

J. F. OHMER & H. TYLER.

FARE REGISTER.

(Application filed Mar. 18, 1901.)

(No Model.)

10 Sheets—Sheet 1.

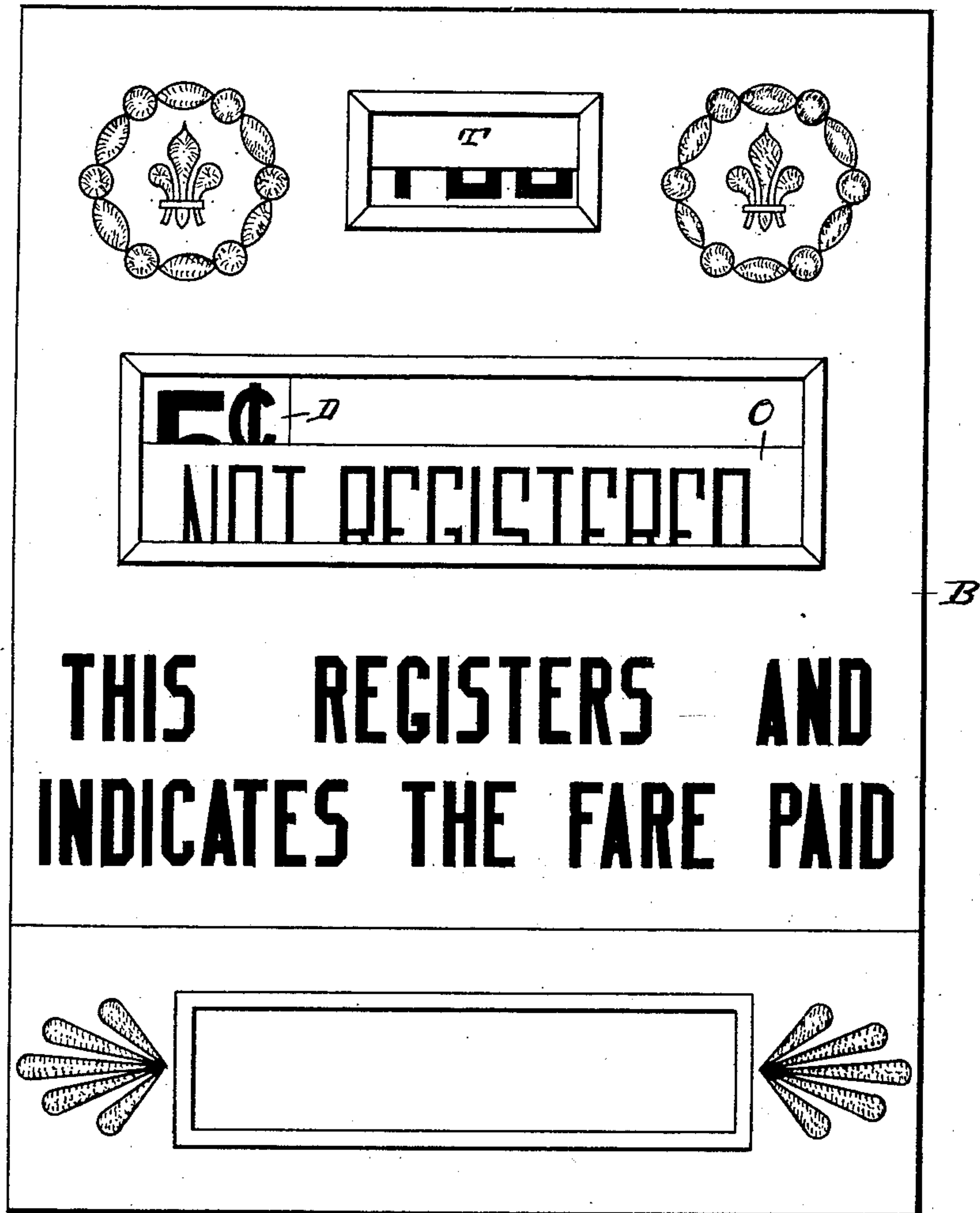


Fig. 1.

Witnesses,  
Matthew Lublin.  
C. M. Theobald.

Jno. F. Ohmer,  
Hiram Tyler,  
Inventors.

By R. J. McCarty  
Attorney.



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10 Sheets—Sheet 3.

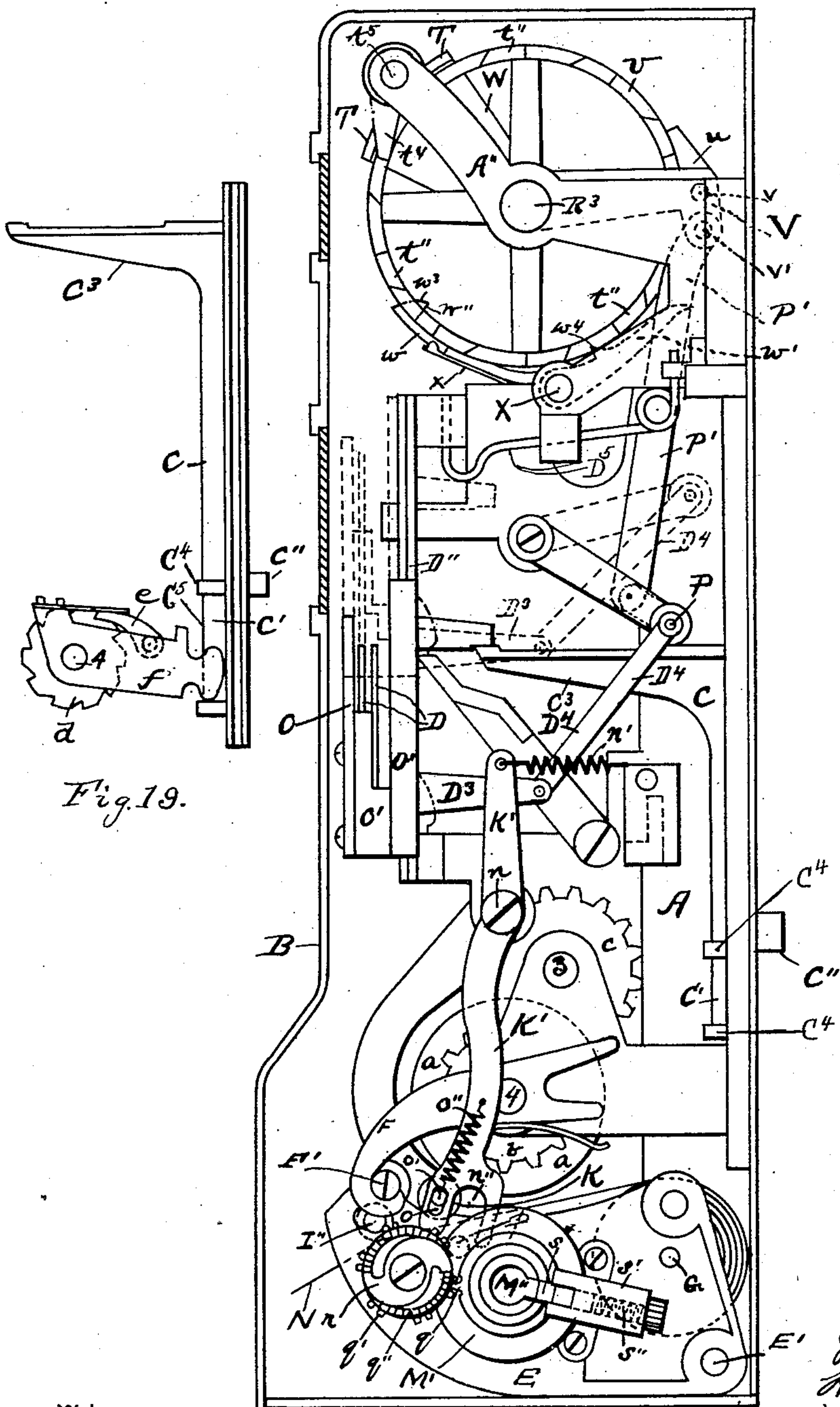


Fig. 19.

Fig. 3.

Witnesses.  
Matthew Libler.  
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10 Sheets—Sheet 4.

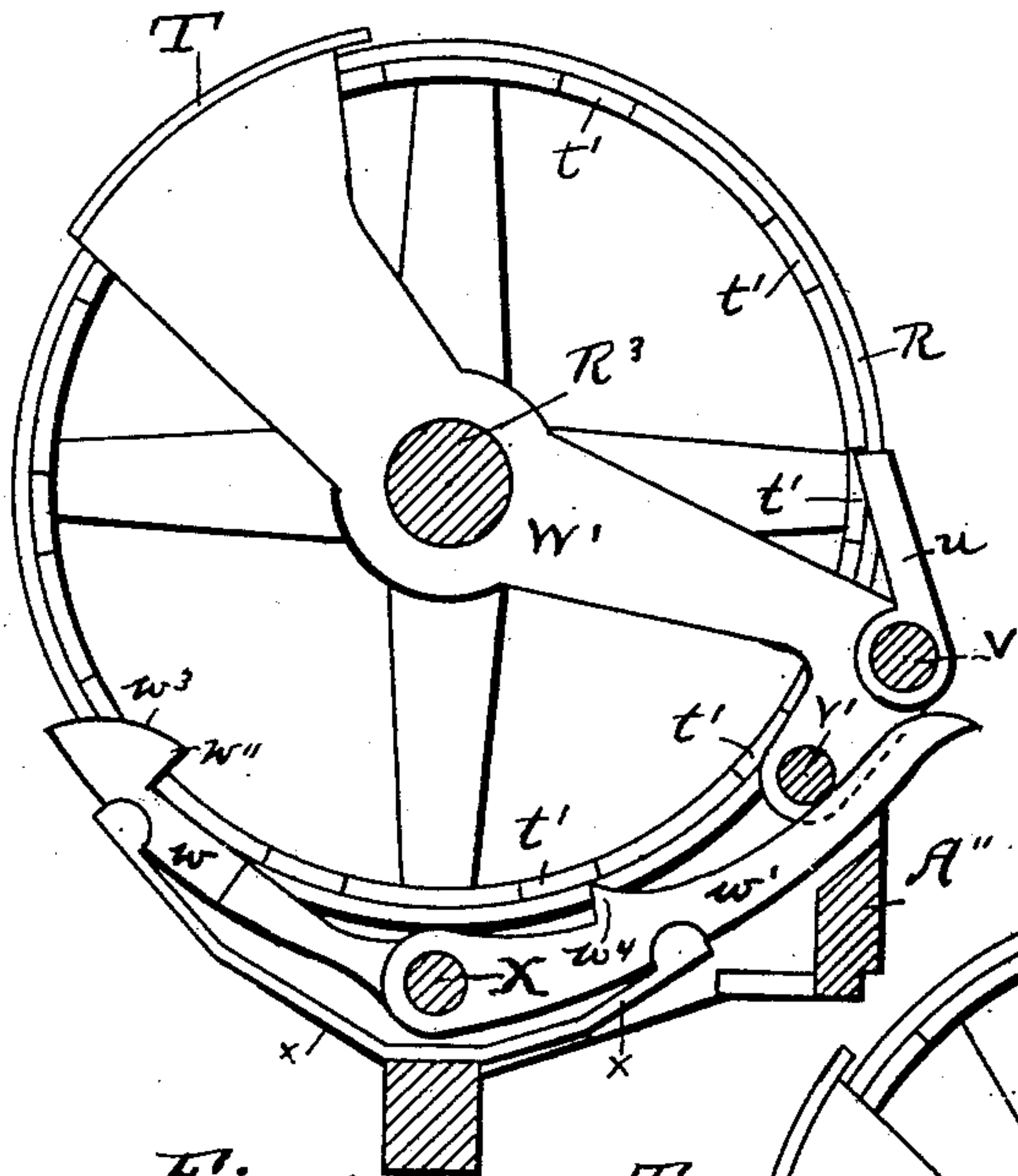


Fig. 4.

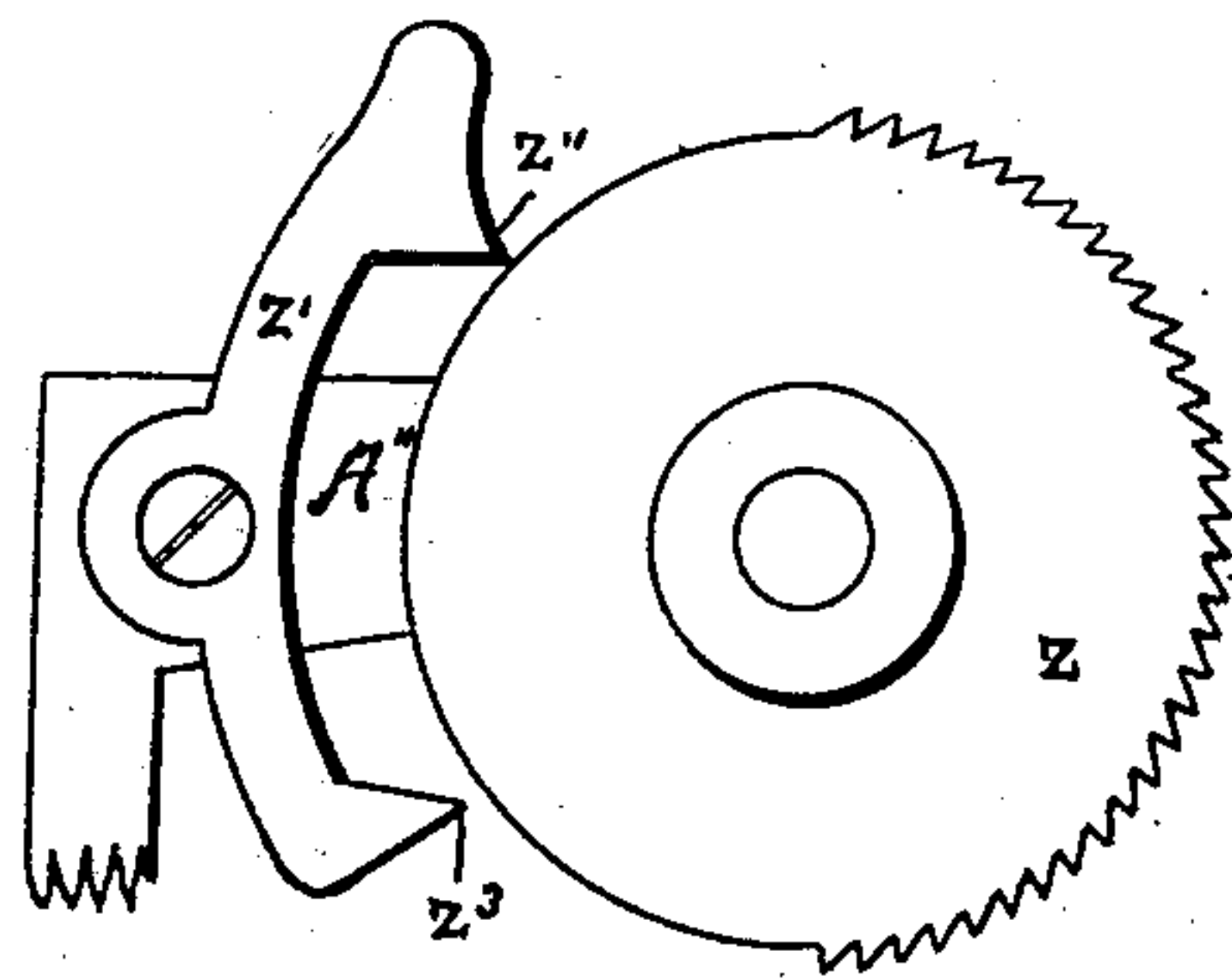


Fig. 6.

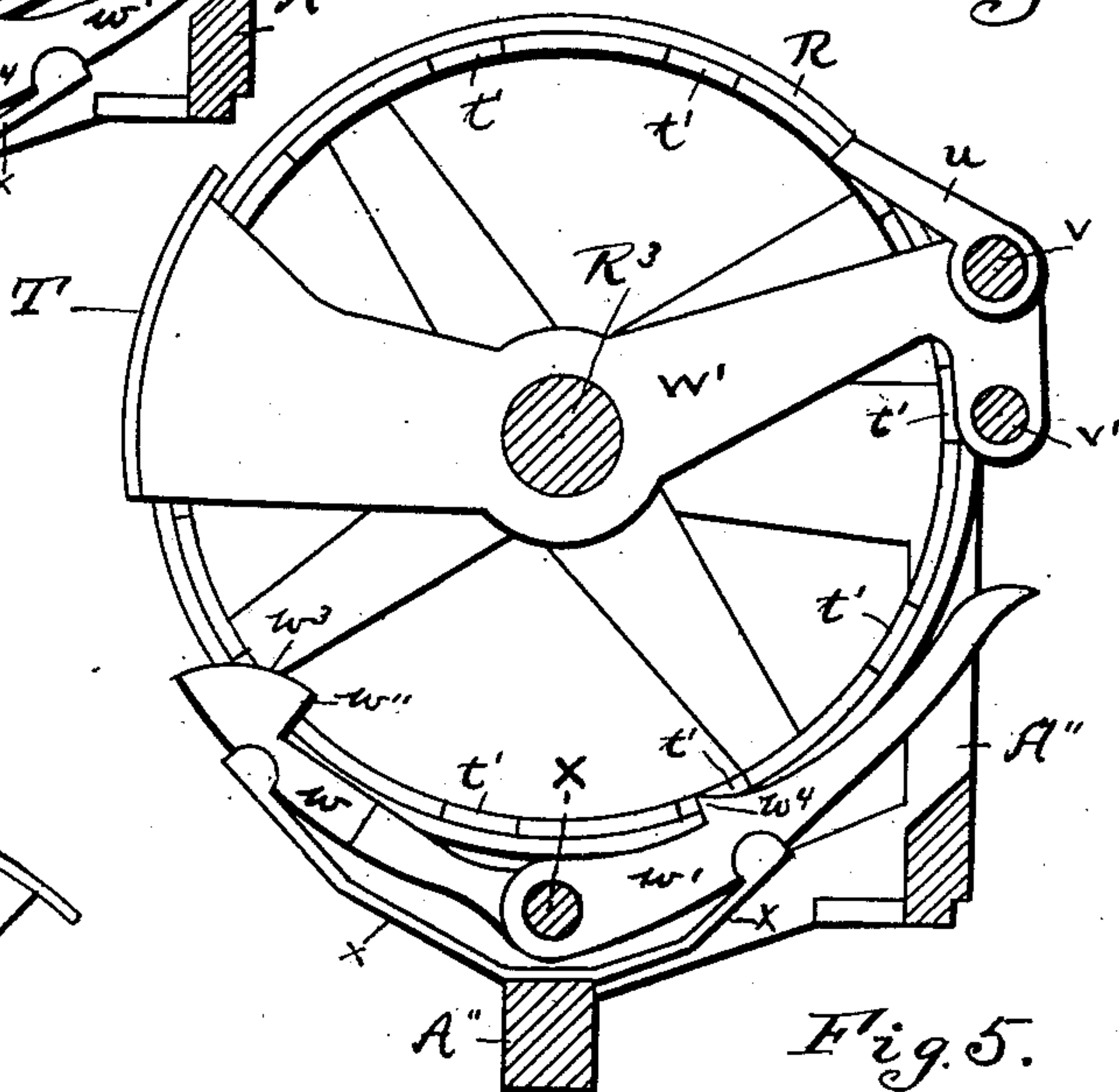


Fig. 5.

