Feb. 23, 1932. J. GLUCK 1,846,417

PRINTING TAXIMETER CONSTRUCTION

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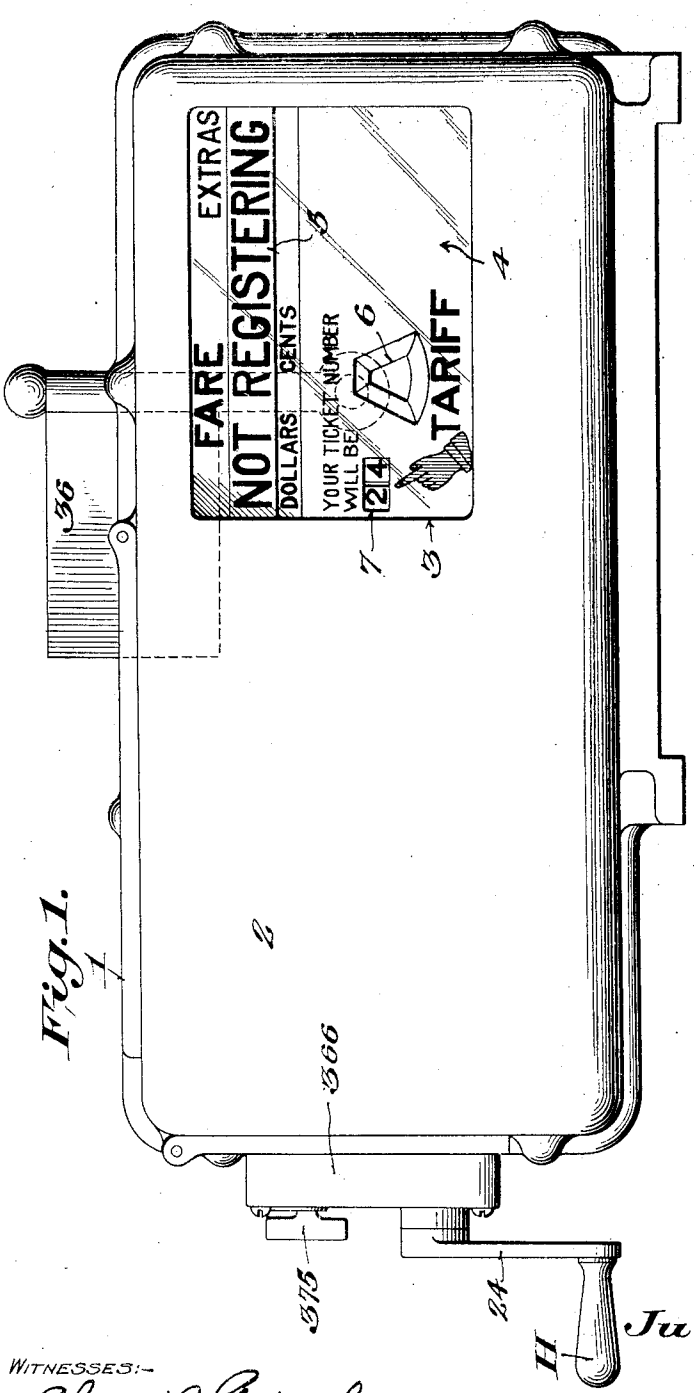

Fig. 1.

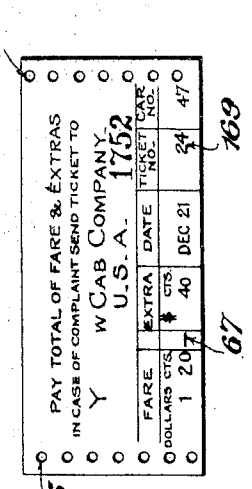

Fig. 2.

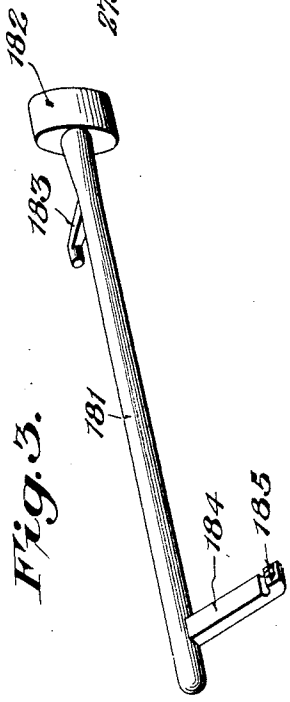

Fig. 3.

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PRINTING TAXIMETER CONSTRUCTION

Filed July 3, 1924 17 Sheets-Sheet 2

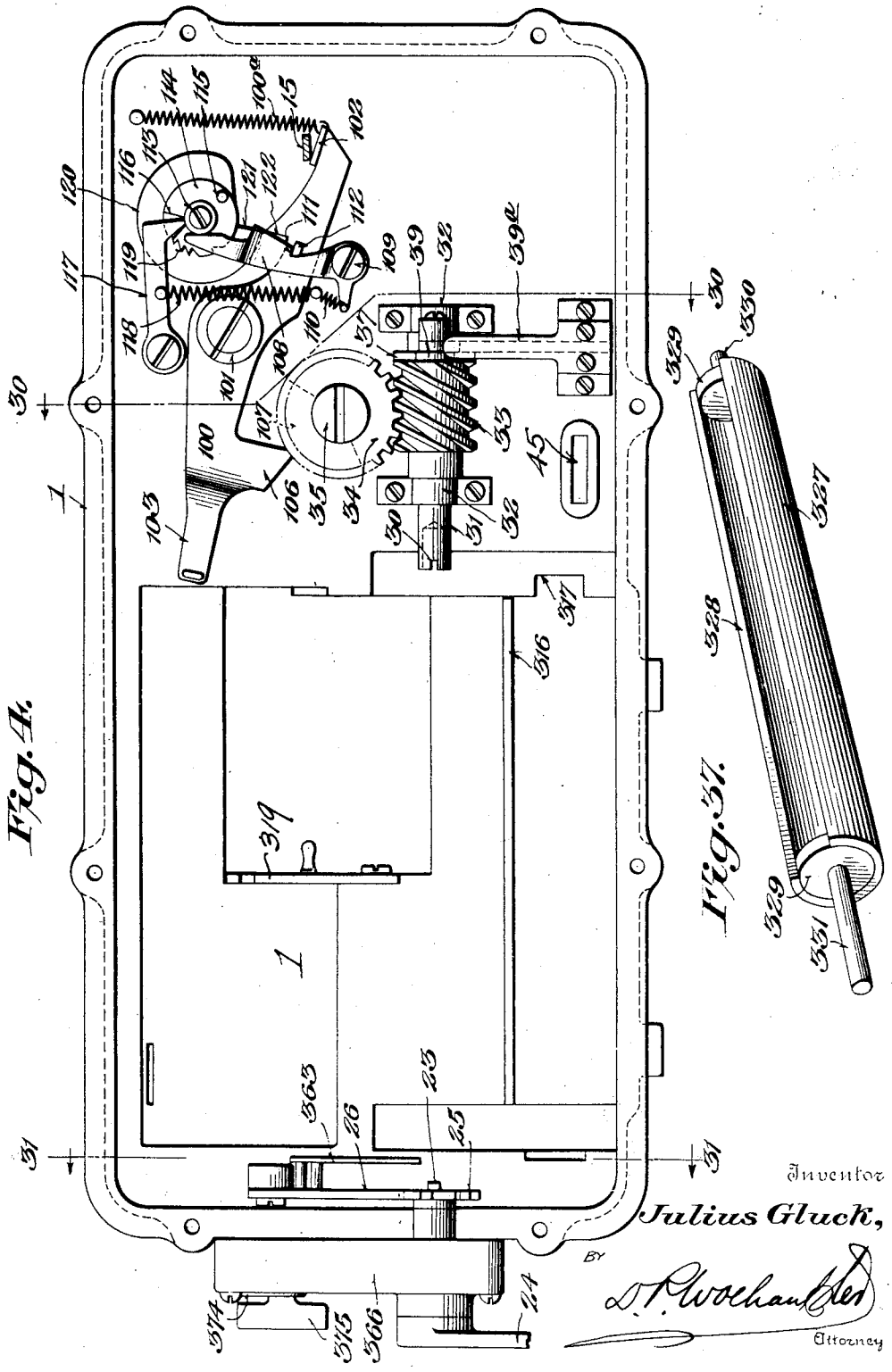

Fig. 4.

Fig. 37.

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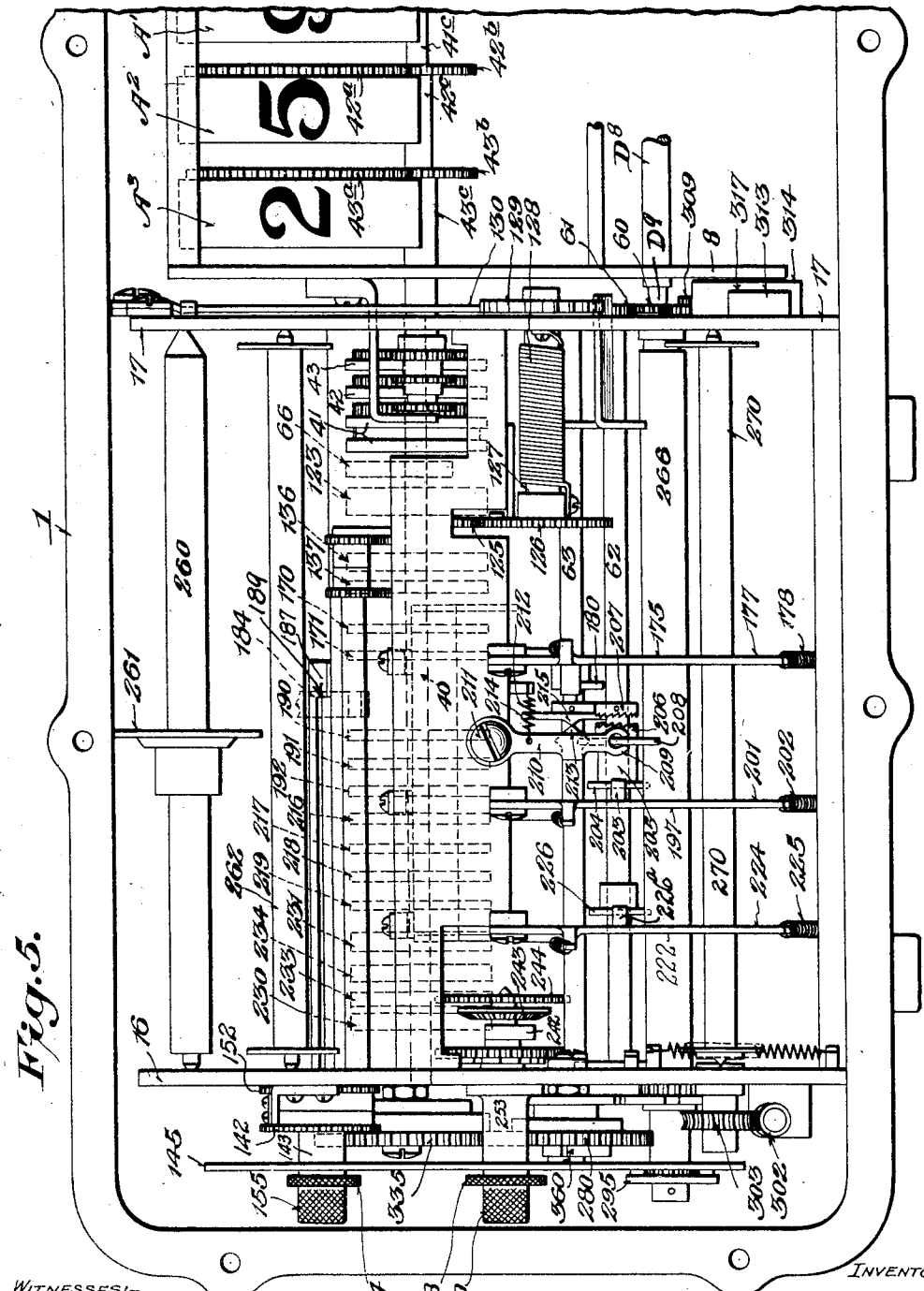

Fig. 5.

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PRINTING TAXIMETER CONSTRUCTION

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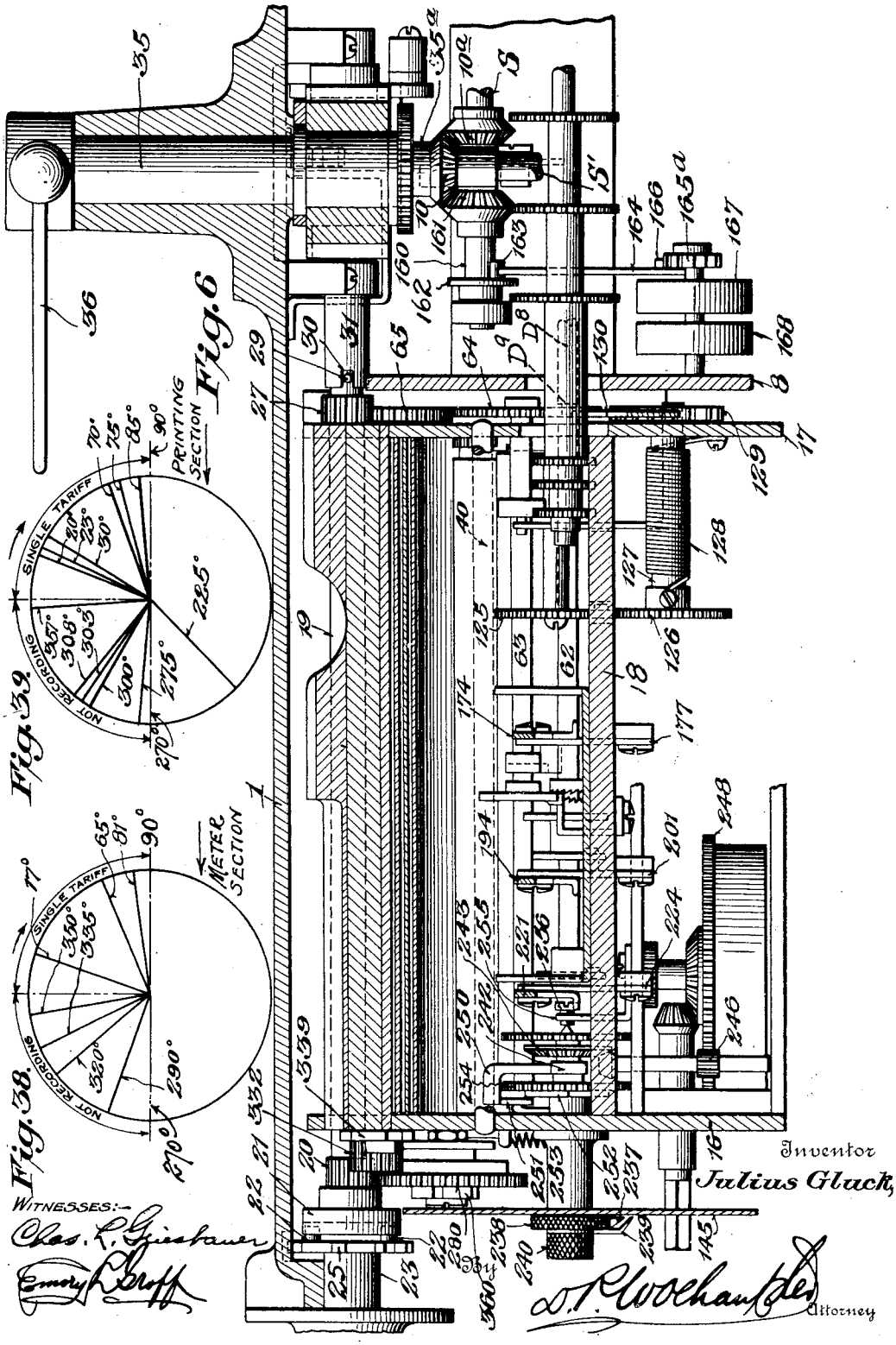

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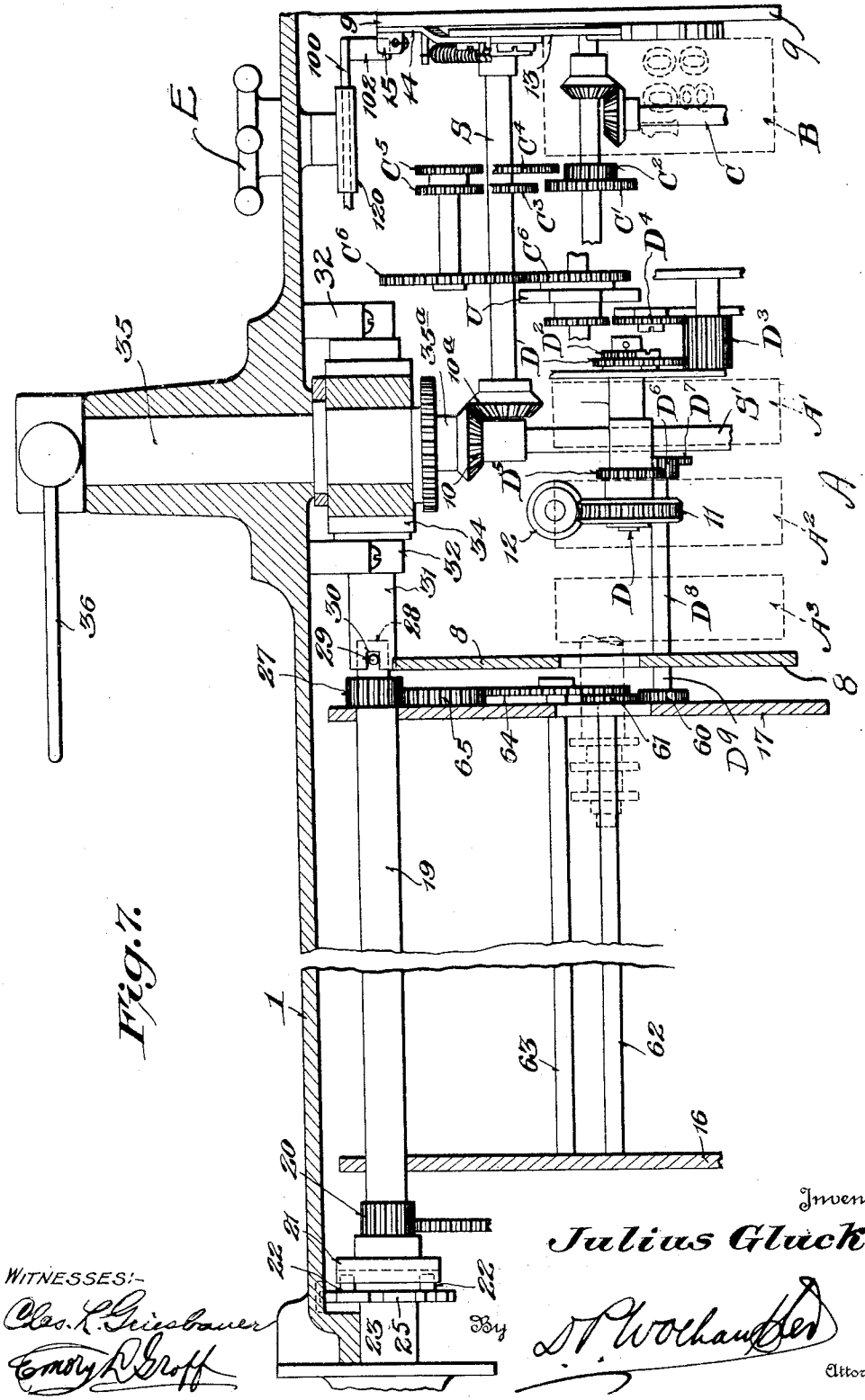

Fig. 7.

