G. A. Ball.

Paper Ruling Mach.

No. 61,382. Patented Jan. 22, 1867.

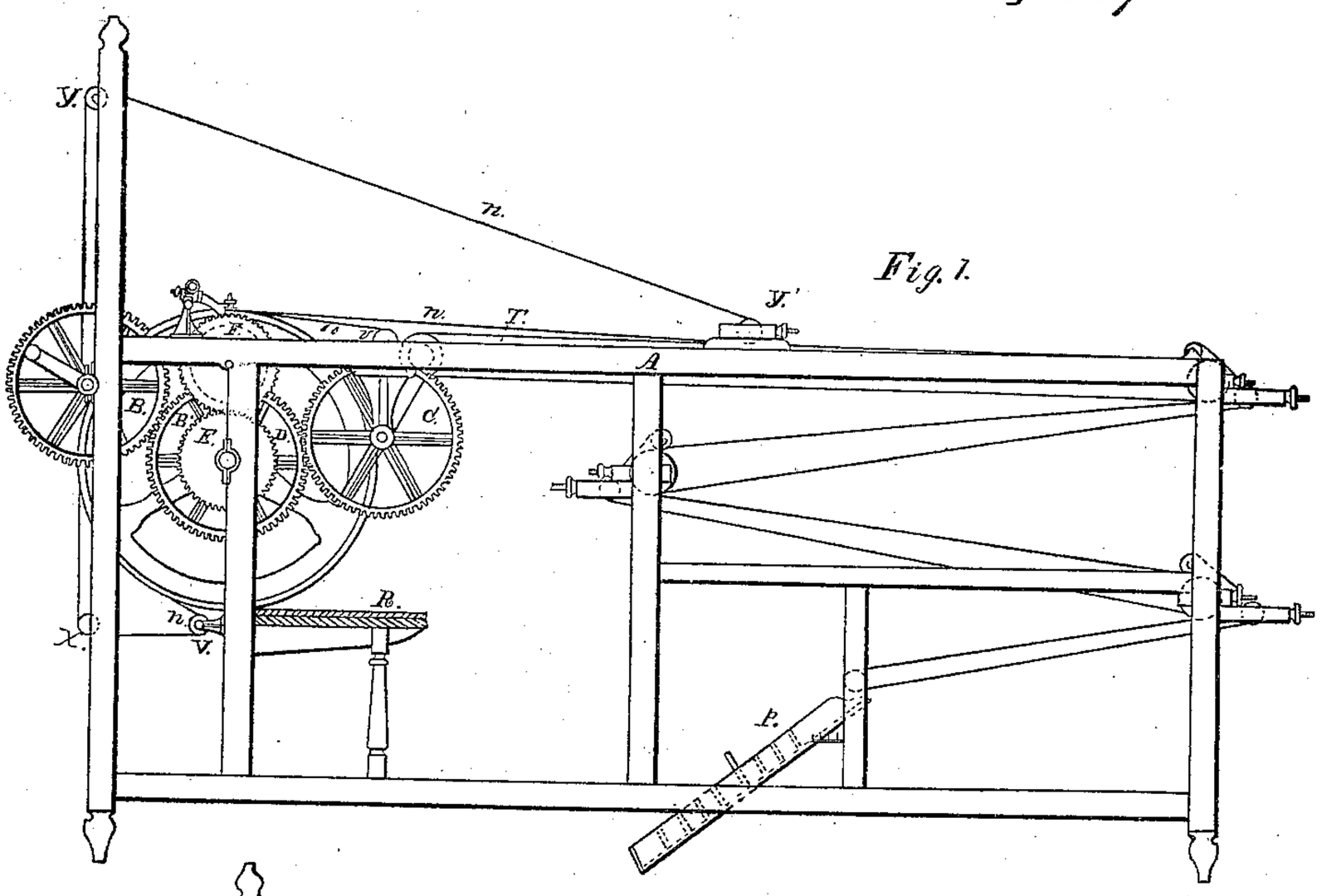


Fig. 1.

