No. 617,313. Patented Jan. 10, 1899.

E. M. BOSSUET.

MACHINE FOR PRINTING, CHECKING, AND ISSUING RAILWAY OR OTHER TICKETS.

(Application filed Oct. 9, 1897.)

(No Model.) 7 Sheets—Sheet 1.

FIG. 2.

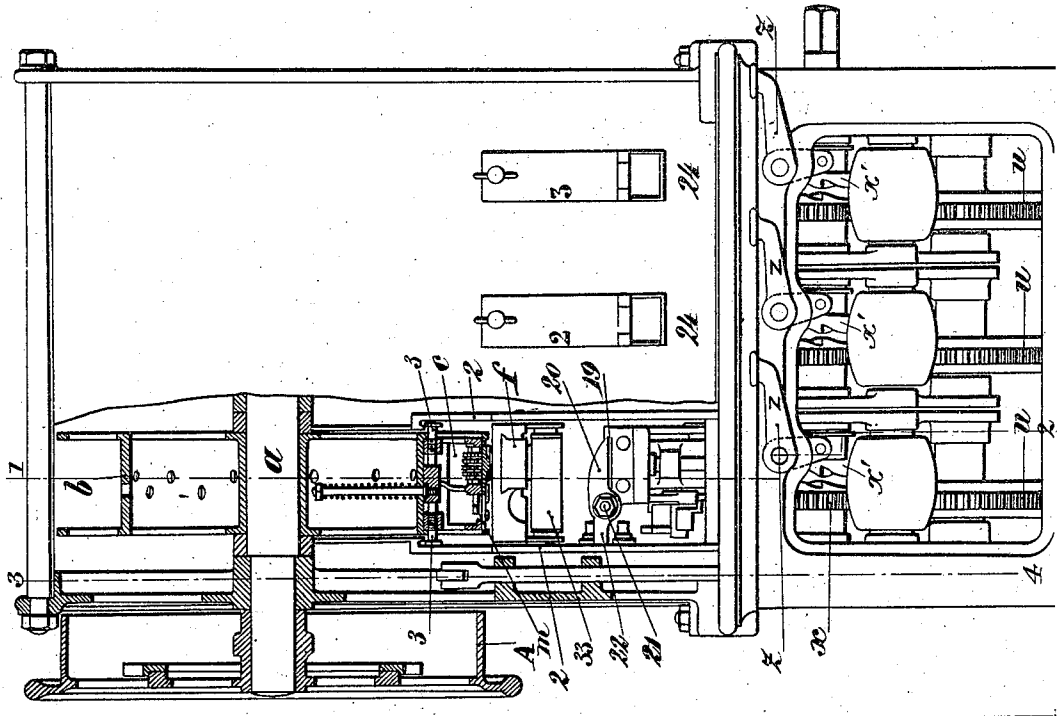
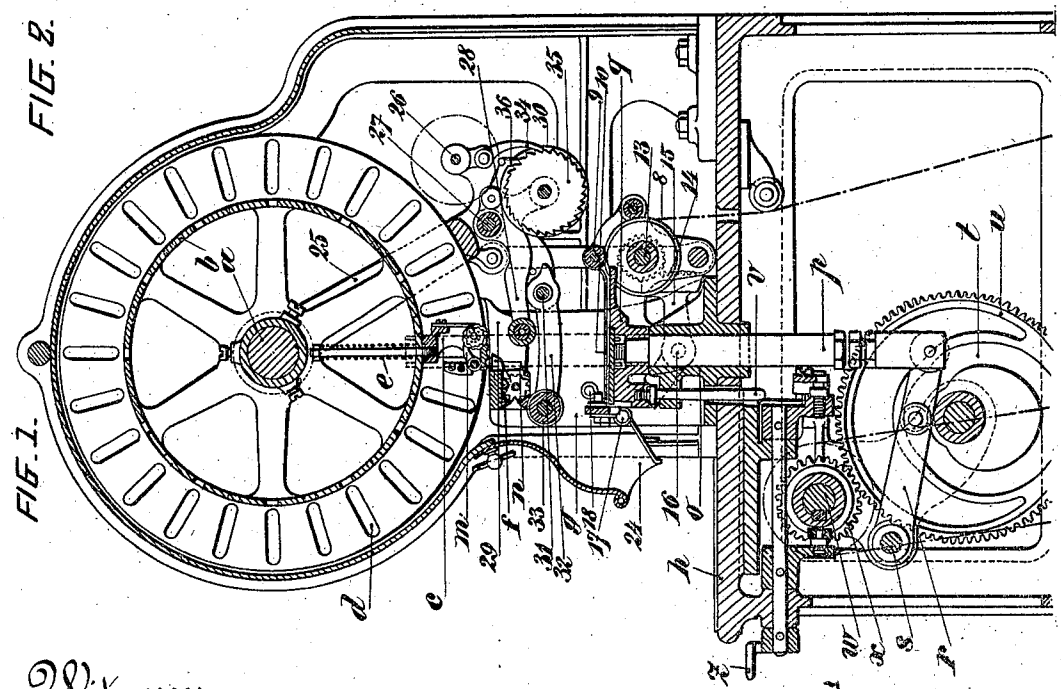


FIG. 1.



Witnesses
R. Abenly
Geo. E. Morse.

Inventor
Emile Médéric Bossuet
By Briesen & Knauth
His Attorneys

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E. M. BOSSUET.

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(No Model.) 7 Sheets—Sheet 2.

