1.
 60 The dog *b* is normally held horizontal by a spring *d*, secured at one end to the end of the dog *b* and at its other end to the casing 1 or otherwise. The end of the lever 17 carrying the teeth *a* is normally below the dog *b* when
 65 the parts are at rest. When the conductor operates the lever 21 to rock the shaft 18 and

raise the lever 17 the teeth *a* will encounter the end of dog *b* and raise the dog, so that if a full motion is given to lever 17 sufficient to turn the disk or wheel 12 the teeth *a* will pass
 70 beyond the dog *b*; but should the conductor only partially raise the lever 17 the teeth *a* will remain in engagement with the dog *b*, and as said dog was thus tilted upwardly the lever 17 will be prevented from descending on
 75 account of the angular positions of the lever 17 and dog *b*. (See full lines in Fig. 12.) The conductor will therefore be obliged to make a full upward stroke of lever 17 to register on wheels 12 and 53 before the next fare collected
 80 can be registered. After the lever 17 has been raised to its full position it will depress the dog *b* in its next descent, (see dotted lines in Fig. 12,) and the new angular positions of the lever and dog will prevent the conductor from
 85 allowing the lever 17 to recede only a partial distance from its full upward position to enable him to again appear to raise lever 17 to register, as the dog *b* will prevent the raising of the lever until the latter has fully passed
 90 below the dog *b*, in which position the pawl 16 will be in position to act on ratchet-wheel 15 to turn wheel 12, and the pawl 50 will be in position to act on the ratchet-wheel 51. By this construction, therefore, the conductor is
 95 obliged to give a full motion in each direction to lever 21 instead of an intermediate half-way up-and-down motion. Therefore he will be obliged to fully register each fare collected, as a half-way motion of the lever 17 will not
 100 allow the bell to be rung to indicate the registering of a fare, whereby if the bell is not sounded it will be known that the conductor did not register the fare collected.

To have the bell strike each time a fare is
 105 registered I have provided the following arrangement:

55 is a pawl carried by a rock-shaft 56 journaled in suitable bearings, as 20 and 20^a.

57 is a suitable spring arranged to normally
 110 hold the pawl 55 in engagement with the ratchet-wheel 51, the pawl 55 having a projection or tooth 58 that will snap quickly off of a tooth of wheel 51. The spring 57 is shown
 115 in Figs. 1 and 4 coiled on a shaft 56 and having one end connected to a standard or bearing 20^a and its other end connected to said shaft.

59 is a clapper or striker connected with the shaft 56 and arranged to strike the bell 60
 120 suitably carried within the casing 1. The arrangement is such that each time the ratchet-wheel 51 is turned the space of a tooth the projection 58 on pawl 55 will snap off of a tooth on wheel 51 and thus rock the shaft 56
 125 and throw the clapper 59 against the bell 60; but should the lever 17 not be lifted far enough to turn wheels 15 and 51 the distance of a tooth the dog *b* will lock the lever 17, as before stated, and the next pull by the conductor will move
 130 the lever 17 the full distance and thus ring the bell.

To conveniently indicate the direction in which a car is traveling I have provided the following arrangement:

From the bearing 7 extend parallel rods 61 5 62, on which is mounted a slide 63, which carries a cross-strip 64, upon which are placed words or symbols indicating the directions in which the car may travel, such as "Up" and "Down." The strip 64 lies behind the open- 10 ing 3 in front of the casing, and the slide 63 is provided with a handle 65 that projects through a suitable slot in the casing 1, whereby the strip 64 may be moved back and forth to show the word "Up" or "Down," (or other 15 words,) as may be desired.

Having now described my invention, what I claim is—

1. The combination of a series of number-wheels, certain of said wheels having toothed 20 rims, and others having spur-wheels, and pinions having cut-away parts to act with said rims and spur-wheels, means for moving each pinion from engagement with its corresponding rim without disengaging it from its cor- 25 responding spur-wheel, and a ratchet-wheel connected with one of said number-wheels, another series of number-wheels having a similar arrangement of rims, spur-wheels and pinions, one of said number-wheels also hav- 30 ing a ratchet-wheel, and with pawls for said ratchet-wheels and a lever to operate said pawls conjointly, substantially as described.

2. The combination of a plurality of number-wheels, a toothed rim on one wheel and a 35 spur-wheel on the adjacent wheel, and means for rotating said wheels to register, with a pinion permanently in mesh with said spur-wheel, said pinion having cut-away parts to bear on said rim, and means for moving said 40 pinion from engagement with said rim without disengaging it from the spur-wheel, whereby the pinion and spur-wheel will remain in mesh at all times while allowing the number-wheels to have independent movement for re- 45 setting substantially as described.

3. The combination of a plurality of number-wheels, a toothed rim on one wheel and a spur-wheel on the adjacent wheel, and means for rotating said wheels to register, with a 50 pinion permanently in mesh with said spur-wheel, said pinion having cut-away parts to bear on said rim, and a longitudinally-movable shaft carrying said pinion, and adapted to move said pinion sidewise to remove its 55 cut-away part from said toothed rim while

keeping the pinion in mesh with the spur-wheel, substantially as described.

4. The combination of a series of number-wheels, having toothed rims and spur-wheels, and means for turning said wheels, with a 60 longitudinally-movable rotative shaft carrying said wheels, pins or projections on said wheels and shaft, pinions having cut-away parts to engage said rims the other parts of said pinions permanently meshing with the 65 corresponding spur-wheels, a shaft carrying said pinions and connections between said shafts, all arranged so that when one shaft is moved to bring the corresponding pins into line the other shaft will be moved to carry 70 said pinions away from the corresponding rims on said number-wheels while said pinions remain in mesh with the corresponding spur-wheels to permit the number-wheels to be turned for resetting, substantially as de- 75 scribed.

5. The combination of a series of number-disks having rims and spur-wheels, means for turning said disks, said disks having pins or projections, a longitudinally-movable rota- 80 tive shaft carrying said disks, said shaft having pins or projections to act on the pins on said disks, with a longitudinally-movable shaft 33, a pivoted lever 38 connecting said shafts, the shaft 33 carrying pinions that 85 have cut-away parts to engage said rims, and a spring for holding said shafts in the normal operative positions and a locking device for holding the shaft at zero on the disks, sub- 90 stantially as described.

6. The combination of a series of number-disks, means for carrying from one disk to another, means for actuating said disks, pins or projections on said disks, a longitudinally-movable rotative shaft carrying said disks, 95 pins or projections on said shaft to engage the pins on the disks a spring to hold said corresponding pins normally out of line, and a support having a recess 48 to receive a pin to hold said shaft in the normal position, and 100 a shaft 33 carrying the means to turn the number-wheels to register and means for moving said shafts together longitudinally in opposite directions, as and for the purposes specified.

STEPHEN M. BALZER.

Witnesses:

T. F. BOURNE,
ARTHUR THAYER.