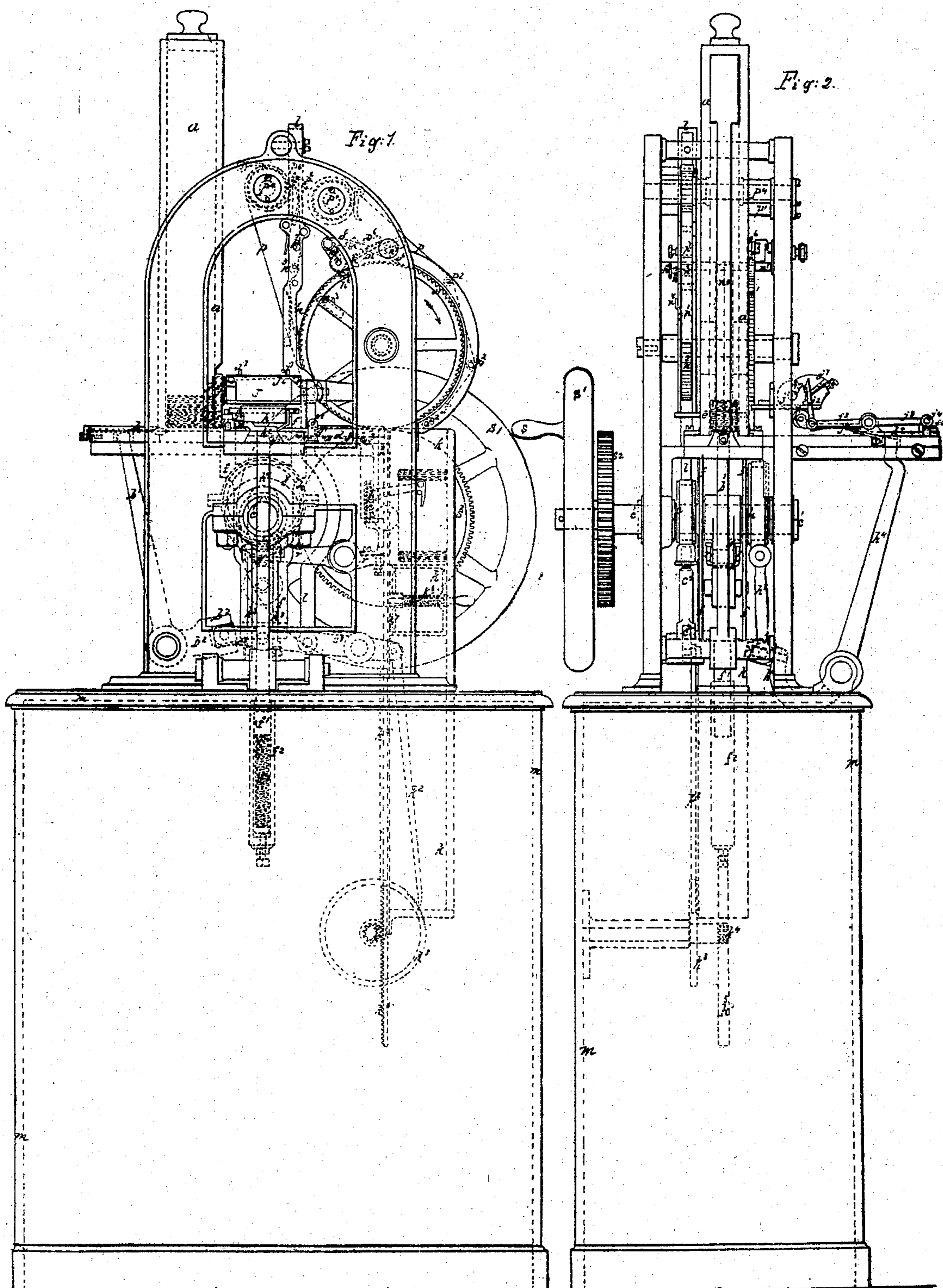


No. 10,947.