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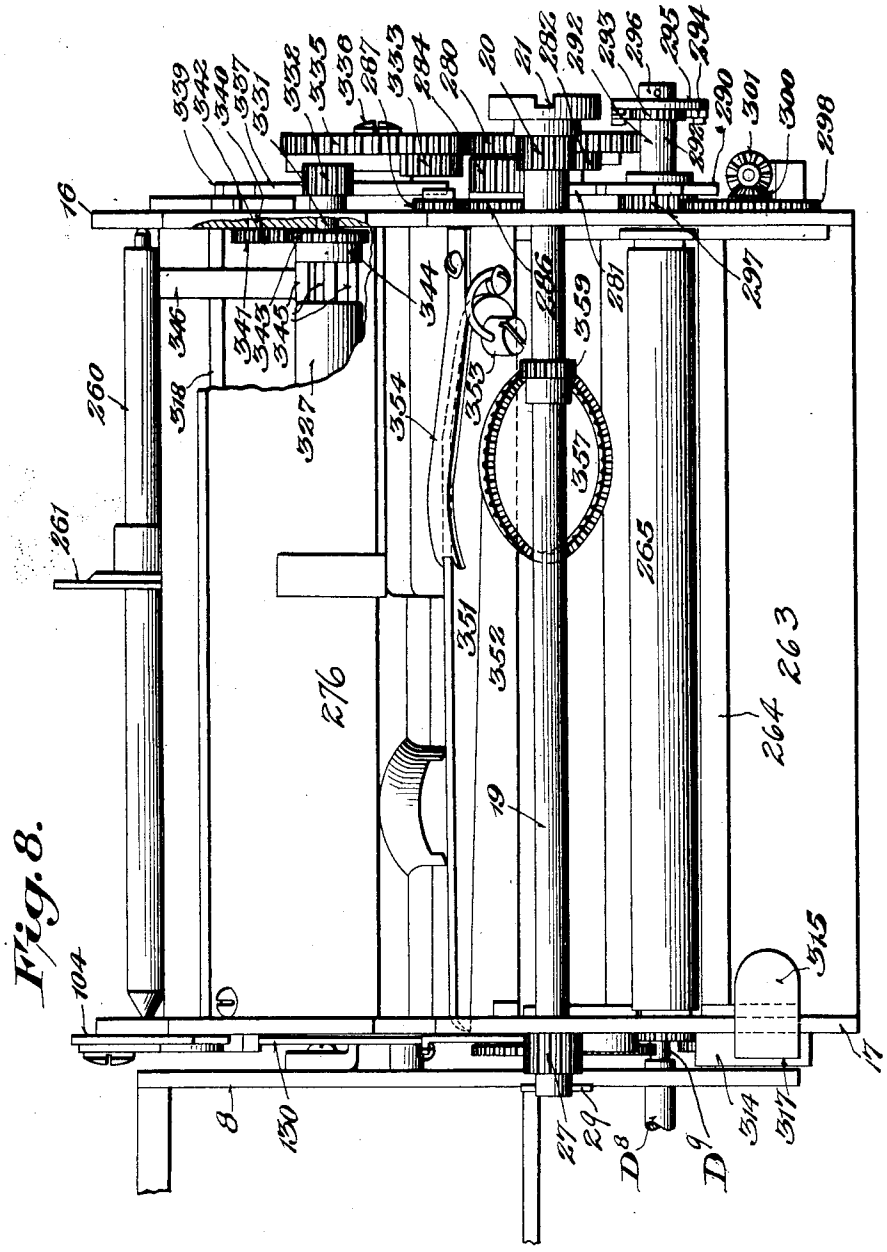

Fig. 8.

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Fig. 9.

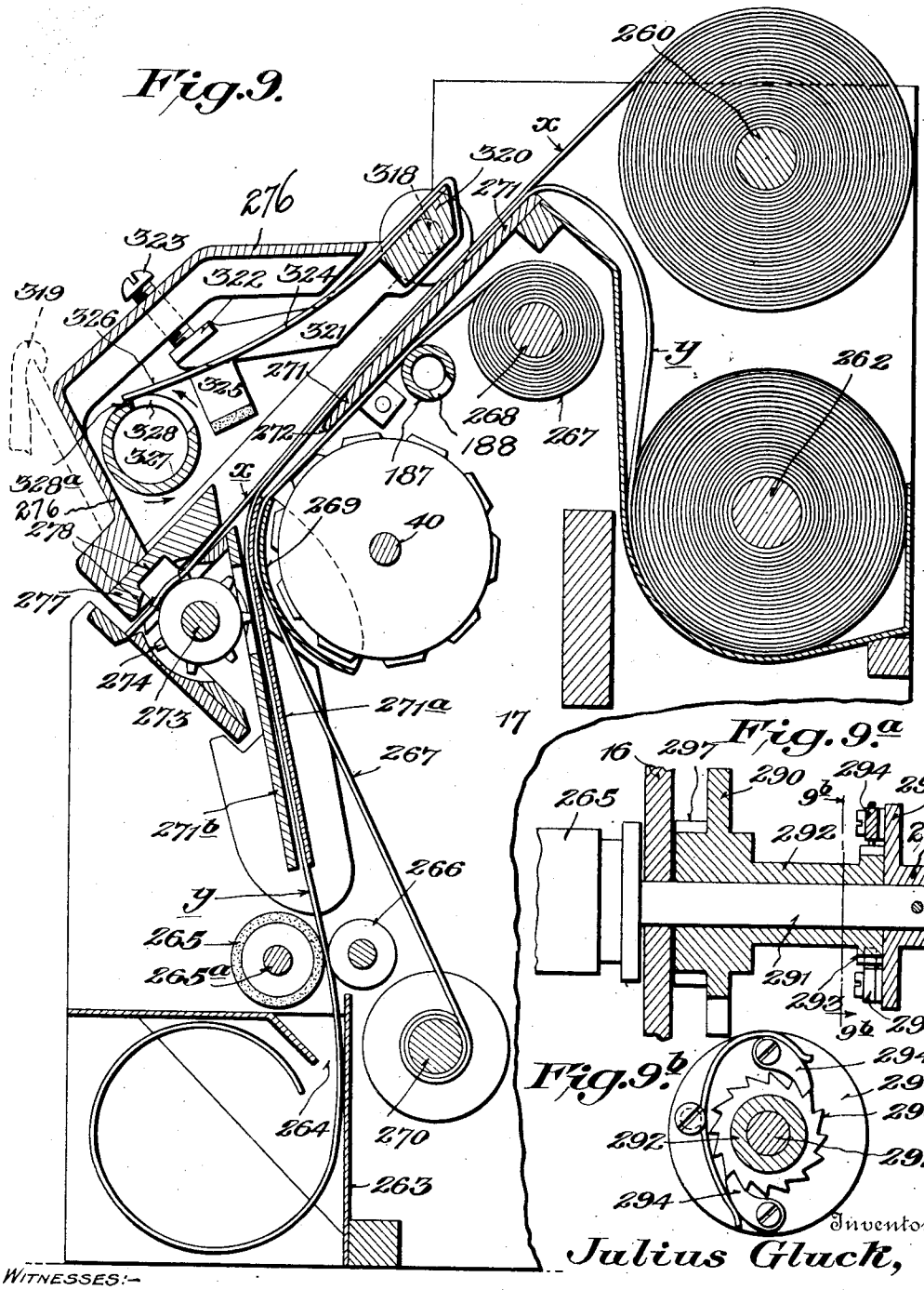

Fig. 9a.

Fig. 9b.

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Fig. 10.

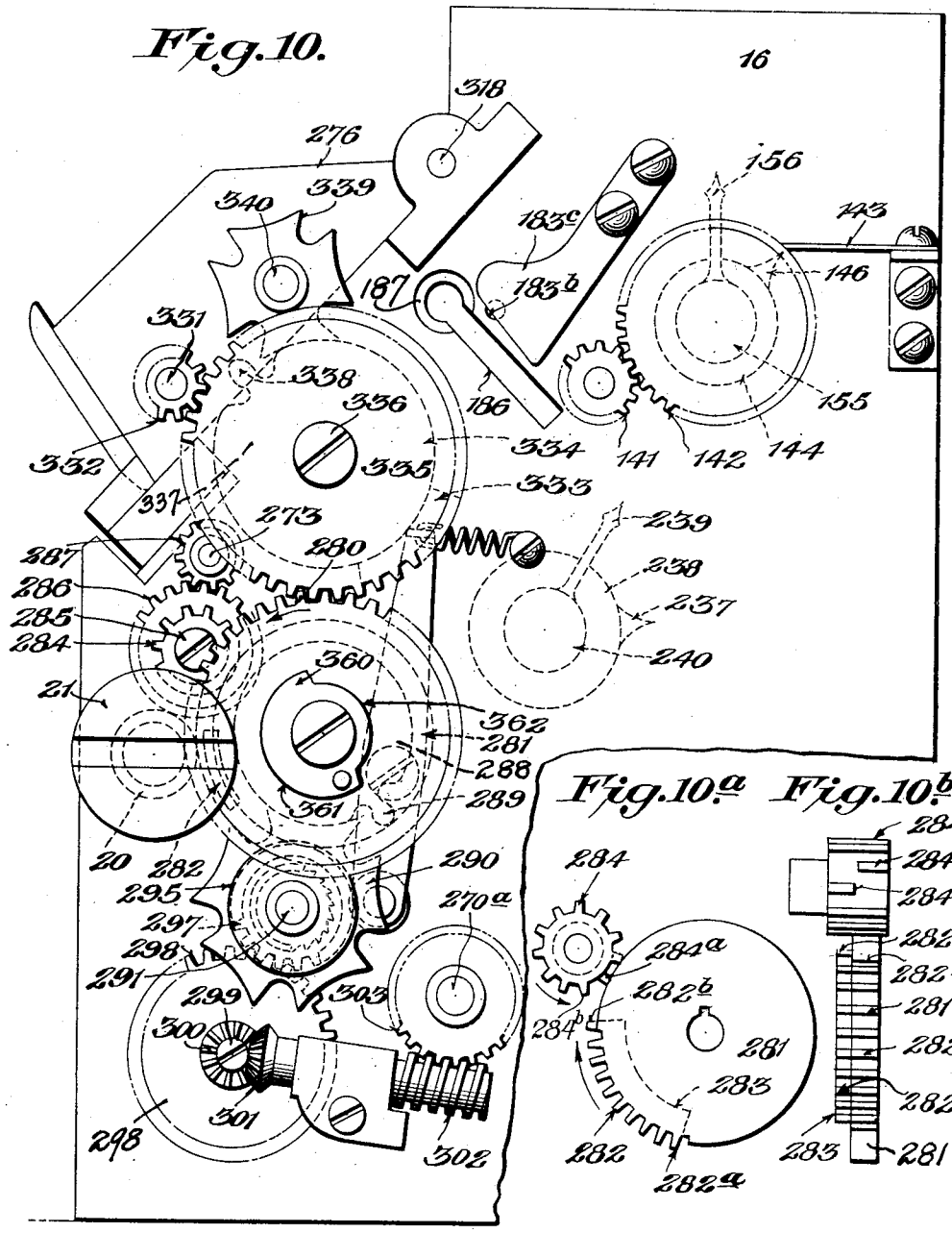

Fig. 10a

Fig. 10b

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PRINTING TAXIMETER CONSTRUCTION

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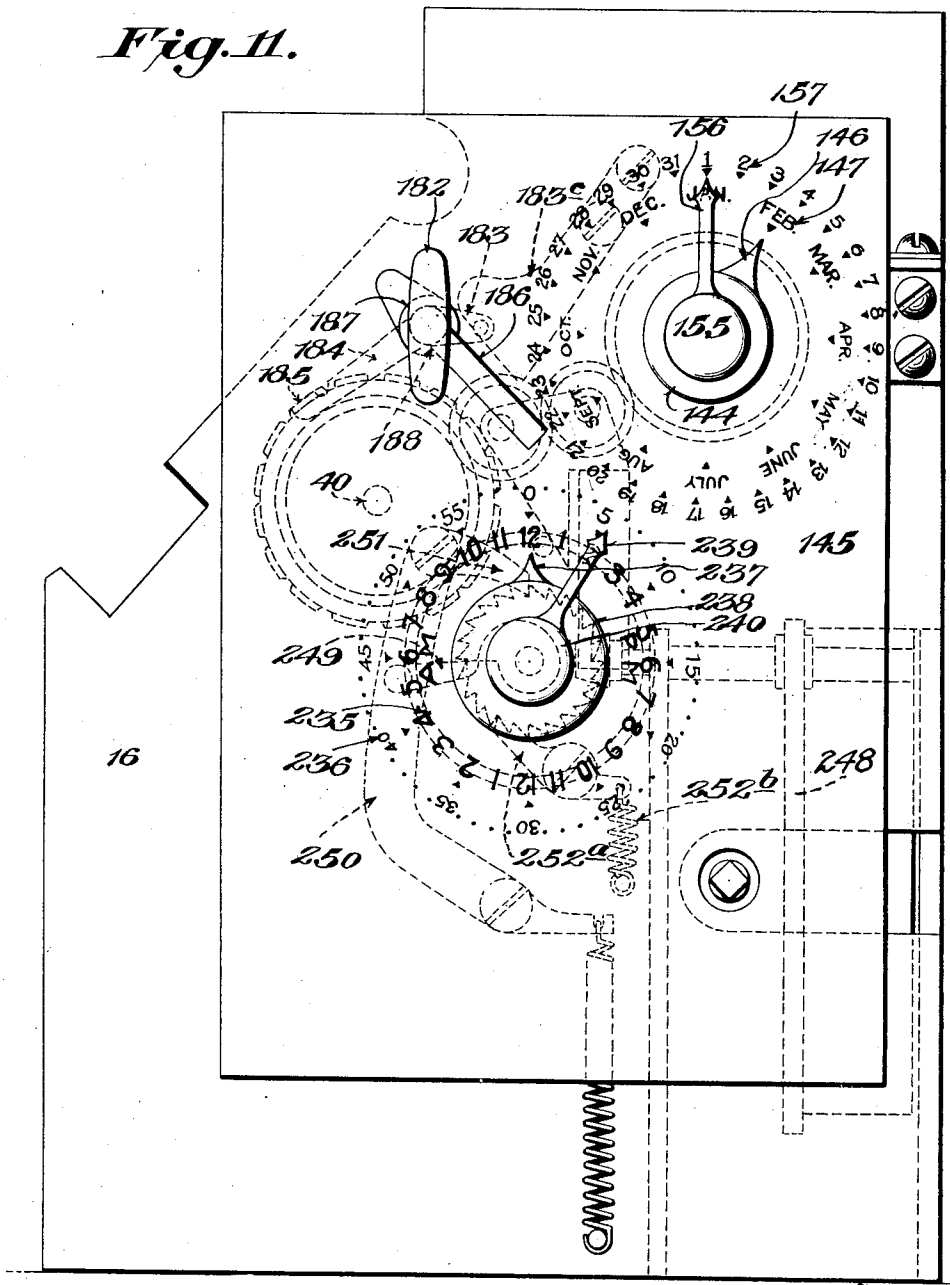
Fig. 11.



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PRINTING TAXIMETER CONSTRUCTION

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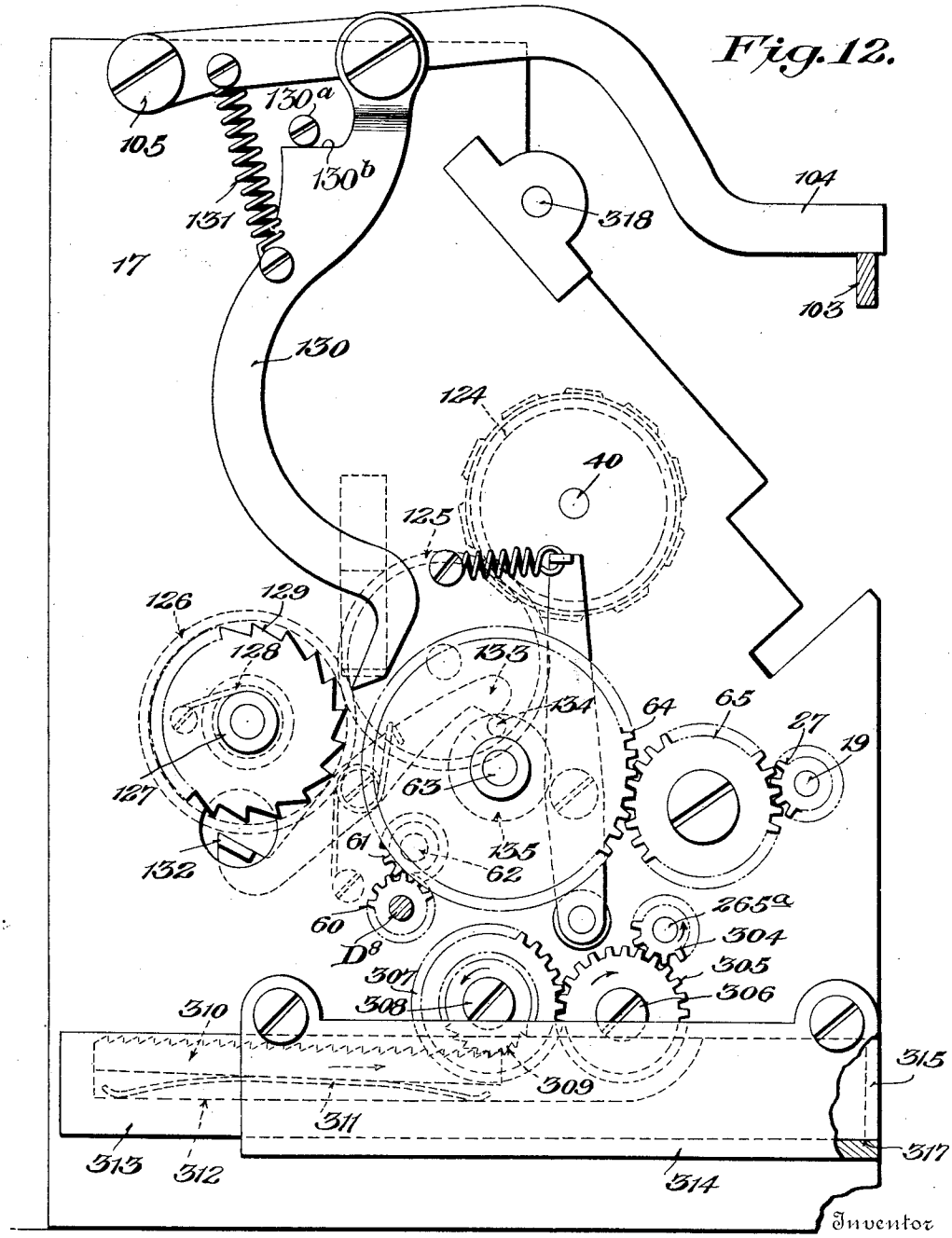
Fig. 12.