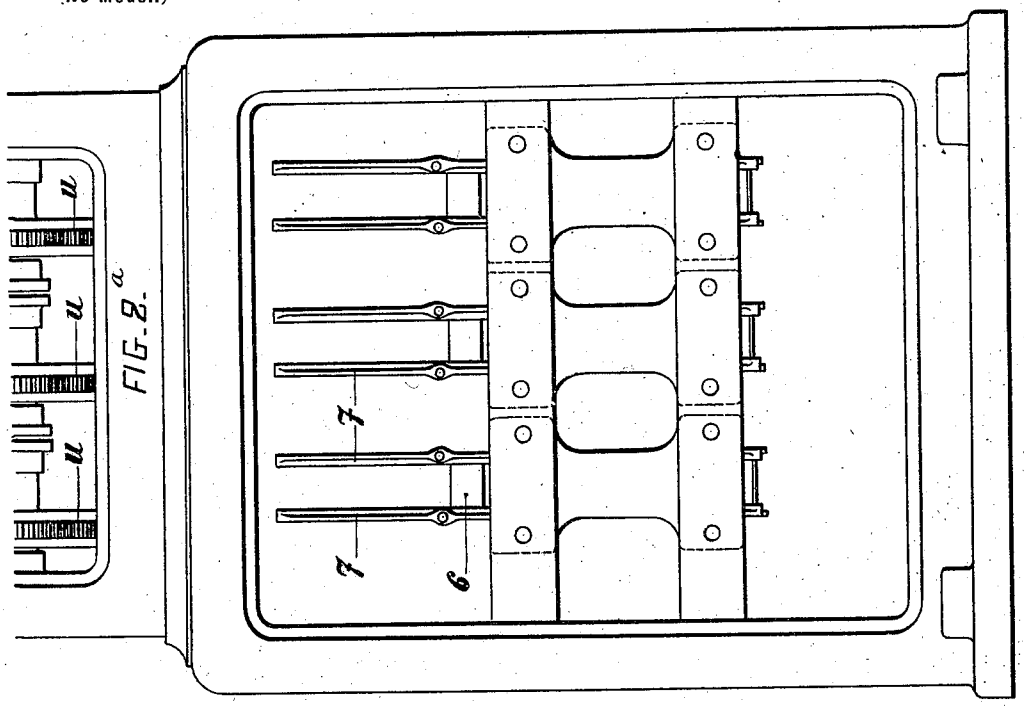


FIG. 2.a

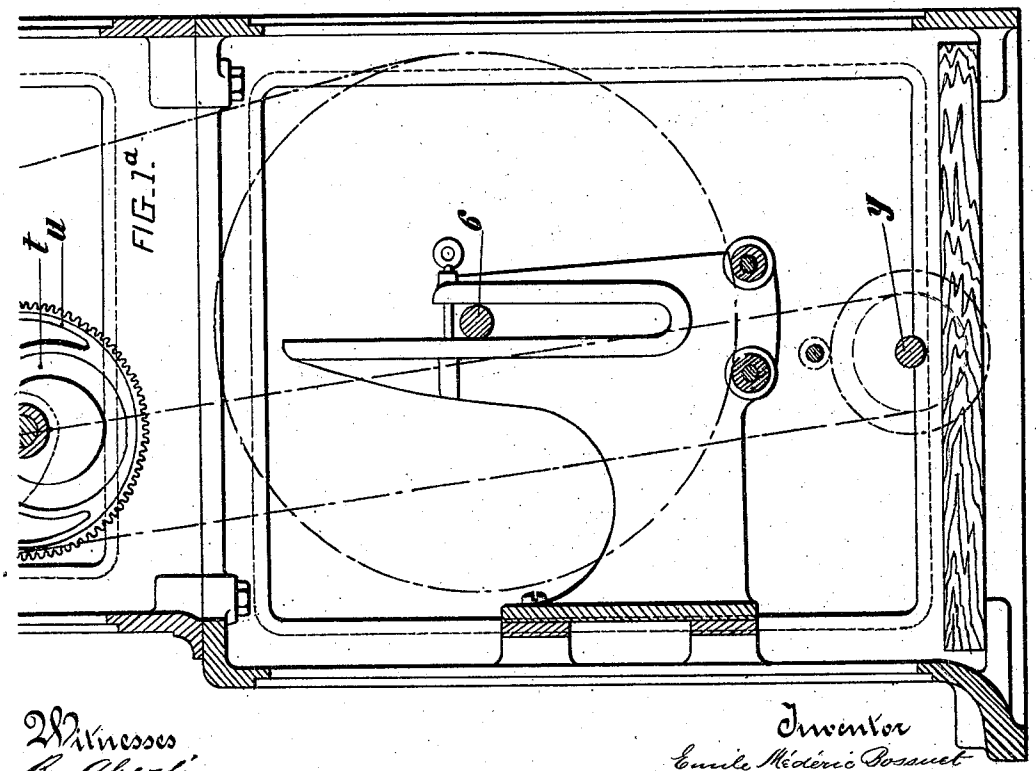


FIG. 1.a

Witnesses
R. Aberly
Geo. E. Moore.

Inventor
Emile Médéric Bossuet
By Briesen & Knauth
his Attorneys

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(No Model.) 7 Sheets—Sheet 3.

FIG. 8.

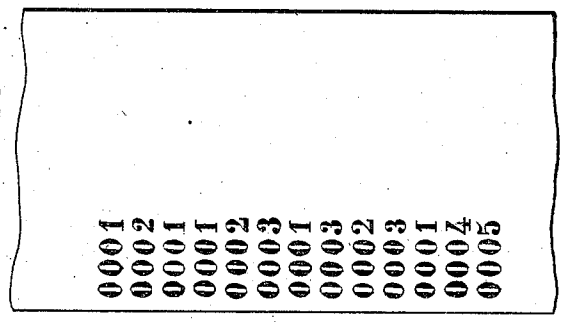
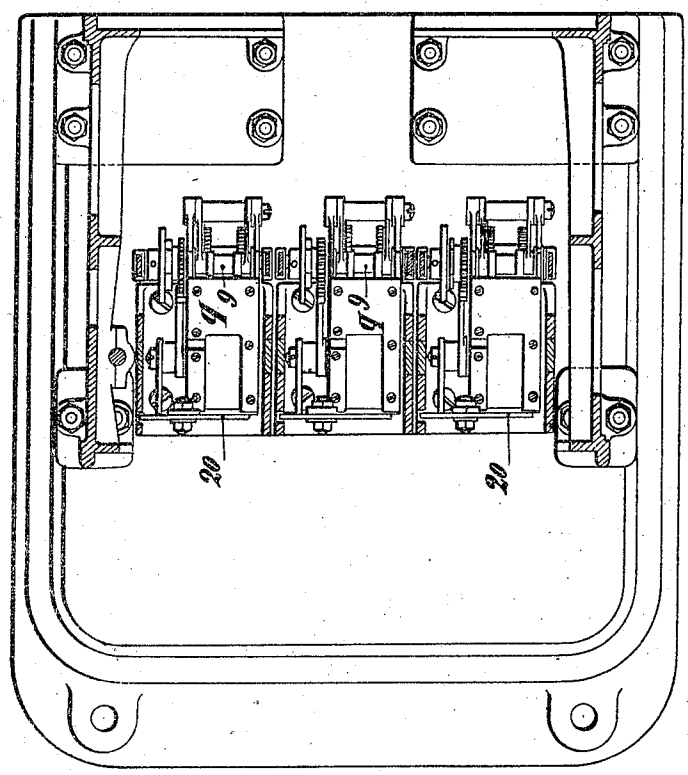


FIG. 3.



