G. J. HILL.

NUMBERING AND PAGING MACHINE.

No. 48,488. Patented June 27, 1865.

Fig: 2.

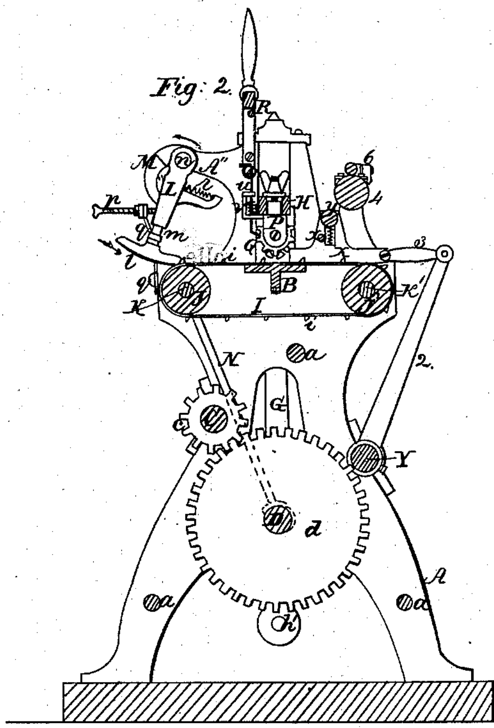


Fig: 1.

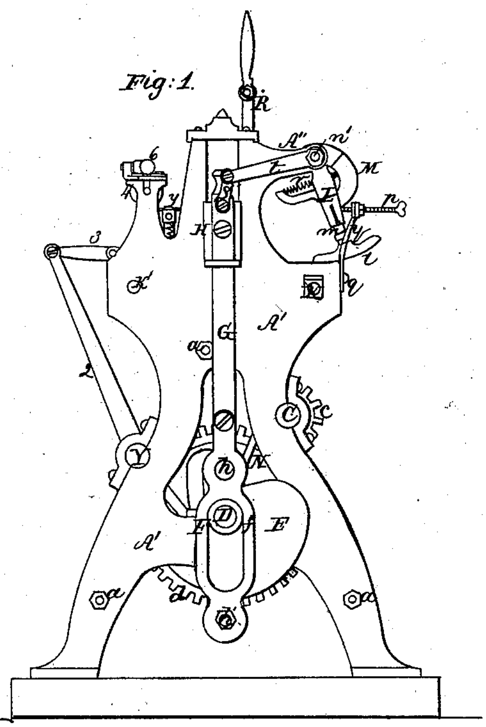


Fig: 4.

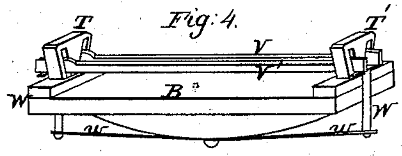


Fig: 3.

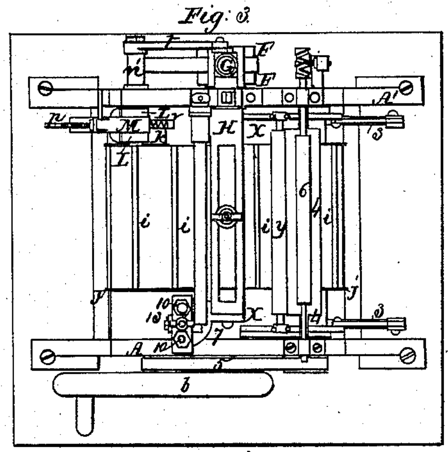


Fig: 6.

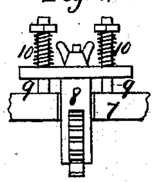
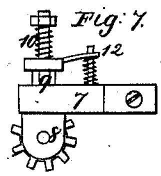


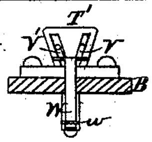
Fig: 7.



Witnesses

Wm Albert Steel.
W. Kellarey

Fig: 5.



Inventor;

G. J. Hill
by his Attorney
Henry Howson

UNITED STATES PATENT OFFICE.

GEORGE J. HILL, OF BUFFALO, NEW YORK, ASSIGNOR TO HIMSELF AND H. G. LEISENRING, OF PHILADELPHIA, PENNSYLVANIA.

NUMBERING AND PAGING MACHINE.

Specification forming part of Letters Patent No. **48,488**, dated June 27, 1865.

To all whom it may concern.

Be it known that I, GEORGE J. HILL, of Buffalo, Erie county, State of New York, have invented an Improvement in Numbering and Paging Machines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists of certain mechanism, fully described hereinafter, for numbering railroad-tickets and other cards and for paging books.