PATENTED MAY 23, 1854.

T. EDMONDSON.
CARD AND TICKET PRINTING MACHINE.

2 SHEETS—SHEET 1.



Witness

H. B. Barlow
John Perkins.

Inventor

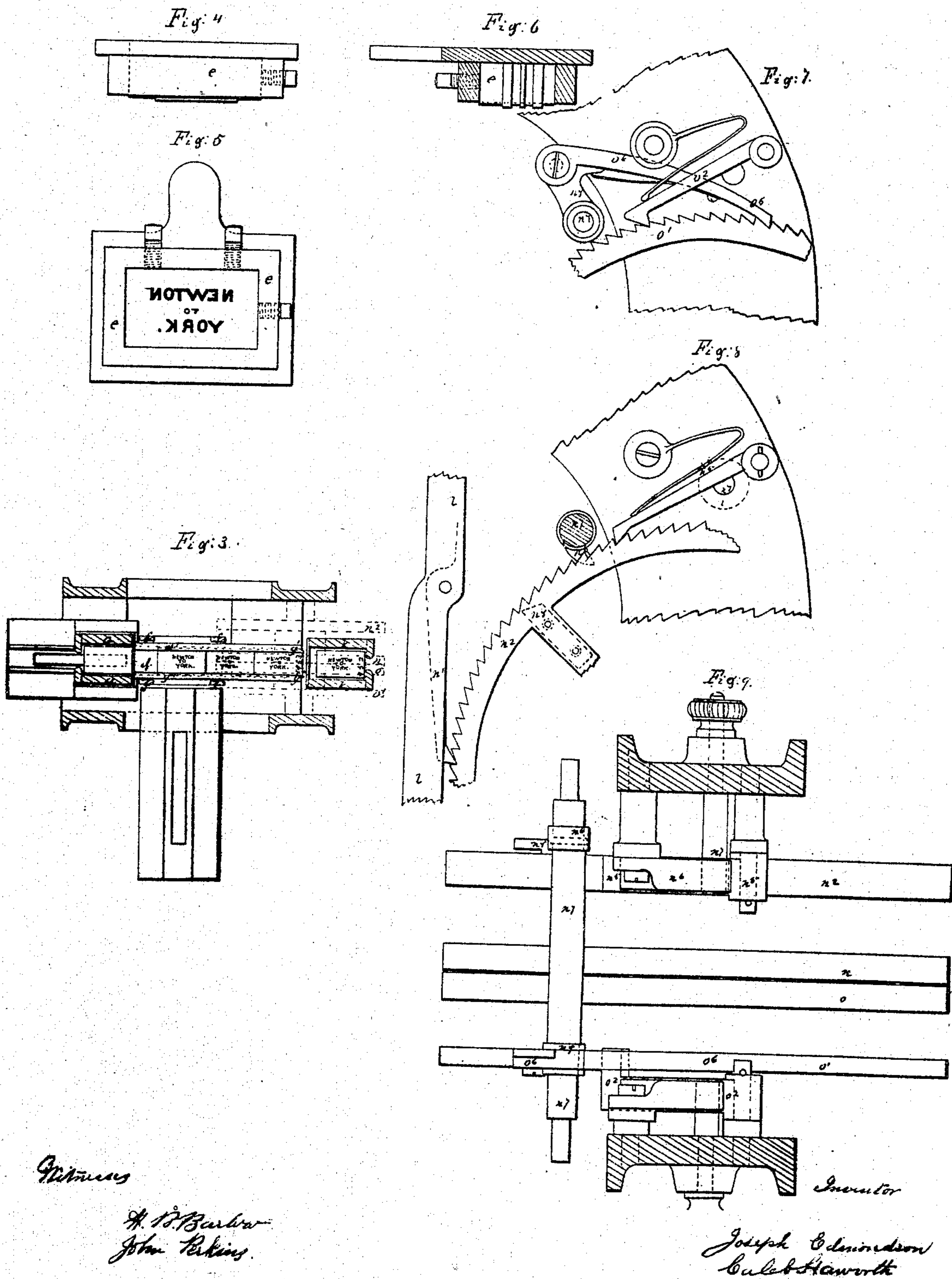
Joseph Edmondson
Calcutt Haworth.