Witnesses
R. Abendi
Geo. C. Moore.

Inventor
Emile Médéric Bossuet
By Briesen & Knauth
his Attorneys

No. 617,313. Patented Jan. 10, 1899.

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MACHINE FOR PRINTING, CHECKING, AND ISSUING RAILWAY OR OTHER TICKETS.

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(No Model.) 7 Sheets—Sheet 4.

Fig. 5a

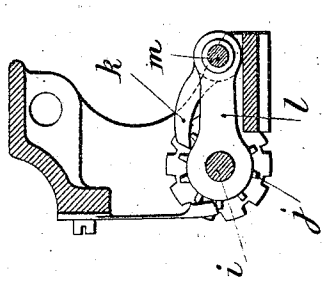


FIG. 5.

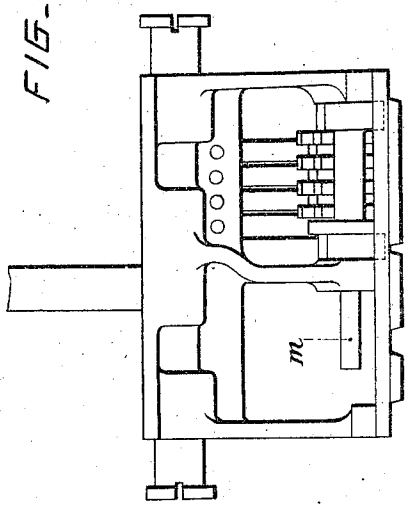


FIG. 7.

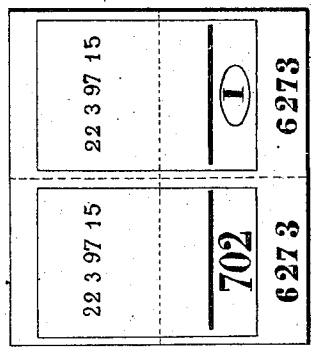


FIG. 6.

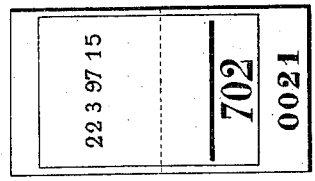
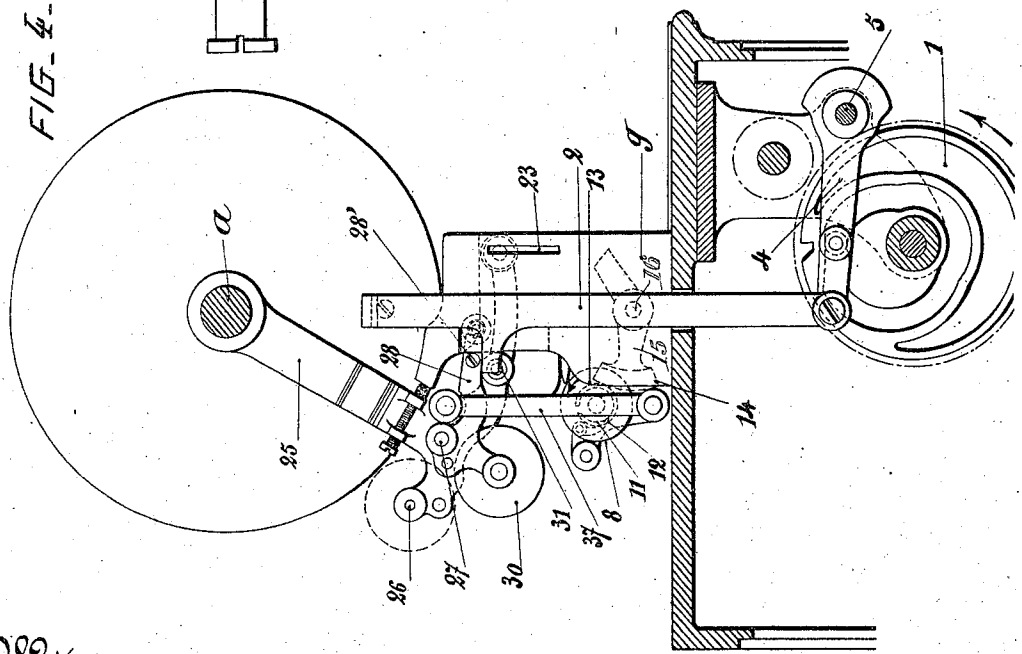


FIG. 4.



Witnesses
R. Abeglen
Geo. C. Morse.

Inventor
Emile Médéric Bossuet
By Briesen & Knauth
his Attorneys.

No. 617,313. Patented Jan. 10, 1899.

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MACHINE FOR PRINTING, CHECKING, AND ISSUING RAILWAY OR OTHER TICKETS.

(Application filed Oct. 9, 1897.)

(No Model.) 7 Sheets—Sheet 5.

FIG. 9.