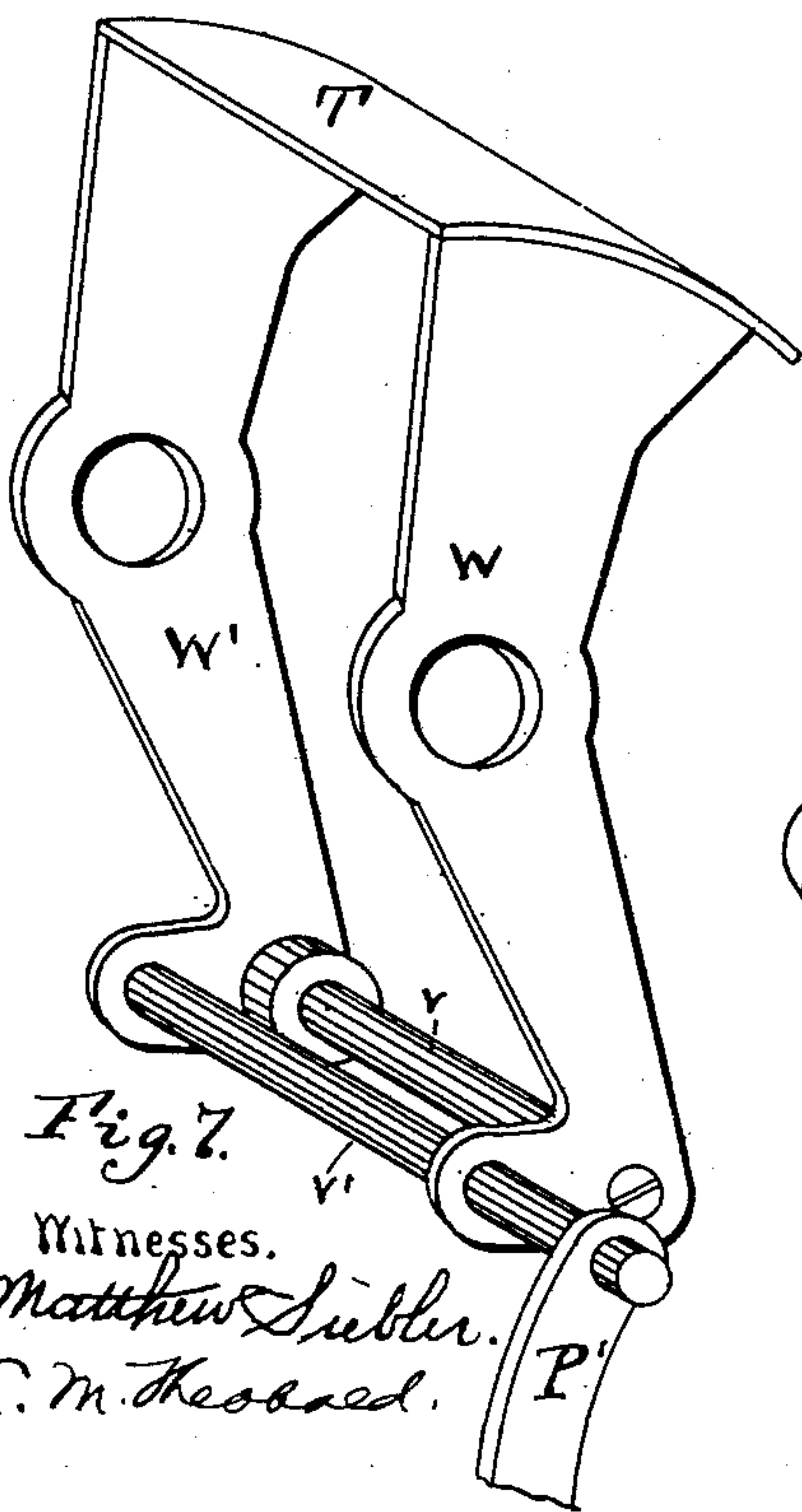


Fig. 7.

Witnesses.  
Matthew Subler.  
C. M. Theobald.

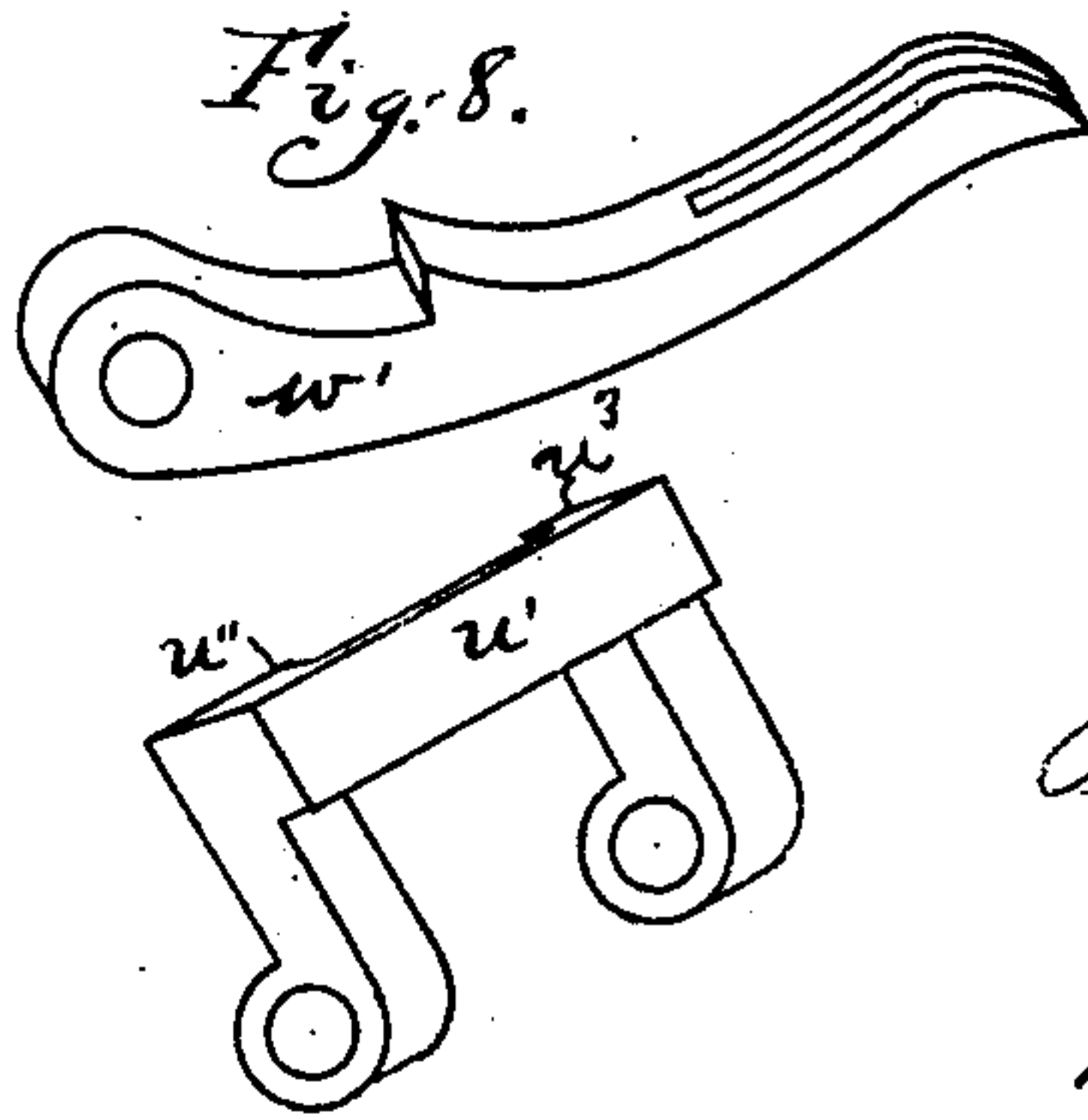


Fig. 8.

Fig. 9.

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J. F. OHMER & H. TYLER.

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10 Sheets—Sheet 5.

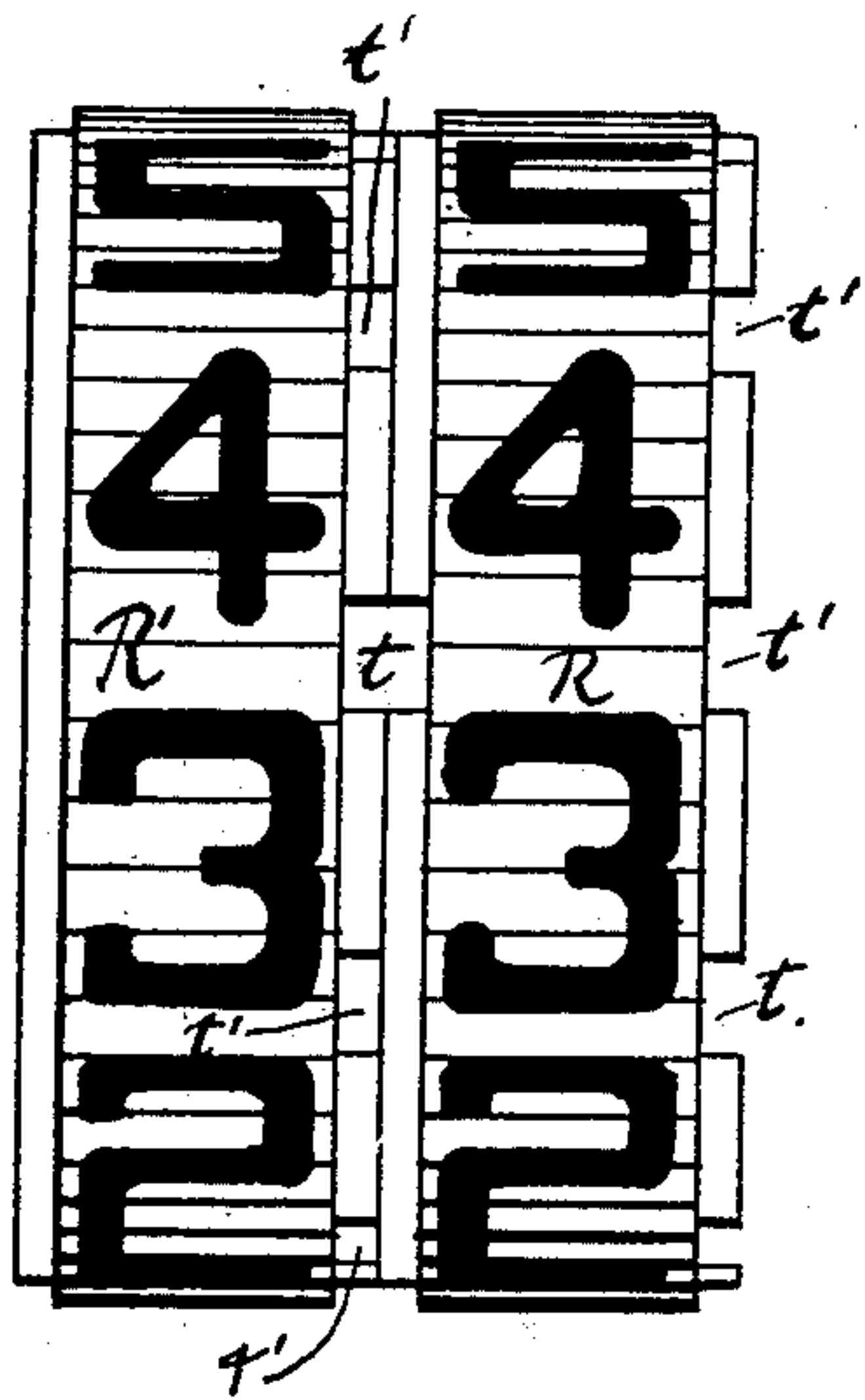


Fig. 10.

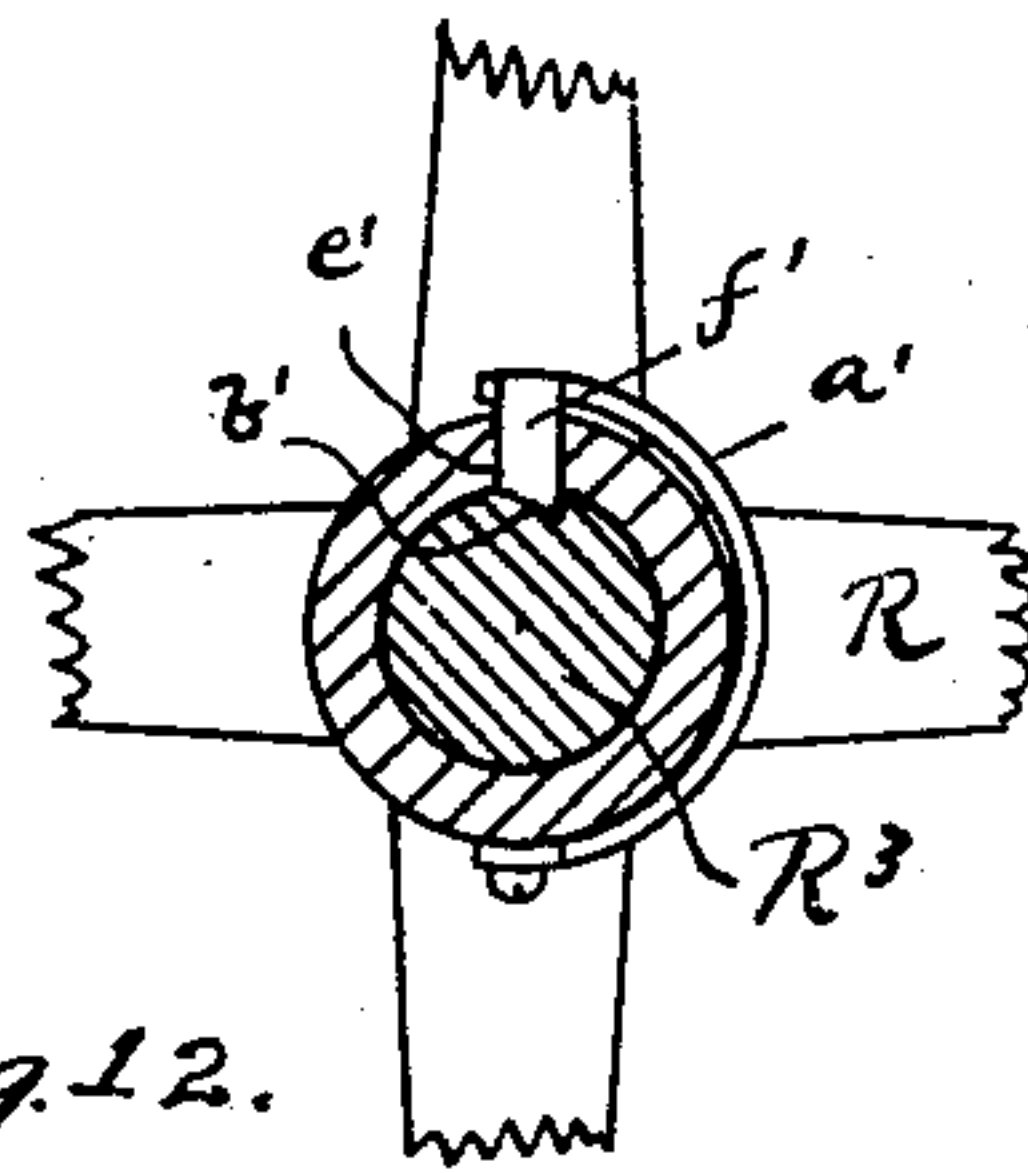


Fig. 12.

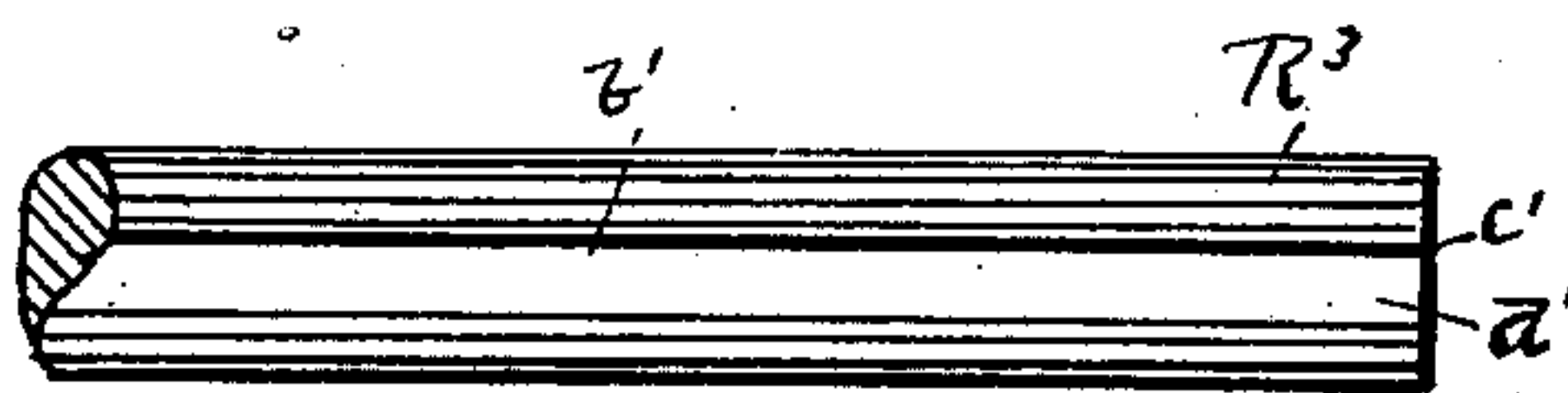


Fig. 11.