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Feb. 23, 1932. J. GLUCK 1,846,417

PRINTING TAXIMETER CONSTRUCTION

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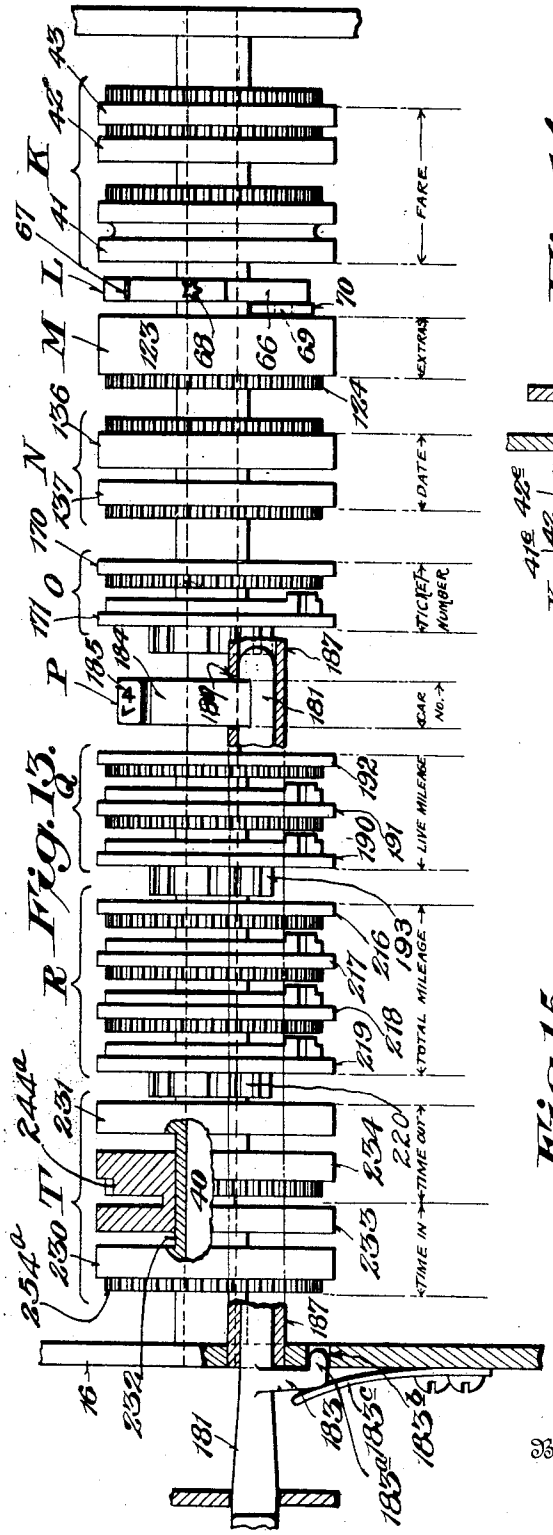

Fig. 13.

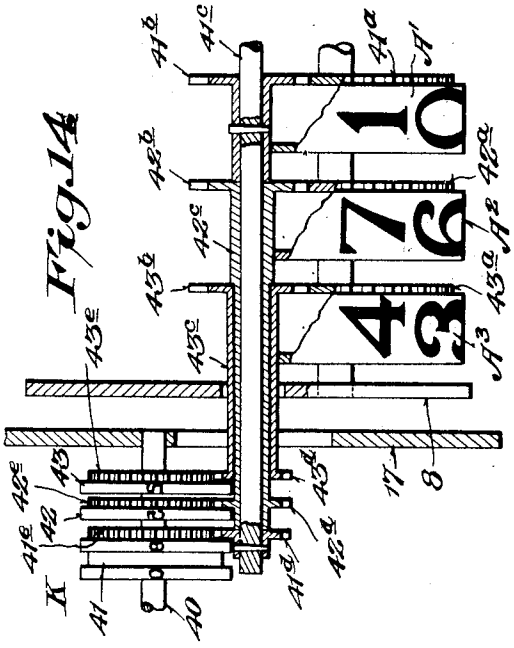

Fig. 14

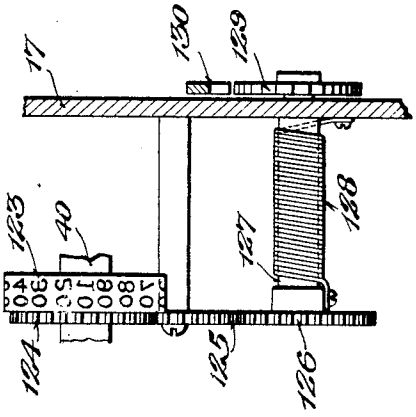

Fig. 15.

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Attorney

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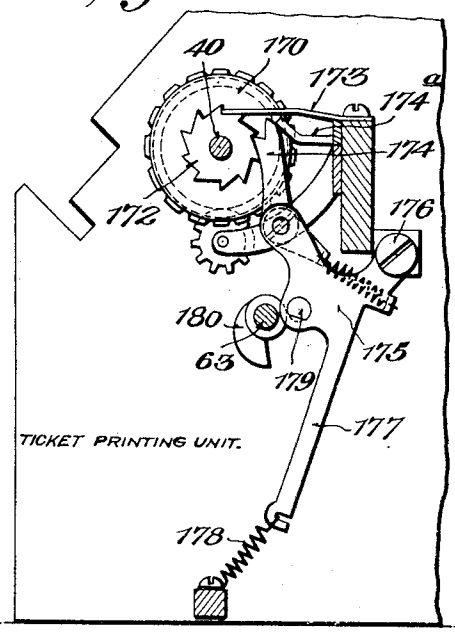
Fig. 16.



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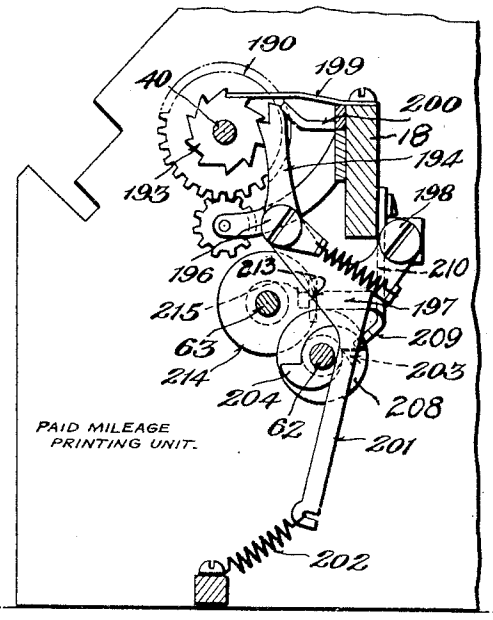

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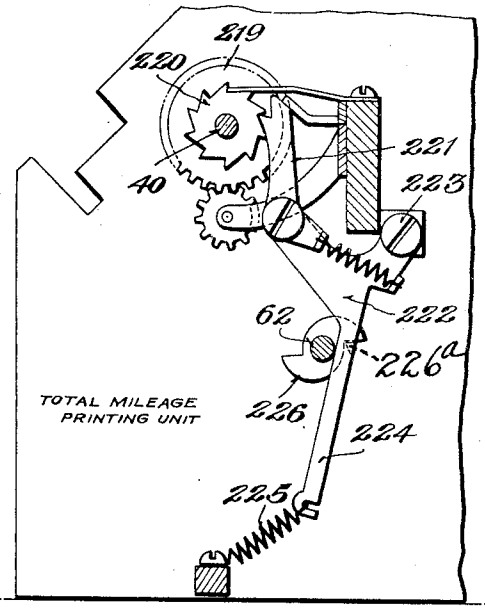

Fig. 19.

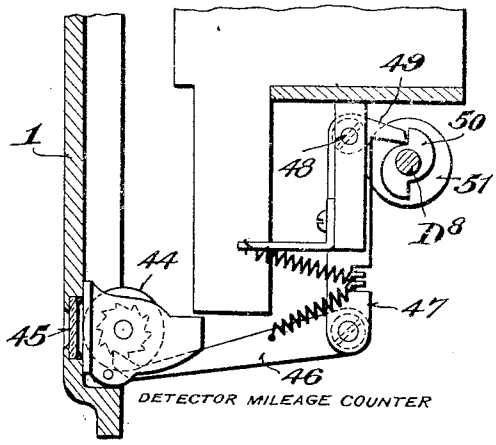

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Fig. 20.

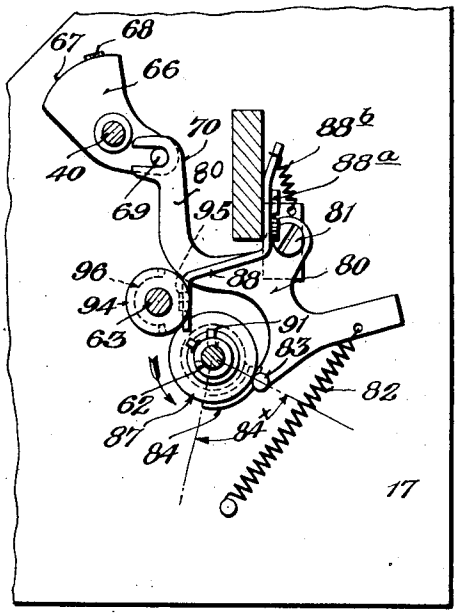


Fig. 21.

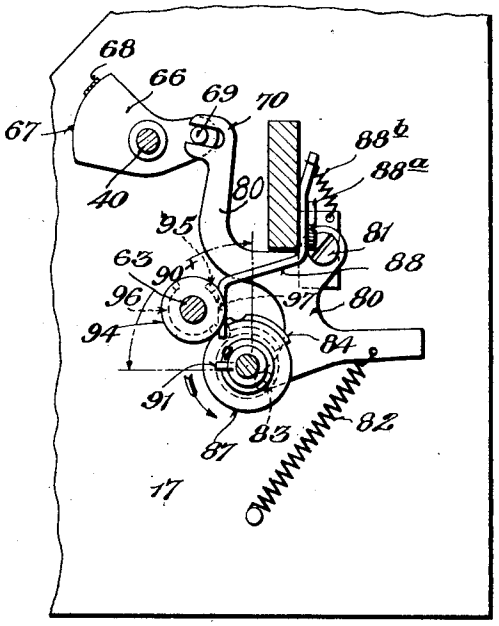
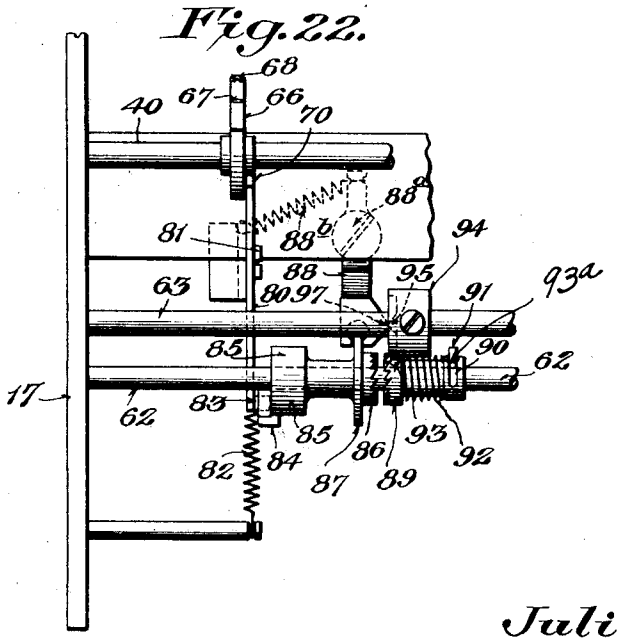


Fig. 22.



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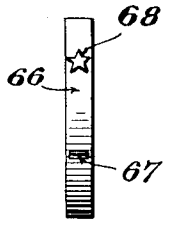

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Feb. 23, 1932. J. GLUCK 1,846,417

PRINTING TAXIMETER CONSTRUCTION

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Fig. 28.

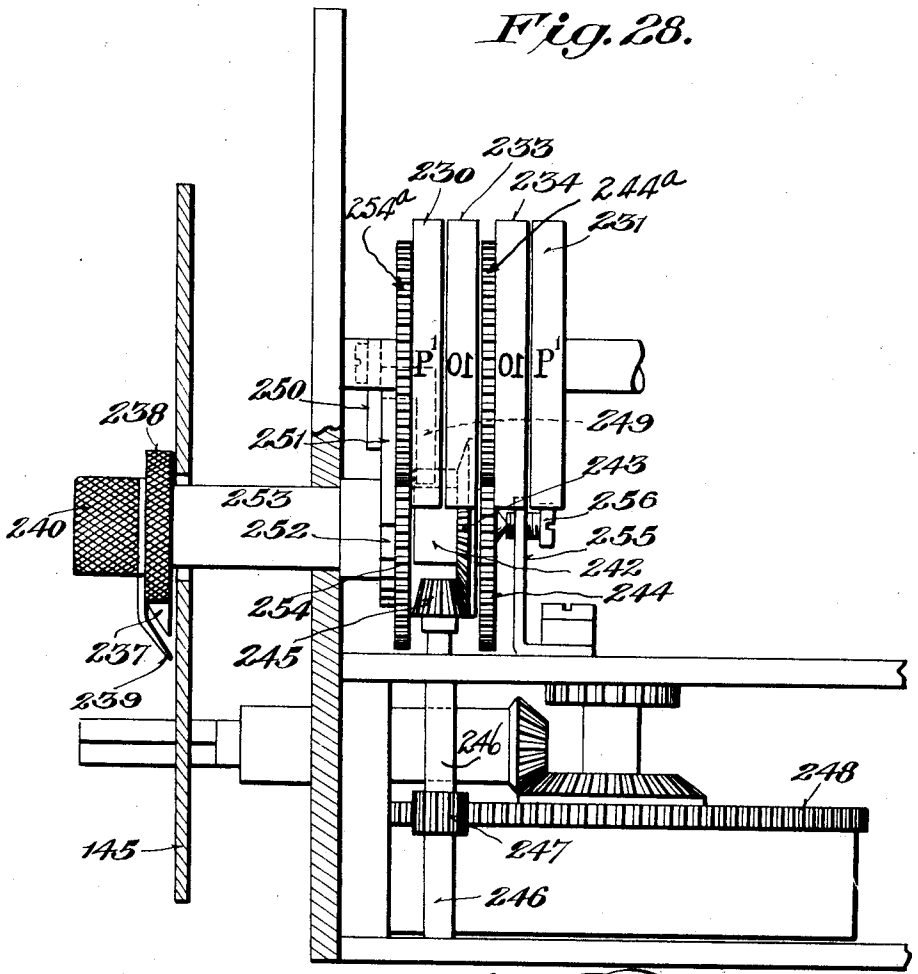


Fig. 19a.

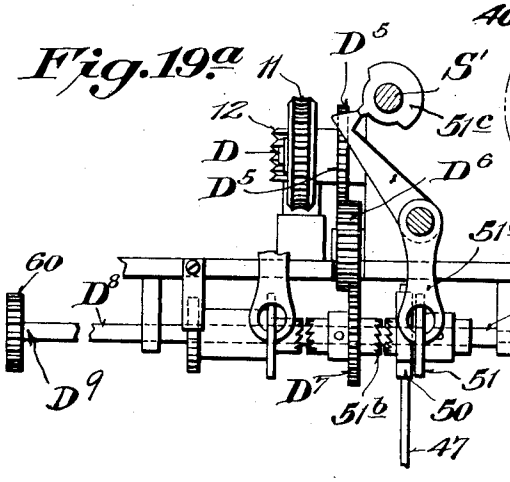
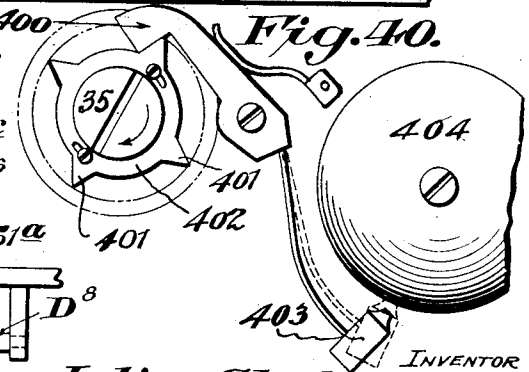


Fig. 40.



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PRINTING TAXIMETER CONSTRUCTION

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Fig. 24.

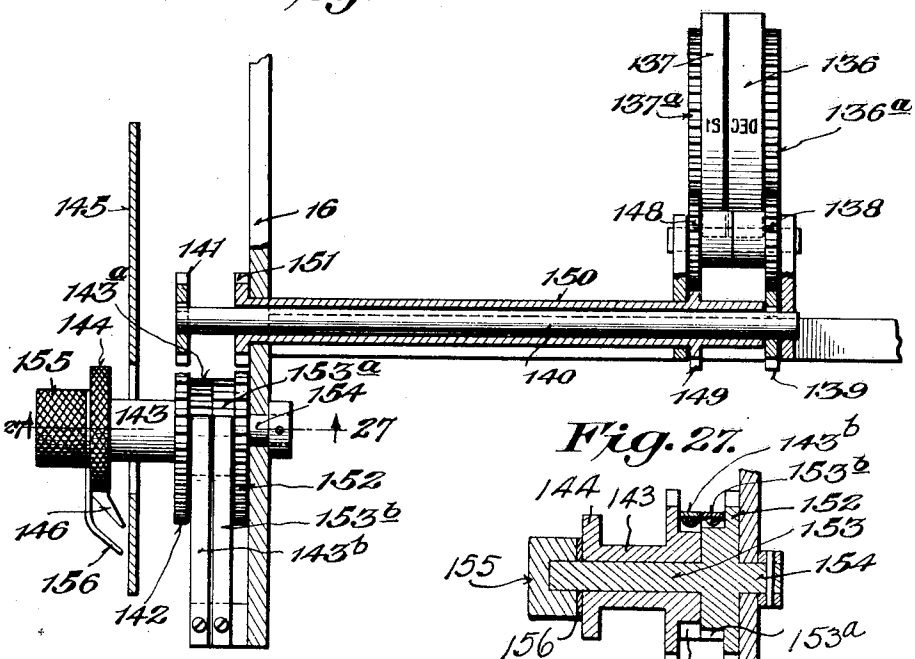


Fig. 27.

Fig. 25.

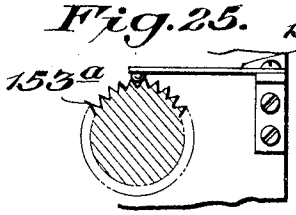


Fig. 26.