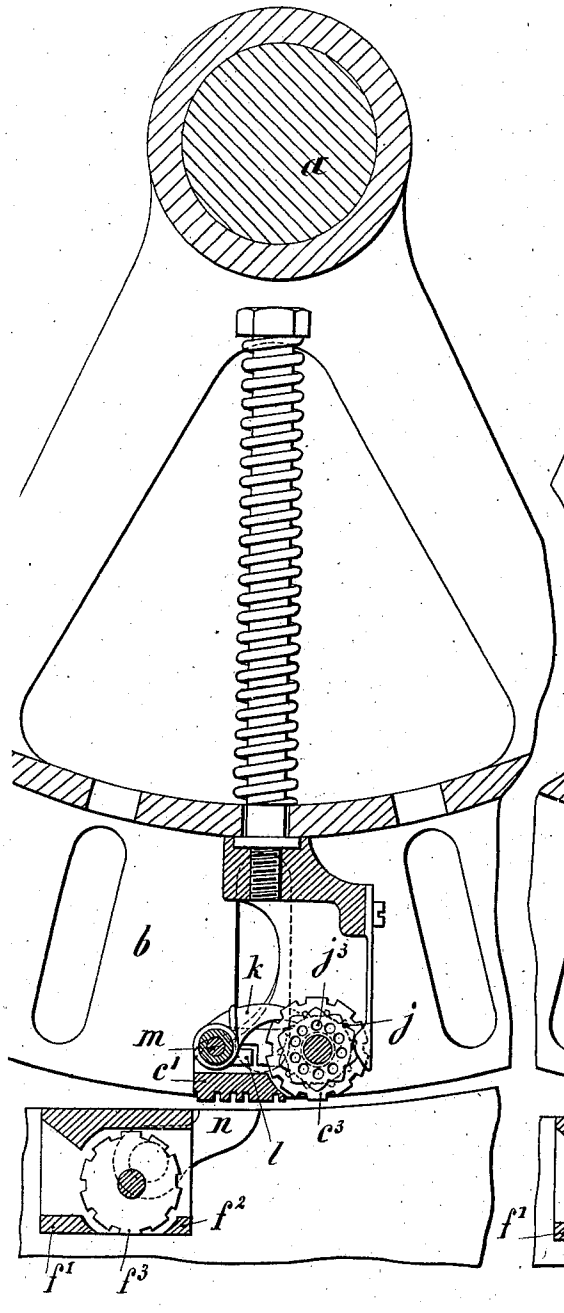
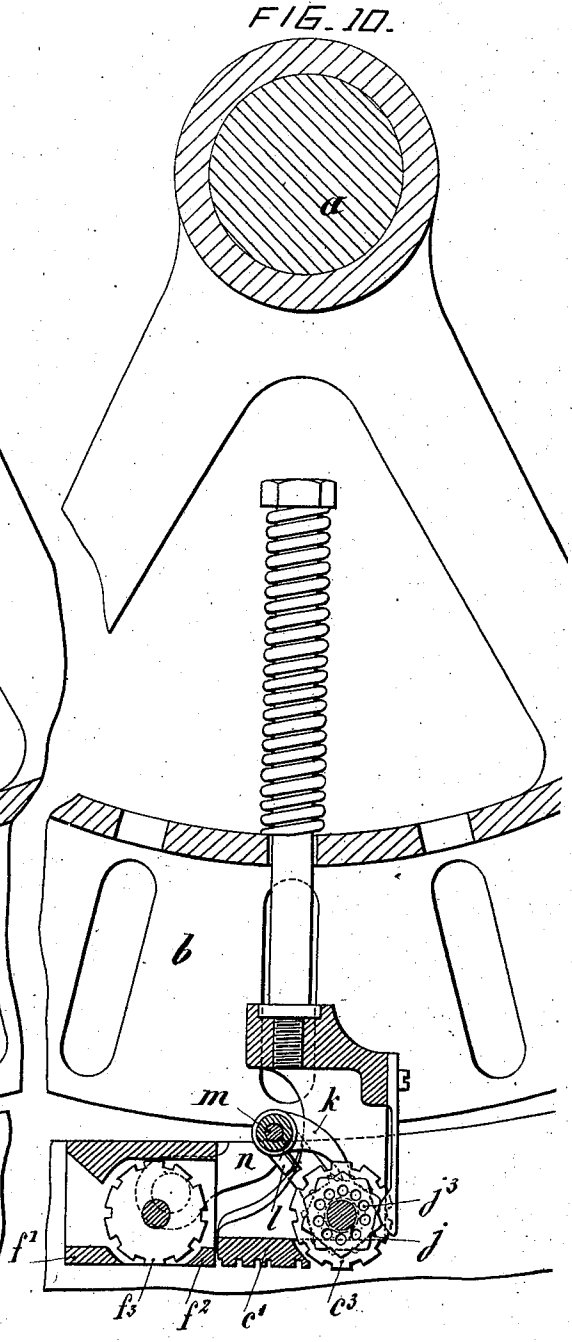


FIG. 10.



Witnesses
R. Aberlin
Fred. Ellerson.

Inventor
Emile Médéric Bossuet
By
Briesen & Knauth
his Attorneys

No. 617,313. Patented Jan. 10, 1899.

E. M. BOSSUET.

MACHINE FOR PRINTING, CHECKING, AND ISSUING RAILWAY OR OTHER TICKETS.

(Application filed Oct. 9, 1897.)

(No Model.) 7 Sheets—Sheet 6.

FIG. 11.

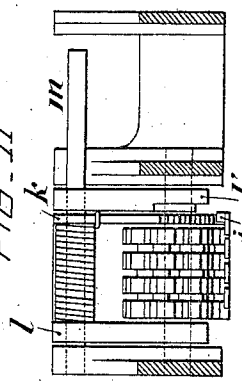


FIG. 12.

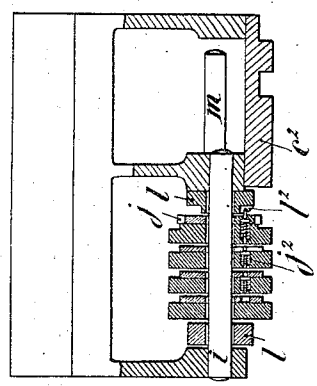


FIG. 13.

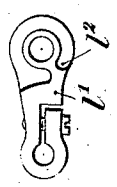


FIG. 14.

