

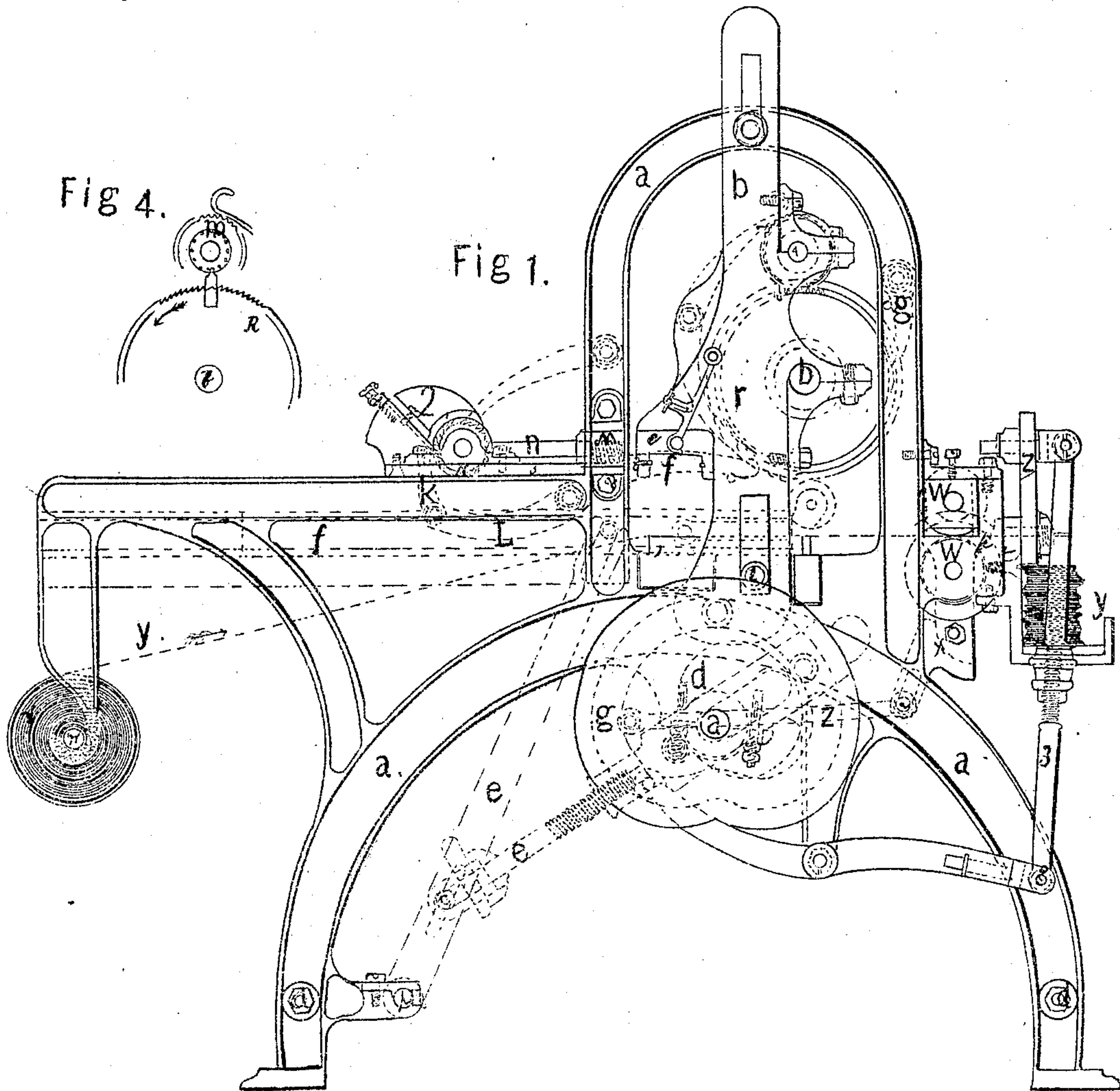
3 Sheets.
Sheet 1.

G. Bailey.

Mach. for Printing Railroad Tickets.