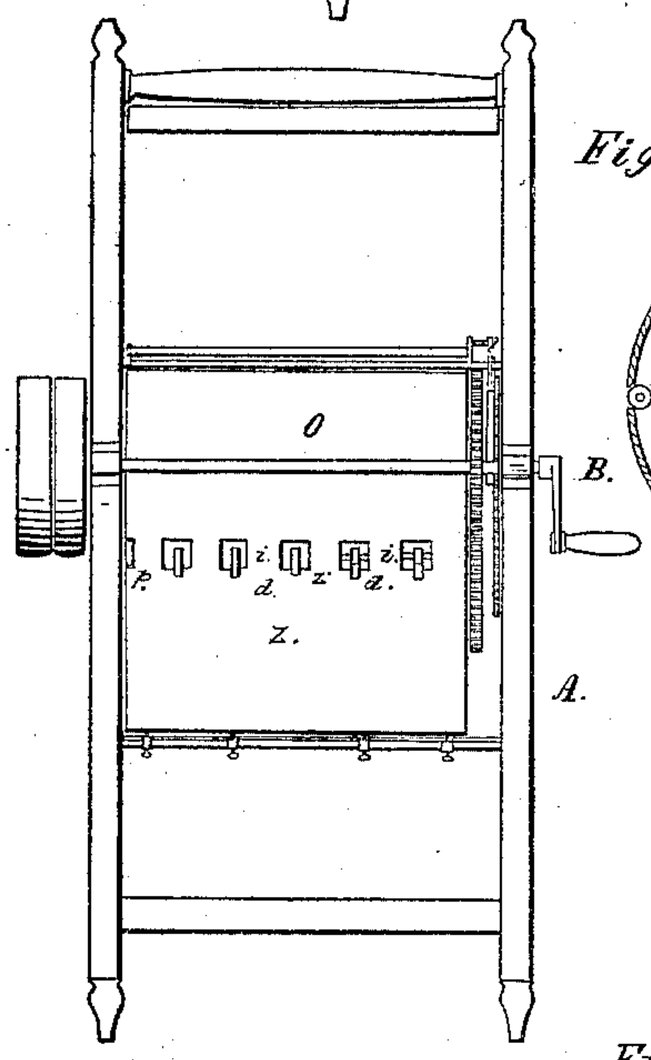


Fig. 2.

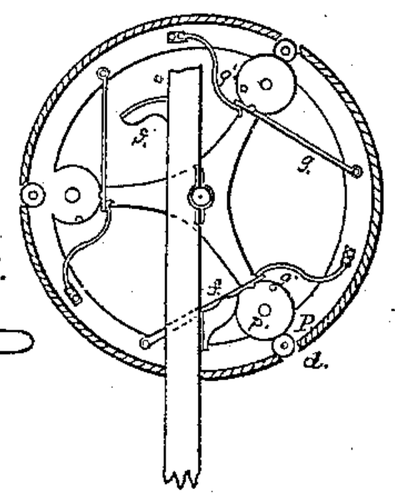


Fig. 3.

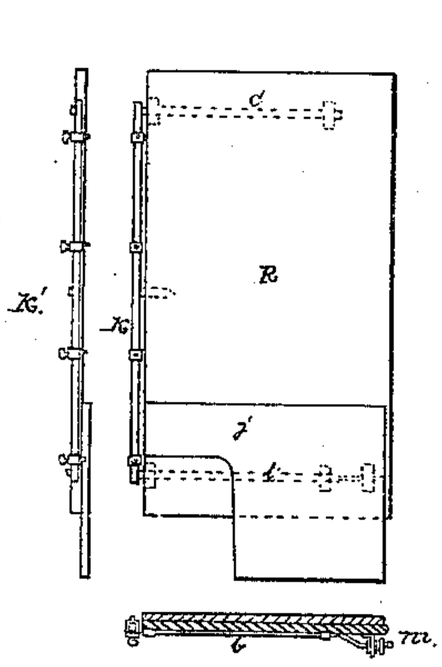


Fig. 6.