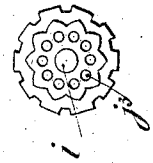
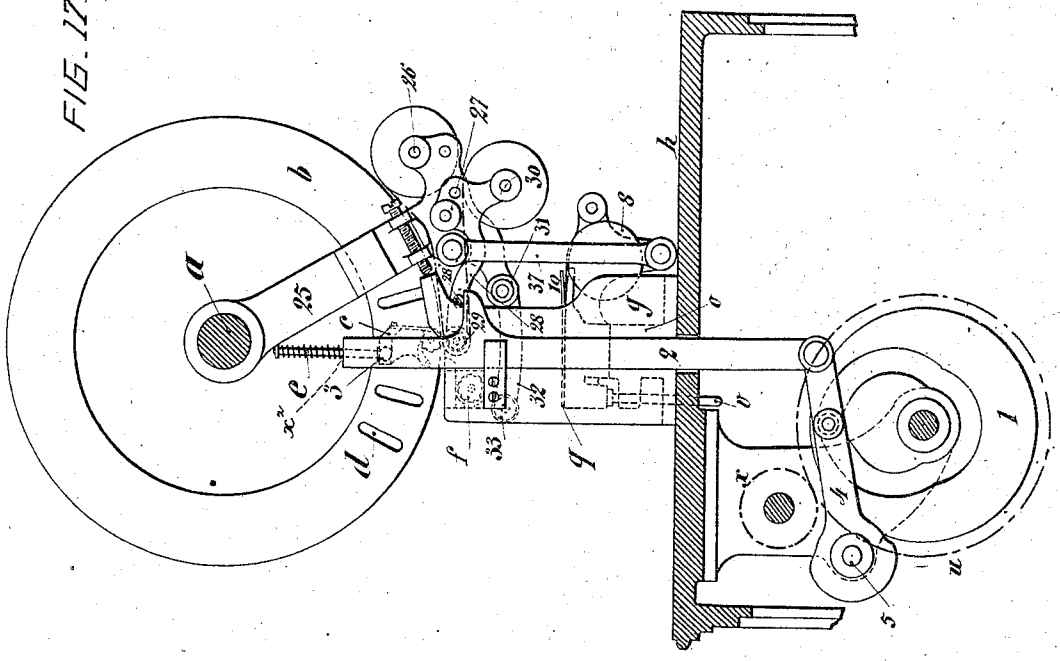


FIG. 14a.

FIG. 17.



Witnesses
R. Abell
F. E. Mouse.

Inventor
Emile Médéric Bossuet
By
Briesen & Knauth
his Attorneys

No. 617,313. Patented Jan. 10, 1899.

E. M. BOSSUET.

MACHINE FOR PRINTING, CHECKING, AND ISSUING RAILWAY OR OTHER TICKETS.

(Application filed Oct. 9, 1897.)

(No Model.) 7 Sheets—Sheet 7.

FIG. 16.

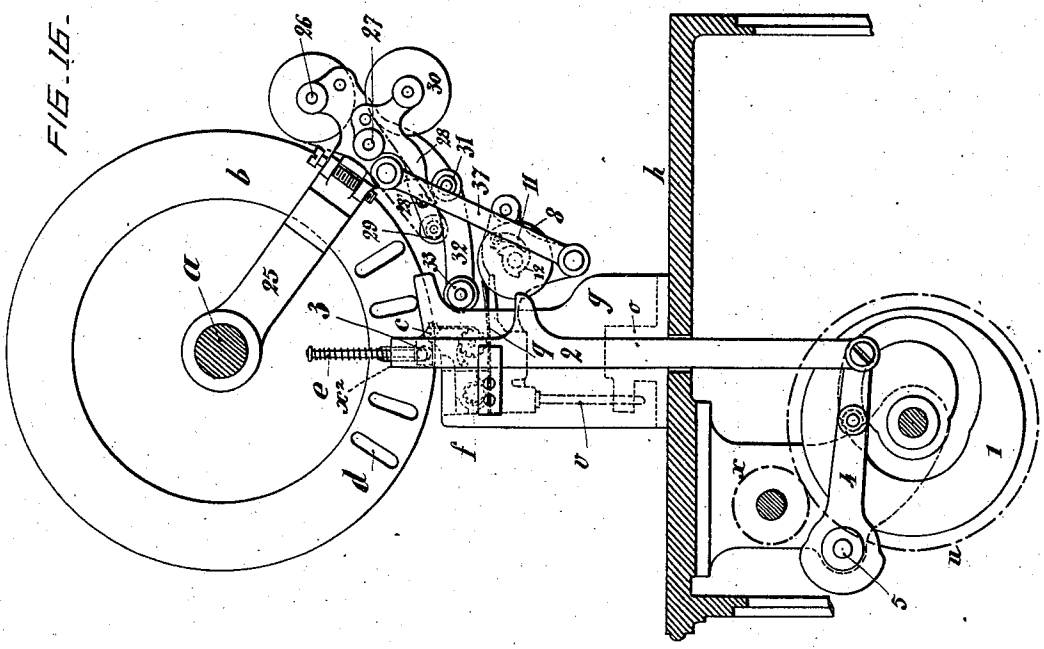
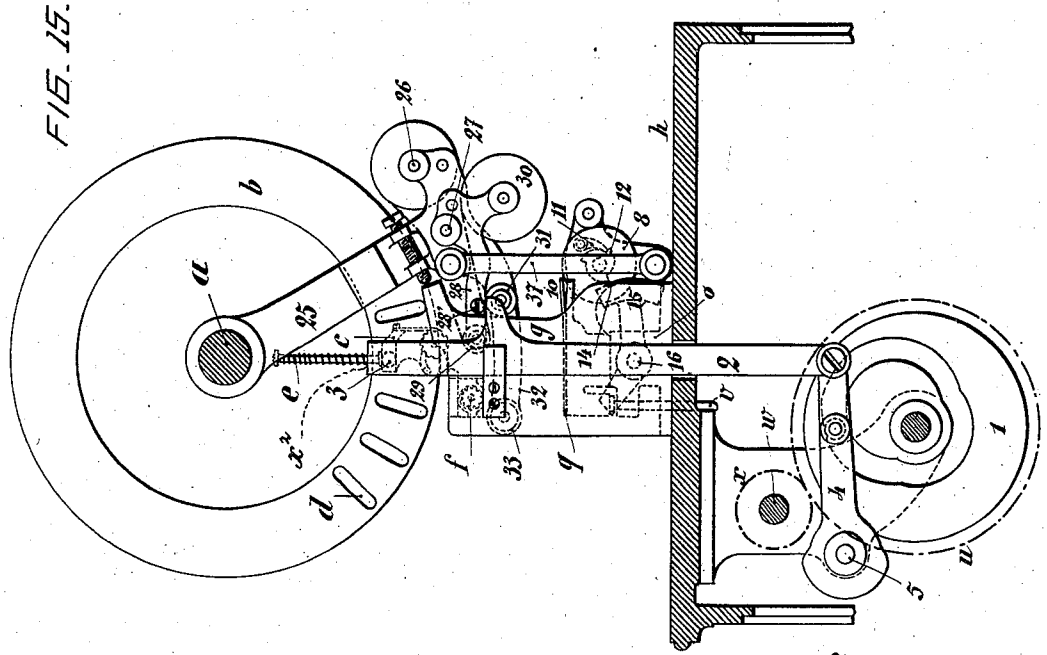