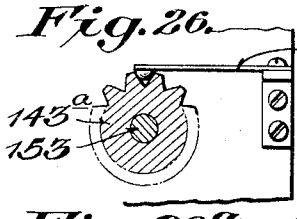


Fig. 28a.

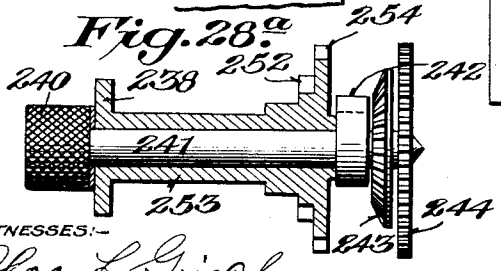
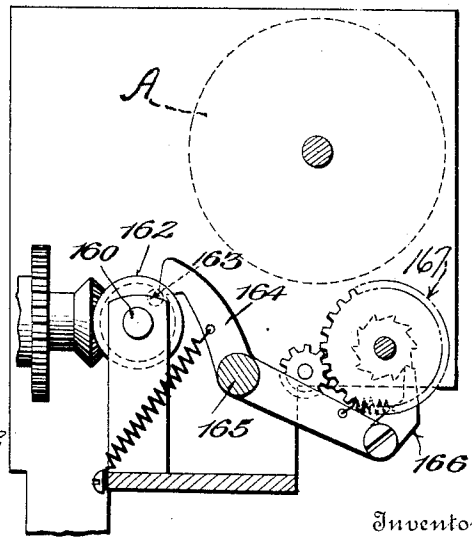


Fig. 29.



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PRINTING TAXIMETER CONSTRUCTION

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Fig. 30.

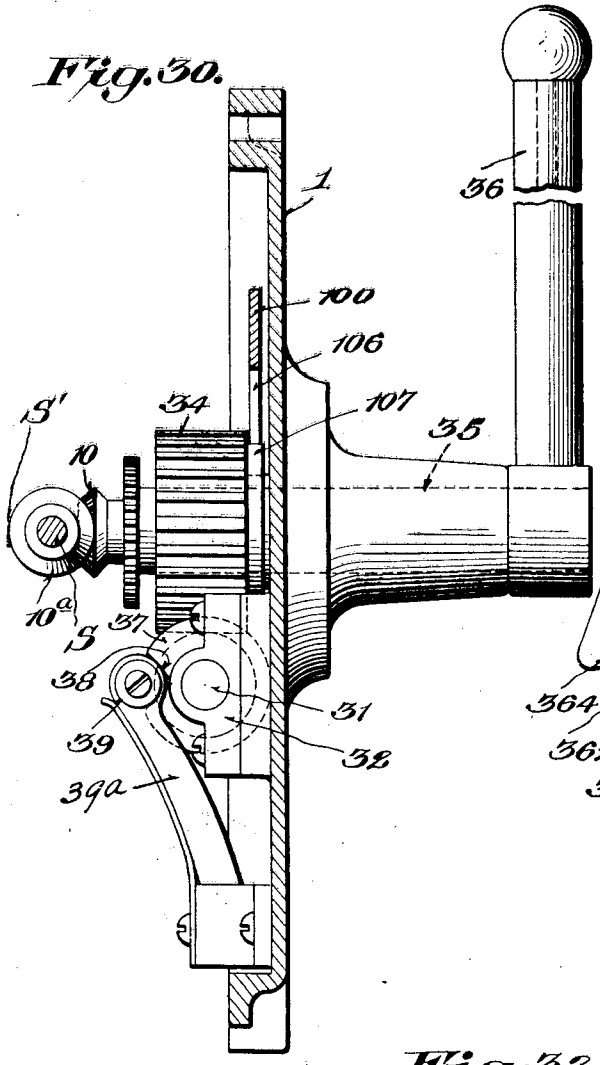


Fig. 31.

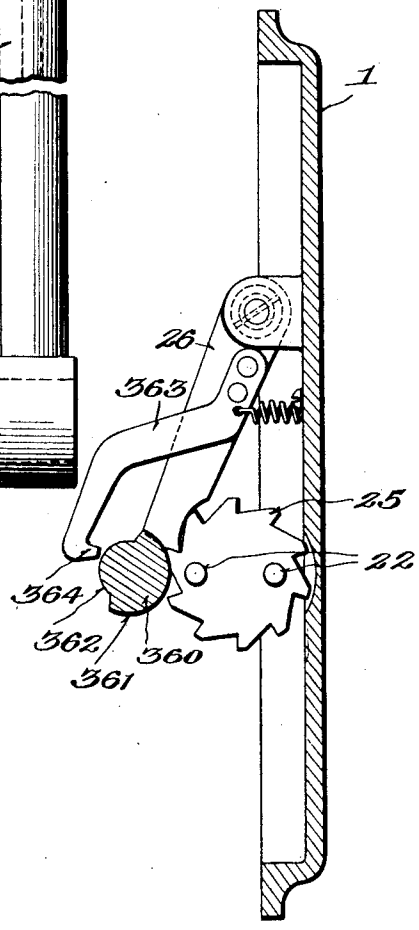
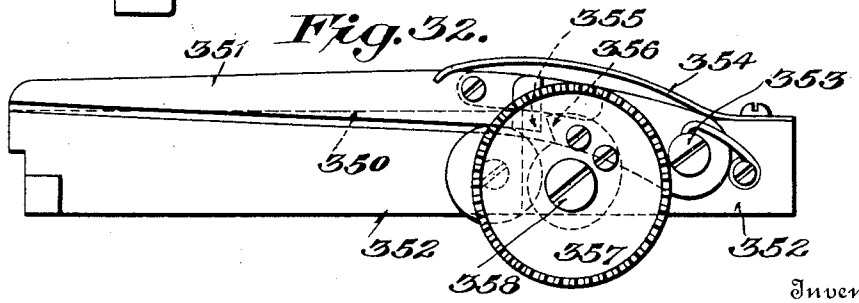


Fig. 32.



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PRINTING TAXIMETER CONSTRUCTION

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Fig. 34.

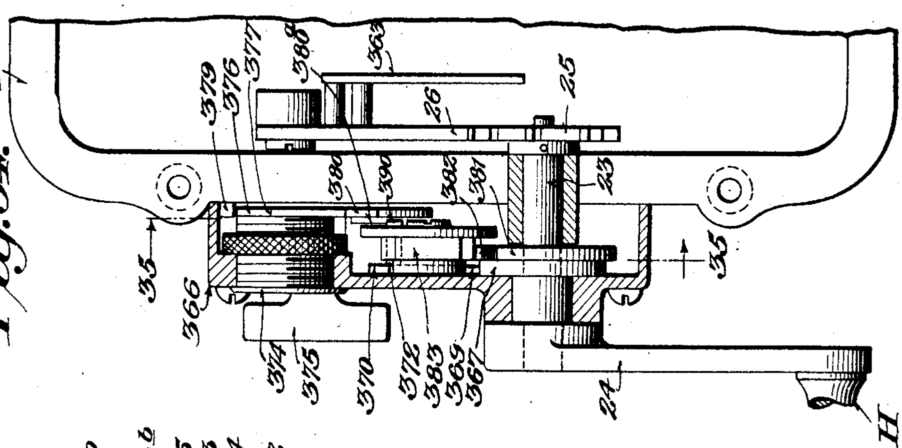


Fig. 35.

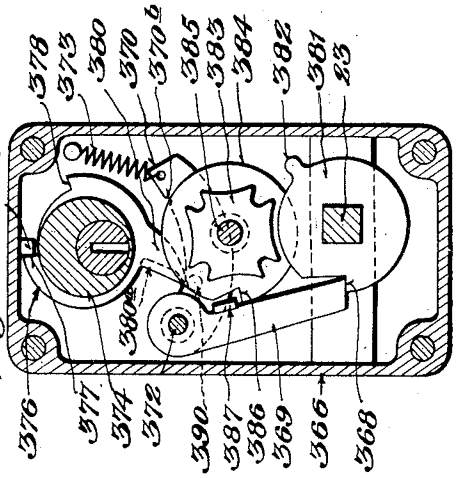


Fig. 36.

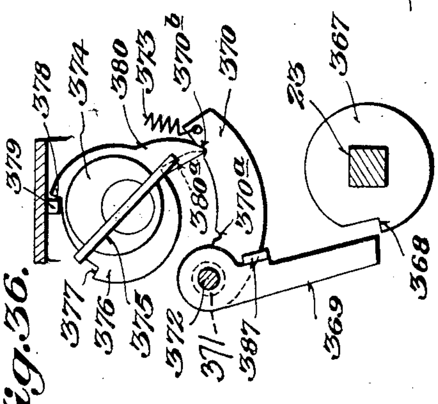
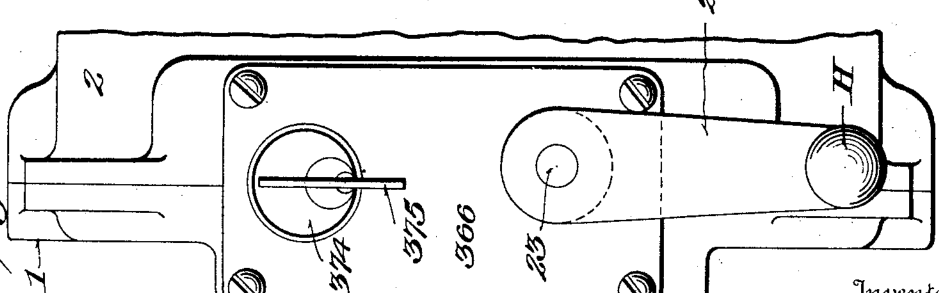


Fig. 33



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UNITED STATES PATENT OFFICE

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PRINTING TAXIMETER CONSTRUCTION

Application filed July 3, 1924. Serial No. 724,144.

This invention relates to taximeters for use on public cabs or other vehicles and has particular reference to a meter of the ticket-printing and issuing type.

A primary object of the invention is to provide a novel meter construction wherein all of the functions of meter control and printing are performed by successive cycles of a single master crank while the flag of the meter is locked against manual manipulation but propelled by the master crank to thereby constitute merely a signal for indicating the state of the meter. Therefore, the present invention aims to provide a construction wherein a single master device controls all operations of the registering and printing instrumentalities of the device as distinguished from printing taximeters which use both a so-called manually operated printing crank in conjunction with a manually operated flag to respectively control the printing and meter sections of the device.

Another object of the invention is to provide a printing taximeter wherein the ticket is automatically sheared or cut off and delivered to the passenger thereby providing a neat and practical ticket which does not become torn or twisted in its removal from the machine as frequently occurs in machines of the type wherein the ticket is fed out of the machine and torn off by pulling against a cutting edge. In other words, it is proposed to provide a construction which delivers a completely printed ticket which is completely severed from the main ticket strip by a novel shearing mechanism.

Also, another object of the invention is to provide a construction which permits of the use of an insertable and removable key for printing the number of the car on the ticket. This construction has the advantage of permitting the meter to be used on different cabs and vehicles without the necessity of making a permanent change in the printing wheel units to indicate the number of the cab.

A further object of the invention is to provide a novel detector unit for registering the operation of the cab with the crank or master shaft in an improper position, in combination with a printing unit adapted to also print a symbol on the ticket and record strip which will show at a glance whether the cab has been operated under improper conditions.

A still further object is to provide simple and practical means for conveniently setting the date and time wheels of the printing mechanism. In that connection, it may be pointed out that a novel feature of the time printing unit is to provide means for recording the elasped time of the passenger's trip, that is, the time he entered the cab and the time that he leaves.

Other objects of the invention are to provide means for feeding the ticket and record strips of the printing unit; a novel assembly of printing wheels; a novel extras registering and printing unit; and a positive and automatically operating crank lock including a standard Yale type lock.

With the above and other objects in view which will more readily appear as the nature of the invention is better understood the same consists in the novel construction, combination and arrangement of parts hereinafter more fully illustrated and claimed.

A preferred and practical embodiment of the invention is shown in the accompanying drawings, in which:—

Figure 1 is a front elevation of the meter.

Fig. 2 is a detail view of a ticket printed by the meter.

Fig. 3 is a detail perspective view of the cab or car number key.

Fig. 4 is a view of the meter with the front casing removed and the meter mechanism removed illustrating a part of the extras operating mechanism and the means for propelling the flag.

Fig. 5 is a front elevation of the printing section of the device.

Fig. 6 is a horizontal sectional view taken through the printing section of the device.

Fig. 7 is a diagrammatic view illustrating the general operation of the device.

Fig. 8 is a rear elevation of the printing section removed from the casing.

Fig. 9 is an enlarged detail sectional view taken through the printing section and show-

ing the printing and ticket feeding instrumentalities.

Fig. 9[a] is a detail view of the means for automatically moving the record feed roller.

Fig. 9[b] is a sectional view on the line 9[b]—9[b] of Figure 9[a].

Fig. 10 is an elevation of the side of the meter where the master crank is located.

Fig. 10[a] is a detail elevation of the mutilated gear arrangement for intermittently advancing the sprocket shaft of the ticket feed.

Fig. 10[b] is a detail side elevation of the gear shown in Fig. 10[a].

Fig. 11 is a view similar to Fig. 10 and showing the location of the time and date setting devices.

Fig. 12 is an elevation of the intermediate frame member of the device, illustrating a part of the extras operating mechanism.

Fig. 13 is a detail view of the printing wheels.

Fig. 14 is a detail view illustrating the manner of transferring the fare registered by the main fare drums to the main fare drum printing wheels.

Fig. 15 is a detail view illustrating the manner of transferring the extras from the extras fare drum to the extras printing wheel.

Fig. 16 is a detail view of the trip printing unit.

Fig. 17 is a detail view of the paid mileage printing unit.

Fig. 18 is a detail view of the total mileage printing unit.

Fig. 19 is a detail view of the detector mileage counter.

Fig. 19[a] is a detail view of the detector counter operating cam and clutch and the mileage shaft which carries over from the meter section to the printing section.

Figs. 20 and 21 are detail vertical sectional views illustrating the different positions of the detector printing unit.

Fig. 22 is a front elevation of the construction shown in Fig. 20.

Fig. 23 is a plan view of the detector printing type member.

Fig. 24 is a detail view of the date printing unit.

Figs. 25 and 26 are detail views of the ratchets employed respectively in connection with the month and day printing sleeves of the date printing unit.

Fig. 27 is a detail section taken on the line 27—27 of Fig. 24.

Fig. 28 is a detail view of the "time in" and "time out" printing means.

Fig. 28[a] is a detail view of the hand knobs used for adjusting and setting the "time in" and "time out" of the elapsed time printing means.

Fig. 29 is a detail view illustrating the means for indicating on the face of the meter the number of the next ticket to be delivered.

Fig. 30 is an enlarged detail sectional view of the back of the meter taken on line 30—30 of Fig. 4.

Fig. 31 is a detail vertical sectional view taken on the line 31—31 of Fig. 4 illustrating the check means for the crank.

Fig. 32 is a detail elevation of the ticket shear operating means.

Fig. 33 is an enlarged detail elevation of the printing crank and the casing for housing the locking means therefor.

Fig. 34 is a detail vertical sectional view of the construction shown in Fig. 33.

Fig. 35 is a vertical sectional view taken on the line 35—35 of Fig. 34.

Fig. 36 is a detail diagrammatic view illustrating the position of parts shown in Fig. 35 when the key has been manipulated to interlock the crank.

Fig. 37 is a detail perspective view of the main printing hammer operating cam.

Fig. 38 is a diagram of the movement of the flag illustrating what takes place at various degrees of movement thereof on the meter section of the device.

Fig. 39 is a diagram similar to Fig. 38 illustrating what takes place at different degrees of movement of the flag on the printing section of the device.

Fig. 40 is a detail view of the bell ringing mechanism.

Similar reference characters designate corresponding parts throughout the several figures of the drawings.

In carrying the present invention into effect it is proposed to provide a printing taximeter which will include a meter mechanism of standard type that may be readily combined with a novel and practical printing mechanism within the same casing; and also to eliminate the manually manipulated flag control feature of the meter section of the device by providing a single manually operated member to perform all of the control functions for the meter mechanism as well as the printing mechanism.

To that end it is proposed to provide a meter housing of the type shown in Fig. 1 of the drawings which includes a back member or plate 1 and a front casing member 2, the same being united by screws or other fastening elements and the front casing 2 being provided with a window 3 for exhibiting the tariff dial or mask 4 of the meter section of the device. The said tariff dial 4 is provided with the usual indication of "Fare" and "Extras" etc. and the shutter 5 bearing the indicia "Not registering" is intended to cover the face of the fare drums when the meter is not registering fare or in other words when the flag or indicator is in vacant position. The dial or mask 4 is also provided with a tariff window 6 and a ticket window 7 for exhibiting the serial number of the ticket next to be issued from the machine.

The meter section of the device is located

behind the dial or mask 4 and is of the type set forth in my Letters Patent 1,744,307, patented January 26, 1930, and more or less diagrammatically illustrated in Fig. 7 of the drawings wherein it will be observed that the meter frame parts 8 and 9 support the cam shafts S and S′ which control the various instrumentalities of the meter, the same being connected by the bevel gears 10 and 10^a.

The main fare drum unit A which includes the units drum A′, tens drum A^2 and hundreds drum A^3, is intended to be actuated, in accordance with the usual custom, by the traveling movement of the vehicle or by the clock work diagrammatically indicated at C, and for the purpose of imparting the movement of the vehicle to the fare drums through the power instrumentalities, the main drive shaft D carrying the worm gear 11 is driven by the worm 12 which is connected to one of the wheels of the vehicle through suitable instrumentalities not shown herein. Therefore, it will be apparent that the shaft D is driven by the movement of the vehicle and serves to actuate the fare drums when the vehicle is in motion through the medium of the gear train D^1, D^2 and D^3 and the clutch gear D^4, and a star wheel unit U. As fully set forth in my companion application the star wheel unit can be driven by the clock shaft C at a differential rate through the gears C^1 and C^2, clutch gears C^3 and C^4, dual gear C^5 and clutch gears C^6—C^6.

The extras drum B is operated by the pawl 13 and lever 14 having the offset portion 15, which latter in turn is operated by a novel actuator which will hereinafter be more fully referred to in connection with the description of the operation of the extras unit. The parts 13, 14 and 15 however, are identical with similar parts in my companion case referred to, and likewise all of the mechanism referred to in connection with the meter section is fully described and shown in that application and only so much thereof is shown here in diagrammatic form, as is believed necessary to properly understand the operation of the printing section of the device.

It will therefore be seen that a standard meter construction may be used in connection with a novel printing mechanism. In that way it is possible to use standardized parts in the meter mechanism that may be used to provide a simple taximeter, thereby proving advantageous from a manufacturing standpoint.

Control means for meter and printing sections

The printing section of the device is carried upon the frame or brackets 16 and 17 which are connected by a suitable web or plate 18 (see Fig. 6), and the bracket 17 adjoins the bracket or frame 8 of the meter section being spaced therefrom as shown in Figs. 6 and 8 to accommodate the various gears of the printing section as will hereinafter more fully appear.