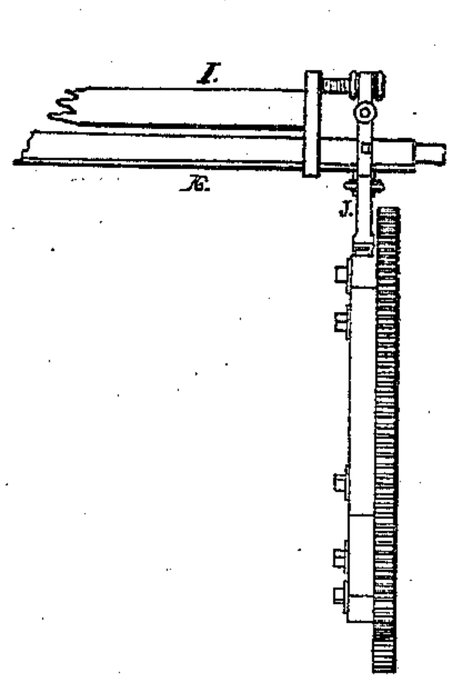


Fig. 5.

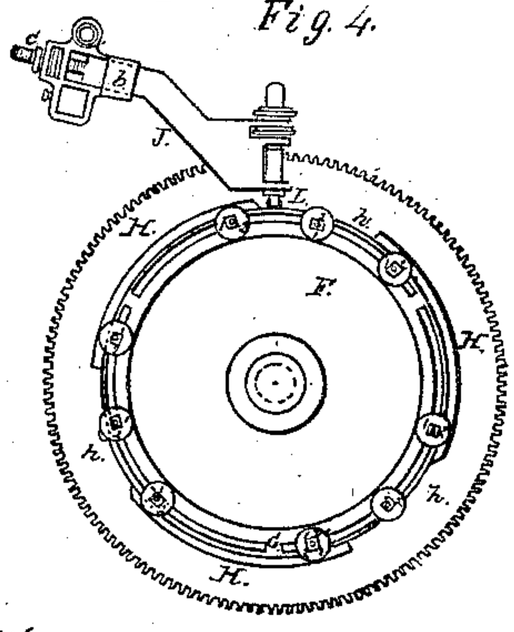
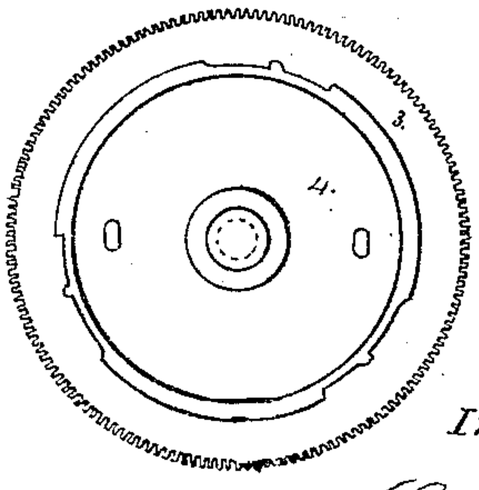


Fig. 4.

Fig. 7.



Witnesses.

C. Cohey

Chas. Smith

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GEORGE A. BALL, OF SAN FRANCISCO, CALIFORNIA.

Letters Patent No. 61,382, *dated January* 22, 1867.

IMPROVEMENT IN PAPER-RULING MACHINES.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, GEORGE AUGUSTUS BALL, of the city and county of San Francisco, State of California, have invented certain new and useful Improvements in "Ruling Machines" for ruling paper; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains, to make and use my said invention or improvements without further invention or experiment.

The principle of my invention consists in the whole of the striking process necessary in ruling paper, with the operation of laying on not requiring the aid of hand-labor to perform the work as heretofore. Referring to the drawings—

Figure 1 represents a side elevation of my machine.

Figure 2, an end view showing the feed-cylinder.

Figure 3, head of cylinder, showing wheels and pinion, nut-rods and springs, also portions of frame with cams attached.