N^o 27510

Patented Mar. 20. 1860



Witnesses:

L.H. Mumma
Author

Inventor:

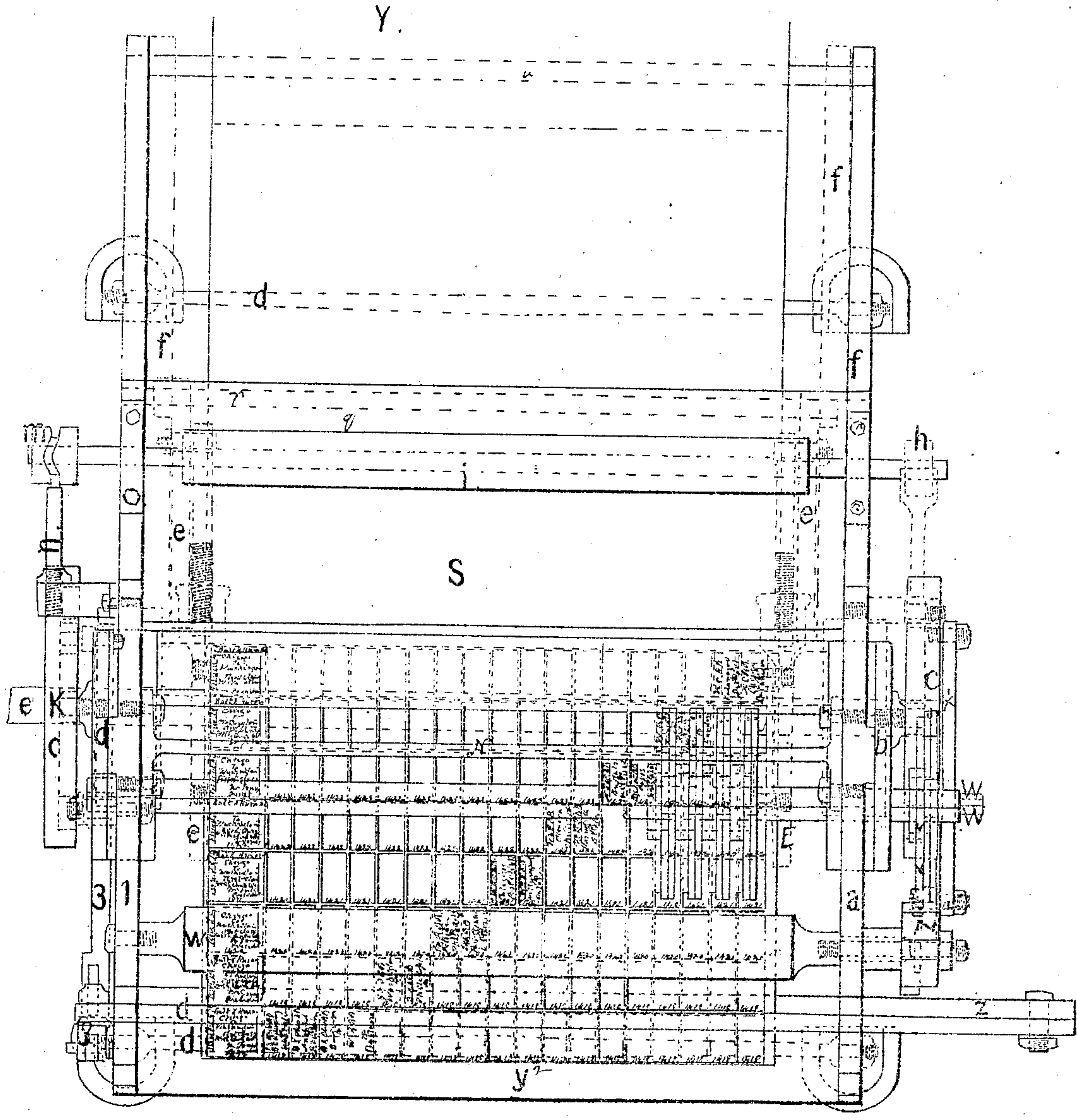
George H. Hardy
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3 Sheets.
Sheet 2.