Journalled in the rear of the brackets 16 and 17 is a master shaft 19 having at one end thereof a gear 20 and a slotted disk 21 adapted to receive the diametrically spaced pins 22 of a ratchet disk 25 mounted on the crank shaft 23. This shaft is journalled in an end portion of the back wall 1 and is provided at its outer end with a crank arm 24 having a handle H whereby the chauffeur may rotate it through several successive cycles to control the meter and printing sections.

The intermediate portion of the crank shaft 23 is provided with novel means for releasing the crank to operate and also automatically lock it at the end of its final cycle as more clearly shown in Figs. 33–35 of the drawings, and which will be taken up later in the description of the device.

Also the ratchet disk 25 on shaft 23 is adapted to cooperate with a detent 26 for preventing backward movement of the crank 24 during its initial and final cycles thus compelling movement in one direction only during these cycles, the purpose of which will also appear later. (See Fig. 31.)

It will thus be seen that the shaft 23 of the crank 24 is mounted to freely rotate in one direction in the back of the meter, and by reason of the engagement of the pins 22 with the slotted disk 21, the master shaft 19, which carries the disk 21, will be rotated when the crank is turned.

The end of the shaft 19 which is journalled in the bracket plate 17, projects beyond the bracket and carries therewith a pinion 27 while the extreme end 28 thereof is provided with a cross key 29 adapted to fit in a slot 30 of a worm shaft 31 (see Figs. 4, 6, 7 and 8). This worm shaft 31 is journaled as at 32 (Fig. 4) to the back of the meter and is provided with a worm 33 adapted to engage with the worm gear 34 mounted upon a flag or indicator shaft 35 journalled in the back of the meter and carrying therewith a flag 36 exposed to the view of the passenger and the operator of the cab.

As previously indicated, the flag 36 is not intended to in any way control any of the printing mechanism or any of the meter mechanism, and in fact is not intended to be grasped by the operator of the cab at any time whatever, the crank 24 being the only part of the entire device which the operator rotates to perform all of the functions of setting the meter mechanism into operation and controlling the printing and issuing of the ticket.

However, in order that the flag may operate in the customary manner to indicate that the cab is vacant or earning a fare, the relation of the worm 33 to the gear 34 is such that the movement of the crank through one com-

plete cycle or 360° only turns the flag shaft 90°. Therefore, four complete turns in the same direction of the crank shaft 24 are required in order to carry the flag 36 from the zero or vertical position to indicate that the cab is vacant through its various tariff positions and thence back to Vacant. The successive turns of the crank 24 are therefore integrative revolutions which contribute to a full revolution of the flag.

For the purpose of temporarily arresting the movement of the crank 24 at the end of each complete cycle, the worm shaft 31 is provided with a cam 37 having a notch 38 and cooperating with a roller 39 carried by a spring-pressed arm 39^a (see Figs. 4 and 30). Therefore, it will be seen that at every complete cycle of the crank 24 its movement will be temporarily arrested by reason of the cam 38 and roller 39, the cam 37 being on the shaft 31 which is in turn coupled with the master shaft 19, and the latter in turn being coupled directly with the crank through the pins 22 of the ratchet disk 25. As will also be observed from Fig. 6 of the drawings, the front end 35^a of the flag shaft 35 is fitted to receive the beveled gear 10 of the section S′ of the cam shaft, the said bevel gear 10 meshing with the gear 10^a of the cam shaft S. Therefore, the sections S and S′ of the cam shaft of the meter section are directly under the control of the crank 24.

General assembly of printing type units

The general control for the meter and printing sections having now been described, the fare printing type wheel units will be briefly referred to and then taken up individually in detail.

The brackets 16 and 17 support a type wheel carrying shaft 40 upon which the various printing units are mounted.

This shaft is shown in Figs. 5 and 6 and the printing units are shown in their assembled relation in Fig. 13. In order that the printing units may record the desired data in the proper order on the ticket and record strips it is necessary to read these units in Fig. 13 from right to left. Therefore, as will be observed from that figure the main fare printing unit is designated generally as K; the detector printing unit as L; the extras printing unit as M; the date printing unit as N; the ticket number printing unit as O; the car number printing unit as P; the live or paid mileage printing unit as Q; the total mileage printing unit as R; the elapsed time printing unit T.

The printing units K, L, M, N, O, P are the only units which are impressed on the ticket strip, but these units as well as the remaining units Q, R and T all print on the record strip so that a complete record of the results recorded by the instrument may be kept for the operator of the cab or vehicle. Each of these units has its individual operating means which is brought into play after the crank 24 has been rotated once to set all of the meter instrumentalities in operative position, and these units will now be more fully referred to in the order above given.

Main fare printing unit

The main fare printing unit K preferably consists of three type wheels 41, 42 and 43. These wheels are respectively operated by the units drum A′, tens drum A^2 and hundreds drum A^3 as will be seen from Fig. 14 wherein the said drums are provided with gears 41^a, 42^a and 43^a. The gear 41^a on the drum A′ meshes with a gear 41^b keyed to a shaft 41^c and this shaft in turn has keyed thereto a gear 41^d for engaging with a gear 41^e of the type wheel 41. Likewise the gear 42^a engages with a gear 42^b carried by a sleeve 42^c surrounding the shaft 41^c and carrying therewith a gear 42^d engaging with gear 42^e on the type wheel 42.

The hundreds drum A^3 operates the type wheel 43 through the intermeshing of the gear 43^a with gear 43^b on sleeve 43^c which in turn carries gear 43^d meshing with gear 43^e of the type wheel.

Thus, it will be seen that when the fare drums of the main fare unit are operated either by the clockwork or movement of the vehicle, the type wheels of the unit K will be correspondingly operated to enable the desired fare record to be printed on the ticket and record strips.

Detector register

The detector counter or register feature is fully described and shown in my companion application Serial No. 724,145, and filed July 3, 1924, but for the purpose of the present case reference may be made to Figs. 19 and 19^a which shows the detector counter 44 mounted on the back of the meter 1 and visible through the inspection window 45. This counter is operated by the arm 46 which is pivotally connected to the tensioned arm 47 which is pivoted as at 48 and has an offset arm 49 adapted to be oscillated by the cam 50 on the shaft D^8. This shaft is thrown into operation automatically when the flag is in either of the prohibited positions above referred to in conjunction with the main drive shaft D of the meter and therefore registers the illegal mileage on the register 44. The cam 50 is integral with the disk 51 which is sleeved on the shaft D^8 thereby to be shiftable by the arm 51^a, Fig. 19^a, to cause the clutch face thereof to engage with the clutch face 51^b of the gear D^7 which is driven directly from the main shaft D. As will hereinafter more fully appear the lever 51^a is rocked by the cam 51^c on shaft S′.

Crank and mileage controlled shafts

At this point it may be stated that the drive

shaft D carries a gear D^5 that meshes with idler D^6 meshing with gear D^7 on the detector or transfer drive shaft D^8 whose extended end D^9 (Figs. 5, 6 and 7) is provided with a gear 60 adapted to mesh with a gear 61 carried by the end of a mileage shaft 62 journalled in the brackets 16 and 17. This shaft 62 is the shaft that is operated directly from the road wheel of the vehicle and is therefore in operation continuously while the cab is moving or traveling.

In addition to the mileage shaft 62 there is also provided a crank driven shaft 63 that is likewise journaled in the brackets 16 and 17, but is directly under the control of the crank 24. This shaft 63 is shown in Figs. 5, 6, 7 and 12 and as will be seen from Figs. 6 and 12 carries therewith a relatively large gear 64 which meshes with a relatively smaller idler gear 65 mounted on the bracket 17 and in turn meshing with the pinion 27 on the master shaft 19. Therefore, the movement of the master shaft 19 through the turning of the crank 24 operates the shaft 63, the gear ratio between the gear 27 and 64 being such that one complete revolution of the master shaft produces a quarter turn of the shaft 63.

Thus, it will be seen that the shafts 62 and 63 constitute important factors in the operation of the devices which control the various type wheels of certain of the printing units.

Detector printing unit

In addition to providing a detector counter for visually registering the miles travelled by the cab with the crank in an improper position, that is, in a position between Vacant and First tariff or between Not recording and Vacant the present invention proposes to print a symbol on the ticket which will also appear on the record strip to indicate exactly what trip the machine was started with the flag in an improper position.

Referring to Figs. 20, 21, 22 and 23 it will be observed that the detector printing type 66 is of segmental form and is mounted upon the type wheel supporting shaft 40. The face of the detector type is provided with a dash 67 and a star 68, the dash being intended to indicate normal operation of the meter and the star intended to indicate operation of the meter with the crank in an improper position. From Fig. 13 it will be seen that the segment 66 which constitutes the detector printing unit L is mounted on the shaft 40 adjacent the main fare printing unit K, and between that unit and the extras printing unit M.

Figs. 20 and 22 shows the normal position of the detector printing segment so that the dash 67 will appear on the ticket and record strip, while Fig. 21 shows the position of parts if the machine runs with the crank in an improper position.

Referring to Fig. 20 it will be noted that the rear end of the segment 66 is provided with a pin 69 adapted to be engaged by the bifurcated end portion 70 of a control lever 80 which is pivotally supported as at 81 to a part of the frame work of the meter. This lever is tensioned by a spring 82 and is provided with a laterally projecting pin or lug 83 adapted to normally rest upon the cam projection 84 of a sleeve 85 loosely mounted upon the mileage shaft 62 and provided with a clutch face 86 and yoke flange 87, the latter adapted to be engaged by the yoke of a shifter lever 88. In connection with the lug 83 and cam 84 it may be pointed out that the latter is of sufficient width so that the relative longitudinal shifting of the sleeve 85 on shaft 62 will not cause the lug 83 to disengage the cam surface 84, the rotational movement of the cam 84 being reserved for that purpose.

Cooperating with the clutch face 86 is a companion clutch sleeve 89 mounted on the mileage shaft 62 and provided with a transverse slot 90 for receiving a pin 91 projecting radially from the mileage shaft 62. Surrounding the sleeve 89 is a spring 92 one end of which is connected to 89 as indicated at 93 while the other end connected to the pin 91 as shown at 93^a. This spring serves to hold the clutch sleeve 89 in such a position that one end of the slot 90 engages with the pin 91 when the flag is in Vacant and the crank shaft is in a corresponding position.

The crank driven shaft 63 is provided with a cam 94 which is provided on one face thereof with a raised lug 95 and a raised arcuate rib 96, the space between the lug and the ends of the ring representing valleys or notches into which the nose 97 of the lever 88 may drop when the crank driven shaft is in a position corresponding to the position of the flag between "flag up" or Vacant and First tariff or between Not recording and Vacant.

The lever 88 which controls the shifting of the cam 84 is pivoted as at 88^a to a frame part of the machine and is under tension of the spring 88^b, thereby compelling the nose 97 thereof to always follow the face of the cam 94. Therefore, when the flag is in Vacant the nose 97 will rest upon the lug 95 of the cam 94 and maintain the clutch faces 86 and 89 disengaged. However, as the crank driven shaft 63 turns toward First tariff, or as it goes back to Vacant from Not recording the nose 97 will rest in the space between the lug 95 and the raised rib 96 and cause the clutch faces 86 and 89 to be engaged.

The operation of this unit is as follows:— Immediately upon the crank 24 being turned from zero position the crank shaft 63 will be moved to permit the clutch faces 86 and 89 to engage and the pin 91 will start to travel in the slot 90 because the so-called mileage shaft 62 will be operated if the vehicle is running. If the operator of the cab moves

his flag on to the full quarter turn or proper position the segment 96 will immediately shift the clutch disk 87 and causes the clutch face 86 to again disengage the clutch face 89 without having imparted any substantial rotational movement to the cam 85 due to the idle movement of the pin 91 in the slot 90. However, should the driver of the cab proceed far enough with his flag in an improper position so as to thereby give the shaft 62 sufficient rotary movement to cause the pin 91 to travel to the far end of the slot 90, the cam 85 will be rotated with the clutch member 89 thereby causing the cam 84 to be rotated out of holding engagement with the pin 83 thereby causing the lever 80 to be rocked on its pivot 81 under the influence of the spring 82 and shift the printing segment 66 to the position shown in Fig. 21. In the latter position the star 68 will be in the line of printing.

Therefore, it will be seen that although the clutches 86 and 89 engage when the flag is moving from zero, they are always kept out of engagement while the flag is at 90°, 180° or 270°, these positions being legitimate positions of the flag. The purpose of the slot 90 and the pin 91 is to give a certain period of grace to the operator so that if he should accidentally start off with his flag not in the full quarter turn he may run a short distance before the detector printing signal is shifted. However, should he proceed a predetermined unauthorized distance, the detector segment will immediately be placed in the position shown in Fig. 21. By varying the length 90^x of the slot 90 as shown by the arrows in Fig. 21 and by varying the length 84^x of the cam 84 shown in Fig. 20 the distance that the cab can be run before the detector operates may be readily controlled. In other words when the parts are manufactured the length of the slot 90 and the length of the cam 84 may be made as desired. Therefore, it will be seen that if the machine is operated with the flag in an improper position the star 68 instead of the dash 67 will appear on the ticket and record. As shown in Fig. 2 the ticket bears the dash 67 which shows that the meter has been operated properly.

In order to reset the detector printing segment and its operating means it is necessary to open the meter casing, and the driver is reprimanded.

Extras operating and printing unit

The extras drum B is operated directly by the pawl 13 and lever 14 having the offset 15 as shown in Fig. 7, but the novel actuator for the extras mechanism as shown in Figs. 4, 5 and 12.

Figs. 5, 12, 13 and 15 illustrate the extras printing unit and operating connections therefor but the actuator for the extras drum as well as the printing unit will first be described in detail.

Referring to Fig. 4 it will be observed that the extras actuator includes a main actuating lever 100 which is pivoted to the back of the meter as indicated at 101 and is provided at one side of its pivot with an offset ear 102 for engaging beneath the projection 15 previously referred to. The opposite end 103 of the lever is intended to engage the end of the extras printing-unit actuating lever 104 clearly shown in Fig. 12 and pivotally mounted as at 105 to the bracket 17.

The lower edge of the lever 100 is provided with a depending foot 106 adapted to be engaged by a cam 107 mounted on the flag shaft 35 whereby the lever 100 will be held locked in an inoperative position while the flag is in Vacant and as it passes through the portion of the cycle from Not recording to zero. When the flag is in Vacant and the lever 100 occupies the position shown in Fig. 4 it is also positively held in its locked position by the locking dog 108 which is pivoted to the back of the meter as indicated at 109 and tensioned by the spring 110. The shoulder 111 of the locking dog 108 engages with a projection 112 on the lever 100 and maintains the lever 100 locked even after the flag has turned to First tariff although the cam 107 has been moved out of obstructing relation to the foot 106. However, the dog 108 is intended to be automatically kicked out upon the first actuation of the extras knob E on the back of the meter and carried upon the shaft 113. The said shaft 113 also carries a disk 114 provided with a pin 115 adapted to engage the upper end of the dog 108 and thereby rock it against the tension of spring 110 to release shoulder 111 from projection 112. The disk 114 is provided with a notch 116 for receiving the end of a pawl 117 which is tensioned by the spring 118 and the disk is also provided with ratchet teeth 119 for compelling continuous forward movement of the extras knob after the end of the pawl 117 is removed from the notch 116.

The shaft 113 which carries the extras knob E and the disk 114 also carries a main actuator cam 120 which is provided with a single valley 121 adapted to cooperate with a corresponding tooth 122 on the lever 100 whereby the rotation of the shaft 113 and cam 120 by the usual extras knob on the back of the meter will cause the lever 100 to rock againts the tension of the spring 100^a which engages its ear 102. As the ear 102 of lever 100 is lifted by the spring 100^a after the lever 100 has been depressed by the cam 120, the upward movement of 102 will operate the lever 14 and pawl 13 and thereby move the extras drum B the distance of one tooth. It will be understood that if the cam 107 is removed from beneath the foot 106, the extras knob E may be rotated in a clockwise direction as viewed in Fig. 4. The pin 115 engages the dog 108 rocking it on its pivot 109

and disengaging the shoulder 111 from the projection 112. The tooth 122 now rides on the cam 120 until the extras knob has completed one rotation. The cam 120 now passes beyond the tooth 122, and the spring 100ª pulls the lever 100 upwardly, the tooth 122 passing into the valley 121 and the ear 102 rocking the lever 14 and actuating the pawl 13 to operate the extras drum B. Obviously, repeated rotations of the operator's extras knob and consequent rotation of the cam 120 will produce additional movement of the extras drum B to indicate additional extra charges.

The extras printing unit M which is shown in Figs. 13 and 15 preferably consists of a single drum 123 mounted on the shaft 40 and carries therewith a gear 124 adapted to mesh with an idler gear 125 which in turn meshes with gear 126 carried by shaft 127 that is tensioned by spring 128. The shaft 127 is journaled in the bracket 17 and carries a ratchet gear 129 (Figs. 5, 12 and 15), the said ratchet gear 129 being actuated by the pendant pawl 130 which is carried by the lever 104 as clearly shown in Fig. 12. When the flag is in a tariff position and the extras actuator lever 100 is rocked, the end 103 thereof will rock the lever arm 104 and lift the pendant pawl 130 which is tensioned by the spring 131 thereby to impart the same movement to the ratchet 129 that is imparted to the ratchet for the fare drum B. A pin 130ª is provided on the bracket 17 to engage a shoulder 130ᵇ of the pawl 130 so as to hold the pawl out of engagement with the ratchet gear 127 when the lever 104 is in its raised position. This permits of the resetting of the extras printing drum 123 when the passenger is discharged.

To constitute a check against retrograde movement when the meter is in a tariff position the ratchet 129 is adapted to be engaged by a check pawl 132. Fig. 12 of the drawings shows this check pawl disengaged when the flag is in Vacant due to the fact that the end 133 of the pawl rests upon the lug 134 carried by cam disk 135 mounted upon the crank controlled shaft 63. When the flag moves to a tariff position under the influence of the crank, lug 134 releases lever 132.

From the foregoing it will be seen that the extras drum B as well as the extras printing unit M are controlled by a common actuator.

Date printing unit

The date printing unit N comprises a month indicating wheel 136 and a day indicating wheel 137 mounted upon the type wheel shaft 40 as shown in Fig. 13.

The means for operating the date wheels is shown in Figs. 5, 11, 24, 25, 26 and 27, Fig. 24 being particularly referred to for the details.

The month wheel 136 is provided with a gear 136ª meshing with an idler gear 138 which in turn is operated by gear 139 carried by shaft 140. This shaft is provided at its outer end with a gear 141 adapted to mesh with a gear 142 of a hand setting unit 143 of sleeve-like formation and carrying a finger gripping knob 144 exposed for manipulation at the outer face of the dial plate 145 so that the finger 146 of the knob 144 may be turned to any one of the months indicated in the circular month calendar 147 on the face of the dial plate 145.

The day wheel 137 is provided with a gear 137ª which in turn meshes with an idler gear 148 that engages with gear 149 on sleeve 150 surrounding the shaft 140. The outer end of the sleeve 150 is provided with a gear 151 adapted to engage with a gear 152 that is a part of a hand setting unit 153 having stem 154 journaled in the bracket 16 while the body thereof extends through the sleeve 143 to receive the finger engaging head 155. The unit 153 carries therewith a pointer finger 156 adapted to register with a circular series of numerals 157 corresponding to the days in the month, the same being etched or stamped on the face of the dial plate 145.

