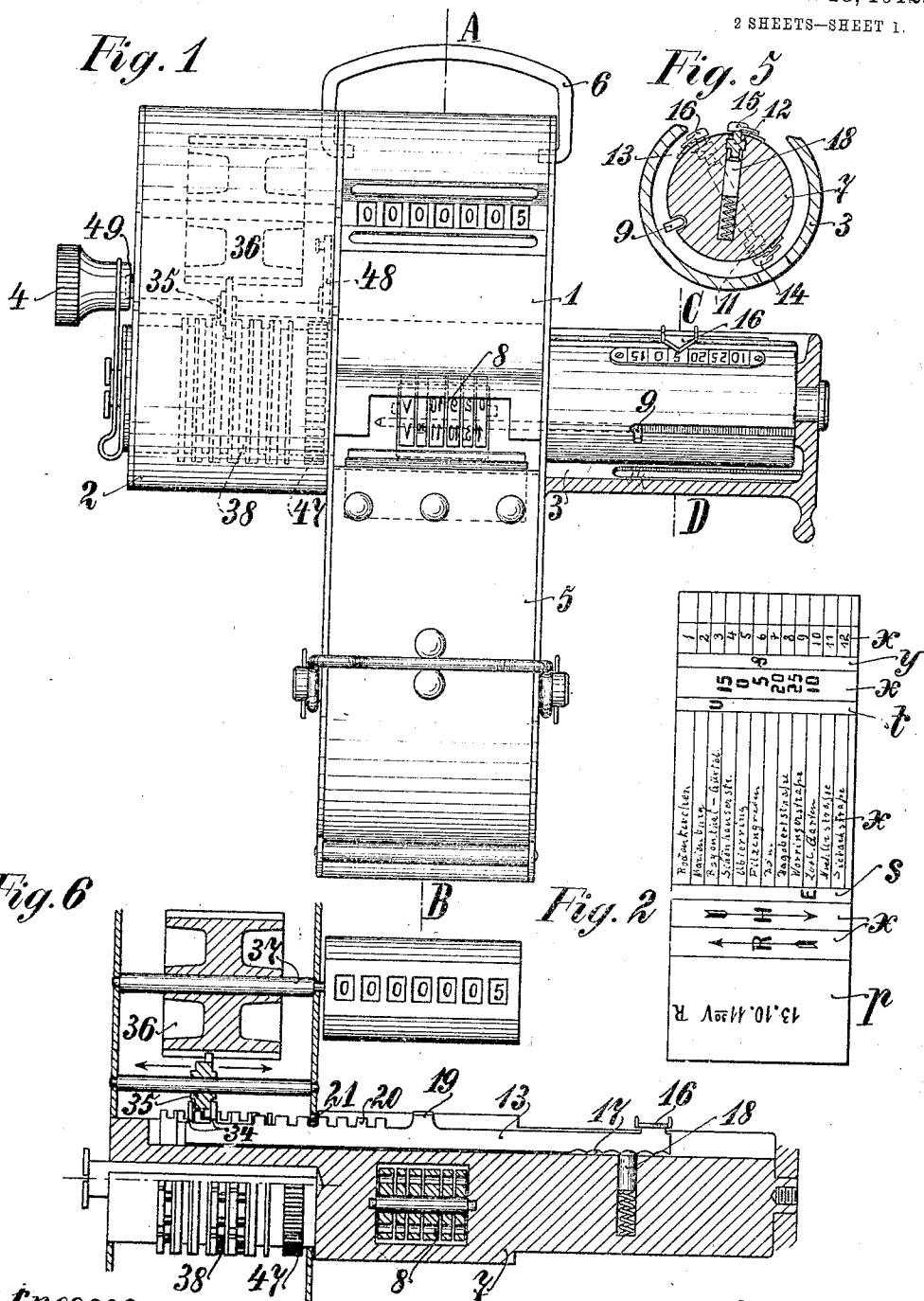


H. FRIEDLEIN.
TRANSPORTABLE TICKET PRINTING AND FARE RECORDING APPARATUS.
APPLICATION FILED SEPT. 1, 1909.

1,017,046.

Patented Feb. 13, 1912.