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2 SHEETS—SHEET 2.



UNITED STATES PATENT OFFICE.

JOSEPH EDMONDSON, OF SALFORD, AND CALEB HAWORTH, OF MARSDEN, NEAR BURNLEY, ENGLAND, EXECUTORS OF THOMAS EDMONDSON, DECEASED, LATE OF SALFORD, ENGLAND.

MACHINE FOR PRINTING RAILWAY AND OTHER TICKETS.

Specification of Letters Patent No. 10,947, dated May 23, 1854.

To all whom it may concern:

Be it known that we, JOSEPH EDMONDSON, of Salford, in the county of Lancaster, England, ticket-printer, and CALEB HAWORTH, of Marsden, near Burnley, in the said county, conveyancer, executors and legal representatives of THOMAS EDMONDSON, deceased, late of Salford, in the county of Lancaster, England, printer and inventor of certain improvements in the manufacture of railway and other tickets and in the machinery or apparatus for marking railway and other tickets and in cases for holding tickets, do hereby declare the following to be a full, clear, and exact description of the said invention, reference being had to the annexed drawings, forming part of this specification.

The machinery which forms the subject of this invention, is intended to print on each of a number of tickets, the same names of places of departure and arrival, or to produce on them any other impression, and to number them consecutively. The blank tickets are placed in a feeding tube from which they are fed, one by one, to a horizontal table, over which is placed a type box containing the type, to give the impression which is to be repeated on all the tickets. This type box has a vertical motion rising to allow the inking roller to pass under, and ink the type, and descending to give the impression to the tickets as they are successively deposited below it. After receiving the impression of the type in the box, each ticket is carried onward along the table and brought under rollers, whose peripheries are furnished with type or otherwise prepared to represent consecutive numbers all the way round; and by means of a stamper under it, is brought in contact with the number above it, to receive an impression therefrom. The numbering wheels receive a suitable movement after the numbering of every ticket, to bring the next number in position to give its impression to the next ticket that is presented, and thus the tickets are numbered consecutively. After being numbered, they are fed regularly into a receiving tube, in which their proper numerical order is preserved.

This invention consists, firstly, in certain mechanism for raising and lowering the

type box, by which the names of places or other impressions are repeated upon the several tickets.

It consists, secondly, in certain mechanism, by which the inking roller for inking the type in the type box, and its distributing roller, are operated.

It consists, thirdly, in a certain arrangement and manner of operating a stamper by which the tickets and an inking ribbon are pressed against the numbering rollers.

It consists, fourthly, in certain means by which the tickets are lowered into the receiving tube, after they are severally deposited therein, in a perfectly regular and uniform manner.

It consists, lastly, in the general arrangement and combination of the several parts of the machine, whereby the tickets are caused to be submitted to their several operations in proper succession.

On sheet 1, of the accompanying drawing:—Figure 1, represents a side elevation of the improved machine. Fig. 2, is an elevation of the same, taken from the feeding end of the machine. Fig. 3, is a plan of part of the machine. Fig. 4, is a plan of the type box. Fig. 5, is a plan view of the same. Fig. 6, is a section of the same. On sheet 2, of the drawing, Fig. 7, is a side view of the mechanism for operating the numbering wheel which impresses the hundreds and thousands. Fig. 8, is a side view of the mechanism for operating the numbering wheel, which impresses the units and tens. Fig. 9, is a plan of the numbering wheels.