In order to enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 is a side view of my improved numbering and paging machine; Fig. 2, a vertical section of the same; Fig. 3, a plan view; Fig. 4, a perspective view of part of the machine; Fig. 5, a transverse section of Fig. 4, and Figs. 6 and 7 views of the paging device.

Similar letters refer to similar parts throughout the several views.

A and A′ are the two side frames of the machine, which are connected together by the cross-stays *a a a* and by the plate B.

In suitable bearings formed on the two frames turns the driving-shaft C, which is furnished with a handled fly-wheel, *b*, and, if required, with suitable pulleys for receiving a driving-belt, the shaft being furnished with a pinion, *c*, the teeth of which gear into those of a wheel, *d*, on the shaft D, which turns in the opposite side frames, A and A′.

To a portion of the shaft D which projects beyond the side frame, A′, is secured a cam, E, situated between two plates, F F, into the openings in which project the hubs *f* of the cam, the edge of the latter being arranged to bear against an upper roller on the pin *h* as well as on a lower roller hung to the pin *h′*. (See Fig. 1.)

A vertical rod, G, is attached to or forms a part of one of the plates, the upper end of the rod being connected to one end of a cross-head, H, which is arranged to slide in vertical guides formed in the side frame, A′. This slot has a longitudinal opening, as seen in Fig. 3, and is arranged to carry the numbering-wheels, which will be more especially alluded to hereinafter.

I, Fig. 2, is an endless apron, of canvas or other suitable material, and is provided with a series of transverse slats, *i*, arranged at equal distances apart from each other, the apron passing round a roller, J, secured to the shaft K, and round a similar roller, J′, secured to the shaft K′, both shafts being arranged to turn in the opposite side frames of the machine.

The shaft K is provided with a plain pulley, *k*, Fig. 3, which is surrounded by a band of gum-elastic or other like material. A segment, *l*, bears against the banded surface of the pulley under the circumstances described hereinafter, this segment having a stem, *m*, which projects into an orifice in the arm L, there being at the end of the orifice a spiral spring, against which the said stem of the segment bears. The arm L is hung loosely to a pin, *n*, secured to a spindle, *n′*, which is arranged to turn in a projection, A″, and to which is secured the bent arm M, the end of the latter being arranged to bear against the edge of the arm L under the circumstances described hereinafter.

A set-screw, *p*, passing through a plate, *q*, secured to the frame of the machine, serves to limit the rearward movement of the arm L and its segment, as well as to regulate the distance of the movement, and a spiral spring, *r*, connected at one end to the bent arm M and at the other to the arm L, tends to maintain the two arms in contact with each other. A guided rod, N, extends from the shaft K to the shaft D, the ends of the rod being provided with bent plates adapted to the shafts.

The shaft D is provided with a cam or projection, which at the proper time during the movement of the machine forces the rod N upward and slightly elevates that end of the shaft K to which the banded pulley *k* is secured, the bearings being so constructed and arranged as to permit this elevation of the shaft, which causes the banded pulley to bear hard against the segment *l*. A vibrating motion is imparted to the arm L from the vertical rod G, to which is connected a link, *s*, the latter being jointed to an arm, *t*, which is secured to the end of the spindle *n′*.

Into the longitudinal opening of the cross-head H are fitted the stems of a number of hangers, P, the stem of each hanger being provided with a suitable nut for securing the said hanger to the cross-head after adjustment. Each hang-

er carries the numbering-wheel Q, and each wheel has a given number of projecting types for imprinting the numerals.

The desired movement is imparted to the numbering-wheels by rods *u*, one of which is arranged to slide vertically in a bracket, *v*, attached to each hanger, the rods during the ascent of the cross-head striking against the under edge of a rod, R, and the bent lower ends of the rods, engaging into the teeth of a ratchet-wheel adjacent to the numbering-wheels, impart the desired motion to the latter. During the descent of the cross-head spiral springs serve to restore the rods *u* to their former position preparatory to being again brought to act on the ratchet-wheels. The manner in which the numbering-wheels and their types are arranged and their relative position changed to produce the desired consecutive numbers is similar to that in other numbering-machines.

To the cross-bar B, which is situated immediately below the numbering-wheels, and which may be termed the "bed" of the machine, are secured the two standards T and T′, as best observed on reference to the perspective view, Fig. 4, and in each standard are two elongated openings inclined downward toward each other and arranged for the reception of the two bars V and V′, which are supported by plates on the ends of the rods W W, one of which is secured to each end of a spring, *u*, attached to the under side of the bed or cross-bar B, the tendency of this spring being to elevate the bars.