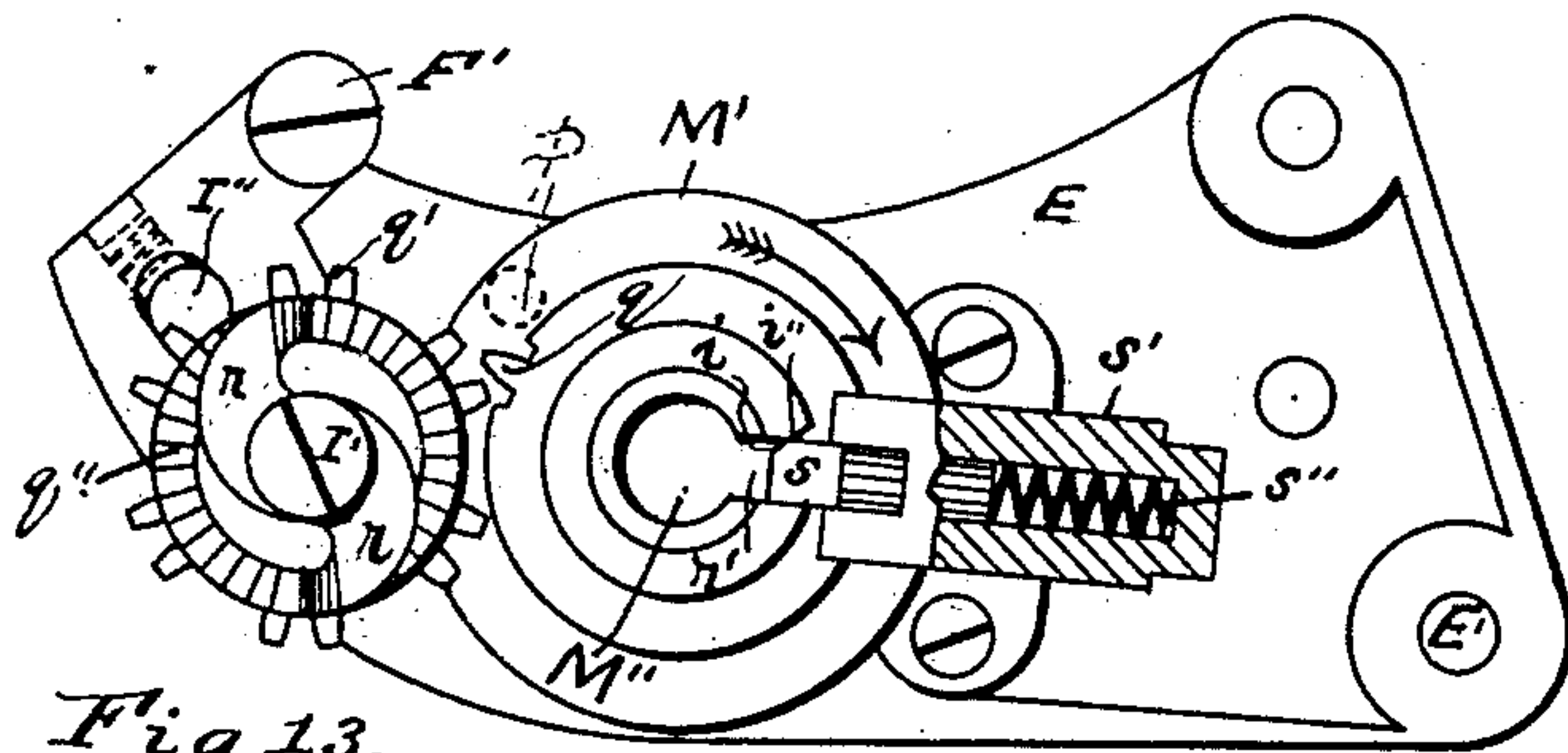


Fig. 13.

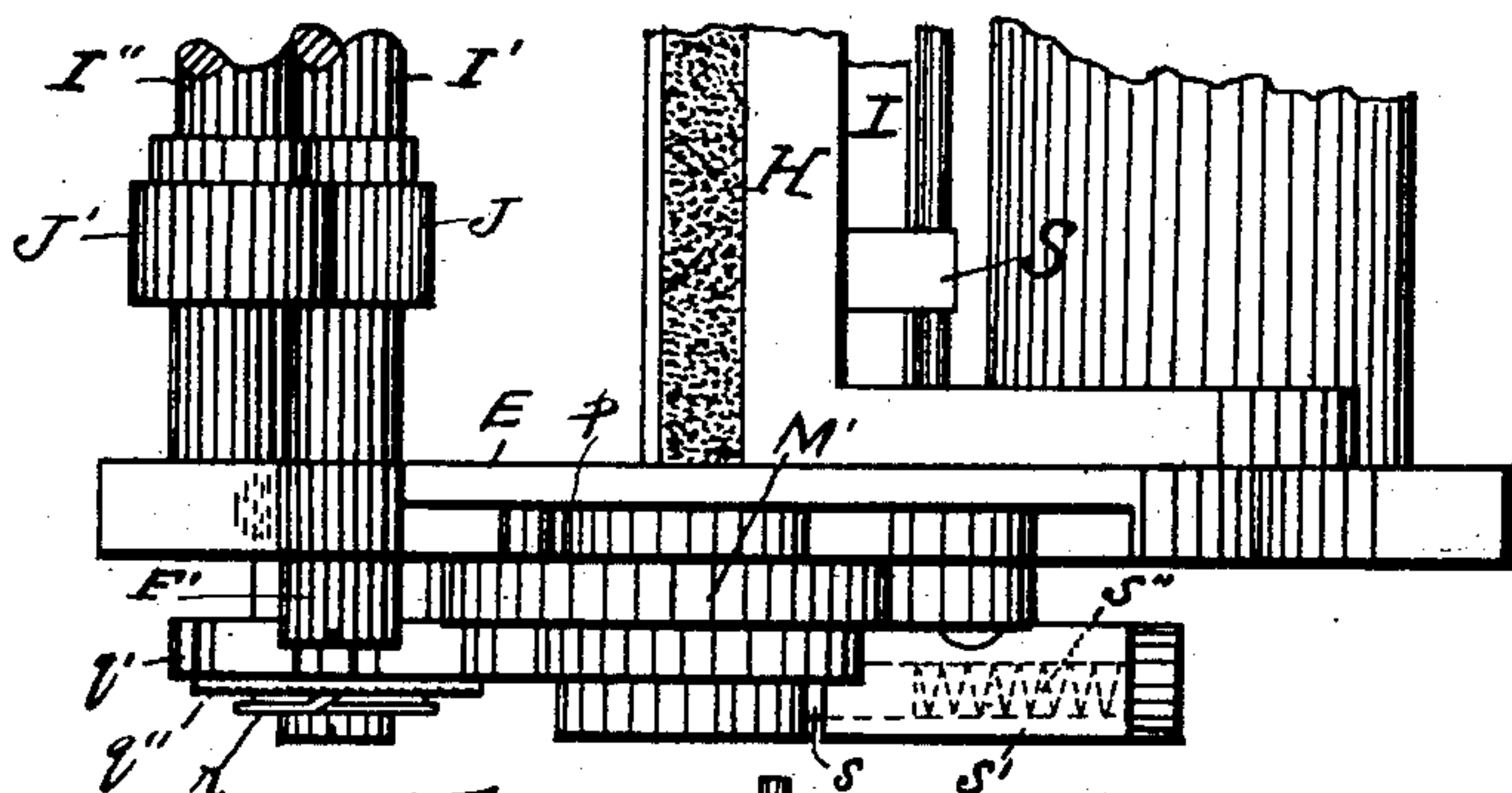


Fig. 14.

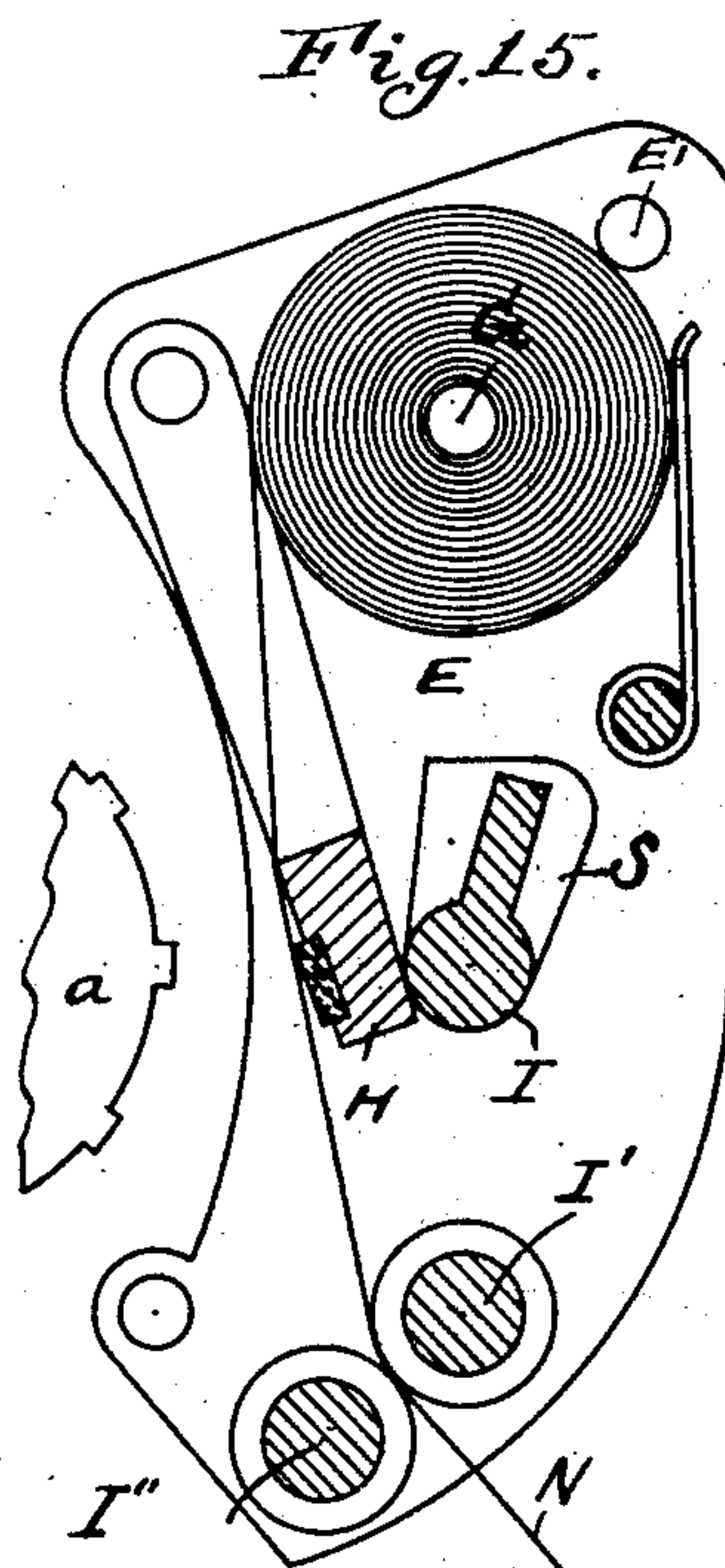


Fig. 15.

Witnesses.  
Matthew L. L. L.  
C. M. Theobald.

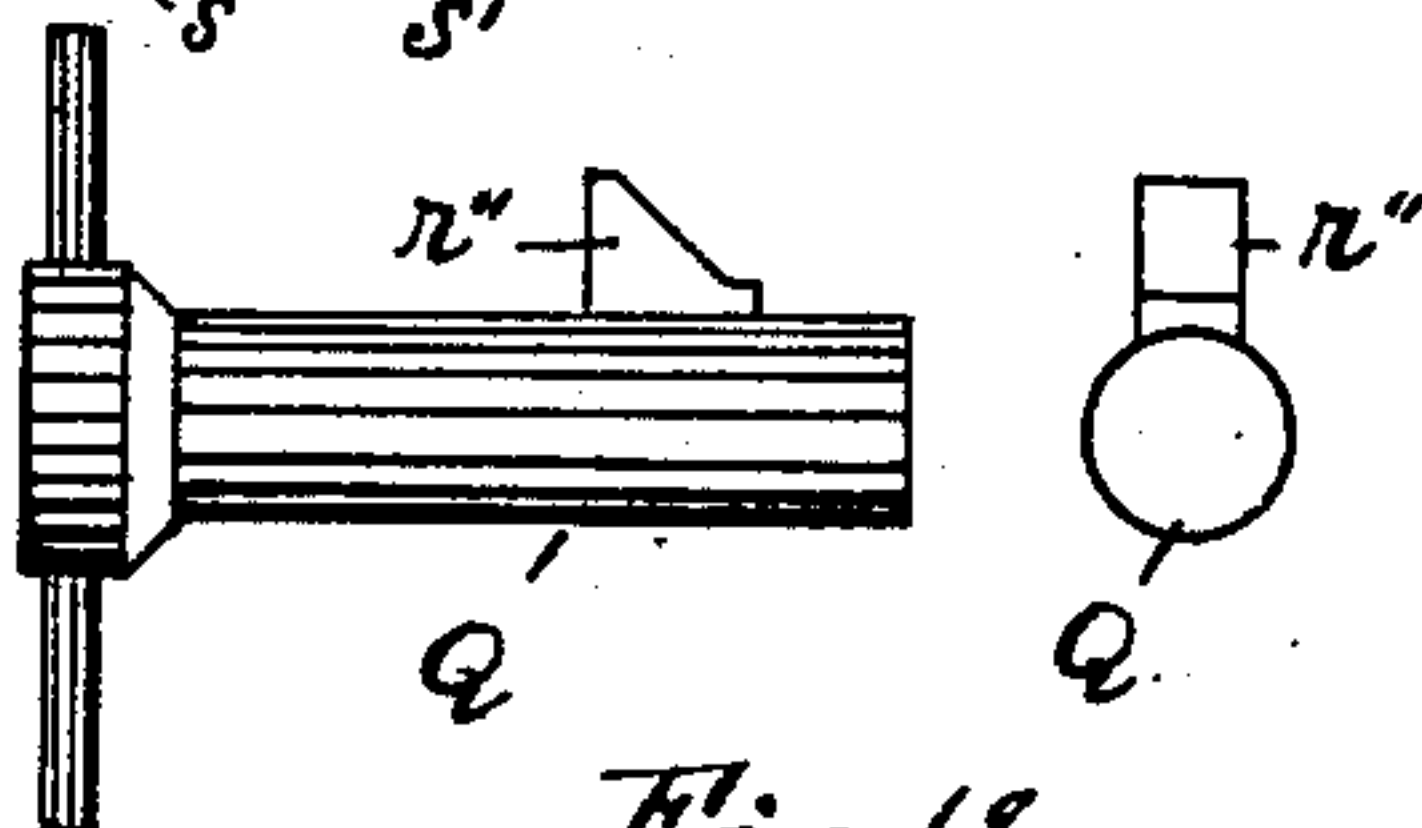


Fig. 18.

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J. F. OHMER & H. TYLER.

FARE REGISTER.

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(No Model.)

10 Sheets—Sheet 6.

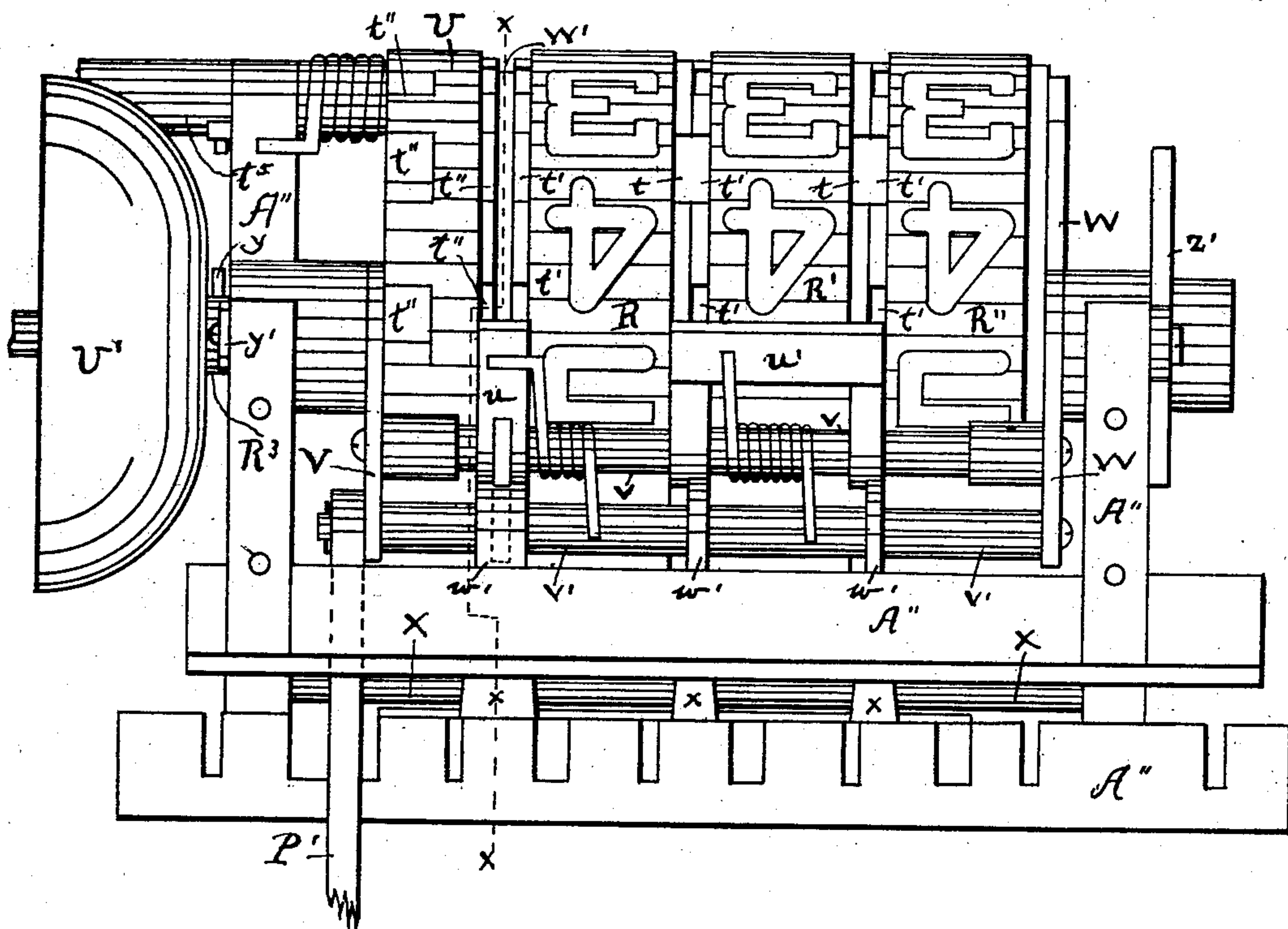


Fig. 16.