Figures 4 and 5, front and edge view of cam-wheel, arm of pen-bar, and pen-bar.

Figure 6, feed-board and gaugers.

Figure 7, substitute for wheel F.

A A are the standards and body frames of the machine; B and B′ are the driving-shaft and pinion, receiving motion from steam or any motive agent, and communicating the same to the wheel C, which takes into and gears with the shaft D. Keyed on to the cylinder shaft is a pinion, E, with spur F, whose inner dial has a raised slotted ring, G, cut in the wheel with three long and three short curves or segments H H H, *h h h*, which are held in place by washers 1, 1 and bolts 2, 2, and are movable in the slots, thus forming an eccentric communicating the up-and-down motion to the pen bar. The pen bar I is constructed in the usual way, with groove and screws for holding the clamp of pens. An arm, J, is affixed to the bar K, also to the pen bar, which is adjustable by a set-screw and check-nut regulating the position of the pen-bar from right to left. The arm J has a friction-roller, L, resting upon the ring G and segments H, *h*, etc.; this arm is raised and lowered, the upper portion being adjustable in a rest or band, *b*, and moved by set-screws *c c*, which regulate the action of the pen bar when in motion, (shown in figs. 4 and 5.) The surface of the cylinder O is divided into sections, between which is placed a rod, *d′*, to which nippers *d d* are attached, (movable to the right and left, and adjustable by set-screws,) and operated by spur P on wheel P′ with segments of cogs. A pin, E, is placed on the dial of said wheel, which opens and shuts the nippers by moving through cams *f f*, the nippers being held firmly down upon the cylinder by bar and spring *g* and *g′*, figs. 2 and 3. The blocks *i i i* on the cylinder are inserted between the sections and between the nippers to preserve the circular form of the surface of said cylinder, and are movable to the right and left according to the nippers on the rod, shown in figs. 2 and 3.

By this arrangement of machines for ruling paper, which I have failed to discover in any other machine, a device similar in character to be used for the same purpose, the sheet is placed upon the feed-board R against the gauge *j*, (upon which the ream is laid,) the head of the sheet being pressed against the pins upon the bar K′, which is adjustable by means of the rods *l l* and lock-nuts *m m*, and is grasped by the nippers underneath the cylinder and carried under the pen-bar, where it is released by the nippers, being held in place upon the cylinder by the strings *n n n*, and borne from the cylinder by the strings *o o o* to the cloth T, and thence to the box *p* in the usual way. The strings *o o o* pass around the cylinder and over the grooved roller U. The strings *n n n* pass around the rollers V X Y and grooved roller Y′, being moved by pressure against the cylinder between the roller V and grooved roller which is set in movable journals to regulate the tension of the strings. In order to arrive at the same results for ruling, by a different method, the wheel O′ and cam-plate 3 may be substituted for the wheel F and slotted ring G, by simply changing the wheels, (shown in fig. 7.) To prevent blotting, I place India-rubber cloth, *z*, around the cylinder, covered with blotting paper. The edge of each section of the cylinder, where the nipples strike, is chamfered, and strips of gutta percha *z′* placed in the depressions upon which the nippers fall, for the purpose of holding the paper more tightly than could be done between two hard substances.

It is confidently believed that by the use of my improved ruling machine full five times more labor can be performed in a given time than by the ordinary machines now in use.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The division of the cylinder into any number of sections, with nippers working between each section, and the introducing of movable blocks *i i i* between each nipper, to preserve the circular form of the cylinder, in combination with the nippers, substantially as described.

2. Covering the cylinder with India-rubber cloth *z*, and placing upon the edge of each section, where the nippers strike, a strip of gutta-percha, *z'*, as described and for the purposes set forth.

3. The gauge *j*, rods *l l*, and lock-nuts *m m*, affixed to the feed-board, in combination with feed-board R.

In witness whereof I have hereunto set my hand and seal this 17th day of April, 1866.

GEO. A. BALL. [L. S.]

Witnesses:

C. C. OLNEY,

C. W. M. SMITH.