Similar letters of reference indicate corresponding parts in the several figures.

a, in Figs. 1, 2, and 3, is the feeding tube into which the blank tickets are put; *b*, is the feeding slide the front edge of which is shaped like a knife and *b'*, the lever for giving motion to the slide, *b*,—the lever, *b'*, is moved to and fro by the eccentric, *c*, on the main shaft, *c'*, the link, *c²*, and lever, *c³*, the end of which has a stud fitting a sliding bush in the arm, *b²*, of the lever, *b'*. The stroke of the lever, *b'*, brings the knife edge of the feeding slide, *b*, against the lowest ticket in the tube, *a*, and causes it to advance on to the table, *d*, into the proper position for being printed by the type in the type box, *e*. This type box fits into a swing

frame, f , to which a downward motion is imparted by the cam, g , on the main shaft, c' . The upper part of the swing frame is guided by the table d and the lower part is guided by the shank, f' , passing through a bush, f^2 , fixed in the stand, m . The lower extremity of the shank, f' , is acted upon by a spring f^3 , the lower part of which bears upon an adjustable washer near the bottom of the bush, f^2 . The object of this spring is to elevate the spring frame, f , after it has been depressed by the cam, g . The ink is distributed over the type in the box, e , by the inking roller, h' , this roller is caused to pass under the type box, e , every time it has been raised off the ticket that has been printed by the eccentric, h , on the main shaft, c' . The inking roller, h' , is supported in bearings attached to the slide, h^2 , which is moved in and out by the clip around the eccentric, h , the links, h^3 , and the elbow lever h^4 , the upper end of which fits in the slide, h^2 .

The inking roller, h' , receives the ink from the distributing roller, j , supported in bearings attached to the frame side; at one end of the roller, j , is a ratchet wheel, j' , which is moved partly round at every to and fro motion of the slide, h^2 , by the click, j^2 , hinged to one end of a lever, j^3 , the other end of which has a stud j^4 , which is raised when the slide is out by an incline j^5 . The spring, j^8 , serves to elevate the click, j^2 , when it has been depressed by the incline, j^5 . The ink for supplying the roller, j , is contained in the chamber formed by the plate, j^6 , and the two side plates, j^7 , and the lower end of the plate, j^6 , serves as a doctor to regulate the quantity of ink carried forward by the roller, j . As soon as a ticket has been brought under the type box, e , to be printed, the slide, b , returns into the position shown in Fig. 1, and in advancing again toward the machine, brings forward another blank ticket which pushes against the one previously printed and causes it to advance toward the numbering wheels, n , and o .

The tickets are held down at their edges and prevented from moving too freely by the guide rails, g' , see Fig. 3, which extend from the feeding tube, a , to the receiving tube, k , and they are connected together below the table by stays, g^2 . The springs, g^3 , act on the stays g^2 , and give the requisite pressure to the tickets.

The consecutive numbers are printed on the tickets by the numbering wheels, n , and o , shown by dotted line in Fig. 2 and in red in Fig. 3. The mode of constructing and giving motion to these numbering wheels, is as follows: The machine is constructed to number consecutively from zero up to 9999 and for this purpose it is requisite that the wheel, n , which impresses the units and tens should be provided with figures beginning