FIG. 15.



Witnesses
R. Aberlin
Geo. Elevens.

Inventor
Emile Médéric Bossuet
By
Brisen & Knauth
his Attorneys

UNITED STATES PATENT OFFICE.

EMILE MÉDÉRIC BOSSUET, OF PARIS, FRANCE.

MACHINE FOR PRINTING, CHECKING, AND ISSUING RAILWAY OR OTHER TICKETS.

SPECIFICATION forming part of Letters Patent No. 617,313, dated January 10, 1899.

Application filed October 9, 1897. Serial No. 654,663. (No model.)

To all whom it may concern:

Be it known that I, EMILE MÉDÉRIC BOSSUET, engineer, of 3 Place de la Madeleine, Paris, France, have invented certain new and useful Improvements in Machines for Printing, Checking, and Issuing Railway or other Tickets; and I do hereby declare that the following is a full, clear, and exact description thereof, sufficient to enable one skilled in the art to make and use the same.

This invention relates to a machine for printing, checking, and issuing railway and other tickets.

By this machine the variable and invariable matter is printed on the ticket simultaneously. At the upper part (which is invariable for each issuing-station, whatever may be the place of destination) is printed the name of the issuing-station, the number of the office of issue, the date, class, and whether a whole, half, or quarter ticket, this part of the ticket being printed by stationary printing mechanism, and upon the lower half of the ticket (which varies for each place of destination) the name of the station, the fare to and number of such station, and a serial number is printed by means of movable printing mechanism (corresponding in number to that of the stations on the line) arranged upon a drum. Every time that a ticket is issued for any station the number-wheels of the printing mechanism corresponding to said station are shifted, so that the serial number always indicates the number of tickets which have been issued at the station. To check the number of tickets issued for each station, there is printed upon a band or check-strip within the apparatus, by means of the movable printing mechanism at each issue of tickets, the name of the destination, station, the price of the ticket, and the serial number. Thus by means of this check-strip the number of tickets for each station may be seen at a glance. The tickets after being printed are cut to the desired length and distributed.

The apparatus comprises as many groups of mechanisms as there are classes of carriages.

An apparatus embodying my invention is illustrated by way of example in the accompanying drawings, wherein—

Figures 1 and 1ª represent vertical sections of the apparatus, and Figs. 2 and 2ª end views of the apparatus, partly in section. The section Fig. 1 is taken on line 1 2 of Fig. 2. Figs. 1 and 1ª and Figs. 2 and 2ª may be fitted together to show the whole apparatus in elevation. Fig. 3 is a sectional plan view of the apparatus with the drums which carry the movable printing mechanisms removed, the section being taken on line 3 3 of Fig. 2. Fig. 4 is a section on line 3 4, Fig. 2. Fig. 5 is a detail view showing one of the movable printing mechanisms in elevation, and Fig. 5ª shows the same in section. Fig. 6 represents a specimen of a single ticket; Fig. 7, a specimen of a return-ticket. Fig. 8 represents a form of the printed check-strip. Figs. 9 to 14ª, inclusive, show detail views of the movable printing mechanism. Fig. 9 is a vertical section of the movable printing mechanism in its highest or idle position. Fig. 10 is a similar view of the same in its lowest or printing position. Fig. 11 is a plan view, and Fig. 12 a longitudinal section, of the movable printing devices, the view being taken from the opposite direction from the direction of view in Fig. 5. Fig. 13 is a detail view of one of the arms *l* of the type-wheels. Figs. 14 and 14ª show detail views of one of the type-wheels. Fig. 15 shows the detailed structure of the check-strip-printing mechanism when the apparatus is at rest. Fig. 16 shows the same mechanism during the printing of the ticket with the check-strip-carrying mechanism swung out of the way, and Fig. 17 shows the position of the same mechanism while the check-strip is being printed. The direction of view of these figures is opposite to that of Fig. 4.

The same letters and numerals of reference denote like parts in all the figures.

The apparatus is constructed as follows:

Upon a shaft *a* (see Figs. 1, 2, 9, 10, 15, 16, and 17) are keyed a number of drums *b*, corresponding to the different classes of carriages, three drums being shown in the drawings for first, second, and third class tickets, respectively. The mechanisms for printing, checking, and issuing the tickets are similar for each class, and I will therefore describe but one—viz., that relating to first-class tickets. Each drum *b* carries on its

periphery movable printing mechanisms *c*, corresponding to each of the stations served by the line, which mechanisms are mounted to slide in radial slots *d* in the two cheeks of the drum and normally retracted by spiral springs *e*. These movable printing mechanisms print upon the lower part of the ticket, Fig. 6, the name of the destination-station, the fare, the number of said station, and a serial number. In Figs. 9 to 14ª, inclusive, I have shown one of these mechanisms on a large scale. Each movable printing mechanism comprises two sets of fixed type, one set c' for printing on the ticket the name of the destination-station, the fare to, and the number of said station, and another set c^2, which is shown clearly in Fig. 12, for printing the name of the destination-station on the check-strip. Each movable printing mechanism also comprises a set of type-wheels c^3 for printing the serial number both upon the ticket and upon the check-strip. I preferably place the fixed type c^2, carrying the name of the destination-station, in line with and at one side of the type-wheels c^3, so that its matter will not be printed upon the ticket, for the reason that the types c' print the same matter upon the ticket. The check-strip being struck up by an impression-roller against the type-wheels and the types c^2, it is advantageous to place the said wheels and types in line.