As will be observed from Figs. 25, 26 and 27 the unit 143 is provided with a twelve tooth aligning gear 143ª adapted to engage with the pawl 143ᵇ so as to stop the rotation of the shaft 140 at each month indication. Likewise, the member 153 is provided with an alining gear hub 153ª which is provided with 31 teeth and cooperates with a pawl 153ᵇ to check the operation of the sleeve 150 at each day indication.

From the foregoing it will be apparent that the month and day printing disks 136 and 137 may be readily and conveniently set to register the proper date.

Ticket numbering and indicating mechanism

According to the present invention it is proposed to serially number the tickets which are given to the passenger, and to also indicate on the face of the meter the number of each ticket so that the passenger will know whether or not he gets the ticket of the trip that he is paying for, and not the ticket of some prior passenger thereby preventing fraud on the patrons of the cab.

Referring to Figs. 5, 6, 16 and 29 the registering and printing mechanism for serially indicating the number of the tickets may be observed.

According to Figs. 6 and 29 it will be seen that there is a stub shaft 160 mounted in the meter section of the device, the said stub shaft being provided with a beveled gear 161 adapted to mesh with the bevel gear 10 that is carried by the flag shaft 35 and controlled by the master shaft 19. The said shaft 160 is also provided with a cam disk 162 having

a projection 163 adapted to rock the lever 164 pivoted as at 165 and carrying a pawl 166 at its free end. This pawl 166 is intended to actuate ratchet 165[a] to operate visual indicating drums 167 and 168 which operate in the usual manner to indicate one or two series of numbers which will be exposed through the window 7 on the dial 4 of the meter. As shown in Fig. 1 the drums 167 and 168 show that the next ticket to be issued from the machine will be number 24. That number will be printed on the ticket as shown at 169 in Fig. 2.

To cause a corresponding number to be registered on the printing types 170 and 171 of the ticket printing unit O the crank controlled shaft 63 is utilized because this shaft has a movement corresponding to the shaft 160; both shaft 63 and shaft 160 being controlled by the master shaft 19 and the crank 24.

Referring to Fig. 16 it will be seen that the type wheel 170 carries a ratchet 172 which is held against retrograde movement by a check spring 173 and is given a forward movement by a pawl 174 carried by an actuating lever 175. This actuating lever is pivoted to a frame part as indicated at 176 and is provided with an extension leg 177 connected to a spring 178. The intermediate portion of the lever 175 has an offset lug 179 adapted to be engaged by a cam 180 on the shaft 63. Each time the shaft 63 makes a complete revolution the lever 175 will be rocked and cause the pawl 174 to advance the type wheel 170 the distance of one figure, and to prevent overthrow of the pawl 164 an overthrow check 174[a] is provided.

With the above construction it will be apparent that the type wheels 170 and 171 will be operated to provide indications on the ticket and record strips corresponding to the ticket number registered on the drums 167 and 168 visible through window 7. The type wheels 170 and 171 and the drums 167 and 168 are actuated while the crank 24 makes its first revolution, that is while the flag is being moved from the vacant position to the quarter turn or tariff position.

Car number printing member

One of the novel and distinctive features of the present invention resides in the provision of a novel car number printing device P. Instead of using a type wheel, or a segment that would have to be changed when the meter is assigned to a different car number, it is proposed to provide a key having thereon a car printing number as shown in Fig. 3. This key is designated as 181 and includes a head 182 and a locking or keeper arm 183 as well as a laterally projecting type bar 184 which is formed with a type number 185 corresponding to the number assigned to the car or cab by the owner.

By reference to Figs. 5, 9, 11 and 13 it will be observed that the dial plate 145 (Fig. 11) and the bracket 16 are provided with registering slots 186 for receiving and admitting the type bar 184 of the key, while at the same time the bracket 16 carries a tube 187 provided with a longitudinal slot 188 opening in the direction of the long axis of slot 186. The slot 188 is intended to guide the type bar 184 clear of the type wheels beneath it as the type bar is moved along the guideway formed by the tube and until the said type bar reaches the proper point adjacent the ticket printing unit 0. That is to say, the type bar of the key is moved along the slot in the tube until it reaches the lateral opening 189 whereupon the shank of the key may rotate on its own axis to shift the type bar into the dotted line position shown in Fig. 11. When the key is thus shifted, the arm 183 will be turned so that the nose 183[a] thereof may drop into the keeper socket 183[b] in the bracket 16 where it may be held by the spring 183[c] (Fig. 13). Thus, the key will be positively held in the supporting tube whereby the type 185 will be positioned to be properly impressed upon the ticket and record. When it is desired to withdraw the key it is simply necessary to pull it out against the tension of the spring 183[c] and disengage the nose 183[a] from the keeper socket 183[b] and then turn the type bar portion of the key into registry with the longitudinal slot 188.

Thus, it will be apparent that an interchangeable car number key may be used to constitute the car number printing unit P.

Live miles printing unit

The live miles printing unit Q is shown in Figs. 5, 13 and 17.

In Fig. 13 it will be observed that the live miles printing unit comprises a units type wheel 190 and additional type wheels 191 and 192 the same being adapted to print the live or paid miles on the record strip of the instrument.

The said type wheels are mounted on the type wheels shaft 40 and the type wheel 190 carries therewith a ratchet disk 193 adapted to be operated by pawl 194 pivotally mounted as at 196 upon an actuating lever 197 which is in turn pivotally hung as at 198 to a part of the meter frame. A check spring 199 is provided for the ratchet 193 and an overthrow stop 200 is provided for the pawl 194. The lower end 201 of the lever 197 is tensioned by spring 202 and carries a laterally projecting lug 203, Fig. 5, at its intermediate portion, the same adapted to be engaged by a cam 204 carried by a clutch sleeve 205 slidably mounted upon the mileage or wheel driven shaft 62. One end of the sleeve 205 is provided with a clutch face 206 adapted to engage with a clutch member 207 fixed on the shaft 62 when the flag is in any of the tariff positions.

For the purpose of bringing the clutch members 206 and 207 into engagement the sleeve 205 is provided with a disk 208 adapted to be engaged by the yoke end 209 of a shifter lever 210 that is pivotally suspended from a part of the meter frame as indicated at 211 and tensioned by spring 212 so that the nose 213 of the lever 210 will be compelled to follow the face of cam 214 mounted on the crank driven shaft 63.

When the flag is in Vacant the projection 215 of the cam 214 will engage the nose 213 of lever 210 and maintain the clutch members 206 and 207 disengaged. However, when the flag is in any of the tariff positions due to the manipulation of the crank 24 the clutch members 206 and 207 will be engaged thereby to cause the paid mileage to be registered on the type wheels 190, 191 and 192.

From the foregoing it will be seen that the paid mileage is readily and accurately registered on the type wheels of the printing unit Q.

Total mileage type wheels

The total mileage type wheels constituting the unit R are designated respectively as 216, 217, 218 and 219 in Fig. 13.

The initial type wheel 219 is provided with a ratchet 220 (Figs. 13 and 18) which is intended to be operated by a pawl 221 carried by lever 222 which is pivotally carried by the frame as at 223 and whose tail portion 224 is tensioned by spring 225 and actuated by cam 226 carried by the mileage or wheel driven shaft 62, the cam 226 engaging projection 226^a on lever 222. The mileage or wheel driven shaft is operated continuously from the counter-driven shaft D^s of the meter section of the device, and therefore operates continuously while the cab is in motion.

Accordingly, all of the mileage of the cab will be registered on the type wheels of the unit R, and each time that a ticket is printed a record of the total mileage will appear on the record strip which is kept in the machine.

Elapsed time printing unit and adjusting means therefor

The elapsed time printing unit designated generally as T in Fig. 13 includes the hour printing wheels 230 and 231 which are carried by a sleeve 232 loosely mounted upon the shaft 40 while loosely mounted upon the sleeve 232 are the minute printing wheels 233 and 234, the same being obviously free to turn independently of the hour wheels 230 and 231. The hour printing wheels have printing type from 1 to 12 p. m. and from 1 to 12 a. m. thereon, the p. m. being designated by the reference character "P." and a. m. being denoted by "A.", as is clearly shown in Fig. 28.

By reference to Figs. 6, 28 and 28^a and also Fig. 11, it will be seen that the dial plate 145 is equipped with an hour dial 235 and a minute dial 236, the same cooperating respectively with an hour pointer 237 carried by a finger knob 238 and a minute pointer 239 carried by a finger knob 240. The hour dial 235 consists of hour indications from 1 to 12 for a. m. and indications from 1 to 12 for p. m., as is clearly shown in Fig. 11.

Referring to the minute setting unit which includes the knob 240 it will be observed from Fig. 28^a that the said knob is carried by shaft 241 carrying therewith a one tooth hour cam 242, a bevel gear 243 and a type wheel driving gear 244 which engages the gear 244^a on the minute type wheel 234. From Fig. 28 it will be seen that the bevel gear 243 is rotated by bevel gear 245 carried upon a clock driven shaft 246. This shaft 246 is equipped with a pinion 247 driven by the clock gear 248 so that the minute type wheels 233 and 234 will be continuously driven by the clock work and will make one revolution per hour. In other words the gear ratio is such that the shaft 241 which carries the gear 243 and 244 will only make one complete revolution in an hour and thereby carry with it the one hour tooth cam 242.

The cam 242 above referred to is therefore intended to operate the hour type wheels 230 and 231 so that these wheels will make one revolution in twenty-four hours or in other words will make one twenty-fourth of a revolution each time that the shaft 241 goes through a complete cycle.

The cam 242 is intended to engage the arm 249 of a lever 250 carrying pawl 251 adapted to engage with a ratchet hub 252 of a sleeve 253 having the hour printing adjusting knob 238. As shown in Fig. 28 and also in Fig. 6 the sleeve 253 having the ratchet 252 is also provided with an integral gear wheel 254 adapted to engage with the gear 254^a on the hour type wheel 230. As the hour wheels 230 and 231 are on the same shaft they will both operate in unison and likewise the minute type wheels 233 and 234 will operate in unison.

The object of providing the two sets of type wheels is to make separate records of the time that the passenger enters the cab and the time that he leaves.

The hour type wheel 230 and the minute type wheels 233 are intended to record the time that the passenger gets in the cab while the hour type wheel 231 and the minute type wheel 234 are intended to record the time that the passenger leaves. To accomplish that end the record is taken from the wheel 230—233 and the wheels 231 and 234 at different times, the first record being taken on the first turn of the crank 24 and the last record being taken on the last turn of the crank 24 through proper instrumentalities. The means for accomplishing these results will be

referred to hereinafter in detail in connection with the impression mechanism.

The provision of the setting knobs 238 and 240 respectively for the hour and minute type wheels enable the same to be adjusted readily and quickly to the proper time setting in conjunction with the hour and minute dials on the dial plate 145. As will be seen from Fig. 11 the ratchet hub 252 is prevented from backward rotation by a check pawl 252[a] which is tensioned by spring 252[b].

When setting the time wheels, the minute finger knob 240 carried by shaft 241 may be pressed inwardly to cause the bevel gear 243 to disengage the bevel gear 245 of the clock. That is to say, the shaft 241 may be pressed inwardly against the tension of the spring bracket arm 255 thereby to permit the type wheels to be readily set without also turning the clock work. When finger pressure is released on the knob 240 the spring bracket 255 will return the gear 243 into engagement with the gear 245. Also an adjusting screw 256 may be used in order to properly set the shaft 241 to keep the gears 243 and 245 normally engaged.

Ticket and record paper mounting

The mounting for the ticket and record strips is generally illustrated in Fig. 9 of the drawings and the positions of the ticket and record carrying spools may also be observed from Fig. 5.

The ticket spool 260 is journaled in the upper part of the brackets 16 and 17 (Fig. 5) and is provided with the flange member 261 at its intermediate portion because the width of the ticket strip is less than the width of the record strip which is carried upon the record spool 262 and likewise journaled in the brackets 16 and 17.

In the lower part of the machine there is provided a record paper receiving compartment 263 having an entrance opening 264 as shown in Fig. 9. Above the opening 264 there is provided a rubber covered record strip feeding roll 265 which operates in conjunction with an idler roll 266 as will hereinafter more fully appear.

The ticket spool 260 carries a ticket strip x while the record spool 262 carries a record strip y which is wide enough to permit of receiving a record from all of the printing wheel units K to T inclusive. The back of the record strip y namely the side which faces the ticket x is provided with a carbon surface or finish so that impressions from the type wheels may be transferred from the back of the record strip onto the face of the ticket. However, for the purpose of printing the record on the record strip y a multi-color inked ribbon 267 is carried by spool 268 and fed between the type wheels and the record strip by means of a guide 269. After the inked ribbon passes through the guide 269 it proceeds toward the bottom of the casing and is wound upon a roller 270. It is the purpose of the invention to provide a ribbon which will print the record of the main fare drums in one color and all of the other records in contrasting colors to make them readily distinguishable.

Ticket feeding

Above the type wheel units on the shaft 40 there is provided a combined ticket and record strip guide 271 which is provided with a slot or opening 272 for exposing the type on the type wheels whereby impressions may be taken therefrom for the purpose of the ticket and the record. The end of the guide or table 271 terminates in a downwardly projecting portion 271[a] which cooperates with a guide portion 271[b] to effectively guide the record strip y downwardly toward the compartment 263.

At the front end of the table guide 271 there is provided a feed roller 273 having sprockets 274 thereon for engaging with marginal perforations 275 on the ticket strip x, and to facilitate the positive engagement of the ticket strip with the sprockets the cover 276 of the impression unit is provided at its front or free end 277 with a recess 278 overlying the sprockets thereby to press the ticket strip into engagement with the teeth of the sprockets 274.

The positive feed of the ticket strip x and the record strip y by means of the sprocket teeth is to insure registration of the previously printed ticket strip with the type wheels so as to print the indicia on the ticket always in the proper place. The feeding of the ticket by the sprocket tooth method avoids relative slippage and therefore insures accuracy.

Referring now more particularly to the automatic feeding of the ticket strip by the crank 24 it will be seen from Fig. 10 of the drawings that the gear 20 on the master shaft 19 is adapted to engage with a master feeding gear 280, the gear ratio being one to four. The gear 280 carries therewith a mutilated gear 281 which is smooth for the greater part of its periphery except for the teeth 282 which are aligned with the teeth 282[a] of the segment 283 fitted to one side of the gear. The teeth 282 and teeth 282[a] are adapted to engage with the teeth of a mutilated pinion 284, in such a way as to intermittently drive the mutilated pinion 284 to thereby intermittently operate the sprocket shaft 273.

By reference to Figs. 10[a] and 10[b] it will be seen that a novel feature exists in connection with the mutilated gear 281 and the mutilated pinion 284, the said novel feature insuring accuracy of the starting to mesh with the gear 281 and pinion 284. In Fig. 10[a] the first gear tooth 282[b] of the segment 283 engages with the tooth 284[a] of the pinion 284,

thus bringing the gears accurately into line and preventing sticking or binding. As the gear 281 and its teeth 282 continue in their cycle the initial tooth 282^c of the gear 281 will engage with the half-tooth 284^b of the pinion 284 and thus the continued movement of the gear 281 will impart the desired degree of rotary movement to the pinion 284.

The pinion 284 is carried by the supporting shaft 285 which also carries therewith a gear 286 meshing with the pinion 287 on the sprocket shaft 273.

It will, therefore, appear that when the crank 24 drives the gear 20, the latter will at each rotation impart a movement of 90° to the gear 280, and the latter carrying with it the mutilated gear 281 will move until its gear teeth 282 and 282^a engage with the teeth 284^a and 284^b of the pinion 284. At the proper point of the cycle of the gear 281, a rotational movement will be imparted to the sprocket operating gears and pinions 286 and 287. Thus, the ticket strip x will be advanced by the movement of the crank 24. In that connection it may be said that the paper feeding takes place on the last one of the four turns of the master shaft 19 which is operated by the crank.

Record paper feed

Simultaneously with but independently of the feed of the ticket strip in the manner above indicated, the record strip y is also moved by the driving roll 265 and idler roll 266 (see Figs. 9 and 10).

Carried by the assembly including the gear wheel 280 and the mutilated gear 281, is a one-tooth gear wheel 288 having its single tooth 289 adapted to mesh with a five tooth Geneva gear 290 that is loose on the shaft extension 291 of the rubber covered feed roll 265 (see Fig. 9^a). This five tooth Geneva gear 290 is carried by a sleeve 292 which carries therewith a ratchet hub 293 adapted to be engaged by pawls 294 carried by a disk 295 whose hub 296 is keyed to the shaft 291. The disposition of the spring pressed pawls 294 (Fig. 9^b) and ratchet teeth 293 are such as to permit the one tooth gear 288 to drive the five tooth Geneva gear 290 in one direction only so that the feed roll 265 may be moved independently to permit a part of the record to be drawn out by hand as will be presently explained. However, with the construction described it will be seen that each time the one tooth gear 288 makes a revolution, its tooth 289 will move the Geneva gear 290 one-fifth of a revolution and thus carry the shaft 291 through one-fifth of a revolution and likewise impart a similar movement to the rubber covered feed roller 265 to thus feed the record tape.

The five tooth Geneva gear 290 has associated therewith an inked ribbon driving gear 297 and the manner of driving the inked ribbon will now be described.

Inked ribbon feed

The multicolor inked ribbon 267 is transferred from spool 268 to spool 270 simultaneously with the movement of the record paper. By reference to Figs. 9^a and 10 it will be seen that the gear 297 carried by the five tooth Geneva gear 290 is adapted to mesh with a relatively large gear 298 mounted on the bracket 16 as indicated at 299. The said gear 298 carries therewith a bevel pinion 300 which in turn meshes with a bevel pinion 301 carried by a worm shaft 302, the latter meshing with the worm pinion 303 carried by the spindle or axle extension 270^a of the inked ribbon spool 270.

Each time that the five tooth Geneva gear 290 is moved the gear 297 will also move and impart its movement through the connections described through the inked ribbon spool 270 thereby providing fresh portions of the ribbon between the type wheels and the record paper.

Means for manually feeding the record paper

The means for automatically advancing the record paper after each printing impression has been already described but at the end of the working period of the cab it may be desirable to pull out a section of the record sheet for inspection and removal from the machine. In order to permit of that feature, it is desirable to be able to operate the rubber covered feed roller 265 by hand so as to have enough of the record strip y to handle.

Accordingly, as will be observed from Fig. 12 of the drawings, the feed roll 265 is provided with a spindle extension 265^a which projects through the intermediate bracket member 17 and carries therewith a pinion 304. This pinion meshes with an idler gear 305 mounted as at 306 on the face of the bracket and in turn meshes with a driving gear 307 also mounted on the face of the bracket as at 308. The driving gear 307 carries therewith a ratchet disk 309 which is adapted to cooperate with a ratchet faced rack 310 yieldingly supported by spring 311 mounted within a recess 312 of a slide bar 313 guided in the bracket 314 carried by the face of the bracket 17. The slide bar 313 is provided with a finger grip 315 which is accessible from the back of the meter through the door indicated at 316 in Fig. 4. In that connection it may be pointed out that the recess 317 is intended to accommodate the slide bar 313.