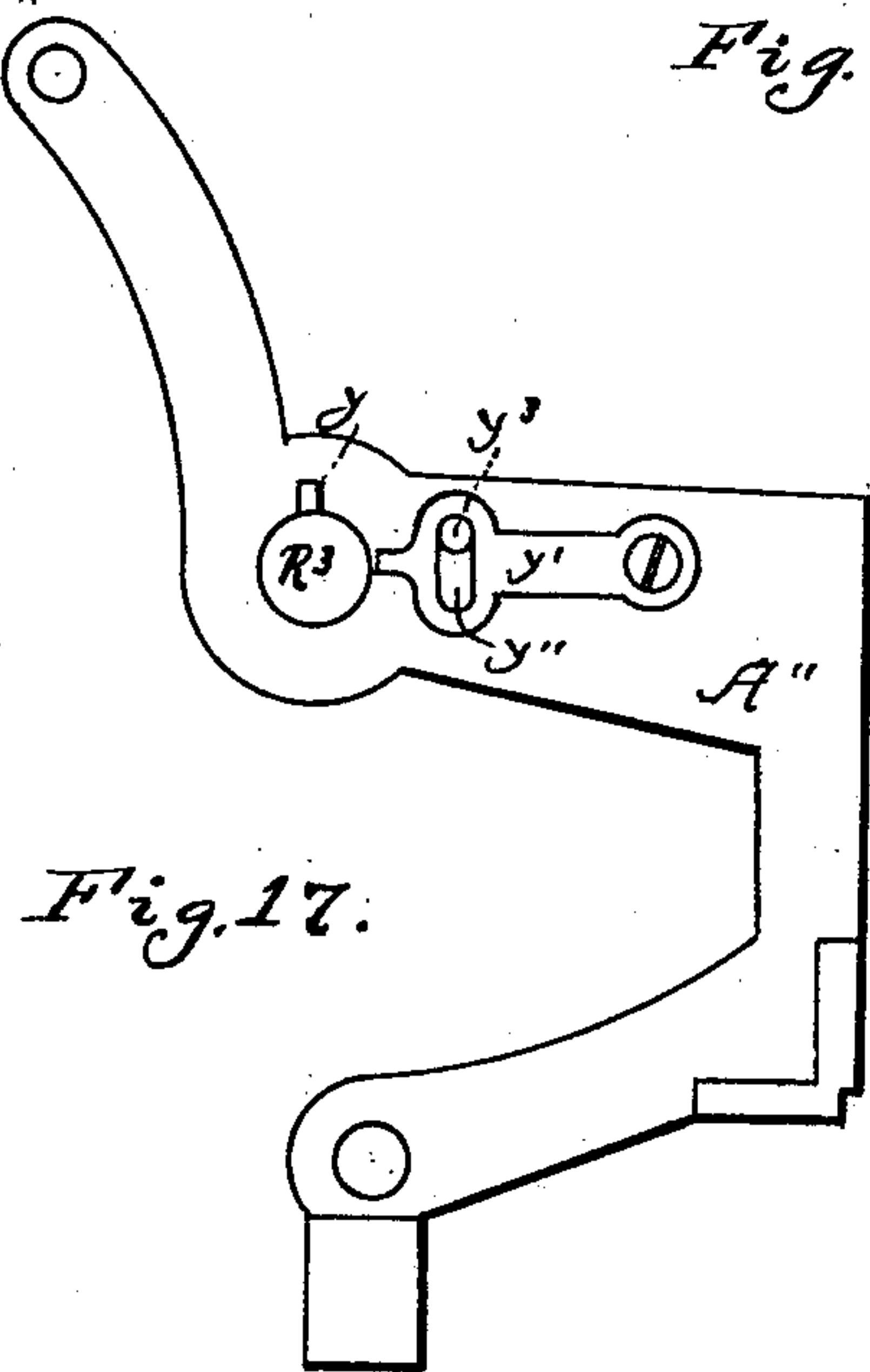


Fig. 17.

Witnesses.  
Matthew Liebler.  
C. M. Theobald.

Jos F. Ohmer.  
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J. F. OHMER & H. TYLER.

FARE REGISTER.

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10 Sheets—Sheet 7.

(No Model.)

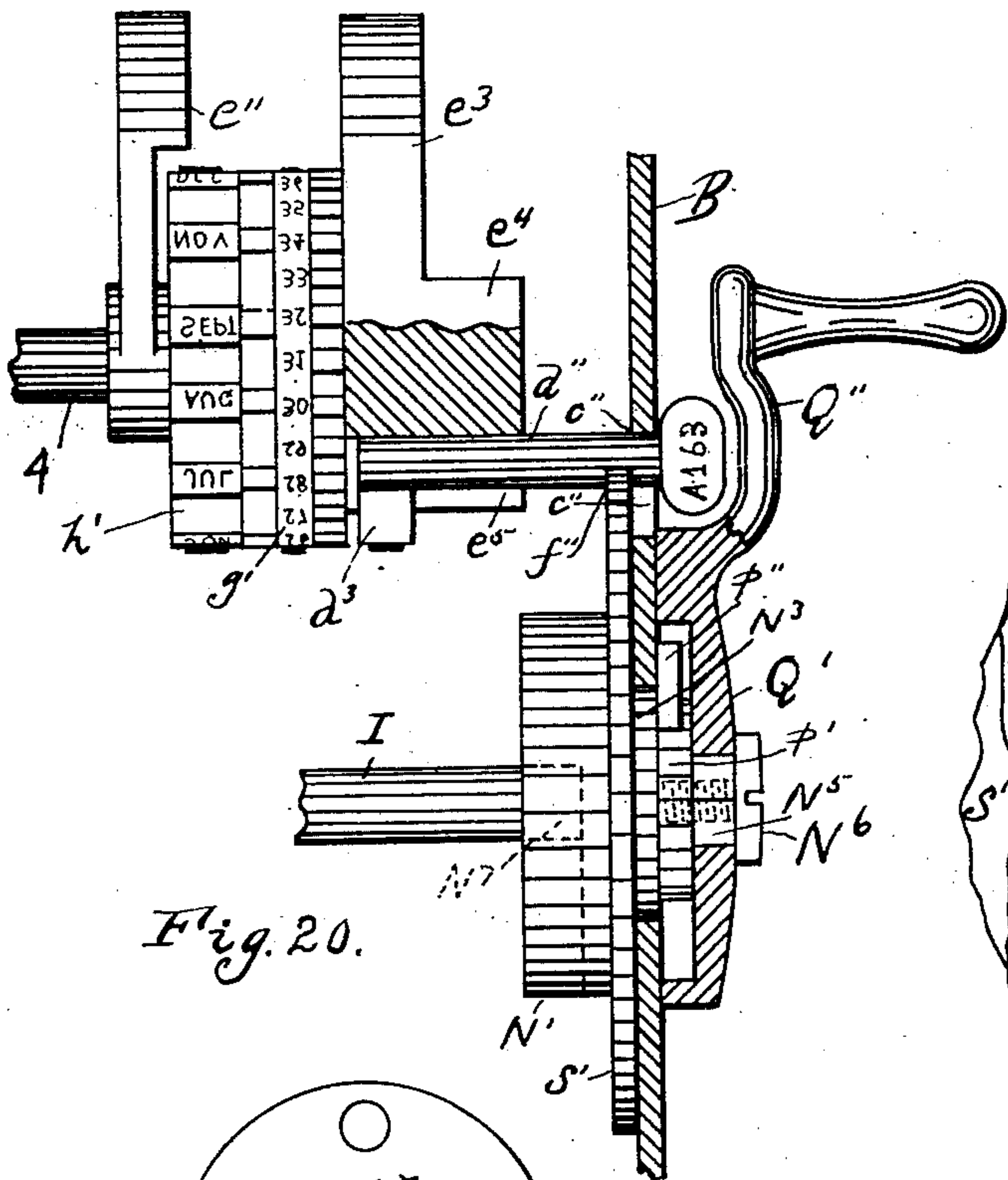


Fig. 20.

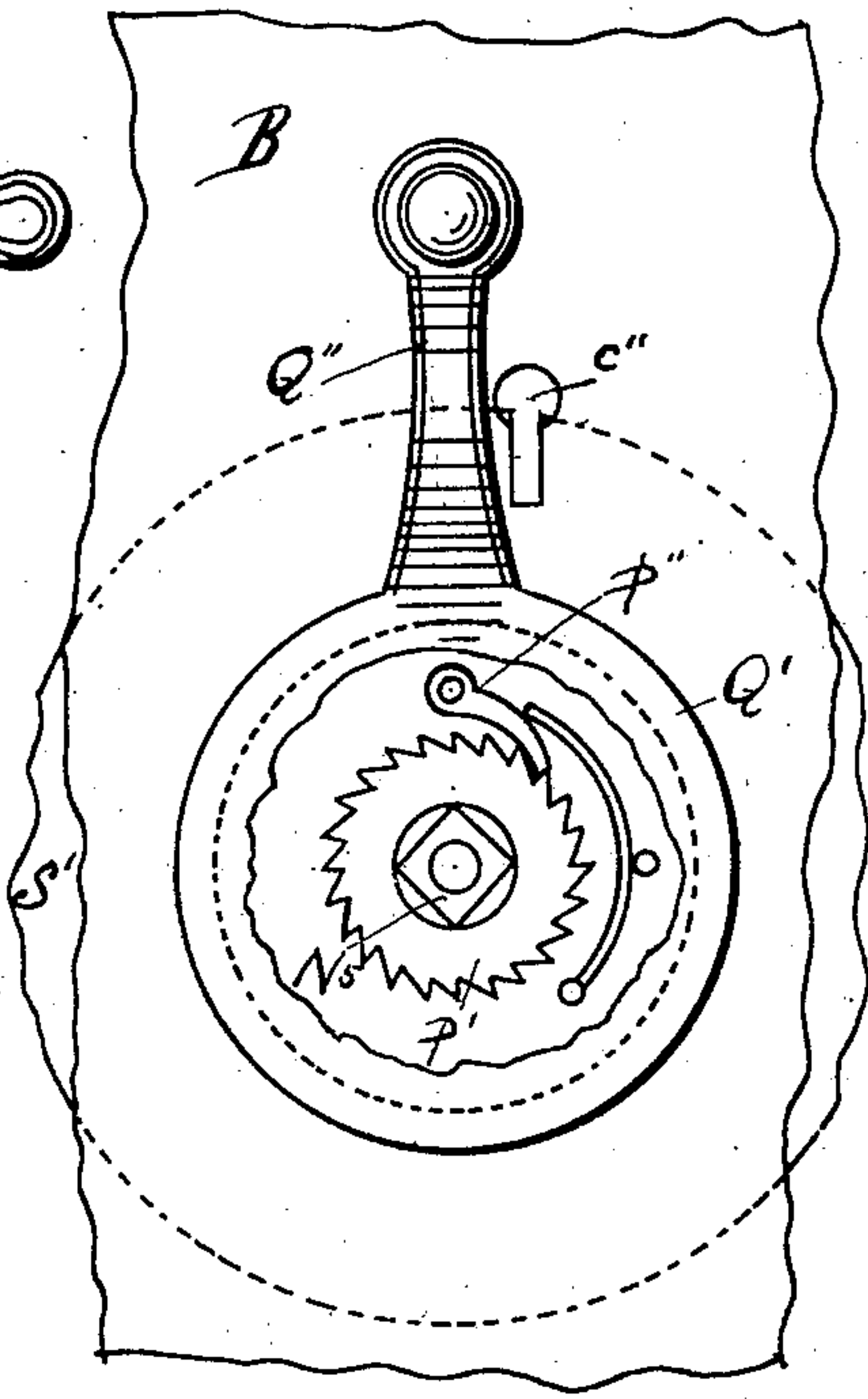


Fig. 21.

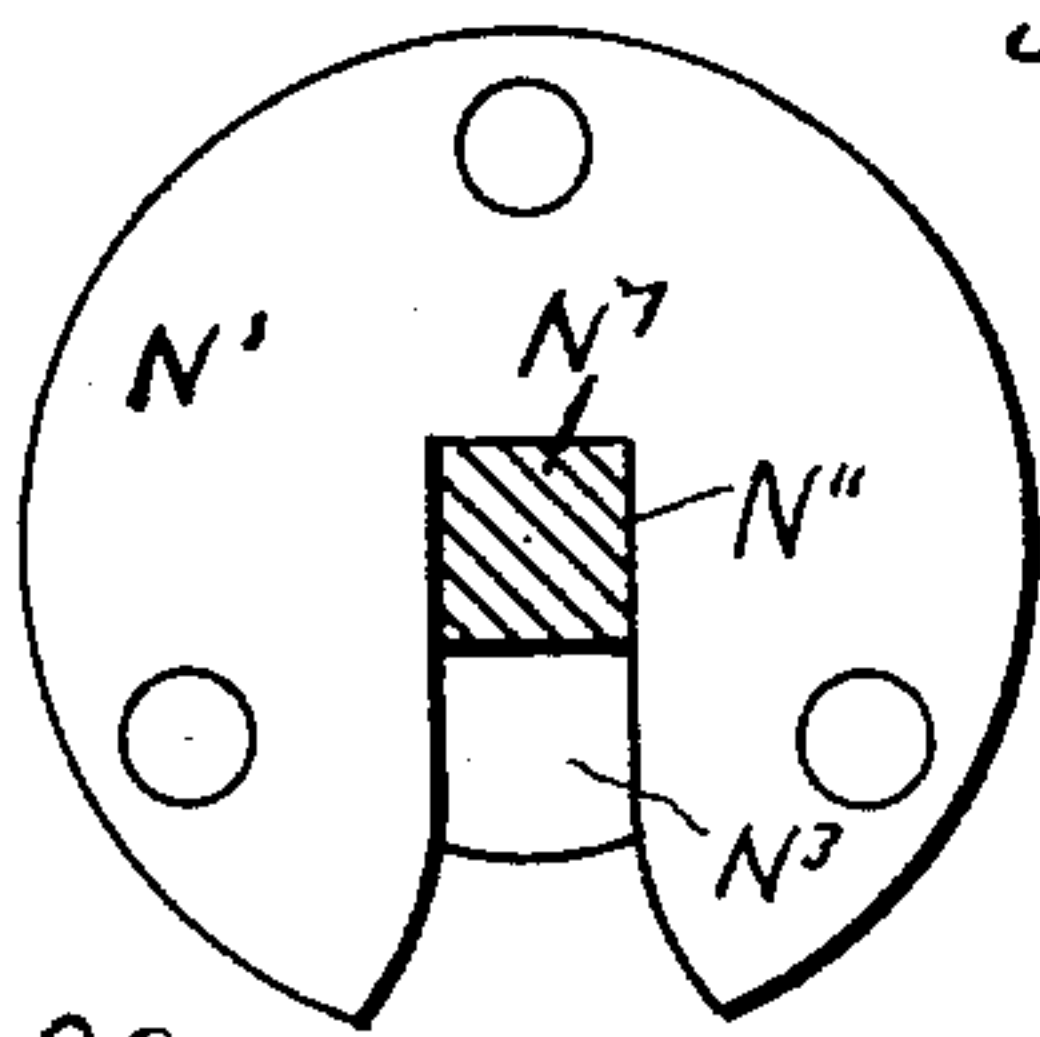


Fig. 22.

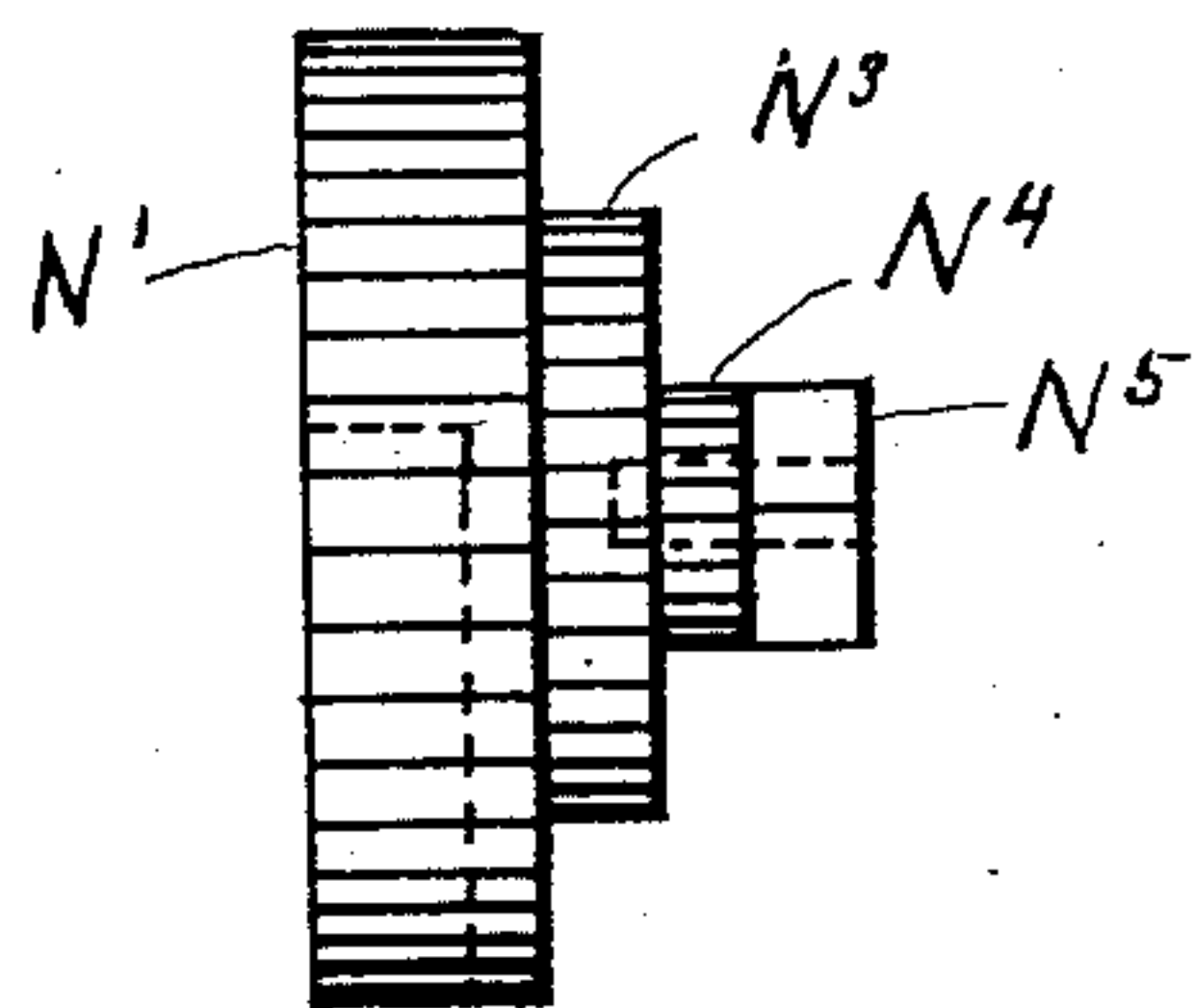


Fig. 23.

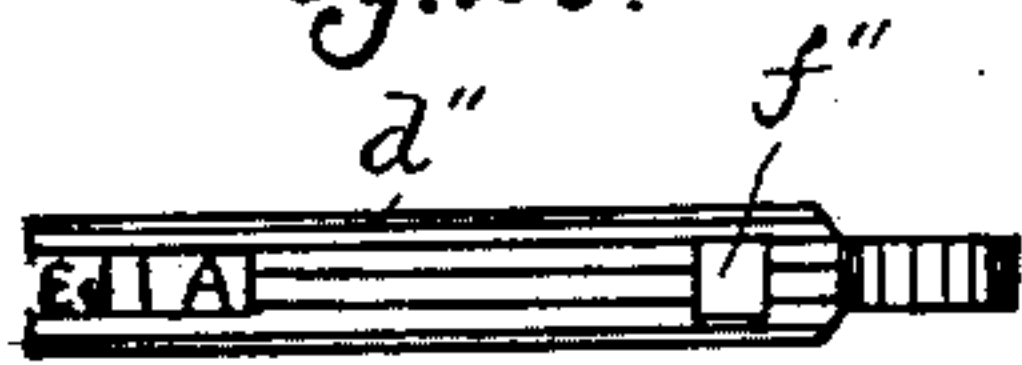


Fig. 25.