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Mach. for Printing Railroad Tickets.
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Fig 2.



WITNESSES.

L. M. Rogers
J. H. Smith

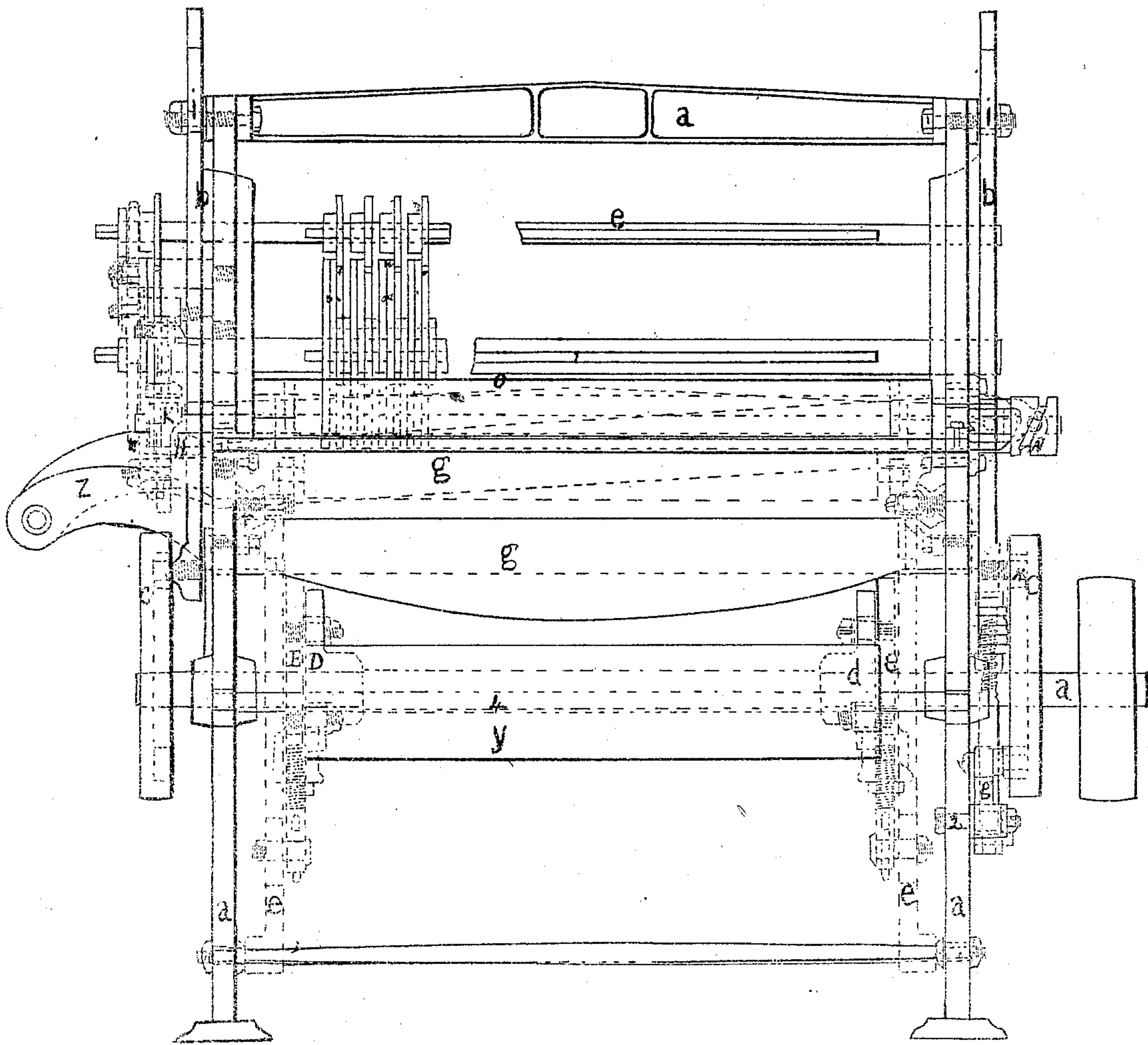
INVENTOR.