When it is desired to pull out a section of the record strip for inspection, the inspector grasps the handle 315 of the bar 313 and pulls it forward thereby causing the rack 310 to engage the ratchet 309 and impart movement thereto. The movement thus imparted to the

ratchet 309 will be transferred through gears 307, 305 and 304 to the shaft 265ª of the rubber covered roller which will feed a section of the record strip into the compartment 263 (see Fig. 9).

By reason of the clutch arrangement consisting of the ratchet 293 and 294 (Figs. 9ª and 9ᵇ), it will be seen that the roller 265 and its spindle or shaft extension 291 may be moved without interfering with the sleeve 292 which carries the five tooth Geneva gear 290, as well as the inked ribbon operating gear 297.

After a desired length of record strip has been thus fed into the compartment 263, the record strip may be severed by pulling it against the sharp cutting edge of the compartment which forms one edge of the mouth 264 thereof.

Impression mechanism

The means for taking the impression from the type wheels will now be referred to in detail.

This mechanism essentially comprises a series of spring tensioned individual hammers positioned over each type wheel, the same being released to snap the ticket against the carbonized rear side of the record paper and to also press the face of the record strip *y* against the inked ribbon overlying the figures of the face of the type wheels.

As will be observed from Fig. 9 the impression unit is mounted above the inclined table or platform 271 and comprises the cover or hood 276 which is co-extensive in length with the printing units as shown in Fig. 13 to thereby overlie all of the type wheels of the printing unit which print on the ticket.

The said cover 276 is pivotally supported on the frame brackets so as to permit of the raising and lowering of the cover to thread in and inspect the ticket strip *x*. The front end of the cover 276 is intended to be engaged by a detent or holding hook 319 (see Figs. 4, 9 and 10).

At the rear of the cover 276 there is provided a carrier bar 320 also pivotally supported concentrically with the axis of the cover 276 as indicated at 318 and carrying therewith an offset arm 321 whose end 322 is adapted to be engaged by an adjusting screw 323 for the purpose of placing the springs 324 carrying the hammers 325 under tension. That is to say, the bar 320 carries a plurality of flat springs 324 provided at their intermediate portions with percussion heads or hammers 325, the said hammers being located over the slot 272 formed in the table 271 and the apron 271ª so as to engage with the ticket strip and record strip where they overlie the printing type of the type wheels.

The free or tip ends 326 of the springs 324 are adapted to be engaged by a controlling cam 327 having a slot or opening 328. This cam is shown in detail in Fig. 37 and in the form illustrated consists of a tubular body having bushings 329 fitted in the ends thereof and provided with supporting spindles 330 or their equivalent. The slot 328 is so arranged that when the cam 327 rotates in the direction of the arrow shown in Fig. 9 the free end 326 of the spring 324 will drop off of the edge 328ª of the slot and snap downwardly toward the type on the face of the type wheels. Since the cam 327 is common to all of the various spring hammers overlying all of the printing units K to R inclusive as well as the "Time out" wheels 231 and 234 of the unit T, it will be apparent that all of the hammers for printing the ticket and the record except the hammers cooperating with the type wheels 230 and 233 will be snapped downwardly at once and will likewise be lifted simultaneously by the further rotation of the cam 327.

The manner of rotating the cam 327 will now be referred to in detail. The shaft or journal 331 of the cam projects beyond one side of the cover or hood as shown in Figs. 8 and 10 and carries therewith a pinion 332. As will be seen from Fig. 8 the cam 327 does not extend all the way to the bracket 16 thereby leaving a relatively long spindle portion 331, a portion of which, between the end of the cam 327 and the bracket 16, supports the special cam mechanism, for operating the hammer which operates the "Time in" printing wheels.

Referring first to the means for driving the main hammer controlling cam 327 it will be observed that the gear 332 is adapted to be driven by the gear portion 333 of a mutilated gear 334 carried by a gear wheel 335 which meshes directly with the main record feeding gear 280. As a matter of fact the main record feeding gear 280 and the impression controlling gear 335 have the same number of gear teeth and rotate in unison, and it will be remembered that the gear ratio between the main driving gear 20 on the master shaft and the cam 280 is 1:4. The gear 335 is mounted on the face of the bracket 16 as indicated at 336 and carries therewith, in addition to the mutilated gear 334, a one tooth gear wheel 337 having its single tooth 338 adapted to mesh with a four tooth Geneva gear 339 carried by stub shaft 340 journaled in the side wall of the cover 276 as clearly shown in Fig. 10.

As will be seen from Fig. 8 shaft 340 of the Geneva gear 339 is provided at the inside face of the cover with a gear 341 adapted to mesh with an idler 342 which in turn meshes with a gear 343 of a four-pin cam 344, the said pins thereof being designated as 345. The cam 344 is loosely journaled upon the shaft or spindle 331 of the main cam 327 and therefore rotates independently of the main cam so as to thereby operate a special

printing hammer 346 (Fig. 8) for printing the "Time in" indication on the record at the first turn of the crank 24.

It will therefore be apparent that the cam 327 operates the series of hammers 324 for all of the printing units K to R inclusive as well as the "Time out" wheels 231 and 234 of the unit T, but on the other hand the special cam 344 operates the hammer 346 for taking the impression from the "Time in" wheels 230 and 233 of the unit T.

By referring to Fig. 10 it is apparent that while the driving gear 20 is being rotated on its first revolution, that is while the flag is being moved into tariff position, the tooth 338 will engage the Geneva gear 339 and rotate it a quarter turn, which motion will be imparted to the gear 343 and the 4-pin cam 344. As the cam 344 moves, one of the pins 345 passes beyond the end of the printing hammer 346 so that an impression is made from the "Time in" printing wheels 230 and 233. However, the cam 344 has not then completed its movement and the next pin 345 engages the end of the printing hammer 346 and raises it. Since the Geneva gear 339 rotates one quarter turn only each time the flag is being moved from vacant to tariff position, no further impression will be obtained from the printing hammer 346 until a subsequent passenger engages the taxicab. The cam 327 operates all of the rest of the printing hammers, during the last or fourth turn of the crank 24 to take a complete record of the registration of the meter, and also to record the time that the passenger leaves or dismisses the cab, that is, "Time out".

Ticket shearing device

It is one of the novel and distinctive features of the present invention that the ticket delivered to the passenger be cut off or sheared from the ticket strip thereby to provide a clean cut and neat appearing ticket.

To that end the ticket shearing device shown in Figs. 8 and 32 is employed. This device consists of a fixed cutting edge 350 and a movable shear blade 351 which is pivoted to the frame part 352 as indicated at 353 and maintained in a closed position by a relatively stout leaf spring 354. For the purpose of operating the shearing knife in synchronism with the ticket feeding mechanism the movable blade 351 is provided with an offset shoulder 355 adapted to cooperate with a cam 356 carried by a crown gear 357 and mounted on the frame part 352 as indicated at 358. This crown gear 357 is adapted to engage with a pinion 359 on the master shaft 19 and is therefore directly under the control of the crank 24. The shear blade 351 is elevated by the cam 356 and snapped downwardly by the spring 354 when the shoulder 355 drops off of the shoulder of the cam during the last revolution of the crank 24, right after the printing or impression strip has been completed.

Means for permitting the crank to turn from Not recording back to First tariff

Figs. 10 and 31 of the drawings show the manner in which the crank 24 is controlled so that it may be turned backwards except during its first turn and its last turn.

As will be seen in Fig. 10 the gear 280 which is directly driven by the gear 20 on the master shaft carries therewith a cam 360 which has a peripheral dwell 361 for slightly more than 180° of its circumference while the remainder is recessed as indicated at 362. As will also be observed from Fig. 31 the pawl 26 which works in conjunction with the ratchet disk 25, carries therewith an arm 363 whose forward end 364 is adapted to be operated by the cam 360. The arrangement is such that when the flag is in Vacant that the end 364 of the arm 363 lies in the recess 362 of the cam and will remain in the recess until after the cam 360 has been rotated slightly more than 90°. During all of this time the pawl 26 is in position to engage with the ratchet 25. As it takes one complete revolution of the crank 24, and therefore the master shaft 19, to turn the gear 280 and likewise the cam 360 one quarter of a turn, it will be seen that it will be impossible to turn the printing crank backwardly during its first cycle of movement. However, after the crank 24 starts into its second cycle and rotates the flag from the 90° position or First tariff toward the 180° position the dwell 361 of the cam will engage the nose 364 of arm 363 and thus lift the pawl 26 out of the ratchet. As long as the nose 364 of the arm is on the dwell 361 of the cam the ratchet 25 will be disengaged from the pawl 26 and the crank 24 may be turned backwardly. This can only take place in the second and third cycles of the crank, and in the fourth cycle of the crank 24 the ratchet 25 is again engaged by the pawl 26.

Flag locking mechanism

For the purpose of locking the meter against unauthorized operation it is desirable to lock the crank 24 against accidental or intentional unauthorized movement. Therefore, it is desirable to employ a flag locking mechanism of the type shown in Figs. 33 to 36 inclusive of the drawings.

As will be observed from Fig. 33 the lock comprises a housing, including a cover 366 through which the end of the crank shaft 23 projects to receive the crank 24. The portion of the shaft 23 within the housing is made square and provided with a locking disk 367 having a shoulder 368 adapted to be engaged by a locking arm 369 of a locking lever which includes an arm 370 connected with the arm 369 by a sleeve portion 371 mounted on a pin 372. Thus the arms 369 and 370 of the lever

are located in different planes. The arm 370 is provided with notches 370[a] and 370[b] and is tensioned by spring 373 to throw the toe of the arm 369 into the path of the shoulder 368.

Above the arm 370 of the locking lever there is positioned a lock barrel 374 adapted to receive a key 375, the said barrel of the lock carrying therewith a cam disk 376 recessed at one edge to provide shoulders 377 and 378 for engaging with lug 379 to limit its oscillating movement while at the side opposite the shoulder the lever is provided with a holding foot 380 adapted to engage with either the notch 370[a] or the notch 370[b] of the arm 370 according to whether the mechanism is locked as shown in Fig. 35 or unlocked as shown in Fig. 36. From these figures it will be seen that by turning the key to the left in Fig. 36 the foot 380 of the cam disk 376 will engage the notch 370[b] and release the toe of arm 369 from the shoulder 368 thereby permitting the crank shaft 23 to be turned.

A novel and distinctive feature of the locking mechanism however, is the provision of means for automatically locking the lever after four revolutions thereby to compel the key to be again used to render the crank 24 operative. To that end it is proposed to mount on the shaft 23, adjacent the disk 367 a one tooth gear wheel 381 having the tooth 382 adapted to mesh with a four tooth Geneva gear 383 carried by a disk 384 mounted on pin 385 thereby to rotate. The disk 384 is provided with a shoulder 386 adapted to engage with a shoulder 387 on the arm 369 as shown in Fig. 35 when the device is locked, and furthermore the rear face of the disk 384 is provided with a pin 390 which moves 90° upon each complete rotation of the crank shaft 23 due to the engagement of the tooth 382 with the Geneva gear 383. After the crank 24 and the shaft 23 have made three revolutions, the pin 390 is located at 270° from its starting point. On the fourth revolution the pin 390 engages with the offset lip 380[a] of the foot 380 thereby turning the cam disk 376 back to its original position as shown in Fig. 35, thereby allowing the spring 373 to exert its influence on the levers 369—370 and cause the toe of arm 369 to be drawn into engagement with the shoulder 368.

From the foregoing it will be seen that the crank 24 is positively locked at the end of every fourth revolution, thus necessitating the manipulation of the key 375 to again release the crank for the next operation of the meter.

Bell ringing mechanism

Any suitable and convenient type of signal may be used to indicate audibly when the flag has reached any one of its temporary stations. That is to say suitable bell ringing mechanism (Figure 40) may be employed in conjunction with the flag shaft 35, as for instance a pivoted hammer lever 400 engaged at one end by properly disposed cam projections 401 of the cam 402 on the flag shaft and carrying hammer 403 to strike the bell 404.

General operation

As previously indicated the present device includes a meter section and a printing section, the meter section proper being diagrammatically illustrated in Fig. 7 of the drawings, while the printing section has been shown and described in detail, and is housed within the same casing as the meter mechanism and coupled therewith so that the indications registered by the meter section will be carried over to the printing section for recording purposes.

When the vehicle on which the device is installed is vacant the flag 36 will occupy a vertical or flag-up position while the master crank 24 will occupy the position shown in Fig. 33. Owing to the fact that the flag is intended to simply serve as a signal for indicating the state of the meter, that is, whether the cab is vacant or earning a fare, while the multi-cycle master crank 24 performs all of the functions of meter control as well as ticket and record printing and ticket issuing, the said flag is locked against manual manipulation due to the engagement of the worm gear 34 with the worm 33. Therefore, the chauffeur is compelled to use only the crank 24 for controlling the entire device.

When a passenger enters the cab and the flag 36 is in Vacant, the chauffeur turns the key 375 from the position shown in Fig. 33 to the position shown in Fig. 36, which has the effect of removing the toe of the arm 369 out of the path of the shoulder 368 on the cam 367 carried by the crank shaft 23. The crank 24 is then free to turn and due to the fact that the pawl 26 engages with the ratchet disk 25 (Fig. 31) on the first cycle of the crank 24 it will be impossible to move the crank backwardly after once starting it on its cycle.

The first complete rotation or cycle of the crank 24 moves the flag 36 from the vertical or Vacant position to the 90° or First tariff position, and that is accomplished by reason of the fact that the crank shaft 23 drives the master shaft 19 through the connections shown and described, and the master shaft 19 in turn operates the worm shaft 31 which controls the worm 33 and worm gear 34 on the flag shaft 35.

The first rotation or cycle of the crank 24 mainly accomplishes the setting of the different operating parts of the meter into operation and the printing of the "Time in" by the wheels 230 and 233.

By reference to Fig. 38 which diagrammatically illustrates what happens at the

various points of the first cycle of the flag, it will be seen that when the crank 24 is turned so that the flag reaches approximately the 17° position, the detector counter shown in Fig. 19 begins to operate. That is to say, the cam 50 carried by the clutch sleeve 51 which is normally loose on the mileage shaft D^8 may be shifted by the lever 51^a into engagement with the clutch member 51^b which is keyed to the shaft D^8 and also connected to the gear D^7 driven from the wheel of the vehicle. The cam 51^c which controls the lever 51^a is on the cam shaft S' Fig. 7 and is therefore directly under the control of the flag which is in turn controlled by the crank 24. When the flag reaches the 65° position the mileage gears D^1, D^2, D^3 and D^4 are thrown into operative engagement with the star wheel unit U and the clock mechanism C—C^6 inclusive is also thrown into operative relation with said star wheel. When the flag reaches the 81° position the detector counter shown in Fig. 19 will cease to work due to the fact that the cam 51^c shifts lever 51^a to move the sleeve 51 and disengage its clutch face from the clutch 51^b. If the chauffeur should run his cab with the flag between the 17° and 81° position, which are the only positions in which the crank could be temporarily held by the ratchet without either falling back to zero or passing on to 90°, the detector printing segment 66 and the means for controlling the same shown in Figs. 20, 21 and 22 will operate.

When the flag reaches 90° the crank 24, having completed one cycle, will be temporarily arrested due to the engagement of the roller 39 in the notch 38 of the cam 37 of the shaft 31.

The above is what happens on the meter section during the first revolution of the crank, and by reference to Fig. 39 it will be observed in connection with the printing section that when the flag reaches the 20° position on the first cycle of the crank 24 the detector printing mechanism is set in position to work due to the turning of the shaft 63 and cam 94 carried therewith (see Fig. 22). In other words, the nose 97 of lever 88 in Fig. 22 is removed from the projection 95 of cam 94 so that if the vehicle is operated with the flag in an improper position the detector printing segment 66 will be placed in position to cause the star 68 to print on the ticket and record strips as indicated in Fig. 21. If the cab is not run with the flag in an unauthorized position, that is, between 17° and 81°, the mechanism shown in Figs. 20, 21 and 22 will not function. When the flag reaches the 23° position the live or paid mileage printing unit is rendered operative due to the fact that the mechanism shown in Fig. 17 is rendered operative by the throwing in of the clutch members 206 and 207 which causes the sleeve 205 carrying cam 204 to rotate whereby the cam engages the projection 203 on the lever 197. When the flag reaches the 30° position in Fig. 39 the "Time in" printing unit consisting of the hour type wheel 230 and the minute type wheel 233 will be operated by the means shown in Figs. 8, 10 and 28 to print the time at which the passenger enters the cab. Also, when the flag reaches the 70° position in Fig. 39 the detector printing mechanism of Figs. 20, 21 and 22 is rendered inoperative, providing of course that the cab has not been operated with the flag in the wrong position, and when the flag reaches the 75° position of Fig. 39 the ticket number printing unit is rendered operative and likewise the mechanism for indicating the next number of the ticket.

When the flag reaches the 85° position the pawl 26 is fully withdrawn from the ratchet 25 due to the fact that the cam 360 has lifted the end 364 of arm 363 carried by the pawl 26 shown in Fig. 31. The crank then may make two complete revolutions to carry the flag to the 180° position or the 270° or not recording position. Due to the fact that the pawl 26 is held out of the ratchet for 180° of the movement of the flag 36 the crank 24 may be moved backwardly in its second or third cycles without effecting the operation of the meter. The second and third revolutions of the crank are relatively idle movements except for the fact that they bring the miscellaneous gears into proper position to perform the numerous operations required on the last turn or cycle of the crank 24. These functions will now be described both with reference to the meter section and printing section of the device.

Referring first to the meter section as shown in Fig. 38, after the flag reaches the 270° position, due to the ending of the third revolution of the crank 24, the last and fourth revolution of the crank 24 may take place to render the metering instrumentalities inoperative and to print the desired records and issue a ticket. Thus, referring to Fig. 38 it will be seen that when the flag reaches the 290° the detector counter shown in Fig. 19 again is thrown into position to operate due to the second shifting of the lever 51^a in Fig. 19^a which throws the clutch face of the sleeve 51 into position to engage the clutch face of the member 51^b. Between the 320° position and the 335° the meter stops working due to the disengagement of the gear D^4 from the star-wheel and the disconnecting of the clock mechanism from the star-wheel. Also, the resetting of the main fare drums and extras drum of the meter takes place. At the 350° position the detector counter of Fig. 19 is rendered inoperative due to the disengaging of the clutch sleeve 51 from the clutch member 51^b of the shaft D^8.

On the diagram of Fig. 39 the various operations of the printing section of the meter

between the 270° position of the flag and the vertical or zero position are shown. Before reaching the 270° position however, it may be pointed out that when the flag is in approximately the 225° position shown in Fig. 39, and the crank 24 is more than half way through its third revolution the movable shear blade 351 of the ticket shearing device starts to raise under the influence of the cam 356 (Figs. 8 and 32).