Witnesses.  
Matthew Liebler.  
C. M. Theobald.

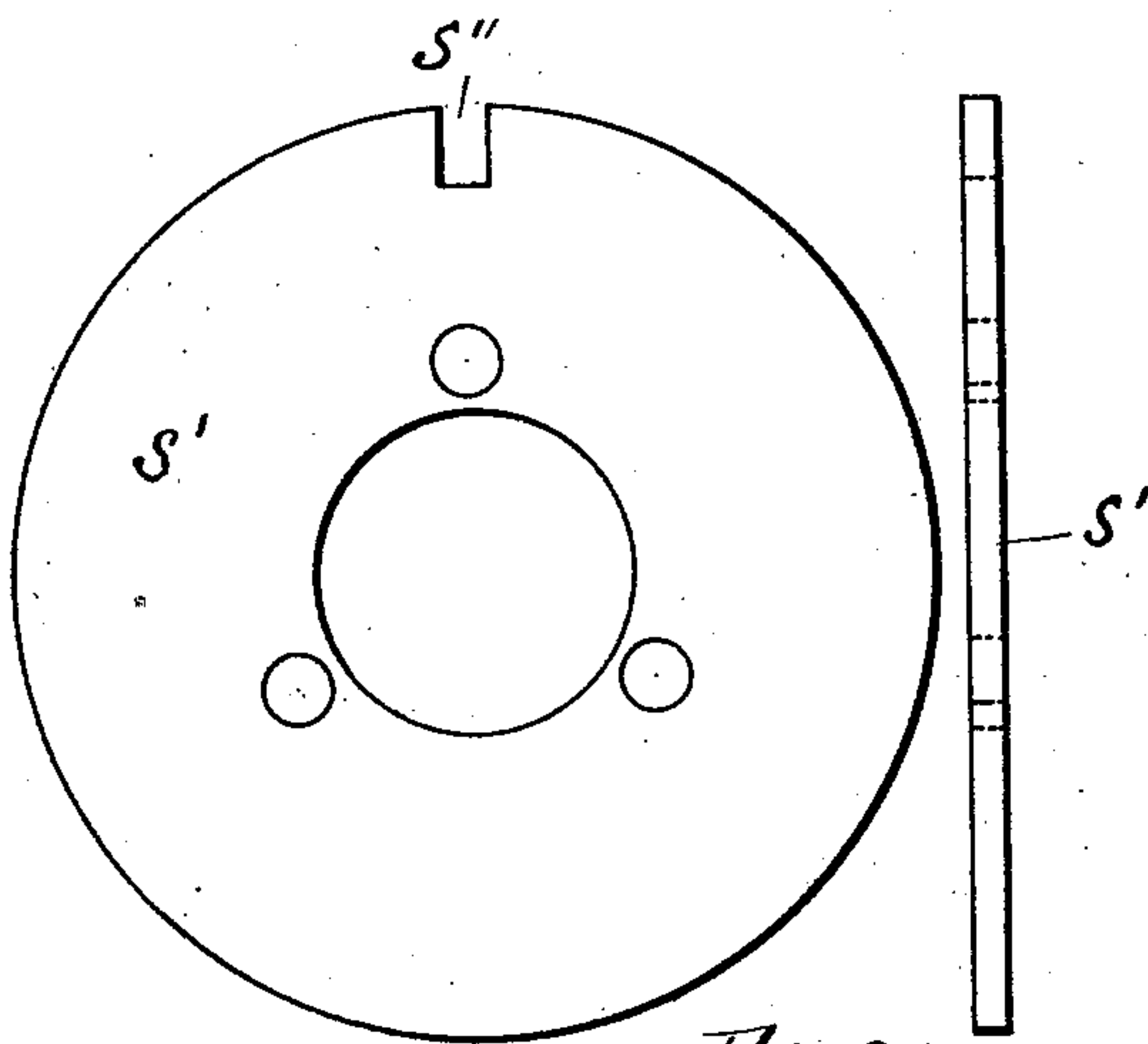


Fig. 24.  
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J. F. OHMER & H. TYLER.  
FARE REGISTER.

Application filed Mar. 18, 1901.

(No Model.)

10 Sheets—Sheet 8.

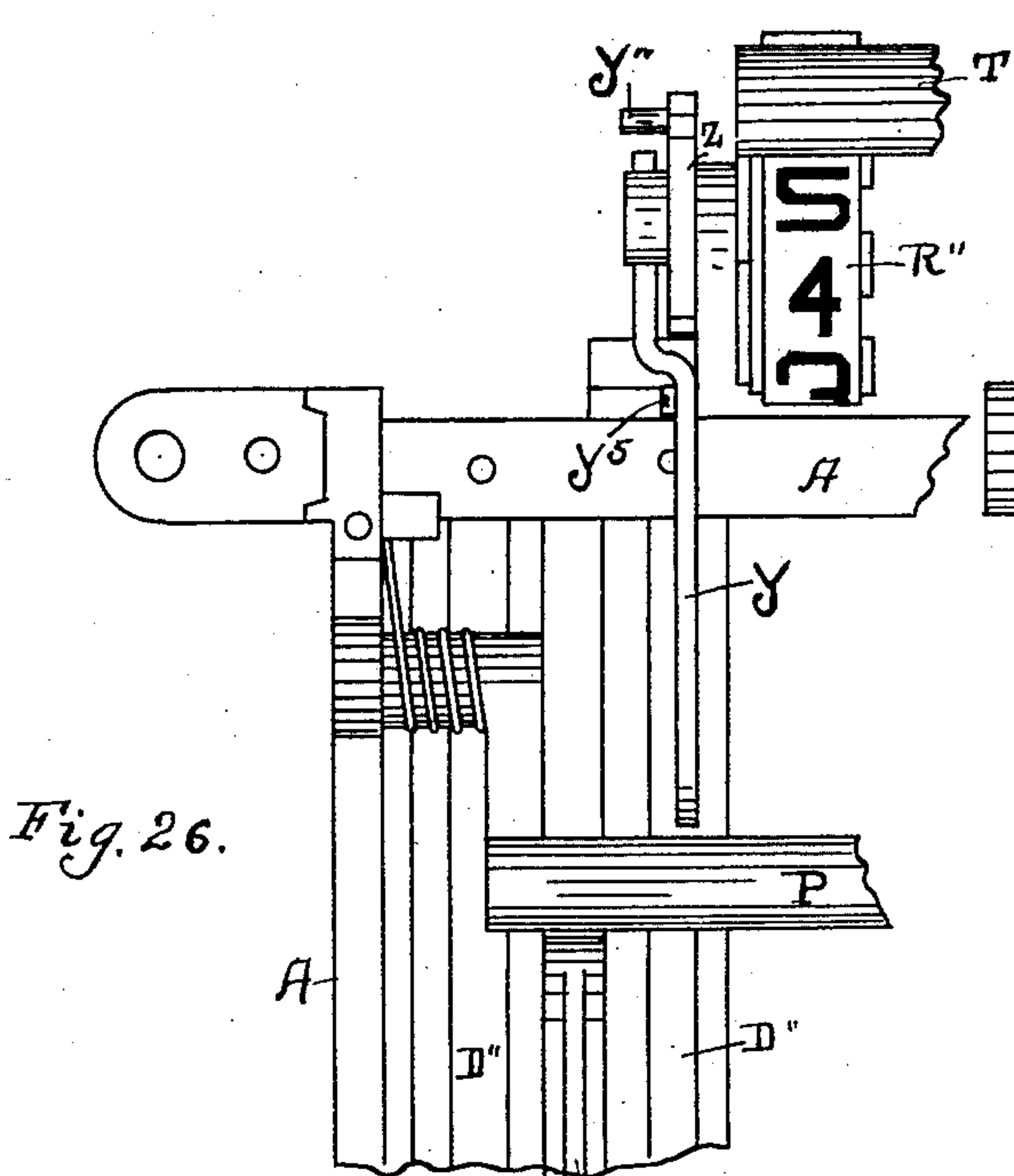


Fig. 26.

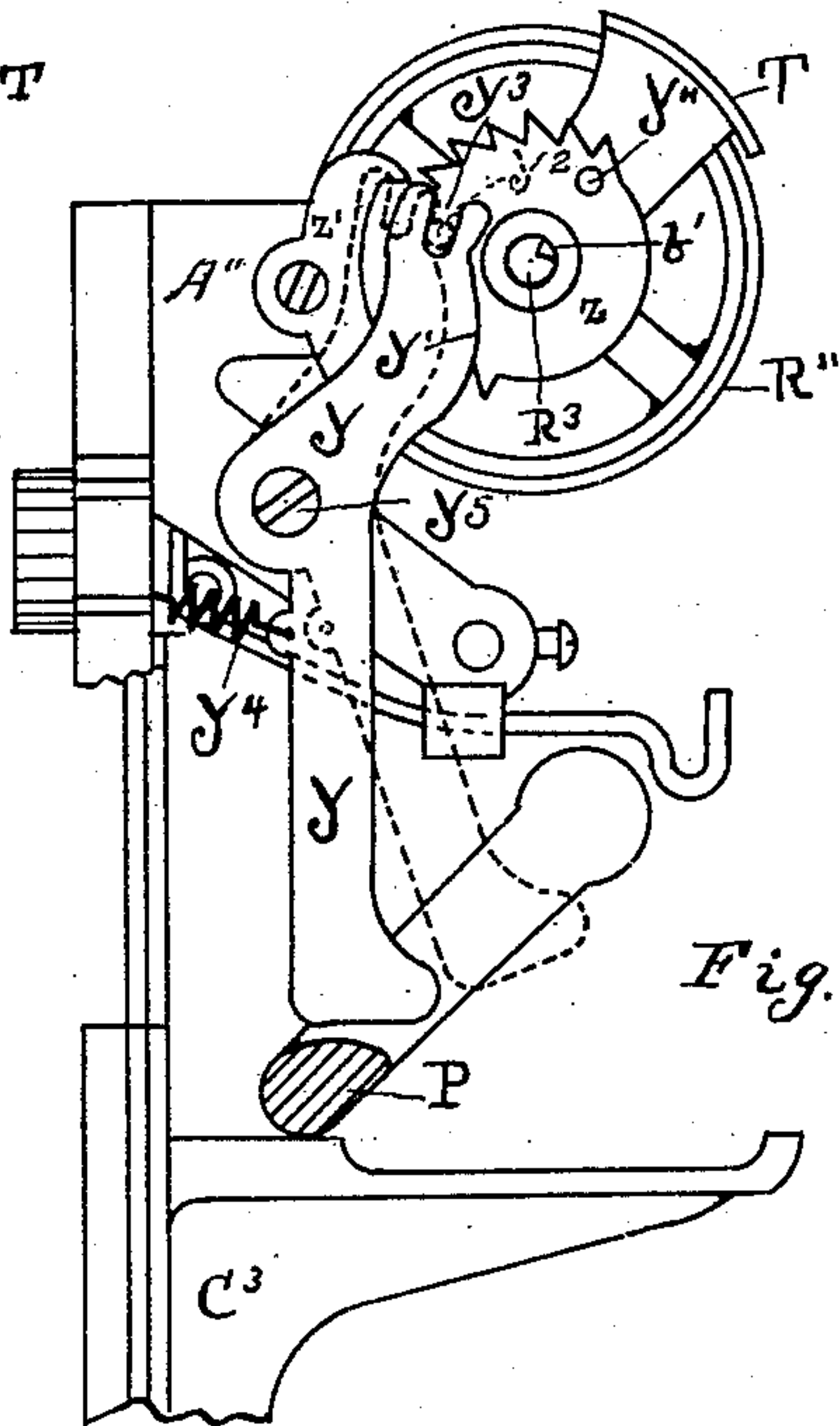


Fig. 27.

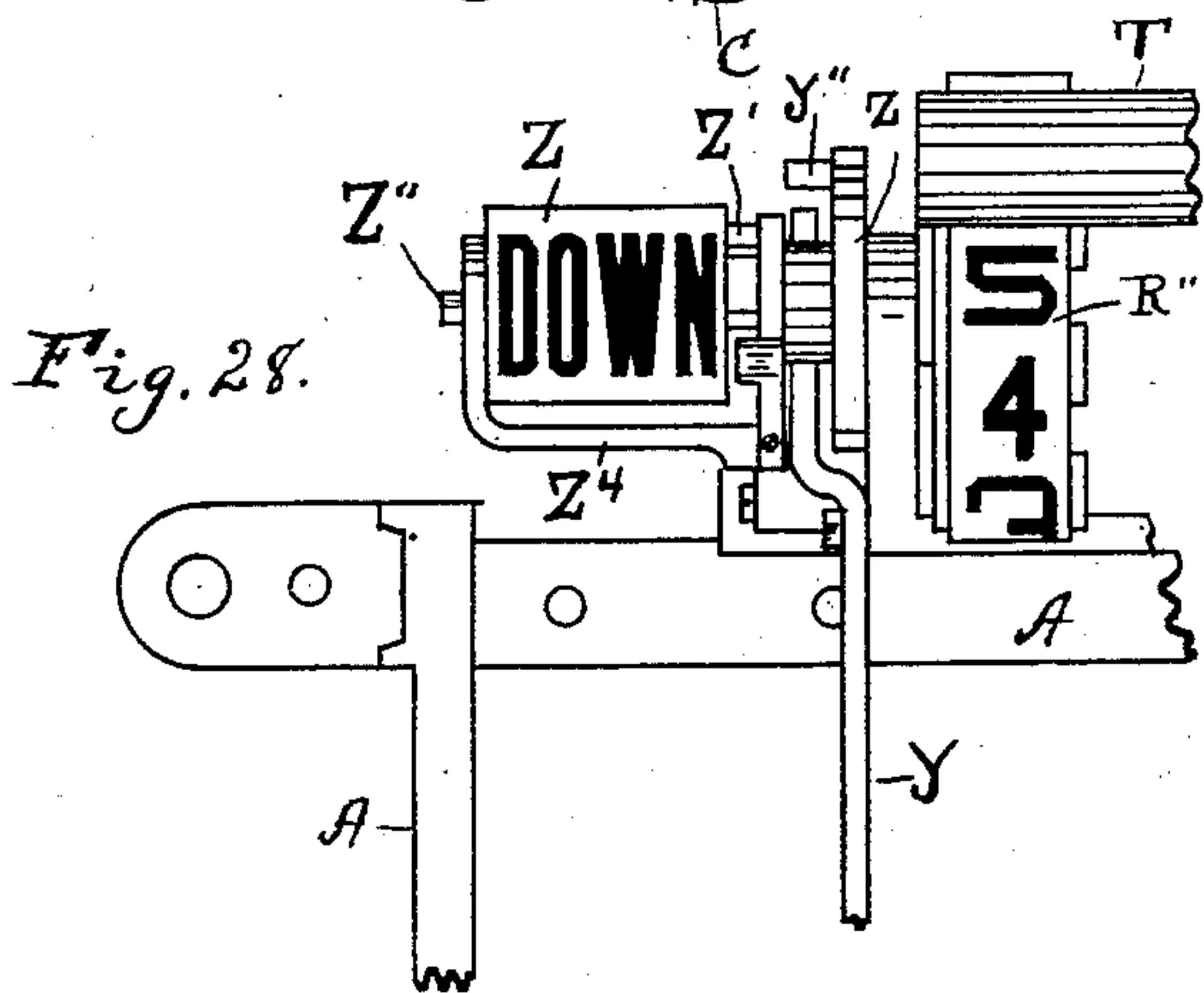


Fig. 28.

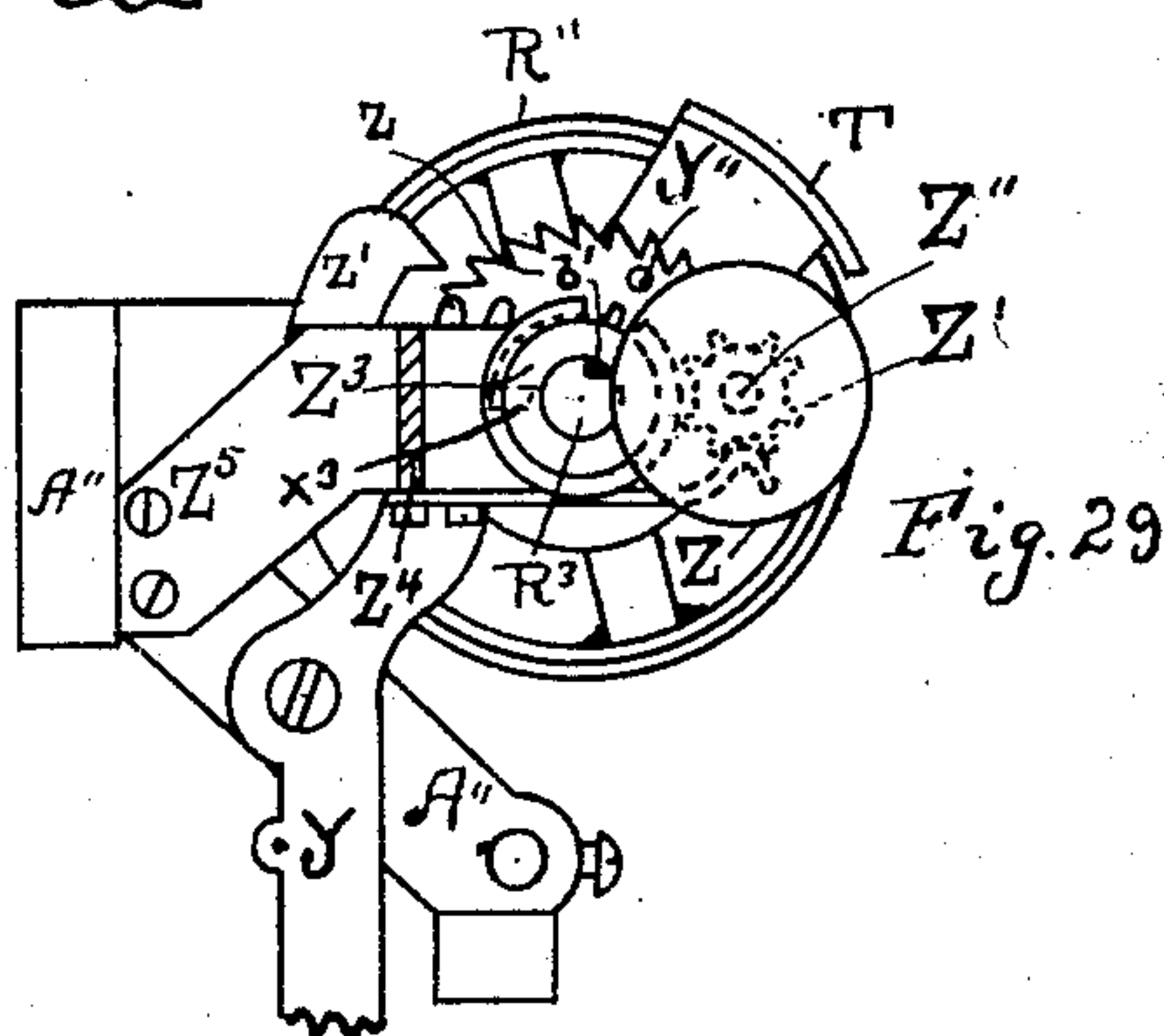


Fig. 29.