at 00, and going up progressively to 99; and the wheel o , which impresses the hundreds and thousands is provided with a blank and with figures beginning at 1 and continuing progressively to 99; these figures are engraved on the circumferences of the wheels n , and o . The wheel, n , see Fig. 1, moves through the hundredth part of a revolution every time that the driving shaft, c' , goes round once and this motion is given by the eccentric, c , which has already been described as imparting the traverse motion to the slide, b , for bringing the tickets from the tube a , on to the tube, d , for being printed. The lever, c^3 , gives an upward and downward motion to the vertical bar l , to which is hinged the click, n' , taking into the units ratchet wheel, n^2 . The click, n' , is held against the teeth of the wheel, n^2 , by a spring attached to the vertical bar, l , and when the click is required to be held out of the teeth of the ratchet wheel the eccentric, n^3 , is turned half round by the handle, n^4 , so as to act on the short end of the click, n' , thereby moving the click beyond the reach of the teeth in the ratchet wheel. The pawl, n^5 , retains the ratchet wheel, n^2 , after it has been advanced a tooth by the click, n' , as above described, the pawl, n^5 , is acted upon by a spring, n^6 , which presses it into the teeth of the ratchet wheel. As it is sometimes necessary to hold the pawl, n^5 , out of action, a small eccentric, n^7 , is placed in such a position that on turning its handle half round, the eccentric lifts the pawl, n^5 , out of the teeth of the ratchet wheel, n^2 , and holds it there until the attendant again moves the handle to bring the pawl into action. A similar arrangement is made on the other side of the machine for disengaging the pawl, o^2 , from the ratchet wheel, o' , which is fast to the numbering wheel, o ; these eccentrics are required when the machine has printed any number of tickets less than the whole number and is then wanted for printing other tickets.

When the machine commences its work the two zeros of the wheel, n , and the blank spaces of the wheel, o , should be brought in a line with the center of the machine and directly over the end of the impresser bar, n^2 , the object of which will be explained hereafter. As soon as the wheel, n , has printed progressively up to number 99, the wheel, o , has to be advanced one hundredth part of a revolution in the direction of the arrow marked on it in Fig. 1, so as to bring the first unit of the wheel, o , opposite the two zeros of the wheel, n , in order to print the number one hundred. This is effected by the click, n^6 , keyed on a fulcrum shaft, n^7 , which click is moved by a catch, n^8 , screwed to the back of the wheel, n ; upon the shaft, n^7 , is a lever, n^9 , to the end of which is jointed the click, o^6 , which takes into the ratchet wheel

o' , thereby causing the shaft n^7 , to move through a small part of a circle, at every entire revolution of the units and tens wheel, n , the shaft, n^7 , is moved back again by a spring fixed to the lever, o^6 , acting on the lever, n^9 .

The ink for giving the impression of the consecutive number on the ticket is contained in the ribbon, p , shown in fig. 1; this ribbon after it has been well saturated with printer's ink is wound on a square bush fitting on the shaft, p' , the end of the ribbon is then carried over the guides, p^2 , under the numbering wheels, n , and, o , and under the guide, p^3 , from whence it is carried round another square bush on the shaft p^4 . The upright bar, l , before referred to serves also to give a rotary motion to the square bushes on which the inking ribbon is wound, the object of this motion is to bring a fresh portion of the ribbon between the ticket and the numbering wheels after every ticket has been numbered. Each of the square bushes is connected to a ratchet wheel, and to the upright bar, l , are hinged the clicks, p^5 , and p^6 ; the click, p^5 , is now supposed in gear with the ratchet wheel on the shaft, p^4 , consequently every down stroke of the bar, l , winds a portion of the inking ribbon on the bush of the shaft, p^4 , and unwinds a portion off the bush on the shaft, p' . As soon as all the ribbon is unwound off the bush on the shaft, p' , the click, p^5 , is moved out of gear with its ratchet wheel and the click, p^6 , is brought into gear; this is effected by the eccentric, p^7 , acting on the lower ends of the clicks and by the spring, p^8 , fitting between them; by this means the upward and downward motion of the bar, l , serves to unwind the ribbon off the full bush and to wind it on the empty one. In order to bring the ticket forcibly against the inking ribbon for the purpose of transferring the number on the numbering wheels on to the ticket, the double lever, r , in Fig. 1, is made to give a slight upward motion to the upright stamper, r^2 , at the same time that the type box, e , is printing the names and other particulars on the ticket; the longer end of the double lever, r , is forked and it is depressed by antifriction rollers fitted to the cam, g , by this means the shorter end of the double lever is elevated, and with it the stamper, r^2 , which is brought down again by a spiral spring, r' . The exact elevation of the stamper, r^2 , can be adjusted by the set screw and lock nut shown by dots in Fig. 1.