2 SHEETS—SHEET 1.



Witnesses:

A. C. Clarkley,
E. M. M. Jore.

Inventor

Heinrich Friedlein

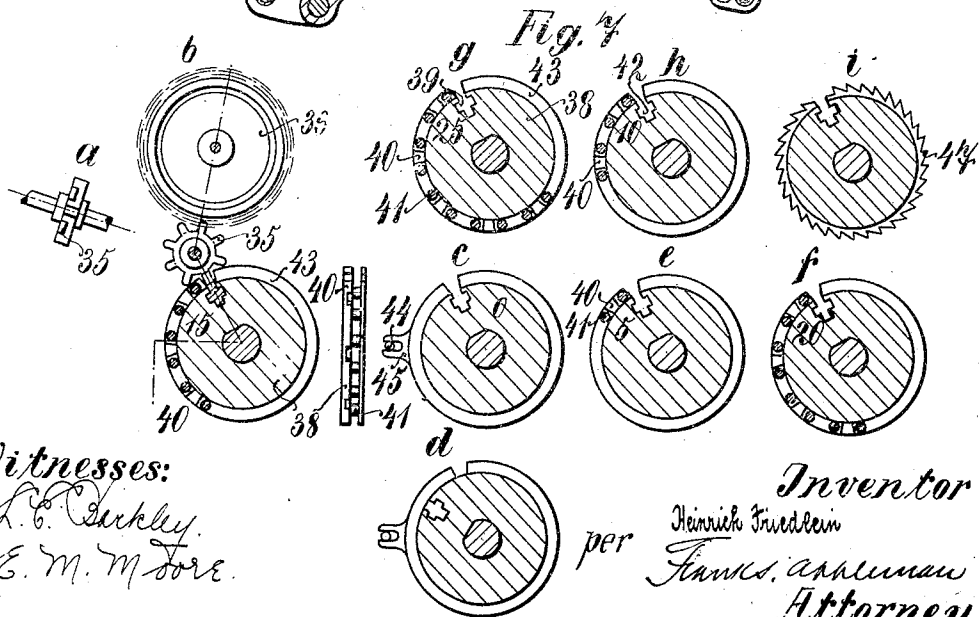
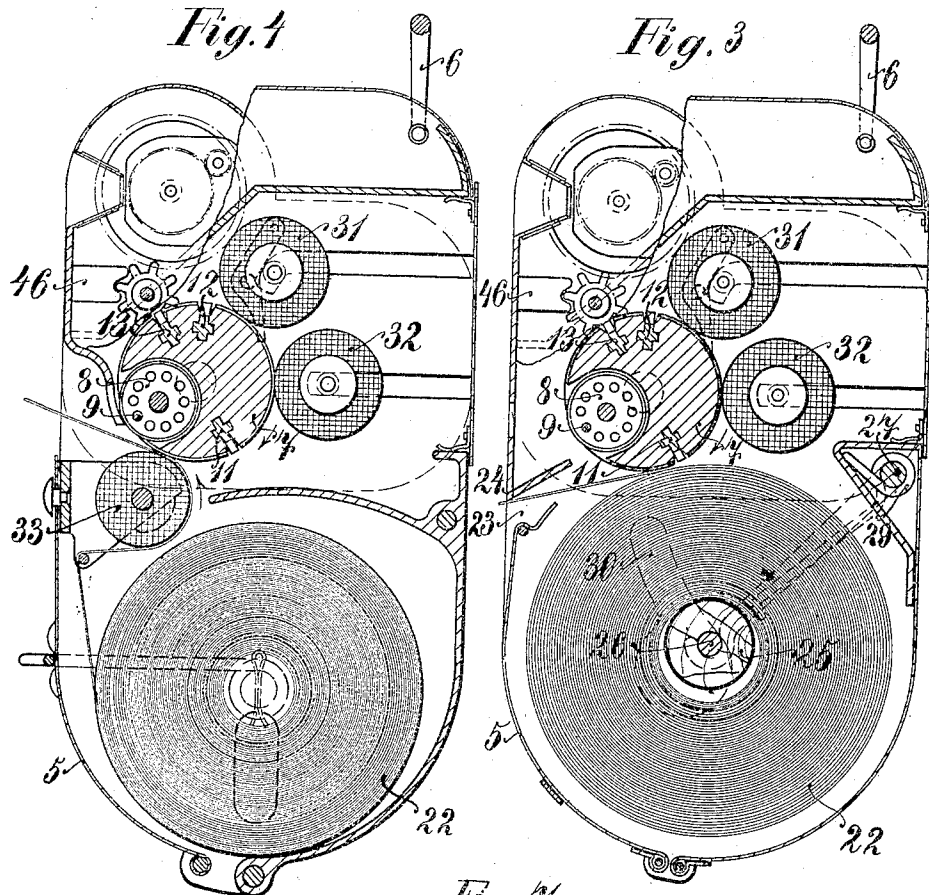
per *James Appelman*
Attorney.