The upper part of the ticket, which bears the name of the issuing-station, the number of the office of issue, the date, class, and other invariable matter, is printed by means of a stationary printing mechanism *f*, carried by a support *g* upon the table *h*. This stationary printing mechanism has immovable type for permanent matter and type-wheels for changeable matter, such as the date. Enlarged detail views of this mechanism appear in Figs. 9 and 10, wherein f' are fixed type for printing the name of the issuing-station and the number of the said station, f^2 are fixed type for printing the class and kind of ticket, and f^3 the type-wheels for printing the variable matter, such as the date.

Each movable printing mechanism has its own serial number, which should be advanced one unit every time a ticket is printed by that mechanism. For this purpose the spindle *i* of the type-wheels carries a ratchet-wheel *j*, (see Figs. 5ª, 9, 10, 11, and 12,) which is acted upon by a pawl *k*, carried by an arm *l*, loose upon the type-wheel spindle. The arm *l* carries a pin *m*, Figs. 2, 5, 11, and 12, which when the movable printing mechanism moves down strikes a fixed abutment *n*, (see Figs. 1, 9, and 10,) so that at each printing of a ticket the arm *l* rocks and causes pawl *k* to move ratchet *j*, and thereby the units-wheel, as follows: Each time the movable type mechanism swings down the arm *l* oscillates on spindle *i*, and the pawl *k*, carried by said arm, moves ratchet *j* one tooth, together with the units-wheel, which is integral therewith. Each type-wheel carries a spring-pressed pin j^2, recessed therein, which pin when pressed engages in one of a series of recesses j^3 in the face of the adjoining wheel. The part l' of arm *l* (see Fig. 13) is formed with a boss l^2, so that the pin j^2 of the units-wheel will be depressed when pawl *k* acts on the tenth tooth of the ratchet *j*, the units-wheel and tens-wheel being thus connected and turning together one tooth, and when the tens-wheel has turned ten teeth the pin j^2 of said wheel will in its turn be pressed on by the pin j^2 of the units-wheel and thus carry with it the hundreds-wheel, and so on.

The ticket-printing table *q* (see Fig. 1) is carried by a vertical rod *p*, sliding in a guide *o*, and is caused to press the ticket-strip of pasteboard carried on its upper surface against the printing mechanism by the following means: The rod *p* is jointed to a lever *r*, pivoted at *s* and provided with a stud and friction-roller working in the groove of a cam *t*, formed in one face of a gear-wheel *u*, Fig. 1. The printing-table is guided in its vertical movement by a rod *v*, passing through the table *h*. The wheel *u* receives rotary motion from a pinion *x* on the main shaft *w*, which may be turned by hand or from a shaft *y*, (see Fig. 1ª,) driven by a motor. In this case the pinion *x* is loose and is coupled with shaft *w* by a clutch x', as shown in Fig. 2. To each class of ticket corresponds a printing mechanism of which the clutch is operated by a key-lever *z*. The opposite face of gear-wheel *u* carries a cam 1, which through rods 2 (see Figs. 15, 16, and 17) brings down the movable printing mechanisms to the level of the stationary ones by hooks x^2 on rods 2 (see Fig. 17) engaging with gudgeons 3, Figs. 2, 15, 16, and 17, at each side of the movable printing mechanisms, the rods being jointed to a lever 4, pivoted at 5, and having a stud and friction-roller engaging in the groove of cam 1. (See Figs. 4, 15, 16, and 17.)

The cardboard strip from which the tickets are to be cut is wound upon a spindle 6 (see Figs. 1ª and 2ª) between guide-cheeks 7 and passes over a drum 8, upon which it is pressed by a roller 9, and thence over the printing-table, upon which it is retained by a guide 10. The feeding of the strip of cardboard is produced by the rotation of a drum 8, which is provided for this purpose with a pawl 11, (see Fig. 4,) actuated by a three-toothed ratchet 12, formed integral with a toothed wheel 13, Figs. 1 and 4, which gears with a toothed segment 14 on the end of a lever 15, which oscillates on a center 16, carried by the printing-table *q*, the movement of said segment being produced by two lugs 17 18, (see Fig. 1,) carried on bracket *g* in such way that on the ascent of the printing-table the lever 15 will not strike the lower lug 17, but only the upper one 18, whereby said lever is oscillated so as to cause the toothed segment 14 to rotate wheel 13 and bring the next tooth of ratchet 12 into engagement with pawl 11.

On the descent of the printing-table the lever 15 strikes the lower lug 17 and is oscillated in the reverse direction, so that the toothed segment 14 rotates wheel 13, so as to cause ratchet 12 to carry around with it the pawl 11, together with feed-drum 8, which being turned a third of a revolution feeds the strip of cardboard a distance equal to the length of a ticket, after which the ticket is severed from the strip. For this purpose the printing-table q is provided with a bed-cutter 19 (see Fig. 2) and a movable cutter 20, pivoted at 21 and having a tailpiece 22 engaged in a slot 23 (see Fig. 4) in bracket g in such manner that the cutter is opened when the table rises and closed when the table descends. The ticket after being severed from the strip drops through an opening 24.