As soon as the progressive number has been printed on the ticket the stamper, r^2 , is drawn down by the spring, r' , and the ticket is pushed into the receiving tube, k , which is furnished with a sliding block, k' , for the tickets to drop upon. The position of the sliding block k , must be lowered according to the quantity of tickets in the tube so that

the upper ticket may be kept at or near the same level, the object of this is to prevent the tickets falling irregularly into the tube; the lowering of the block, k' , is effected in a regular and uniform manner by the following mechanism, to the double lever, c^3 , is jointed the long click, k^2 , taking into the teeth of the ratchet wheel, k^3 , fixed on the same shaft as the pinion, k^4 , which gears into the rack, k^5 , the upper end of which is bent at right angles and bears upon the top of the block, k' . The descent of the block, k' , by its own gravity, is prevented by the spring k^6 , which presses against a movable plate k^7 , forming the back of the block. The number of teeth in the ratchet wheel, k^3 , must be such that every vibration of the lever, c^3 , shall move the ratchet wheel one tooth and lower the block, k' , for the thickness of a ticket, but as the tickets vary in thickness, it may sometimes be requisite to change the ratchet wheel k^3 , for one having more or less teeth. The tube, k , is supported by hooks as seen in the drawing and the whole machine is fixed to the stand, m , the height of which is made to suit the person who attends to the machine.

When the requisite number of tickets has been printed the attendant stops the machine, disconnects the tube, k , and empties the tickets collected in it on to a table or stand, and replaces the tube in the machine, taking care that the block, k' , is near the upper end of the tube. The printed tickets are tied up in bundles or otherwise disposed of until they are put into the ticket case when they are required for use. The various parts of the machine are put into operation by steam or other power or by the handle, s , projecting from the fly wheel, s' , to which is fixed a spur wheel s^2 , gearing into a pinion, c^3 , on the main shaft c' . In Figs. 1 and 2, the type box, e , is shown down and the impresser r^2 , is up, or in the positions they assume when the tickets are being printed and numbered; as soon as the type box is raised, the inking roller, h' , is passed under it to give fresh ink to the type and the slide, b , is advanced to bring a fresh ticket under the type box.

Having thus described the nature of the invention of the aforesaid THOMAS EDMONDSON, and the construction and operation of the same, we will proceed to state what we claim, and desire to secure by Letters Patent:

1. We claim, causing the type box, e , to be raised and lowered to receive the ink and print the tickets by placing it in a swing frame, f , receiving motion by any means substantially as described.

2. We claim, operating the inking roller, h' , by attaching it to a slide, h^2 , which receives motion transversely to the movement of the tickets, by means of a lever, h^4 , oper-

ated by an eccentric, h , or other equivalent device upon the main shaft of the machine, substantially as herein set forth.

3. We claim, giving rotary motion to the
5 distributing roller, j , by means of a ratchet wheel, j' , click, j^2 , lever j^3 , stud j^4 , incline j^2 , and spring j^3 , all arranged and operating substantially as set forth.

4. We claim, the stamper or impresser
10 bar, r^2 , working through the table, d , substantially as described, for the purpose of pressing the ticket and the inking ribbon up to the numbering wheels, n , and o .

5. We claim, the sliding block, h' , and
15 the machinery by which it is gradually low-

ered in the tube, h , for the purpose of keeping the tickets even, and in proper numerical order.

6. And we claim, the general arrangement and combination of the several parts of the
20 machine, substantially as, and for the purpose set forth.

JOSEPH EDMONDSON,
CALEB HAWORTH,

Executors of the estate of Thomas Edmondson, deceased.

Witnesses:

H. B. BARLOW,
JOHN PERKINS.