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2 SHEETS--SHEET 2.



UNITED STATES PATENT OFFICE.

HEINRICH FRIEDLEIN, OF DEUTZ, NEAR COLOGNE, GERMANY.

TRANSPORTABLE TICKET-PRINTING AND FARE-RECORDING APPARATUS.

1,017,046.

Specification of Letters Patent.

Patented Feb. 13, 1912.

Application filed September 1, 1909. Serial No. 515,672.

To all whom it may concern:

Be it known that I, HEINRICH FRIEDLEIN, a subject of the Emperor of Germany, residing at 9-11 Hallenstrasse, Deutz, near Cologne, in the Empire of Germany, have invented a new and useful Improvement in Transportable Ticket-Printing and Fare-Recording Apparatus, of which the following is a specification.

10 The present invention relates to a transportable apparatus for printing and issuing traveling tickets and for the simultaneous adding up of the cost of traveling printed upon the tickets issued.

15 The apparatus consists essentially of a printing mechanism with partly fixed and partly adjustable types which are printed upon a strip of paper adapted to be uncoiled from a roll; also of a counting mechanism, 20 by which the cost of the journeys printed upon the tickets is recorded according to the unit of price chosen; and finally of a propelling mechanism for the counting mechanism, which when the ticket issue is 25 concluded, stops correspondingly the printing mechanism.

The principal distinctive feature of the invention consists in that the printing mechanism, the adjusting devices for the 30 various denotations in the printing and the adjusting device for the counting mechanism are arranged upon a single roller revolvable by means of a crank handle. Moreover the following points are to be regarded 35 as further features of the present invention; as the counter roller in the printing, the paper roll itself is made use of and by means of it the paper strip is permanently pressed against the printing roller. The 40 adjusting of the various indications of the printing takes place by means of slides movable parallel to the axis of the printing roller, of which slides, that which serves for marking the price of the ticket operates 45 the corresponding change in the counting apparatus by moving an intermediate tooth wheel.

In order to attain a dry, unsmeared impression upon the tickets which hitherto has 50 not been attainable even with the use of powder rollers, instead of a color roll a second felt roll is provided which removes the excess of color from the inked type, and on the other hand when the color roll is 55 exhausted the second roller is, sufficiently supplied with color to make on its own ac-

count a contribution toward inking of the types. Finally there are also provided in the apparatus, devices which render the use of it impossible until the adjusting slides 60 have been properly set.

The drawing illustrates the invention in one construction.

Figure 1 shows a front elevation of the apparatus with partial section of the casing. 65 Fig. 2 shows a ticket produced by the apparatus. Fig. 3 shows a section on the line A-B of Fig. 1. Fig. 4 the same section with a slight alteration of the device for the pressing of the paper strip on the printing 70 roll. Fig. 5 shows a section on the line C-D of Fig. 1. Fig. 6 shows a longitudinal section through the printing roll driving mechanism for the counter. Fig. 7^a to Fig. 7ⁱ illustrate details of the counting mecha- 75 nism.

The casing of the apparatus consists of a central box 1 with two side boxes 2 and 3. The central box 1 contains a printing and inking device, the paper roll and the in- 80 closed counting apparatus. In the part 2 is located the driving gear for the counting device; in the part 3 are located the handles for the adjusting slide and adjusting scales. At the side of the part 2 is placed the crank 85 handle 4 for the actuation of the entire apparatus. Upon the front face of the casing 1 is provided a lid 5, after the opening of which the paper roll can be inserted. A loop 6 serves for carrying the apparatus, 90 preferably for the attachment thereof to a supporting belt.

The principal part of the apparatus consists of a roll 7 which, projecting through openings corresponding to its diameter in 95 the side walls of the part 1, is revolvably pivoted on the one hand in the side wall of the part 2 and on the other hand in the side wall of the part 3, and is rotated by means of the crank handle 4. This roll 7, 100 bears upon its middle part which is within the box 8, the printing types, which consist firstly of a fixed cliché, which prints the unalterable part of the ticket upon the paper strip. 105