Per. H. Bailey
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Sheet 3.

G. Bailey
Mach. for Printing Railroad Tickets.
N^o 27510 *Patented Mar. 20. 1860.*

Fig 3.



Witnesses.

Cheng Yang
1990

Inventor,

George Washington
J. P. Polk

UNITED STATES PATENT OFFICE.

GEORGE BAILEY, OF BUFFALO, NEW YORK.

MACHINE FOR PRINTING RAILROAD-TICKETS.

Specification of Letters Patent No. 27,510, dated March 20, 1860.

To all whom it may concern:

Be it known that I, GEORGE BAILEY, of Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Machinery for Printing Railway-Tickets with Coupons Attached; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being made to the annexed drawings, making a part of this specification, which are fully described herein, and in which similar letters indicate similar parts throughout the figures.

My improvement has for its object the printing and numbering in succession of what are known as "through tickets" that is, tickets intended to secure the conveyance of passengers from one part of the country to another part in such direction as will necessitate the passage over different lines of railroads, or other means of travel, without requiring the purchase of a new ticket for each transfer of said passenger from one line to another. These tickets, as is well known, have what are termed coupons, or checks, attached to them, indicating the different roads or companies the traveler must pass over. The order of these coupons is such that they may be detached in proper succession by each different company as the traveler progresses.

The principal feature of my improvement consists in printing the ticket with its checks attached, and numbering the same successively, at one operation.

The advantages of my said improvement, over the old mode of printing, wherein the ticket and its checks have first to be printed and afterward numbered, are, firstly, the important feature of affording greater security against fraud and counterfeiting, and secondly, in reducing the cost of the work. As by this system perfect accuracy of numbering is insured, every road would be entitled to collect its respective share of the fare from the company selling the principal ticket, even if they had not all the checks as vouchers, because the last number held would control the rest. For instance, if a road should have collected, say the first five checks of any series of tickets, and then have collected as the next in order, number eight, they would still be entitled to the fare of passengers holding tickets Nos. six and seven although their checks had never come to hand, because it could be proved that such

tickets must have existed, and if the originals could not be produced must therefore have been sold.

The tickets are printed upon a paper fillet which is fed from a roll at one end of the machine, passing under the types and numbering mechanism, and off at the opposite end, where they are cut off finished, and fall in a pile in the exact order of their numbers. The machine also partially cross-cuts the checks from each other, so that they may be readily detached by tearing.

In the process of printing and numbering, the ticket and its coupons are first printed, and at the next feed of paper are numbered, the printing of both the text of the tickets and the numbers however, being done at one impression, but as the matter of the ticket is constant, while the number types are required to be altered at every impression, it is necessary that the paper shall be submitted twice to the printing press, although the printing of one ticket and the numbering of another is done at one pressure. A ticket with its checks is first printed, and then, being fed along a certain distance, at the next movement of the press the ticket is brought under the numbering part and numbered, while at the same time a second ticket and its checks is also printed.

In Figure I an end view of the press is shown, and at Y is represented an end view of the roll of paper on which tickets are to be printed, Y' shows the course of the paper as it passes through the machine.

At (g) is an end view of the bed which receives the pressure of the ticket types. This is a strong bar lying across the press and is supported upon the side frames. At (h) is seen a second bed, narrower than the first, and this receives the pressure of the numbering types. Both beds are stationary, as it is the types that move up and down.—The fillet of paper is shown as lying on these beds. The press carries the numbering wheels and the chase containing the form of type for the ticket matter.

This press consists of two strong movable pieces, one on each side frame, of the machine, and outside of the same, and as seen at B. These pieces stand vertically, and are held to the side frames A by bolts (i) which pass through slots in B, as shown. These pieces B are caused to move up and down in unison by the revolution of two heart-shaped cams G placed outside of the

frame A but connected by one cross shaft (a) which is also the main shaft from which all the other parts are driven.