The inking-frame consists of the two plates X X, connected together by a cross-stay, *x*, Fig. 2, and carrying the inking-roller *y*, the bearings of which are arranged to slide in vertical guides formed in the said plates X X, and to rest on spiral or other springs, which tend to elevate the roller. An intermittent reciprocating motion is imparted to this inking-frame by a cam-groove in a disk-wheel on the shaft D, a pin on an arm secured to the shaft Y projecting into this groove, and this shaft having two other arms, 2, which are connected to the inking-frame by two links, 3 3.

The roller *y* obtains its ink from a roller, 4, which turns in the opposite frames of the machine, and to which a rotary motion is imparted from the driving-shaft D by means of a belt, the ink being evenly distributed over the surface of the roller 4 by another roller, 6, to which a horizontal reciprocating motion is imparted by appliances commonly used in printing-presses.

To the outer end of the cross-head H is secured a bracket, 7, in which the hanger 8, Figs. 6 and 7, is arranged to slide vertically, the hanger being guided by bolts 9 9, acted on by spiral springs 10, which surround the bolts.

The hangers carry appropriate numbering-wheels, 11, which are actuated by a rod, 12, attached to the hanger and engaging with its lower end into the teeth of a ratchet-wheel adjacent to the numbering-wheel, the said rod 12, when the cross-head rises, coming in contact with the lower edge of the bar B, which is so hung to the frame of the machine that its edge can be turned away from the range of the whole of the rods *u u*, as well as from that of the rod 12.

Operation: As the cross-head H commences its upward movement the rod N is elevated by the cam or projection on the driving-shaft D, and consequently the banded pulley *k* is brought to bear against the segment *l*. Simultaneously with this elevation of the banded pulley a movement in the direction of the arrow is imparted to the spindle *n*, causing the bent arm M to move the arm L, and with it the segment, in the direction of its arrow, thereby moving the endless apron I a given distance over the face of the bed or cross-piece B. It should be here understood that the attendant stands or is seated in front of the machine, and that it is his duty to place on the apron, between the slats *i*, the strip of paper or cardboard to be numbered, each movement of the apron bringing one of these strips directly under the numbering-wheels. When the cross-head has reached the limit of its upward movement it remains stationary, owing to the peculiar shape of the cam E, while the driving-shaft revolves and while the inking-frame is pushed forward by the devices described, and the roller *y* imparts some of its ink to the lowest projecting types of the numbering-wheels. The moment the cross-head begins to descend the inking-frame is moved rapidly out of the way and the banded pulley *k* falls clear of the segment *l*, the latter moving back in a direction contrary to that pointed out by the arrow. As the cross-head continues to descend, the apron remaining stationary, those projecting types of the numbering-wheels which have to impart impressions to the paper on the apron pass between the inclined bars *v* and *v′*, and the latter will be depressed by the numbering-wheels and approach each other and close on the sides of the projecting types, the whole of which are thereby brought in line and in a proper position for imparting the desired impression. The importance of these bars *v* and *v′* will be better understood when it is borne in mind that if some of the numbering-wheels may not be turned to the desired extent and others beyond the desired point, and that consequently the types are not in a favorable position to impart a perfect impression, and that however out of line the types, may be when the cross-head begins to descend, the bars will move them to their proper position. After the desired figures have been imprinted on the paper a repetition of the above-described movements will take place.

The extent of the movement of the apron can be regulated at pleasure by the adjusting-screw *p*, Fig. 2, for this screw will retard the backward movement of the arm L at the desired point, permitting the bent arm M to continue its backward movement.

The device illustrated in Figs. 6 and 7, and described above as being secured to the cross-head H, near the outer end of the same, is brought

into play when the machine is required to number the pages of books. The book is placed in a proper position beneath the numbering-wheel 11, on a table, 13, Fig. 3, attached to the frame of the machine. The springs 10, against which the hanger 8 bears, are sufficiently rigid to insure a proper impression from the types of the numbering-wheel, and yet sufficiently elastic to accommodate themselves to the thickness of the book the pages of which have to be numbered.

I do not claim, of itself, the endless apron I with its slats *i*; but

I claim as my invention and desire to secure by Letters Patent—

1. The reciprocating cross-head H and its system of numbering-wheels, in combination with the endless apron, the whole being arranged for joint action as set forth, for the purpose specified.

2. The bars V and V′, adapted to inclined openings in the standards or guide-pieces T and T′, and supported by a spring or springs, all substantially as set forth, for the purpose specified.

3. The hanger 8, with its numbering-wheels, and the spring 10, or their equivalents, for rendering the said numbering-wheels self-accommodating to the thickness of the book the pages of which have to be numbered.

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

GEO. J. HILL.

Witnesses:
HENRY HOWSON,
JOHN WHITE.