The unalterable part according to Fig. 2 comprises the information in the spaces marked with the letter *a*, of which the middle space is the largest and indicates continuously the various stations on the line. 110 In addition to this, variable indications are printed upon the ticket which can be ad-

justed as follows. In the part marked *p* is printed the date and the time of day when the ticket is issued (for instance 13. 10, 11.30 a. m.). The note R (return) or H (single journey); in the space *s* the indication E alongside the list of stations which marks the stations of entrance, in the space *a* the indication U to mark the changing station. The indication in the space *y* alongside the permanently printed ticket prices is always placed opposite that amount which corresponds to the ticket price to be charged. The adjustment of the date and the time of day and also of the single or return journey is effected by means of a series of type wheels 8 which is adjusted by hand and is held fast in the position desired by means of the adjustable pin 9. For the adjusting of the marks in the spaces *s*, *t* and *y* there are provided the three slides 11, 12, 13. These slides are movable in grooves corresponding to their sectional area along the axis of the roll 7, and bear upon that part of the roll 7 which is located in the space 3, the handles 14, 15, 16 which are placed alongside scales on which the adjustment of the slides can be made. The lower edges of the slides turned toward the axle of the roll possess notches 17 into which respectively a pin 18 placed under spring pressure can engage, whereby the unintentional displacement of the slide is prevented and moreover it is insured that each slide must always be moved forward by the requisite amount.

On the outside of the roll, each slide bears a type 19. This type is for the slide 11, the letter E (for the space *s*), in the case of the slide 12, the mark has the type U (for the space *a*) and on the slide 13 the mark of the space 9 for indicating the respective ticket price. Moreover there is provided on the slide 13 a tothing 20 which corresponds to an aperture 21 in the circular opening of the wall of the box 1. As soon as one tooth of this tothing 20 is placed in the aperture 21 of the roll, any turning of the roller 7 is rendered impossible; this can only be effected when a space of the tothing 20 is placed opposite to the aperture 21. In this manner, the right adjustment of the slide 13 is assured. The same device can also be applied to the other slides.

Opposite the printing surface of the roller, there is placed the paper roll 22, the free end of which projects through the opening 23 of the casing 1, and can there be torn off against a sharp edge 24 placed at that point. The paper roll 22 is supported upon the roll 25 and this again upon the axle 26, which axle is carried by two arms revolvable about the axle 27; said axle 27 is itself impelled by the spring 29 and thereby pressed continuously upward. In the side walls of the casing 1 there are curved slots

30, which will widen out below for the passage of the roll 25, in which slots the axle 26 oscillates.

Instead of pressing the paper roll 22 immediately against the printing roll, in the construction shown in Fig. 4 there may be arranged an intermediate roll 33, over which the paper strip is guided. By this means a more powerful impression of the strip against the printing roll can be effected, and consequently a clearer print. The roll 33 is preferably attached to the folding lid 5 so that it can be folded down together with this latter when a new paper roll is to be inserted.

Behind the printing roll are placed two felt rolls 31, 32 in the casing 1. Of these, the one which is the first in the direction of rotation of the printing roll forms the inking roll 31 which inks the types. The second roll 32 takes off from the first the excess of color. As soon as the supply of color on the roll 31 is exhausted, the roll 32 will be sufficiently supplied with color in order to take part in the inking of the types.

The ticket prices inserted from time to time in the type in the manner above set forth, are calculated by means of a counting apparatus of known construction. The adjustment thereof is effected simultaneously with the adjustment of the ticket price slide 13. This slide possesses a fork 34 in its end lying in the part 2 of the apparatus, which fork surrounds a movable intermediate wheel 35 sliding upon a fixed axle, and which wheel is in engagement with a broad toothed wheel placed upon the axle 37. The rotation of the wheel 35 is consequently transmitted to the counting axle through the wheel 36. The wheel 35 is actuated by the wheels 38 which are connected rigidly with the roller 7 and participate in its rotation. Each one of these wheels 38, of which there are six in all, belongs to one of the ticket price marks 10, 25, 20, 5, 0, 15, each of which presses the fixed type upon the ticket. The wheels 38 placed side by side firmly upon the roller 7 are illustrated in Figs. 6^b to 6^h. Each of the wheels has an aperture 39 for the slide 13. The cavity thereof consequently goes through all the wheels. The tooth wheel 35 has an even number of teeth, preferably eight, four of which have only half the width of the others (Fig. 7^a). Each wheel 38 has as many tooth intervals 40 as the respective ticket amounts have units. Consequently the wheel (Fig. 7^e) which corresponds to the amount 5 has one space, the wheel (Fig. 7^b) which corresponds to the amount 10 has two spaces, and the wheel (Fig. 7^b) corresponding to the amount 15 has three spaces and so forth. Each tooth space of these intermediate wheels is bounded on both sides by pins 41. All the wheels

moreover possess at the place which stands opposite to the tooth wheel 35 in the position of rest, a cavity 42 in the outer periphery 43. These spaces permit of the displacement of the tooth wheel 35 at the desired place.