The chase is shown at (e), and at (f) is the space to contain the types for the tickets, face downward. The chase is divided into compartments, as seen at (t) in the top view Fig. II. A large compartment at one end contains the types for the ticket itself, and the smaller ones hold the types for the checks or coupons. The chase when in place in the machine is attached by its ends to the two press posts B by the hooks (j), as shown, which keep it up under the bracket or recess formed to take it in, and in this position is suspended directly over the bed (g). The numbering types are also suspended to the pieces B. These types are arranged upon the circumferences of wheels which are secured upon one cross shaft (b), which has its bearings in the press B. There are two type wheels to the ticket, and a like number to each check. Each pair constitutes a set, and is capable of printing to four places of figures. On each wheel are one hundred type figures, "00" to "99" inclusive, and thus the number on any ticket is in fact the representative of the actual number of tickets printed prior to that one, for instance, as the tickets are issued in regular series, if the lowest number on hand is "1,000" it tells that one thousand tickets have been issued—viz "00", and Nos. "1" to "999" inclusive. One of these type wheels advances a number at each impression until it has made one revolution, when the other type wheel will advance one figure and thus add one place of numerals, or two, as the case may be. These wheels are so set that all shall move in the same precise order of numbers, so that the ticket and each check will be certain to be numbered alike. The lower edges of the type wheels are on the same level with the faces of the types in the chase and are thus inked by the same inking roller. This is shown at G', and is supported in a frame F, which slides in grooves in the main frame, so as to be taken from the ink distributing roller H to the type. This roller is propelled by an eccentric D on the shaft (a) through the rod E acting on the forked levers E' which engage with the frame F, as shown.

The type wheels are shown at Q and Q². Those which move at each impression of a ticket in order to advance number by number, are marked Q, and are so secured to the shaft (b) as to stand over the proper place on the ticket to give the number, as well as to be alike in the position of their numbers. These are all turned by the shaft (b). The other type wheels Q² which stand along side of Q are loose upon the shaft (b). They are kept in position as to maintaining the uniformity of their numbers with each

other by means of a set of pinion wheels V secured to a shaft (c), which shaft is hung upon the press frame B within the other wheels. These pinions gear into toothed wheels V' attached to the type wheels Q². Thus the type wheels Q will revolve with their shaft (b), while Q² will remain stationary until moved by the pinions V. On the outside of the frame A and upon the shaft (b) there is a ratchet wheel R, having as many teeth as there are types on a type wheel. A fixed pawl S attached to the side frame plays into this so that at each upward movement of B the ratchet wheel is advanced one notch, thus advancing the type wheel one number. On the ratchet wheel there is a single tooth or cog (r') which projects beyond the edge, and there is also a pinion or trundle wheel (m) into which the cog (r') gears at each revolution of R thereby turning the shaft (c) the distance of one tooth, by which means the second of each set of type wheels Q² is moved. At W and W' is shown the feeding apparatus for advancing the fillet of paper, properly, and which feeding device is also the perforator for cross-cutting the coupon.

W is a roller supported in bearings in the side frames; at certain distances, (viz, at the spaces which separate one check from the next); it has toothed rings secured, as at (Z'), the points of which are sufficiently sharp to penetrate the paper.

W' is a roller suspended over W and so as to press upon the teeth of the perforators. This pressure can be adjusted by set-screws pressing down the journal box (l). The paper fillet V' lies upon the teeth and is pressed thereon by the upper roller W'. Thus, after each impression the lower roller W is revolved a sufficient distance to carry the paper along for a space equal to the width of a ticket, the puncturing points insuring a very accurate feed while partially dividing the paper lengthwise between the rows of checks. The feed roller is made to turn by means of a vibrating arm X which is so attached to the projecting end of said roller as to grip it when moving in the direction the paper is to be fed, and release its hold when returning, being a common mechanical device. A connecting rod X' leads from the arm to the side of the cam-plate where it is primed on sufficiently far from the center shaft to act as a crank, with a throw long enough to give the right feed by the extent of vibrations.

At Z and Z' is seen a pair of shears, Z, being the movable half and Z' the stationary. Between these the paper passes in such order that at each motion of the shear a ticket with its checks is separated, and falls in a pile, as seen at Y², in the ticket box. At (g) is the ink fountain and within it is shown the ink distributing roller H;

this is turned by a lever I, and pawl K at each rise and fall of B and operates in other respects substantially as is common to printing machines.