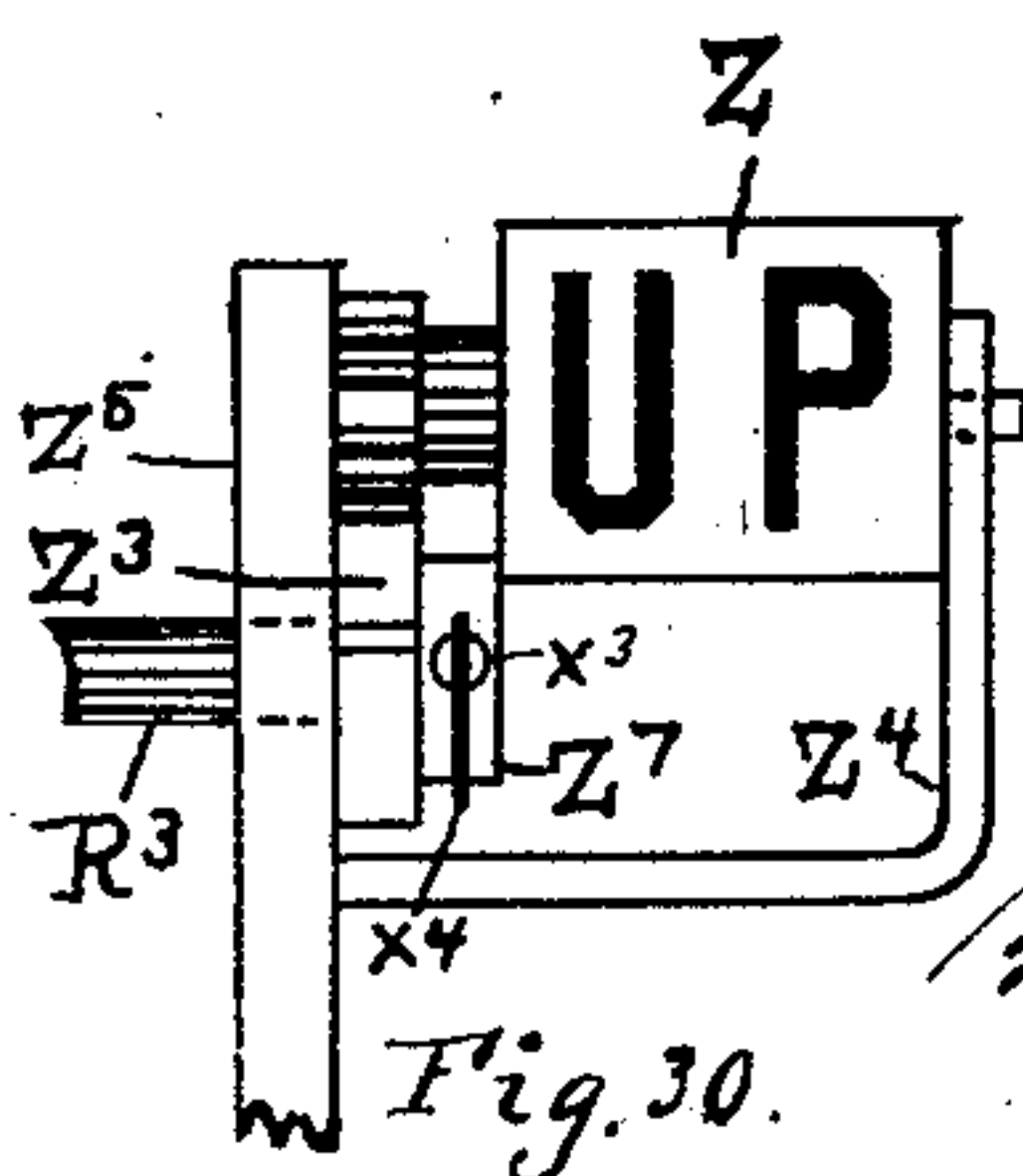


Fig. 30.

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FARE REGISTER.

(Application filed Mar. 18, 1901.)

(No Model.)

10 Sheets—Sheet 9.

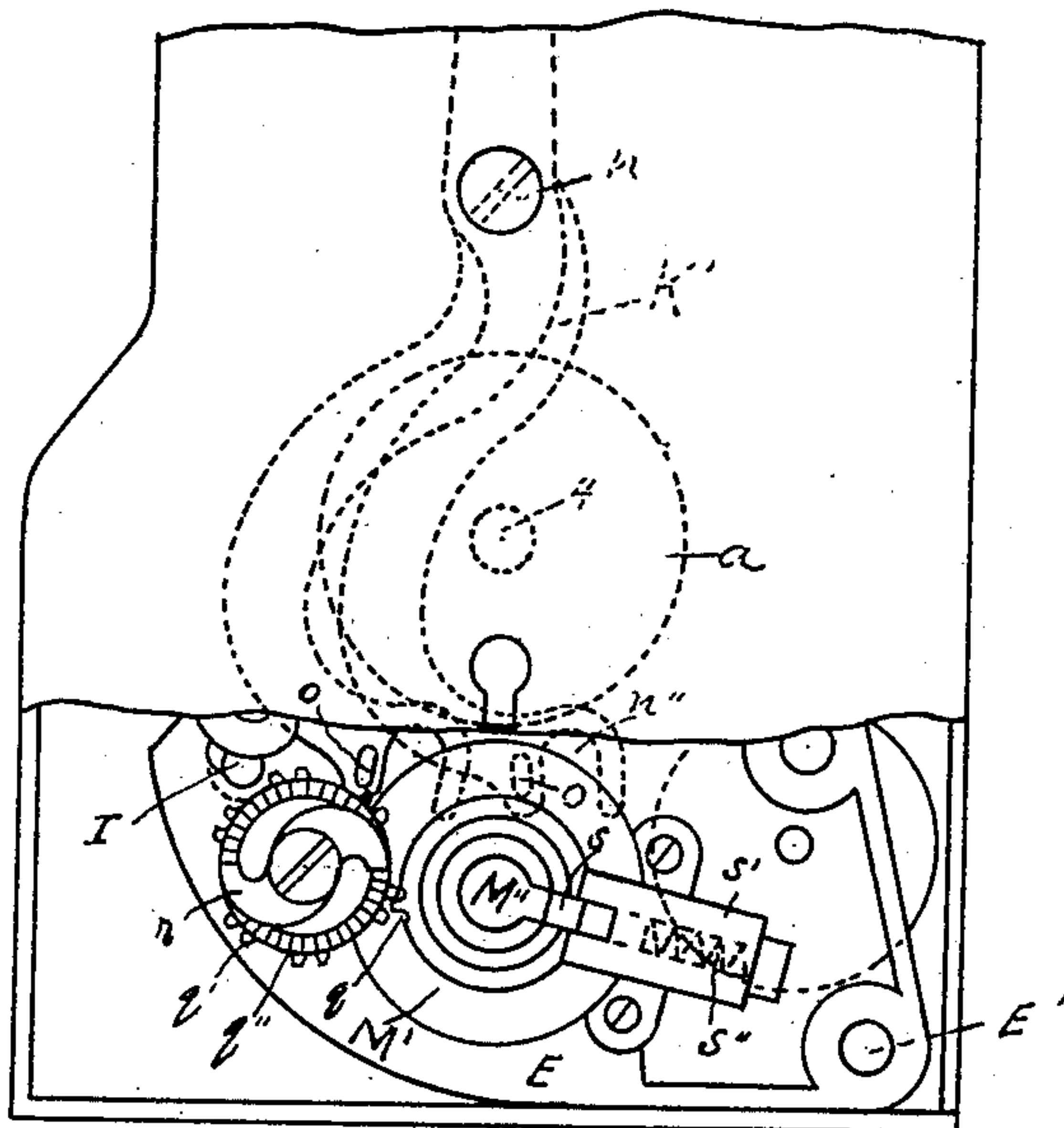


Fig. 32.

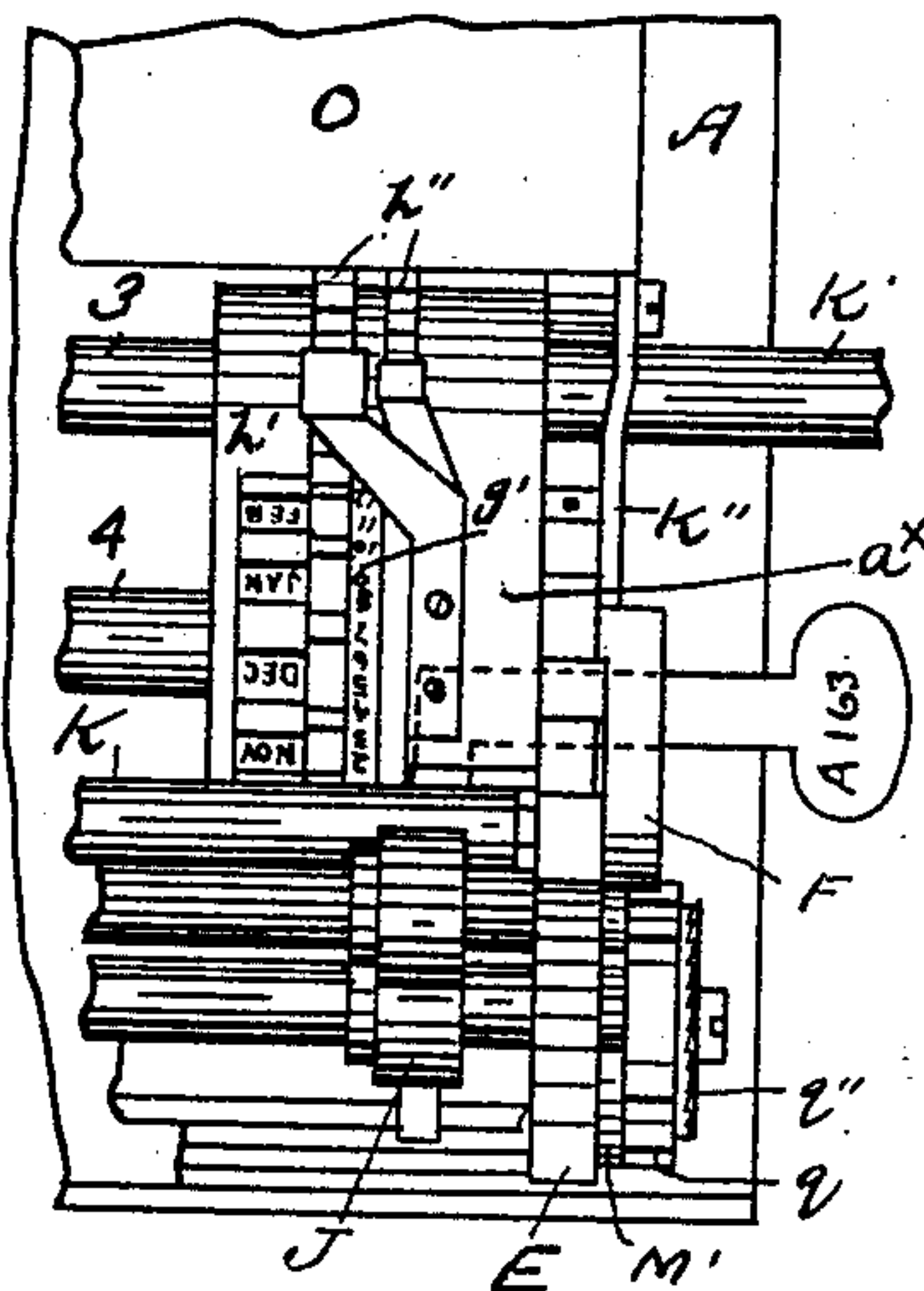


Fig. 31.

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INVENTORS.

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C. M. Theobald.

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J. F. OHMER & H. TYLER.

FARE REGISTER.

(Application filed Mar. 18, 1901.)

(No Model.)

10 Sheets—Sheet 10.

| Trips. | Identification mark. |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |   |     |     |
|--------|----------------------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|-----|-----|
|        | 12                   | 4 | 0 | 5 | 0 | 4 | 5 | 7 | 5 | 4 | 1 | 0 | 7 | 1 | 3 | 2 | 2 | 1 | 3 | 4 | 0 | 1 | 5 | 3 | 1   | MAY |
| 12     | 4                    | 0 | 5 | 0 | 4 | 5 | 7 | 5 | 4 | 1 | 0 | 7 | 1 | 3 | 2 | 2 | 1 | 3 | 4 | 0 | 1 | 5 | 3 | 1 | MAY | 50  |
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| 4      | 3                    | 9 | 7 | 8 | 4 | 4 | 9 | 6 | 4 | 0 | 6 | 5 | 1 | 2 | 7 | 5 | 1 | 2 | 8 | 8 | 1 | 4 | 8 | 1 | MAY | 54  |
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| 1      | 3                    | 9 | 5 | 5 | 4 | 4 | 6 | 3 | 4 | 0 | 4 | 3 | 1 | 2 | 5 | 3 | 1 | 2 | 6 | 5 | 1 | 4 | 6 | 6 | MAY | 50  |

Dr. F. Ober

Fig. 33.

WITNESSES.  
Matthew Lieber.  
C. Theobald.

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Hiram Tyler.  
INVENTORS  
By R. J. McCarty  
ATTORNEY.



# UNITED STATES PATENT OFFICE.

JOHN F. OHMER AND HIRAM TYLER, OF DAYTON, OHIO, ASSIGNORS TO THE OHMER CAR REGISTER COMPANY, OF ROCHESTER, NEW YORK, A CORPORATION.

## FARE-REGISTER.

SPECIFICATION forming part of Letters Patent No. 715,129, dated December 2, 1902.

Application filed March 18, 1901. Serial No. 51,744. (No model.)

*To all whom it may concern:*

Be it known that we, JOHN F. OHMER and HIRAM TYLER, citizens of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Fare-Registers; and we do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in fare-registers of the class which have a capacity for recording separately a multiplicity of different denominations of fares and for indicating or exhibiting separately the fares of each denomination and for recording and indicating a total of all the fares registered irrespective of the different denominations or classes. Fare-registers having the above capacity have heretofore been patented to us, the number and date of one of said patents being as follows: Reissue, No. 11,681, of July 19, 1898.

The present invention relates, first, to means for operating and locking the primary actuating-bar through which the inking-roller is first actuated to ink the type-wheels. The platen is next actuated to press the paper against the said type-wheels, and the paper-feeding shafts are next actuated to cause an initial feed of the paper after an impression has been taken; secondly, to means for operating and controlling the operations of the totalizing-wheels; thirdly, to means for directing the attention of passengers or occupants of a car to the register whenever an imperfect or incomplete registration is made. These means coöperate, respectively, with the indicator cards or tablets by which the individual fares are exhibited.

Our invention further relates to means whereby the machine may be easily and quickly locked against operation during the temporary absence of the conductor, also to means for indicating the direction of the car, commonly known as "direction-block."

Preceding a detail description of the inven-

tion reference is made to the accompanying drawings, of which—

Figure 1 is a front elevation of the machine inclosed in a casing. Fig. 2 is a front elevation with the casing removed, also a portion of the sets of detail fare-recording wheels are removed. Fig. 3 is a side elevation with a side of the casing removed to exhibit the interior mechanism. Fig. 4 is a full-sized elevation of the totalizing-wheels on the line *xx* of Fig. 16, showing the normal position of the parts. Fig. 5 is a similar elevation showing the relative positions of the parts when the wheels are operated. Fig. 6 is a detail of the locking device to prevent an improper movement of the registering-wheels when turning said wheels back to zero. Fig. 7 is a detail of the oscillating frame which operates in connection with the registering-wheels. Figs. 8 and 9, respectively, are details of pawls operating in connection with the registering-wheels. Fig. 10 is a front elevation of two of the registering-wheels. Fig. 11 is a detail of the portion of the shaft upon which the registering-wheels are mounted. Fig. 12 is a cross-sectional view of the shaft upon which the registering-wheels are mounted, the section being through the hub of one of said wheels. Fig. 13 is a detail elevation of the mechanism through which the printing operations are effected, also the locking device for the primary actuating-bar through which said operations are effected. Fig. 14 is a lower plan view of the mechanism shown in Fig. 13, parts being broken away. Fig. 15 is a transverse sectional view of Fig. 14; Fig. 16, a full-sized rear view elevation of the registering-wheels assembled; Fig. 17, an end elevation of the frame upon which the registering-wheels are mounted, showing the yielding stop; Fig. 18, views of the key; Fig. 19, a detail of one of the main actuating slides or members, showing a primary actuating-pawl and ratchet-wheel operating in connection with a set of detail recording-wheels. Fig. 20 is a partial sectional elevation of the mechanism for identifying the conductor or other person with the printed statements of the register. Fig. 21 is a front elevation of the same with parts broken away. Fig. 22 is a detail elevation of part of



said mechanism. Fig. 23 is a side elevation of part of said mechanism. Fig. 24 represents detail views of said mechanism. Fig. 25 is a view of the conductor's number-key. Figs. 26 and 27 are elevations of a portion of the registering - wheels and the mechanism by means of which the machine is locked during the temporary absence of the conductor. Figs. 28 and 29 are elevations of a portion of the registering-wheels, showing the direction indicator or block and the mechanism cooperating therewith. Fig. 30 is a top view of the direction - indicator, the shaft  $R^3$  being broken away. Fig. 31 is a front elevation of the lower portion of the machine, part of which is broken away. This view shows the application of the identification-key to the machine as shown in Figs. 2 and 3. Fig. 32 is a side elevation of the lower portion of the machine, parts being broken away. This view also shows the application of the identification-key. Fig. 33 is a view showing a statement taken from the machine, in which will be seen the identification-impression.

We will first briefly describe the well-known mechanism of the register, which is mounted on a supporting - frame A, which, together with the various mechanism, is inclosed in a suitable casing B.