Immediately upon the crank 24 starting its last revolution, and when the flag 36 reaches substantially the 275° position the pawl 26 drops back into the ratchet 25 due to the fact that the nose 364 of arm 363 drops into the recess 362 of cam 360 (Fig. 31). At the 300° position the ticket and record strips receive the impressions from the fare types due to the releasing of the hammers 324 by the cam 327. After the hammers have been snapped down onto the type wheels and the flag is moved approximately three degrees, that is, to the 303° position the cam 327 will raise the hammers again and when the flag reaches approximately the 308° position the ticket x, record paper y and inked ribbon 267 all start to move and the movement thereof is continued until the flag reaches approximately the 357° position at which time the ticket x, record y, and ribbon 267 all stop moving and the movable shear plate 351 of the shear device is released, to sever the ticket.

When the crank shaft 24 completes its last cycle the roller 39 drops into the notch 38 of the cam 37 (see Fig. 30) as it does at the end of each revolution of the crank 24, but also the positive crank locking mechanism shown in Figs. 33–36 comes into play to positively and automatically lock further movement of the crank until the key 375 is again turned by the operator. In other words at the end of the fourth and last revolution of the crank 24 the lug 390 on the disk 384 resets the locking barrel 374 and likewise releases the locking lever 369—370 (Fig. 35) so that the toe of the arm 369 again engages the shoulder 368.

The foregoing steps will show the general operation of the device in terms of the various revolutions of the crank shaft 24, and the diagram of Fig. 7 may be resorted to to show the manner in which the crank 24 controls the entire operation of the device.

Referring to Fig. 7 it will be seen that briefly the operation is as follows:

The turning of the crank 24 operates master shaft 19 and the latter in turn operates the flag shaft 35 and the flag shaft in turn controls the cam shafts S and S′ of the meter section of the device. The said cam shafts S and S′ respectively control the throwing into and out of operation of the clutches for connecting the meter mechanism with the wheel of the vehicle or with the clock. The first rotation of the crank 24 accomplishes that result.

The movement of the vehicle is imparted to the printing section of the meter through the counter-drive or detector shaft D^8 having thereon the gear 60 which in turn meshes with gear 61 on shaft 62. The shaft 62 is the mileage shaft of the printing section of the meter.

The crank control for the printing section of the meter is transferred from the master shaft 19 to the meter crank operated shaft 63 by the pinion 27 on shaft 19, idler 65 and gear 64 on shaft 63. The shafts 62 and 63 cooperate to control the operation of the ticket printing unit O, the paid or live mileage printing unit Q and the total mileage printing unit R.

The date and time printing units have been fully described in previous parts of the description and from Figs. 9 and 10 the operations of ticket feeding and issuing, record strip feeding and printing may all be observed.

Ticket feeding, record strip feeding, printing of "Time in" and "Time out" as well as printing of all of the other various records, and ink ribbon feed, can all be traced on Fig. 10 wherein all of the various instrumentalities are controlled directly by the gear 20 on the master shaft 19.

The gear 20 operates the main ticket and record strip feeding and ribbon feeding gear 280, the gear ratio being 1 : 4, and the said gear 280 in turn operates the printing or impression controlling gear 335. The gear 335 has a 1:1 gear ratio with the gear 280 and its primary function is to carry with it the necessary means for operating the printing cam shaft 331 as well as the "Time in" printing cam 334 having the pins 345.

For detail operation of the various units reference may be made to titles in the specification relating to each unit and the description thereunder.

Without further description it is thought that the features and advantages of the invention will be readily apparent to those skilled in the art, and it will of course be understood that changes in the form, proportion and minor details of construction may be resorted to, without departing from the spirit of the invention and scope of the appended claims.

I claim:—

1. A printing taximeter including fare printing types, time and distance means for actuating certain of the said types preparatory to printing, ticket feeding mechanism, a common manual device adapted for movement in successive integrating cycles for controlling on its first cycle the operative relation between said types and their actuating mechanism and on its last cycle actuating said ticket feeding mechanism.

2. A printing taximeter including fare printing types, time and distance means for

actuating certain of the said types preparatory to printing, ticket feeding mechanism, a single rotatable manual device adapted for movement in successive integrating cycles for controlling on its first cycle the operative relation between said types and their actuating mechanism and on its last cycle actuating said ticket feeding mechanism.

3. A printing taximeter including ticket printing means comprising a plurality of printing types, impression mechanism, time and distance means for actuating certain of said types preparatory to printing, ticket feeding means, a single revoluble control device adapted for movement in successive integrating cycles so as to cause a part of the printing operation to be performed in the first cycle and the remainder in the last cycle to respectively control the operative relation between said type and their actuating means, to operate said impression mechanism and to operate said ticket feeding means, all during successive complete revolutions of said revoluble device, and means for preventing backward movement of said revoluble device during certain of its cycles.

4. A printing taximeter including meter mechanism adapted to be driven by movement of the vehicle or by time mechanism, fare drums, a plurality of printing units certain of which are operatively connected with the fare drums, ticket feeding means, impression mechanism for the printing units, a single manually controlled master shaft adapted to make a multiplicity of cycles, and means controlled by said master shaft during its first cycle to print certain information and to print the remainder of the information during the last cycle.

5. A printing taximeter including fare registering drums, means for operating said drums, a vehicle wheel-driven shaft, a plurality of type wheel units certain of which are operatively connected with the fare drums, cam shafts for controlling the operation of the fare drums, an indicator shaft operatively connected with said cam shafts, a master shaft operatively connected with said indicator shaft, impression mechanism, ticket feeding means, record strip feeding means, means controlled by said master shaft for respectively operating the impression mechanism and ticket and record feeding means, and a single crank operatively connected with the master shaft.

6. A printing taximeter including fare registering drums, means for operating said drums, a vehicle wheel-driven shaft, a plurality of type wheel units certain of which are operatively connected with the fare drums, cam shafts for controlling the operation of the fare drums, an indicator shaft operatively connected with said cam shafts, a master shaft operatively connected with said indicator shaft, impression mechanism, ticket feeding means, record strip feeding means, means controlled by said master shaft for respectively operating the impression mechanism and ticket and record feeding means, a single crank adapted for movement in successive integrating cycles and operatively connected with the shaft, a ratchet disk for the crank, and pawl engaging said ratchet, and means operated by the master shaft for keeping the pawl out of the ratchet on certain cycles of the crank.

7. A printing taximeter including printing types, time and distance means for actuating certain of said types, ticket feeding mechanism, a flag, a multi-cycle common manual device for controlling the operative relation between the said types and their actuating mechanism and controlling the printing of certain type during one cycle and the printing of the remaining type during a subsequent cycle.

8. A printing taximeter including fare printing types, time and distance means for actuating certain of said types preparatory to printing, ticket feeding mechanism, an indicating flag, and a common manual device adapted for movement in successive integrating cycles to equal one complete cycle of the flag, said device controlling the operative relation between the fare types and their actuating mechanism and also actuating said ticket feeding mechanism.

9. A taximeter including fare printing types, time and distance means for actuating certain of said types preparatory to printing, ticket feeding mechanism, an indicating flag adapted to be temporarily arrested at each 90° of its cycle of movement, and a common manual device adapted to be rotated in successive cycles for controlling the operative relation between said types and their actuating mechanism and for actuating said ticket feeding mechanism, said device during each cycle propelling the flag through an arc of 90°.

10. A printing taximeter including fare printing types, means for actuating the same in accordance with a predetermined rate for time and distance, ticket feeding mechanism, impression mechanism cooperating with said fare printing types, an indicator, and means operatively connected with the indicator and adapted to move through four revolutions to one of the indicator for controlling the operative relation between said fare printing types and the actuating mechanism therefor, and also controlling said impression mechanism.

11. A printing taximeter including printing type-wheel units, means for actuating the same, impression mechanism for the type wheels, ticket feeding mechanism, a flag for indicating the state of the meter and adapted to move intermittently through a complete circle, a single manually controlled crank for

propelling the flag through 90° of its movement upon each revolution of the crank, and said crank controlling the operative relation between said type wheels and their actuating mechanism and also controlling said impression mechanism.

12. In a printing taximeter, the combination with a plurality of rotatable type wheels, of a tubular slotted guide member paralleling the periphery of said type wheels, and a car printing key including a shank, a head, and an offset type bar adapted to be shifted through said slot to thereby be positioned adjacent the desired type wheel, and said type bar having a car printing symbol thereon adapted to be shifted with an arcuate movement after leaving the slot of the tubular guide member to be moved into alinement with and between certain of the type of the type wheels.

13. In a printing taximeter, the combination with a plurality of rotatable type wheels, of a removable car printing key adapted to be moved parallel to the axis of the type wheels thereby to locate a car number printing symbol between certain of the type wheels, and means for holding said car number printing key in place.

14. In a printing taximeter, the combination with a plurality of rotatable type wheels of a removable car printing key adapted to be moved parallel to the axis of the type wheels thereby to locate a car number printing symbol between certain of the type wheels, and means for detachably locking said car number printing key in place.

15. In a printing taximeter, the combination with a plurality of rotatable type wheels, of a tube supported parallel to the periphery of said wheels and having a longitudinal and lateral slot, a removable car number printing key including a shank and an offset type bar having thereon a car identification symbol, a plate carrying said tube and having a slot for admitting the type bar and also having a keeper socket, a radial locking arm carried by the shank of the key and having a locking stud adapted to fit in said keeper socket when brought to registry therewith, a spring overlying said socket and adapted to overlie the radial arm to hold the stud in the socket when the type bar is swung into alinement with the printing face of the type wheels.

16. In a ticket and record printing taximeter, the combination with a flag for indicating the state of the meter and a master crank for propelling the flag, of a detector counter rendered operative when the flag is in a prohibited position between Vacant and First tariff or between Not recording and Vacant, and means controlled by said master crank for printing a symbol to indicate whether the vehicle has been driven with the flag in a proper or a prohibited position.

17. In a ticket and record printing taximeter, the combination with a flag for indicating the state of the meter and a master crank for propelling the flag, of a detector counter rendered operative when the flag is in a prohibited position between Vacant and First tariff or between Not recording and Vacant, and means controlled by said master crank for printing a symbol to indicate whether the vehicle has been driven with the flag in a proper or a prohibited position, said means comprising a segment having thereon contrasting symbols respectively indicating the operation of the cab with the flag in a proper or an improper position.

18. In a ticket and record printing meter, the combination with a manually operated control device, of an indicator for visually registering operation of the vehicle with the control device of the meter in a prohibited position, and printing means operated synchronously with said visual register for recording the operation of the vehicle with the control device in a prohibited position.

19. In a printing taximeter, the combination of a flag and a manual control device for propelling the flag, and a vehicle wheel driven member, a detector register controlled by said control device to be operative when the flag is in a prohibited position and a detector printing unit also controlled by said control device and vehicle wheel driven member to become operative if the vehicle is operated in a prohibited position.

20. In a printing taximeter, the combination of a flag and a manual control device for propelling the flag, and a vehicle wheel driven member, a detector register controlled by said control device to be operative when the flag is in a prohibited position and a detector printing unit also controlled by said control device and vehicle wheel driven member to become operative if the vehicle is operated in a prohibited position, said means comprising a printing segment having contrasting symbols thereon for respectively indicating a normal and illegal operation of the meter, means for maintaining the segment in position for the normal symbol to print when the vehicle is legally operated, and means for rendering said last named means inoperative when the vehicle is illegally operated.

21. In a printing taximeter, type wheels, a shaft for supporting the type wheels, a detector printing unit including a segment mounted on the shaft for supporting the type wheels and having thereon contrasting symbols for indicating legal and illegal operation of the vehicle with the flag in a proper or improper position, and means for operating said segment comprising a lever, an operator controlled shaft, a vehicle controlled shaft, a cam slidably mounted on said vehicle controlled shaft and adapted to normally engage with said lever, and a clucth device con-

trolled by said operator shaft for connecting said cam with the vehicle operated shaft if the vehicle is operated with the flag in an improper position.

22. In a printing taximeter, the combination of an operating crank and two sets of time actuated type wheels, and impression means controlled by the crank for making successive records from said two sets of type wheels.

23. In a printing taximeter, the combination of an operating crank, two sets of time actuated type wheels, impression means actuated at the beginning of the operation of the crank for taking a record from one set of type wheels, and other impression means controlled by the crank near the end of its operation for making a record from the other set of type wheels.

24. In a printing taximeter, the combination of an operating crank, a plurality of record printing type wheels, separate sets of time actuated printing wheels respectively for printing hours and minutes, impression means for all of said type wheels including one set of the clock driven type wheels, a cam controlled by the operating crank for operating said impression mechanism, other impression means for the other of said clock driven type wheels, and separate controlling means for said last named impression mechanism, and means for controlling said cam and the last named impression controlling operating means to respectively record the time the passenger enters and leaves the vehicle.

25. In a printing taximeter, the combination of a manual control device and duplicate sets of correspondingly actuated time driven type wheels, means operated at the beginning of the operation of the control device for taking an impression from one set of wheels and means operated near the end of the path of operation of said control device for taking a record from the other set of type wheels.

26. In a printing taximeter, the combination of a manual control device, a pair of time driven type wheels for recording the time the passenger enters the cab, a pair of type wheels for recording the time the passenger leaves the cab, separate impression elements for said type wheels, gearing including a Geneva gear for operating the "Time in" printing wheels, a one tooth gear operated by the control device for engaging said Geneva gear, and a multilated gear for operating the impression mechanism for the "Time out" printing wheels.

27. In a printing taximeter, the combination with a manual control device, of a set of "Time in" and a set of "Time out" printing wheels, separate impression means for said "Time in" and "Time out" wheels, gearing including a Geneva gear and a cam for actuating the impression mechanism for said "Time in" wheels, a one tooth gearing operated by said control device near the beginning of its movement for engaging the Geneva gear to actuate the impression mechanism for the "Time in" type wheels, a cam for operating the impression mechanism for the "Time out" type wheels, a pinion for said cam and a mutilated gear also operated by said control device whereby the toothed portion of said mutilated gear engages with the pinion near the end of the operation of the control device.

28. In a printing taximeter printing wheels, means whereby said wheels are driven, a multi-cycle operating crank and means for automatically locking said crank at the end of the final cycle, said means comprising a locking disk on the crank shaft, a lever adapted to engage said locking disk, a key-controlled member for maintaining said lever in an inoperative position with reference to said locking disk and means controlled by the crank shaft for rendering said key-controlled means inoperative thereby to release the lever into locking engagement with the locking disk.

29. In a printing taximeter, a multi-cycle-operating crank, and means for automatically locking said crank at the end of the final cycle comprising a locking disk on the crank shaft, a spring-tensioned lever adapted to engage said locking disk, key-controlled means for maintaining said lever free of the disk to permit the crank to operate, a Geneva gear having notches corresponding to the number of cycles of the crank, a lug carried with the Geneva gear for engaging the key-operated means, and a one tooth gear carried by the crank shaft for engaging with the Geneva gear.

30. In a printing taximeter, a multi-cycle operating crank, and means for automatically locking and releasing said crank, said means comprising a key-controlled member for releasing the lock to permit the crank to perform its series of cycles, and crank controlled means for rendering said key-controlled means inoperative to reset the lock at the end of the final cycle of the crank.

31. In a ticket printing taximeter, a ticket strip having marginal perforations, ticket feeding means having projections for engaging with the perforations, means for operating said ticket feeding means including a mutilated pinion and an intermeshing mutilated gear.

32. In a ticket printing taximeter, type wheels, a ticket strip having marginal perforations, ticket feeding means for engaging with said perforations and gearing for operating said ticket feeding means, said gearing comprising a master driving gear and a main feeding gear, a mutilated pinion operatively engaging with the ticket feeding

means and a mutilated gear carried by the main feeding gear, and adapted to engage with said mutilated pinion.

33. In a ticket and record printing taximeter, type wheels, a ticket strip having marginal perforations, ticket feeding means having projections for engaging with said perforations, a record strip, record strip feeding means, and a common manually controlled actuator having means for independently and simultaneously operating the ticket feeding means and record feeding means, said means including a mutilated pinion and mutilated gear for advancing the ticket feeding means, and a Geneva gear and one tooth gear for operating the record strip feeding means.

34. In a ticket printing taximeter, the printing mechanism, a ticket strip, an intermittent feed device for said ticket strip including a gear train having a pinion provided with a setting tooth and an initial engagement tooth respectively in separate circular planes, and a gear unit having a pilot member for engaging with said setting tooth and a mutilated gear member adapted to be engaged by said initial engagement tooth.

35. In a printing taximeter, type wheels, a ticket strip having marginal perforations, ticket feeding means adapted to engage said perforations, a record strip, rolls for advancing the record strip, an inked ribbon supported beneath the record strip, and over the type wheels, and a manually controlled actuator for synchronously operating said ticket feeding means, record feeding rolls and inked ribbon, said means including a master actuating gear, a mutilated pinion and a mutilated gear carried by the master gear for operating the ticket means, a Geneva gear associated with the record feed rolls, a one tooth gear carried by the master feeding gear for operating the Geneva gear, and gearing operatively connected with said Geneva gear for moving the inked ribbon.

36. In a taximeter, a rotatable multi-cycle control shaft, a ratchet connected with said shaft, a pawl for engaging said ratchet, and means actuated by said control shaft for releasing the pawl from the ratchet during intermediate cycles of the control shaft.

37. In a printing taximeter, the combination of a flag, setting means therefor, a detector symbol, and printing means cooperating therewith for printing said symbol on a record, said printing means being controlled by said setting means.

38. In a printing taximeter, the combination of a flag, setting means therefor, a detector symbol, means cooperating therewith for printing said symbol on a record, said printing means being controlled by said setting means, and means whereby a visual indication of the position of the detector symbol may be given.

39. In a ticket and record printing taximeter, the combination of a flag, setting means therefor, a detector symbol, and means for printing the detector symbol on a ticket and a record, said printing means being controlled by said setting means.

40. A ticket-printing taximeter including printing types, impression mechanism therefor, actuating means for the printing types, a single manual device movable in successive integrating cycles and means controlled thereby to govern the operative relation between said types and their actuating mechanism and to cause a part of the printing operation to be performed in the first cycle and the remainder in the last cycle.

41. A ticket-printing taximeter including printing types, impression mechanism therefor, time and distance actuating means for the printing types, a single manual device movable in successive integrating cycles and means controlled thereby to govern the operative relation between said types and their actuating mechanism and to cause a part of the printing operation to be performed in the first cycle and the remainder in the last cycle.

42. A ticket-printing taximeter including printing types, impression mechanism therefor, time and distance actuating means for certain of the printing types, a single manual device movable in successive integrating cycles and means controlled thereby to govern the operative relation between said types and their actuating mechanism and to cause a part of the printing operation to be performed in the first cycle and the remainder in the last cycle.

43. A printing taximeter including fare printing types, selective time and distance means for actuating certain of the said types, the faster moving of said means being the effective means for actuating the type driven thereby, a common manual device movable in successive integrating cycles and means controlled thereby to govern the operative relation between said second-mentioned types and their actuating mechanism and to cause a part of the printing operation to be performed in the first cycle and the remainder in the last cycle.

In testimony whereof I hereunto affix my signature.

JULIUS GLUCK.