5 The operation is as follows. The roll of paper being put in the hanger upon its rod (u), its end is led off and passed through the machine and between the feed rollers W and W'. The shaft (b) is next turned until the character "00" on all the type wheels 10 Q is downward, so as to be the first number printed. The pawl (n), Figs. I and IV, is to be raised from (m), and then turning the shaft (c) will cause the second of the set of 15 type wheels Q² to revolve until the blank space thereon stands opposite to the "00" of the wheel Q. The types for the ticket being set up, as well as for the checks, and placed in due order within the chase (e), 20 and the other requisites for printing supplied as usual, the work of printing is begun by slowly turning the main shaft at first until the first ticket is printed. The inking roller G' is thus sent across the face of the 25 type and the number wheels, inking the same, then, returning to H, the cam G begins to draw down the press-frames B until the types in (f) and on the type wheels come down upon the paper, which, resting 30 upon the beds (g) and (h), the ticket with its checks is printed, the number wheels giving also at the same time an impression upon the blank paper in advance. The press B now begins to rise, but in order to 35 prevent the type wheel Q from turning until it has numbered the ticket and checks the pawl S is to be, for that time lifted out of the ratched wheel. The arm X is now moved by its connecting rod X' and turning 40 the roller W causes a feed of paper to take place to a distance sufficient to bring the tickets and checks along so as to be directly under the type wheel and at the proper space in said tickets for numbers to be 45 printed therefrom. The ink roller G' having again advanced to ink the types and number wheels as before, the full speed may now be given. The press descending prints another ticket and its checks, while that 50 previously printed and its checks are all numbered with the character "00." The press rising again, the pawl S is now suffered to act upon the ratchet wheel and thus advance the shaft so as to turn forward 55 the type number "01" on Q, the wheels Q² remaining stationary. This printing and numbering then goes on regularly, the numbering being in the successive order of the figures. The shears Z cut the tickets apart 60 as they pass off the machine. When one hundred tickets have been printed (r') Fig. IV has come around and engaged the trundle (m), thus moving the wheel Q² one

space forward, which will be to number 1, and which will then stand opposite to "00," 65 on wheel Q, and will therefore print a ticket numbered "100." The number 1 on Q² will remain stationary until one hundred tickets have been printed and then number 2 will be advanced to stand opposite to "00" on 70 the other wheel, and so on until Q² has made one revolution, when the series would begin again.

The chase (e) is made long enough to take in type for the greatest number of 75 checks likely to be required for any route. The press therefore is capable of printing tickets with from one check or coupon attached, to the maximum number, since 80 whenever any ticket is printed which requires a less number of checks than the chase is capable of printing the overplus will be left blank. The paper fillets need then only be of the width necessary to receive the impression of that precise num- 85 ber, therefore fillets of different widths will be introduced, according to circumstances. These fillets however must be so wound upon the roller (a) as to have one edge always lead off against the gage plate at that end 90 of the chase which contains the heading or ticket.

I claim—

1. The printing of coupon tickets for rail-roads and other lines of travel, and num- 95 bering said tickets with their coupons in successive order or series, by one operation of the press, by means of an arrangement of a chase to hold the types for the ticket and its coupons, and sets of numbering 100 wheels corresponding to the ticket and coupons upon one press, operating so as to imprint the ticket upon a fillet of paper properly fed along to receive said printing, 105 as set forth.

2. I also claim the mechanism for feeding the paper under the types in such manner as to perform likewise the operation of perforating or partially separating the coupons from each other and from the ticket 110 so as to be readily torn apart at the place of such perforations, consisting of two rollers or cylinders, one of which is plain and the other armed with a series of rings having teeth upon them which press upon or 115 pass into the other or plain roller, so that the points of the rings will cut through or perforate the paper and thus by the act of perforation secure the necessary grip to feed the paper, as described. 120

In testimony whereof I have hereunto subscribed my name.

GEO. BAILEY.

Witnesses:

J. P. PIRSSON,
S. H. MAYNARD.