Upon shaft a is keyed a drum A, bearing upon its periphery the names of the different stations served and corresponding to the movable printing mechanisms mounted on drums b, so that the movable printing mechanism corresponding to the station for which the ticket is to be issued may be brought quickly into position to print along with the stationary printing mechanism. The issue of each ticket is registered on a check-strip (shown in dotted lines in Figs. 15, 16, and 17) by the following mechanism: At either side of each drum b, loose on shaft a, are radial arms 25, (see Figs. 1, 4, 15, 16, and 17,) carrying, first, a spindle 26, on which the check-strip is wound; second, an axis 27, on which a two-armed lever 28 is free to oscillate, which lever carries on one of its ends an impression-roller 29, of india-rubber or other elastic material, over which the check-strip passes and by which the strip is pressed against the movable printing mechanism, the other arm of lever 28 carrying drum 30, upon which the strip is wound after being printed, and, third, an axis 31, on which is mounted a lever 32, which carries an inking-roller 33 at its end. The winding of the check-strip is effected by the action of a pawl 34, (see Fig. 1,) carried by the radius-arm 25 on a ratchet 35, fast on drum 30. 36 is a check-pawl carried by lever 28. The arm 25 is connected to the printing-table q by a connecting-rod 37 in such manner that the whole of the mechanism connected with the check-strip is lifted out of the way when the table q rises to allow of the printing of the tickets.

The following is the action of the apparatus: Supposing it is desired to issue a second-class ticket, the booking-clerk rotates shaft a so as to bring the movable printing mechanism c corresponding to the station for which the ticket is to be issued into operative position. He then presses the key-lever z of the clutch corresponding to second-class tickets, whereupon the entire mechanism is set in motion, as follows: The movable printing mechanism c in question is brought by the hooked rods 2 to the same level as the fixed printing mechanism f. The printing-table then rises, forcing the mechanism for printing the check-strip, by means of rod 37, into the position shown in Fig. 17, the roller 29 being during the said movement free from contact with the printing mechanism, (see Fig. 15,) and presses the strip of cardboard against the type of the fixed and movable printing mechanisms, which print, respectively, upon the upper and lower parts of the ticket the indications specified, and shown in Fig. 6. During its downward movement the pin m of the movable printing mechanism strikes stud n and causes pawl k to advance the ratchet j one tooth, so that the serial number printed will be increased one unit. The upward movement of the printing-table oscillates the lever 15 and brings the pawl 11 into engagement with the next tooth of ratchet 12 and raises the cutter 20. After the impression the printing-table descends and oscillates lever 15 in the opposite direction, thereby causing pawl 11 and ratchet 12 to rotate the drum 8 one-third of a revolution, so as to feed the cardboard strip a distance equal to the length of a ticket, whereupon the cutter 20 severs the ticket, which drops through the opening 24. The printing-table in descending returns the check-strip mechanism to position for printing at the same time that the rods 2 are moved upward by cam 1, allowing the movable printing mechanism c to be returned to its normal position by spring e, the rods 2 during their upward movement striking the studs 28′ and swinging lever 28, so as to cause roller 29 to press the check-strip against its printing mechanism C^2C^3 to print thereon the number of the destination-station, the serial number of the tickets issued thereto, and also the fare.

It will be observed that when the check-strip mechanism is in its printing position the roller on arm 4 occupies the highest portion of the cam 1, (see Fig. 17,) and as the shaft carrying the cam revolves the roller moves into a lower portion of the cam, (see Fig. 15,) thus moving the roller 29 from the printing devices of the drum b, so that when the said drum is rotated there will be no blurring of the strip. There is sufficient lost motion between the parts x^2 and 3 to allow this action to take place.

The fixed and movable printing mechanisms f and c are inked by the inking-roller 33 passing over the same on the backward movement of radius-arm 25. On the lever 28 returning to its original position the ratchet-wheel 35 in meeting the pawl 34, carried by the radius-arm 25, is caused to turn one tooth and feed the check-strip forward after it has been printed on.

The apparatus may be adapted for printing return railway-tickets of the form represented in Fig. 7 by providing the fixed and movable printing mechanisms with two sets of printing characters corresponding to the outward and return halves of the ticket, means being also provided for making the line of separation.

This improved apparatus may be varied in form and modified in its accessory arrangements and the nature and arrangement of the matter printed thereon also be varied to suit the purpose for which the tickets are intended.

Having fully described my said invention and one embodiment thereof, I declare that what I claim is—

1. A machine for printing, checking, and issuing railway and other tickets, consisting essentially in the combination of a stationary printing device for printing the invariable matter at the upper part of the ticket; movable printing devices corresponding in number to that of the stations and capable of being brought into printing relation with the fixed printing device; a printing-table receiving vertical movement and serving to press the cardboard strip against the fixed and movable printing devices; a radius-arm carrying a check-strip and adapted to be brought into position after the ticket has been printed, for causing the printing of the check-strip to be effected by a roller pressing the check-strip against a corresponding part of the movable printing device all as hereinbefore described.

2. A machine for printing, checking, and issuing railway and other tickets, consisting essentially in the combination of a stationary printing device for printing the invariable matter at the upper part of the ticket; movable printing devices corresponding in number to that of the stations and capable of being brought into printing relation with the fixed printing device; a printing-table receiving vertical movement and serving to press the cardboard strip against the fixed and movable printing devices, and feed mechanism for the cardboard strip comprising a lever and toothed segment gearing with a toothed wheel and a ratchet and pawl on a feed-drum coöperating with the lever aforesaid, said lever being mounted on the printing-table and oscillated in opposite directions when the printing-table rises and falls, by contact with fixed abutments, as specified.

3. A machine for printing, checking, and issuing railway and other tickets, consisting essentially in the combination of a stationary printing device for printing the invariable matter at the upper part of the ticket; movable printing devices corresponding in number to that of the stations and capable of being brought into printing relation with the fixed printing device; a printing-table receiving vertical movement and serving to press the cardboard strip against the fixed and movable printing devices and check-strip-printing mechanism consisting of a pair of radius-arms carrying the check-strip spool; a lever carrying a roller which presses the check-strip against the movable printing device and a roller for winding up the strip after it has been printed, said roller being fast with a ratchet engaged by a pawl carried by the radius-arm; and a lever carrying an inking-roller, all substantially as hereinbefore described and illustrated in the drawings for the purpose specified.

The foregoing specification of my machine for printing, checking, and issuing railway and other tickets signed by me this 15th day of September, 1897.

EMILE MÉDÉRIC BOSSUET.

Witnesses:
EDWARD P. MACLEAN,
MAURICE HENRI PIGNET.