3 and 4 designate transverse shafts suitably mounted. The detail recording-wheels  $a$  are loosely mounted in groups on the shaft 4. In Fig. 1 we have shown only one complete set of said detail recording-wheels, consisting of four wheels—to wit., the "units," "tens," "hundreds," and "thousands" wheels. The remaining sets are exact duplicates of this set. Each of these wheels has attached to it mutilated gears  $b$ . Above said wheels  $a$  on shaft 3 are mounted their actuating-wheels  $c$ , which are primarily driven from a ratchet-wheel  $d$ , that is engaged by a pawl  $e$ , Fig. 19. The pawl  $e$  is supported on an oscillating piece  $f$ , which is loosely mounted on shaft 4, adjacent to the ratchet-wheel  $d$ . The actuating-wheels  $c$  engage with the gears  $b$ , fixed to the detail-wheels  $a$  in a well-known manner, transmitting motion in succession to each of said wheels  $a$  upon a complete rotation of the preceding wheel  $a$ . In line with the lower shaft 4 there are also loosely placed type-wheels  $g$ ,  $h$ ,  $g'$ , and  $h'$ , which indicate dates or other matter—for example, the month and the days thereof—also the number of trips and the directions—for example, east and west, north and south—or these type-wheels may convey any other information. The printing-surfaces of all the type-wheels are in alinement, so that the printed statements hereinafter referred to may be clear and perfect. The wheels  $g$ ,  $h$ ,  $g'$ , and  $h'$  are in gear with the wheels  $g''$  and  $h''$ , which are in line with shaft 3. These latter wheels are fixed to short shafts  $k$  and  $k'$  and are set by turning the finger-pieces  $k''$  and  $k^3$ . On the outer ends of shafts  $k$  and  $k'$  there are fixed dials L and L', which bear indications corre-

sponding with the indications on the type-wheels  $g$   $h$   $g'$   $h'$ . These indications on such dials are pointed to by fingers  $m$ , which are operated by the finger-pieces  $k''$  and  $k^3$ .

It will be observed that the type-wheels  $g$ ,  $h$ ,  $g'$ , and  $h'$  are not operated by the same means which operates the recording-wheels  $a$ . The means for operating the latter wheels consist of vertical slides C, of which there is one cooperating with each bank or set of said wheels. These slides C have a recess C', in which an end of the pawl-support  $f$  projects, and as said slides are elevated the pawl-support  $f$  thereon is correspondingly elevated to engage the ratchet-pawl  $e$  with a ratchet-wheel  $d$ , through which the actuating-wheels  $c$  are primarily operated. The recess C' lies on one side of a web C<sup>5</sup> and is inclosed above and below by lugs C<sup>4</sup>, which confine within said recess the end of the pawls  $f$ . (See Sheet 3 of the drawings.) Each slide C has a rearward projection C'' and a forward projection C<sup>3</sup>. Through the former projection—to wit, C''—the primary movement is imparted to said slides through the operating mechanism, (which is not shown.) The forward arm or projection C<sup>3</sup> moves an indicator-tablet D. Each of said indicator-tablets D exhibits a definite kind of fare which corresponds to the particular class of fares of the set of detail recording-wheels  $a$ , with which it is associated. These indicator-tablets D are secured to bars D', which move in vertical guides D'', that are rigidly attached to the frame of the machine.

From the above description, which describes the well-known features of the fare-register shown in the patent to us hereinbefore referred to, it will be seen that upon each operation of one of the members or slides C the recording-wheels  $a$  and the fare-indicator tablet D belonging to the said set of wheels  $a$  will be operated to record and indicate a definite class of fares.

We will now describe the features embodied in the present invention.

E designates two side plates, which are hinged at E' to the lower portion of the main supporting-frame. These plates are held in an upper position by spring-pressed arms F, which are pivotally mounted upon the shaft 4 or in line with said shaft and which when supporting the said plates in an operative position engage at their outer ends with projections F' on the outer sides of said plates. In these plates E the paper-roll shaft G, the platen H, the pressure-bar I, and the paper-feeding rollers I' and I'' are mounted. The feed-rollers I' and I'' have collars or raised portions J and J'. The former collars are on shaft I', which is the primarily-movable one of said shafts, and said collars have a suitable rough surface to engage the paper N to unwind it from the roll after the completion of each impression of the type-wheels.

K is an inking-roller which is mounted in suitable proximity to the type-wheels in arms



K' and K''. These arms are pivoted at *n* to the sides of the supporting-frame, and the upper ends of such arms are controlled by coil-springs *n'*, in positions that hold the inking-roller in its normal position, which is away from the type-wheels. The lower ends of said arms K' and K'' are bifurcated to provide cam-slots *n''*, which will be again referred to. The portions of said arms lying above the cam-slots are provided with oblong openings *o*, in which the journals *o'* of the inking-roller project and have some yielding movement when the inking-roller impacts with the type-wheels. Attached to the ends of said journals *o'* are coil-springs *o''*. These springs normally maintain the journals *o'* in an inner position in said openings *o*. (See Fig. 3.) The paper-feeding shaft I' has a finger-piece I<sup>3</sup>, by which it may be turned to continue the feed of paper after the primary feeding operation is completed. This primary feeding operation of the paper takes place after the impression is completed.

In the operation of taking a printed statement or impression from the type-wheels the inking-roller is first operated to ink said type-wheels. After this inking operation is completed the platen H is moved up against the paper by the pressure-bar I coming in contact therewith, and at the completion of the operation of the platen the feed-shafts I' and I'' are operated. These operations all take place within a single rotation of the pressure-bar I and are accomplished by the following devices:

M and M' designate two disks or wheels which are rigidly attached to the ends of the pressure-bar I, or they may be an integral part thereof. Each of these wheels has in similar positions a pin or projection *p*, which are in positions to enter the cam-slots *n''* in the arms K' and K'' in the initial movement of the pressure-bar I. (See Fig. 3.) The pressure-bar I has eccentric surfaces S, which come in contact with the platen H and elevate said platen, with the paper, against the type-wheels. The disk or wheel M' has a single tooth *q*, which at a certain period in the movement of the pressure-bar engages with a mutilated gear *q'*, loose on the feed-shaft I'. The outer face of the mutilated gear *q'* is provided with ratchet-teeth *q''*, and rigidly attached to the end of the feed-shaft I' is a ratchet-plate *r*, the points of which turn inwardly and engage with the ratchet-teeth *q''* when the gear-wheel *q'* is moved to its normal or operative direction. The plate or wheel M' has a keyhole M''. A locking device for maintaining the pressure-bar I in a locked condition, so that it cannot be operated, consists of a dog *s*, which is mounted in a housing *s'* and is normally pressed by a coil-spring *s''*. The upper portion of the dog has a tapering surface *i*, which matches with a tapering surface *i''* on the wheel adjacent to the keyhole, and when the key is inserted the dog is moved outwardly to bring said ta-

pering surfaces in relative position, which enables the plate M' to be turned by the key in the direction of the arrow, as shown in Fig. 13; but the wheel cannot be turned in an opposite direction owing to the lower sharp corners of the dog and the plate at the opening. (See Figs. 3 and 14.) When pressed outwardly by the spring *s''*, the dog *s* enters the key-slot *r'*, and thus the bar I and the parts attached thereto are locked against any operation. As before stated, the dog is moved out of a locking position and the bar I is operated by means of the key Q. This key is inserted in the keyhole in a position that brings the tapering surface of the lug *r''* in contact with the end of the dog *s*. The key is then turned, and the first movement of the wheels M and M' causes the lugs or projections *p* on the wheels M and M' to enter the cam-slots *n''* in the arms K' and K''. The inking-roller is thereby moved against the peripheries of the type-wheels. Continued rotation of the wheels M and M' moves the lugs *p* out of the cam-slots *n''*, and the tension of the coil-springs *n'* moves the inking-roller back to its normal position away from the type-wheels. During the impact of the inking-roller with the type-wheels it has some yielding movement, which is due to the mounting of the journals of the inking-roller, as hereinbefore described. The next operation performed by the continued movement of the pressure-bar brings the eccentrics S on said bar in contact with the platen H, and thus presses the paper against the previously-inked type-wheels. The continued movement of said bar brings the tooth *q* on wheel M' in engagement with the mutilated gear *q'* on the feed-shaft I'. The movement of this mutilated gear causes the ratchet-teeth *q''* thereon to engage with the ratchet-plate *r*, which has a fixed connection with the feed-shaft I', and consequently the said feed-shaft is given movement which gives an initial feed to the paper. This operation completes one rotation of the bar I and brings the key-opening M'' in a position to receive the dog *s* after the withdrawal of the key, and whereby such bar is locked against further rotation. Further movement is imparted to the feed-shafts I' and I'' by turning the finger-piece I<sup>3</sup>, Fig. 2.

We will next describe the means by which the conductor or other person taking a statement from the machine may be identified with such statement. In this connection we desire to state that these means are equally useful in obtaining an identification-mark from a cash-register, by which the operatives of such cash-register may be identified with the statement taken from the machine at stated times. For example, when a cash-register is under the control of two or more operatives or clerks during different periods of the working hours. For example, when a clerk or operative is relieved at the noon hour and the machine is placed under the control of an-



other clerk or operative, at this time a statement may be taken from the register showing the amount of cash received, together with the identification-mark of the clerk or operative who controlled the register up to that time. Thus there may be kept a separate and distinct accounting of the work of each separate clerk or operative who may operate the machine at different periods. We therefore do not wish to limit the use of this important feature of our invention to the purposes of a fare-register alone. These means are illustrated on Sheet 6 of the drawings and are described as follows: On the outside of the casing B there is mounted a rotatable housing Q', which terminates in a crank portion Q'', by means of which the said housing is rotated. N' is a disk which has a rectangular slot N'', which extends from its axis to the periphery. The portion of said slot approaching the periphery has a rounded or tapering form. This disk or wheel N' has reduced annular extensions N<sup>3</sup> and N<sup>4</sup> and an end extension N<sup>5</sup>, which is rectangular or square in cross-section. Mounted upon the part N<sup>3</sup>, adjacent to the disk N', is a larger disk S', which is rigidly secured to the disk N' and has a notch S'' cut in its periphery. The outer portion of the extension N<sup>3</sup>, which is not occupied by the disk S', has a bearing in the side of the casing B. p' is a ratchet-wheel which is rigidly mounted on the extension N<sup>4</sup>, and the housing Q', which has a square opening, fits onto the rectangular extension N<sup>5</sup> and is made secure by a screw N<sup>6</sup>, which penetrates the extensions N<sup>4</sup> and N<sup>5</sup>. It will be thus seen that the parts N', S', the ratchet-wheel p', and the housing Q' will all rotate together in a bearing in the casing B. The ratchet-wheel p' is prevented from retrograde movement by a spring-pressed pawl p''. The end of the pressure-bar I has a square or rectangular terminal N<sup>7</sup>, which when said bar is lowered and elevated from and to its upper or normal position moves out of or into the rectangular opening N'' in the disk N'. The object of the slot N'' is to permit the journal of the pressure-bar I to move out of said slot when the printing mechanism is lowered by lowering the plates E on their hinges E', as hereinbefore described. The movement of said pressure-bar in performing its functions is simultaneously effected with the movements of the other parts that are affected by turning the crank Q''.

In Fig. 20 we have shown two of the type-wheels with their adjacent bearings e'' and e<sup>3</sup>. The bearing e<sup>3</sup> has a hub or extension e<sup>4</sup>, through which there is a keyhole e<sup>5</sup>. In line with this keyhole there is a keyhole c'' in the wall or casing B. d'' designates a key, which bears a number or sign-mark of the conductor who possesses such key. It will be understood that there are a number of such keys. For example, each operator or clerk will have one of such keys with his particular number or identification-mark thereon. In the present

instance the number is "A 163." The lug d<sup>3</sup> has upon its lower horizontal surface type bearing the number or other identification-mark. When the key is inserted in the key-holes c'' and e<sup>5</sup>, the end having the type thereon comes in printing alinement with the surface of the type-wheels, and an impression thereof is made simultaneously with the impression taken from the type-wheels. The keyhole c'' in the casing occupies a normal position on one side of the crank Q'', as shown in Fig. 21. The key-slot S'' in the disk S' normally stands in line with the lower portion of the keyhole c''. With the disk S' in this position and the crank Q'' in its normal position, as shown in Fig. 21, the key d'' may be inserted and the type end d<sup>3</sup> thereof placed in a position to print. The disk S' and the crank-housing Q', as well as the parts which move therewith, cannot be operated until the key d'' is placed in a position to print. This is owing to the notch S'' engaging with the key; but when the key is inserted its full length a notch f'' in the lower side thereof comes in a position in line with the periphery of the disk S'. In this position the disk may be rotated with the other parts to which it is connected by turning the crank Q''. The rim of the disk will then pass through the slot f'' in the key. The operation of turning the crank Q'' actuates the pressure-bar I and the inking-roller, as well as the paper-feeding shafts I' and I'', as hereinbefore described. In the use of this identification key or device the locking device shown and described in connection with Figs. 3, 13, and 14 is not utilized; but it will be seen that either means will prevent unauthorized statements being taken from the machine. In cases where the locking device shown in Figs. 13 and 14 is used no one can take a statement who does not possess a key as shown in Fig. 18. In the use of the conductor's identification device as shown in Fig. 20 the printed statement must always identify the conductor or other person having possession of a key. Also in Figs. 31 and 32 is shown the identification-key d'', which may be used to take an impression therefrom simultaneously with the impression taken from the type-wheels. This key may be used in the machine as shown in Figs. 2 and 3. In the use of such key the necessary keyhole is provided in the side of the casing, and a suitable interior support a<sup>x</sup> is provided for the key to hold it level. (See Fig. 13.) The support a<sup>x</sup> is a modification of the key-support e<sup>3</sup>. (Shown in Fig. 20 of the drawings.) When inserted, the lug of such key, which contains the identification-mark, comes in printing alinement with the type-wheels. In adapting this identification-key to the machine as shown in Figs. 2 and 3 it only becomes necessary to construct the arm K' as shown in Fig. 32 in order that the key may be moved to the proper printing position without the interference of such arm. D<sup>5</sup> designate springs, one of which is se-



cured above each of the indicator-bars  $D'$ . The operations of a machine of this character are very rapid and are often in quick succession. It therefore becomes necessary to provide a yielding contact above each indicator to limit their upward movement and to quickly return such indicators to their lower or normal positions when released. The springs  $D^5$  perform both of these functions.

Another feature of the present invention comprises means, hereinbefore briefly referred to, for attracting the attention of the occupants of a car to the register whenever the operator has failed to make a complete operation. This means consists of a movable plate or blind  $O$ , which extends across the median portion of the machine and which may contain any suitable word or words to disclose an incomplete operation of the machine. For example, the words "Not registered" are preferably placed thereon in bright or contrasting letters. This plate or blind is elevated upon each operation of the machine and occupies a position in the front of the indicator-tablets  $D$ . It is attached to two members or supports  $O'$ , which are guided in their movements by the two end guides  $D''$ . These two supports  $O'$  have rearwardly-projected arms  $D^3$ .  $D^4$  designates pivotal links, which connect such arms  $D^3$  with a transverse oscillating bar  $P$ . This bar  $P$  is an element shown in the patent to us, hereinbefore referred to. The said bar rests across the upper ends of the operating members or slides  $C$ , which, it will be remembered, are the primary means through which the detail recording-wheels and the individual fare-indicators are operated. Upon each operation of any one of said parts  $C$  the bar  $P$  is elevated, and through its movement the plate or blind  $O$  is likewise elevated, as well as a specific fare-indicator tablet  $D$ . If the operation is complete, the plate or blind  $O$  will resume its normal or lower position, allowing a full view of the indicator-tablet which was elevated therewith; but if the operation is incomplete the said plate or blind  $O$  will remain in the position to which it is moved by said incomplete operation, and it will be apparent to the observers that a fare was not properly registered. This condition of the register is illustrated in Fig. 1. It will be understood that a complete and successful operation of the machine depends upon a complete elevation of the actuating member  $C$  to the upper limit of its movement by the operating mechanism, which is not shown.

Coöperating with the plate or blind  $O$  is another concealing plate or blind  $T$ , which moves in a similar manner in front of the registering-wheels  $R$ ,  $R'$ , and  $R''$ , which will be described in connection with said wheels. These wheels  $R$ ,  $R'$ , and  $R''$  are loosely mounted upon a shaft  $R^3$ , which is mounted in the frame  $A''$ . On one side of each of these wheels there is a single rectangular notch  $t$ , while on the opposite side of each of said wheels there are ten such notches  $t'$ .

$U$  designates a wheel on shaft  $R^3$  through which the bell  $U'$  is sounded. The side of this bell-wheel adjacent to the units-wheel  $R$  has ten notches  $t''$ , while the opposite side of said wheel  $U$  has a similar number of notches  $t''$ , through which the bell-pawl  $t^4$  is actuated. The pawl  $t^4$  is engaged by the notches  $t''$ , and as the bell-wheel  $U$  is actuated the shaft  $t^5$ , upon which the pawl  $t^4$  is fixed, is oscillated. A bell-hammer  $t^6$  is fixed to one end of the shaft  $t^5$  and makes contact with the bell whenever the shaft is thus moved. Movements are imparted to the bell-wheel  $U$  and to the units-wheel  $R$  through a pawl  $u$ . This pawl moves the said wheels in unison upon each upper movement thereof by engaging with the notches  $t$  and  $t'$ , which are always in alinement. Through a double pawl  $u'$  the tens and hundreds wheels  $R'$  and  $R''$  are actuated. A complete rotation of the units-wheel  $R$  brings the single notch  $t$  therein in line with one of the notches  $t'$  on the tens-wheel adjacent to the nose  $u''$  of the double pawl  $u'$  when said nose enters said notches, and the next upward movement of the pawls  $u$  and  $u'$  actuates both the units and tens wheels in unison. A complete rotation of the tens-wheel brings the single notch  $t$  therein in line with one of the notches  $t$  on the hundreds-wheel  $R''$ , and the nose  $u^3$  of the double pawl enters said notches, and the next upward movement of the pawls causes a rotation of the three wheels in unison. The pawls  $u$  and  $u'$  are mounted on a shaft  $v$ , one end of which is mounted in an oscillating arm  $V$ , Fig. 16, which is mounted on the shaft  $R^3$ , and the other end of which is mounted on an oscillating arm  $W$ . There is another arm  $W'$ , similar to the arm  $W$  and joined thereto, which supports the concealing plate or blind  $T$ , that moves across the face of the registering-wheels  $R$ ,  $R'$  and  $R''$ , Fig. 7. These arms are loosely mounted on the shaft  $R^3$ .