Before the commencement of an adjustment, the wheel 35 rests with half a tooth in the cavity 42 of a counting beam. In Fig. 7^b this initial position is illustrated for the counting wheel for the amount 15. As long as the handle 4 is not moved, the tooth wheel 35 remains with the two full teeth on each side of the space 42 resting upon the outer periphery of the circle 43. If the handle be then turned, the tooth which is in the space 42 will be moved one division by means of the first pin 41, and at the same time the next whole tooth enters into the first space 40. This latter space on further turning of the handle, causes this tooth also to move one division, whereby again the next half tooth enters into the ring 43. If no further tooth space 40 then follows as shown for the counting wheel for the amount 5 (Fig. 7^c), the wheel 35 remains stationary and two whole teeth rest upon the ring 43 whereby a further motion of the counting apparatus is prevented. In this position the tooth wheel 35 remains until the initial position has been again restored. The counting apparatus is consequently moved forward by one unit of the ticket price at every second tooth. The number of units corresponds to the number of tooth spaces 40 of each counting wheel. The counting wheel (Fig. 7^c) which corresponds to zero, has neither spaces nor pins, so that also no motion of the counting wheel can be effected. In order to prevent more effectively any accidental moving of the wheel 35 in this zero position, the corresponding ring 43 may be separated from the inner core of the roll, so that the ring remains stationary when the handle is turned. The holding fast of the ring can then be effected by means of a pin 44 which engages in a fork 45 placed upon the ring 43. In Fig. 7^b is shown another position of the roll in order to indicate that the ring 43 remains stationary in another position of the crank.

Instead of the above described arrangement, the securing of the wheel 35 in the zero position might also be effected by means of a stop 46 as illustrated in Figs. 3 and 4. This stop possesses at its end opposite to the tooth wheel a slot of such a shape that one of the teeth in the opposite piece can enter and be held fast. In addition to the counting wheels, there is moreover mounted upon the roll, a ratchet wheel 47 (Fig. 7^d) which, in combination with the catch 48, prevents the backward motion of the handle 4. The handle itself is constructed with a

tion against a projection 49 provided on the casing. Before it can be turned, it must be first lifted over the projection 49 against the pressure of the spring and with simultaneous turning.

What I claim is:

1. In a fare registering and ticket printing apparatus in combination with an inclosed roller printing mechanism; longitudinally adjustable type bars determining the printing of variable indications of fare, destination, and the like on a ticket, and mechanism for registering and totaling the fares thus printed, said mechanism adapted to be actuated by the turning of the printing roller.

2. In combination in a transportable fare registering apparatus adapted to print consecutive detachable tickets on a paper roll; means for pressing the ticket to be printed against the type face of the printing roller, a handle on the axle of said roller adapted to rotate the roller by hand pressure, sliding and locking bars for varying the composition of the said type face, and mechanism operated from the printing roller for registering and for totaling the separate fares printed by said type face.

3. In combination in a transportable fare registering apparatus adapted to print consecutive detachable tickets on a rotatable paper roll; means for pressing the ticket against the type face of the printing mechanism, a longitudinally grooved printing roller, a handle on the axle of said roller adapted to rotate the roller by hand pressure, an inking device adapted to come periodically into contact with said roller, type bars on said roller adapted to slide in the longitudinal grooves of said roller, means for securing said type bars in predetermined positions on said printing roller, a movable gear wheel adapted to transmit the adjustment motion of the type bar to the fare-registering mechanism, and a fare-registering and totaling mechanism operated from the printing roller.

4. In combination in a transportable ticket printing and fare registering apparatus, a roller adapted to press the ticket against the type surface of the printing roller, means for rotating said printing roller, a longitudinally grooved printing roller having partially fixed type surface, longitudinally adjustable type bars adapted to slide in the grooves of said printing roller, a double roller inking device adapted to ink the types on said printing roller, a fare-totaling and registering apparatus, and gearing adapted to transmit the indications of the movable type bars to the said registering apparatus.

5. In combination in a hand-operated transportable ticket printing and fare registering apparatus, a longitudinally grooved printing roller, adjustable type bars on said

roller, a locking rack on the ticket price type bar of the printing roller, so adjusted that the mechanism can only revolve when the said bar is correctly adjusted, an inking device adapted to ink the printing surface of said printing roller, a fare-totaling and registering apparatus, and a gear wheel movable on its axle in coöperation with the ticket-price type bar for transmitting the

indications of said bar to the registering 10 apparatus.

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

HEINRICH FRIEDLEIN.

Witnesses:

LOUIS VANDORY,
THOMAS AUER.