$v'$  designates a shaft parallel with shaft  $v$  and movable therewith by being mounted in the downwardly-projected portions of the arms  $V$ ,  $W$ , and  $W'$ . An end of the shaft  $v'$  has pivotally connected to it a link  $P'$ , which is pivotally connected at its lower end to the transverse oscillating bar  $P$  and through which an oscillating movement is imparted to the shafts  $v$  and  $v'$  upon each movement of said oscillating bar  $P$ , as hereinbefore described. (See Fig. 3.) The extent of the movement thus imparted to the said shafts  $v$  and  $v'$  and the arms upon which they are mounted is shown in Figs. 4 and 5, the former figures showing them in the lower or normal position and the latter showing them in the upper position or after the pawls have completed a movement of the wheels  $R$ ,  $R'$ , and  $R''$ . Such wheels  $R$ ,  $R'$ , and  $R''$  are under complete control—that is to say, they are prevented from overthrowing in either direction through the effect of the momentum imparted to them in their operation. The means for accomplishing this result consists of pawls  $w$  and  $w'$ , which



are pivotally mounted on a shaft X, which is mounted in the frame A". These pawls are pressed into the notches  $t'$  in the wheels by springs  $x$ , which are attached to the frame.

5 The nose  $w''$  of each of the forward pawls  $w$  projects into the notches and prevents any backward throw of such wheels. The wheels are permitted to rotate in their normal direction by the surface of the notches coming in contact

10 with the rounded surface  $w^3$  of the pawls  $w$ . An overthrow of said wheels when rotating in their normal direction is prevented by the nose  $w^4$  on the rearward pawls  $w'$ , which enters the notches at each operative movement

15 of the wheels, as shown in Fig. 5. When the actuating-pawls  $u$  and  $u'$  are in their lower or normal position, the nose  $w^4$  of the rearward set of pawls  $w'$  is out of the notches, as shown in Fig. 4. The rear ends of said pawls

20  $w'$  have a suitable curvature, and as the shafts  $v$  and  $v'$  are lowered from the position shown in Fig. 5 to the position shown in Fig. 4 the shaft  $v'$  comes in contact with the rearward or curved ends of said pawls  $w'$  and moves

25 them down to the position shown in Fig. 4, which position moves the nose  $w^4$  of said pawls out of the notches  $t'$  and places the wheels in a condition for the next operation. The shaft  $R^3$  upon which the wheels are

30 mounted has a longitudinal surface groove  $b'$  in that portion which is covered by the wheels. This groove has a shoulder or straight surface  $c'$  on one side and a beveled surface  $d'$  on the other side. In the hub of

35 each of the wheels there is a slot  $e'$ , which receives a detent  $f'$ , having a beveled inner end which matches with the groove  $b'$ . These detents are pressed inwardly by springs  $a'$  (see Figs. 11 and 12) and enable the wheels  $R$ ,  $R'$ ,

40 and  $R''$  to be turned back to zero at the completion of each trip or at any other time desirable. The shaft  $R^3$  is rotated by the hand through the finger-piece  $A'$  until the figures of similar denomination upon the wheels

45 come in line, as in Fig. 2. The detents  $f'$  ride around the surface of the shaft until they reach the groove  $b'$  when they enter said groove and compel the wheels to move in unison back to zero. The shaft is limited to

50 the necessary movement to return the wheels to zero by a pin  $y$  and a yielding stop  $y'$ . The former projects from the shaft and the latter is pivoted at one end to the side of the frame A" in the path of the movement of pin  $y$ .

55 The stop  $y'$  is yieldingly supported by means of an oblong slot  $y''$  therein and a pin  $y^3$ , which passes through said slot into the frame. By this yielding stop the shaft  $R^3$  is permitted to make one complete and exact rotation in

60 returning the wheels to zero. (See Figs. 16 and 17.) The hand operation of turning the shaft is controlled by a ratchet-wheel  $z$  and a ratchet-dog  $z'$ . The wheel is fixed to the shaft and has a limited number of teeth there-

65 in, it being not necessary to extend the teeth entirely around the wheel. The ratchet  $z'$  is mounted adjacent thereto on the frame.

The pivotal point of said ratchet is below its center of gravity in order that the upper nose  $z''$  may be in normal contact with the teeth on 70 the wheel and the lower nose  $z^3$  out of contact with said teeth. In turning the shaft to bring the wheels to zero if the movement of said shaft is quicker than necessary the effect will be to throw the upper nose  $z''$  out of 75 engagement and the lower nose  $z^3$  into engagement with the wheel, and thus lock the shaft against rotation; but this locking engagement of the lower nose of the dog or ratchet  $z'$  will not occur if the movement of 80 the shaft is slow. The effect of such slow movement will be to permit the upper nose  $z''$  of the dog to gradually move in and out of the ratchet-teeth on the wheel without bringing the lower nose in locking contact with the 85 teeth.

Referring to Sheet 8, we will describe the mechanism contained thereon, which comprises means for temporarily locking the machine against operation and mechanism by 90 means of which the directions of the car are indicated. Y designates a lever or locking-arm which is pivoted at  $Y^5$  to a projection portion of the frame A. The lower end of this pivotal arm Y lies above the transverse 95 oscillating bar P, and when in the position shown in full lines in Fig. 27 it locks said bar P and prevents the machine from being operated. When the said arm is in the position shown in dotted lines, it permits of the 100 bar P moving in the operation of the machine. The upper portion of said arm has a curvature substantially as shown, and the extreme upper end thereof is bifurcated, as at  $Y^3$ . The ratchet-wheel  $z$  has a pin  $Y''$  projecting therefrom, which in the rotation of 105 said wheel will move against the surface  $Y'$  of the arm Y and throw the lower end of said arm away from the bar B, as shown in dotted lines. The conductor may thus lock the machine against operation at any time in which 110 he is temporarily absent from a car by simply turning the finger-piece  $A'$ , which is on the other end of the shaft  $R^3$ . The movement of the shaft  $R^3$ , which takes the pin  $Y''$  115 away from the arm Y, will permit such arm, under the tension of spring  $Y^4$ , to assume a locking position, as shown in full lines in Fig. 27. Referring, further, to the mechanism shown on Sheet 8, the locking device shown 120 thereon has several functions to perform—namely, the temporary locking operation hereinbefore described; a complete movement of shaft  $R^3$ , that will permit the totalizing wheel-pawls  $f'$  and the pawl  $x^3$  to drop into the 125 groove  $b'$  in said shaft, thereby compelling a rotation to zero of said totalizing-wheels; also, the mutilated gear  $Z^3$ , which gear actuates the gear  $Z'$ , connected to the shaft of the direction-indicator, and simultaneously with 130 the action of the pin  $Y''$  by coming in contact with the surface  $Y'$  on arm Y thereby throwing said arm to a position to unlock the machine. By the movement of the direction-



indicator the exposed indication thereon is turned from view and another direction indication is exposed to view. In rotating the wheel  $z$  in the direction that moves the pin  $Y''$  away from said arm a continued movement of such wheel  $z$  will bring the pin  $Y''$  against the bifurcated end  $Y^3$  of said arm and will stop the movement of the wheel and the shaft  $R^3$  in that direction, which is the limit of the movement in such direction.

$Z$  designates a rotating cylinder, upon which is indicated the various directions of the car. The shaft  $Z''$  of this cylinder is mounted in a bracket  $Z^4$  on frame  $Z^5$ , the latter frame being secured to the frame  $A''$ , in which the registering-wheels  $R, R',$  and  $R''$  are mounted. On the shaft of said cylinder there is rigidly mounted a mutilated gear  $Z'$ , which is driven from a single-tooth wheel  $Z^3$ . The latter wheel—to wit,  $Z^3$ —is made to rotate with the shaft  $R^3$  by means of a pin  $x^3$ , which projects through a collar or extended portion  $Z^7$  on the wheel  $Z^3$ . (See Fig. 30.) This pin  $x^3$  is pressed inwardly by a spring  $x^4$  and enters the groove  $b'$  in the shaft  $R^3$ , and movement is thus imparted thereto. This direction-indicator is movable with the registering-wheels  $R, R',$  and  $R''$  whenever the latter wheels are being turned to zero, or the said direction-indicator is movable independently of the movement of said registering-wheels. It will be borne in mind that a movement of the shaft  $R^3$  does not affect the wheels  $R, R',$  and  $R''$  after they are set to zero; but a movement of such shaft  $R^3$  will effect a rotation of the direction-indicator when such movement is in a direction which moves the pin  $Y^2$  on the wheel  $z$  in the direction of the surface  $Y'$  of the arm  $Y$ . The movement of the direction-indicator  $Z$  independent of the movement of the wheels  $R, R',$  and  $R''$  is accomplished by reason of the groove  $b'$  in shaft  $R^3$ , and the same groove in the body of the shaft into which the pawls  $f'$  enter are out of alinement with each other. In other words, the groove  $b'$ , as shown in Fig. 26 and into which the pawl  $x^3$  enters, and the groove  $b'$ , as shown in Fig. 12 and in which the pawls  $f'$  enter are not in alinement. This enables the direction-indicator  $Z$  to be moved independently of the wheels  $R, R',$  and  $R''$  after said wheels have been turned to zero. It will be understood that in turning said wheels to zero the direction-indicator is turned just prior to the completion of the movement which turns said wheels to zero. The shaft  $R^3$  is then turned in the reversed direction until limited by the stop  $Y^2$  engaging with the forked end of the arm  $Y$ . In the next forward movement of said shaft  $R^3$  or in the same direction that is required to set the wheels to zero the direction-indicator is rotated alone. This direction-indicator and the mechanism for locking the register against operation are not shown in Figs. 2 and 15 of the drawings; but it will be understood that such mechanisms are located adjacent to the registering-wheels  $R,$

$R',$  and  $R''$ . The shaft  $R^3$ , as shown in Figs. 2 and 15, is extended for the purposes of the application of the direction-indicator.

Referring to Fig. 33, the vertical column of figures to the left—viz., from “1” to “12”—indicate the trip members, and it will be observed that duplicates are made of trip 1 and trip 12. The first or bottom figure indicates trip 1, and all the figures parallel thereto are made by the inspector, whose identification-mark is “0,” and the last or top impression or statement is also made by the inspector. It will therefore be noted that the two first statements taken are similar in character throughout, excepting the identification-marks, and that the last two statements taken are identical, excepting the identification-marks. The conductors have taken the intervening impressions or printed statements. The figures to the extreme right, beginning at the lower part of the sheet and reading “0, 9, 9, 9, 9, 9, 2, 2, 2, 2, 2, 4, 4, 4, 4, 0,” are the identification-marks of the various persons who took the impressed statements, and the same have been printed from keys or devices peculiar to each operator which were inserted by operator in the machine at time of taking statement. The illustration shows that the inspector, having taken the first impression and with his own key, has left his identification-mark “0.” The identification-mark of the first conductor to operate the car is “No. 9,” and it will be observed that he has taken the first five impressions, the latter being taken at the beginning of trip 5, as shown by the figure “5” at the extreme left hand of sheet. He is then relieved by conductor No. 2, and he also takes an impressed statement and with his own key, leaving his identification-mark “2.” It will be observed that conductor No. 2 takes the next four impressions, and leaving his car at the beginning of trip 9 his successor makes a duplicate impression at trip 9 and leaves his identification-mark “4.” The last conductor takes three impressed statements thereafter and leaves with each statement taken his own identification-mark, which is “No. 4.” The car is then retired for the day, and the inspector, whose identification-mark is “0,” takes the last impressed statement. These identification-marks fix absolutely the responsibility upon the various operators, and from them it is an easy matter to determine the operations of each.

Having described our invention, we claim—

1. In a fare-register, the combination with type-wheels upon which various registrations are made, a series of indicating cards or tablets coöperating with said type-wheels to indicate each fare as registered on said type-wheels, actuating mechanism common to both said registering and indicating mechanism, inking devices, a platen, a rotating pressure-bar, and means successively and positively operated by said pressure-bar during a con-



tinuous rotation thereof to first effect the movement of said inking devices and then said platen.

2. In a fare-register, the combination with  
5 type-wheels upon which are registered various fares, a series of indicating cards or tablets coöperating with said type-wheels to indicate the fares registered on said wheels, actuating mechanism common to both said registering and indicating mechanism, an inking-roller, a platen, a rotating pressure-bar and means successively and positively actuated by said pressure-bar during a continuous rotation thereof to first actuate the inking-roller and then the platen, and means for  
15 supporting said platen and said pressure-bar in operative relation with the type-wheels.

3. In a fare-register, the combination with type-wheels upon which various registrations  
20 are made, a series of indicating cards or tablets coöperating with said type-wheels to indicate the specific fares registered, actuating mechanism common to both said registering and indicating mechanism, an inking device, pivotal arms upon which said inking device  
25 is supported, a platen, a rotating pressure-bar, means on said pressure-bar for engaging the arms of said inking device to ink the type-wheels while the pressure-bar is moving to a position to successively actuate the  
30 platen, means for actuating said pressure-bar to thus successively and positively effect the movement of said inking device and said platen during a continuous rotary movement  
35 of said pressure-bar.

4. In a fare-register, the combination with type-wheels upon which various registrations are made, a series of indicating cards or tablets coöperating with said type-wheels to  
40 indicate the specific fares registered, actuating mechanism common to both registering and indicating mechanism, an inking device, oscillating supports upon which said inking device is yieldingly mounted, a rotating pressure-bar, means on said pressure-bar for actuating the inking device during a continuous movement of said pressure-bar, means  
45 for imparting such continuous movement to said pressure-bar, to successively and positively actuate the inking device and to press a sheet against the type-wheels to take an impression therefrom, and means for locking said pressure-bar after each operation of inking the type-wheels and subsequently taking  
50 an impression from said type-wheels.

5. In a fare-register, the combination with type-wheels upon which various registrations are made, a series of indicating cards or tablets coöperating with said type-wheels to  
60 indicate the specific fares registered, actuating mechanism common to both said registering and indicating mechanism, inking devices, a platen, a rotating pressure-bar, means successively and positively operated by said pressure-bar during a continuous rotation  
65 thereof to first effect a movement of said inking devices and then said platen, a locking

device for locking said pressure-bar after each operation thereof, and a key by means of which said pressure-bar is unlocked and  
70 is operated.

6. In a fare-register, the combination with a series of fare-indicators movable one at a time to indicate fares, of a plate or blind adapted to be actuated simultaneously with  
75 the movement of each of such fare-indicators and to remain in a position to partially conceal a fare-indicator whenever the operation of moving such fare-indicator is incomplete, and individually-moving parts each of which  
80 actuates a specific fare-indicator and such plate or blind.

7. In a fare-register, the combination with a series of fare-indicators, a primary actuating member for each one of such fare-indi-  
85 cators, of a plate or blind actuated by any one of such primary actuating members simultaneously with the movement of any one of such fare-indicators, said plate or blind adapted to remain in a position to partially conceal  
90 a fare-indicator whenever an operation of exposing such fare-indicator is not complete.

8. In a fare-register, a series of fare-indicators, a series of registering-wheels, an oscillating bar, connections between such oscillating bar and such wheels, a series of primary actuating members adapted to actuate  
95 such fare-indicators and such oscillating bar whereby simultaneous movements are imparted to such fare-indicators and such registering-wheels, a plate or blind mounted adjacent to such fare-indicators, and a plate or blind mounted adjacent to such registering-wheels, said plates or blinds being actuated  
100 simultaneously with each fare-indicator and with the registering-wheels, substantially as and for the purposes specified.

9. In a fare-register, the combination with a primary actuating member, of a series of registering-wheels, means for actuating said  
110 wheels at predetermined times, an oscillating bar, a connection between said actuating means and said oscillating bar, interlocking mechanism between each of such registering-wheels and the shaft upon which said wheels  
115 are mounted, and devices for compelling a proper movement of said wheels in turning them back to zero by means of such interlocking mechanism.

10. In a fare-register, the combination with  
120 a main actuating-bar, registering-wheels, means for actuating such totalizing-wheels, and a pivotal connection between such means and the primary actuating-bar, of means for preventing an overthrow of said wheels when  
125 moving in their normal direction, means for preventing a retrogressive movement of said wheels when moving independently of the shaft upon which such wheels are mounted, interlocking mechanism between such wheels  
130 and the shaft whereby such wheels may be turned to zero, and devices for compelling a proper movement of the shaft in turning such wheels to zero.



11. In a fare-register, the combination with a transverse oscillating bar through which the totalizing-wheels are actuated, and a series of members each acting independently on said bar, of a locking-arm adapted to be placed in a position to prevent the operation of such oscillating bar, and means controlling such locking-arm whereby the positions of such arm with relation to the transverse oscillating bar is varied.

12. In a fare-register, the combination with an oscillating bar through which the registering-wheels are actuated, and a series of members each acting independently on said bar, of a locking-arm movable to a position to prevent the operation of such operating-bar, a wheel, and means on said wheel which controls the positions of such locking-arm, and whereby said arm is permitted to assume a position which prevents the movement of such oscillating bar, or is moved to a position that permits movement of such oscillating bar.

13. In a fare-register, means for locking such fare-register against operation, the said means consisting of a pivotal arm, a transverse oscillating bar, a series of slides or members adapted to actuate said bar through which to impart movement to the registering-wheels of such register, and means for controlling the positions of such locking-arm and whereby such arm may be permitted to assume a position that prevents an actuation of said transverse oscillating bar, or whereby said locking-arm may be caused to assume a position which permits of the actuation of such transverse oscillating bar.

14. In a fare-register, the combination with an oscillating bar, a series of movable parts each adapted to actuate said bar and through which movement is imparted to the registering-wheels, of a wheel mounted on the shaft of said registering-wheels, a locking-arm mounted adjacent to said wheel and above the transverse oscillating bar, and means on said wheel whereby the said locking-bar may be moved to a position that permits of the operation of said transverse oscillating bar.

15. In a fare-register, the combination with a shaft and trip-registering wheels mounted

on said shaft, of a direction-indicator geared to said shaft, said direction-indicator being movable from said shaft in setting said wheels to zero, and independently of the resetting movement of said wheels.

16. In a fare-register, the combination in a fare-register, of a locking-arm, an oscillating bar below said arm, means for moving said locking-bar in and out of positions to prevent an operation of said oscillating bar, and a series of movable members or slides each of which is adapted to actuate said oscillating bar when the locking-arm is moved to a position to permit of the movement of such oscillating bar, substantially as described.

17. In a fare-register, means for locking such register against operation, said means consisting of a depending pivotal arm, in combination with an oscillating bar which is immovable at times when the depending arm occupies a position above it, and a series of independently-movable parts each of which is adapted to actuate said oscillating bar when movement of the latter is permitted by the depending arm.

18. In a fare-register, the combination with an oscillating bar, and a series of individual members each of which is adapted to actuate said bar, of a locking-arm movable to a position to prevent an operation of the register by impeding the movement of said oscillating bar, and means controlling the positions of said locking-bar, substantially as described.

19. In a fare-register, the combination of a series of registering-wheels arranged in groups, an indicator to exhibit the fares of each group, and a spring located above each of such indicators, whereby each indicator is provided with a yielding stop which checks its upward movement and whereby each released indicator is instantaneously returned to its lower or unexposed position.

In testimony whereof we affix our signatures in presence of two witnesses.

JOHN F. OHMER.  
HIRAM TYLER.

Witnesses:

JOHN W. KALBFUS,  
R. J. McCARTY.