F. L. BURNS.

COUNTING ALARM APPARATUS.

No. 184,954. Patented Dec. 5, 1876.

Fig. 1.

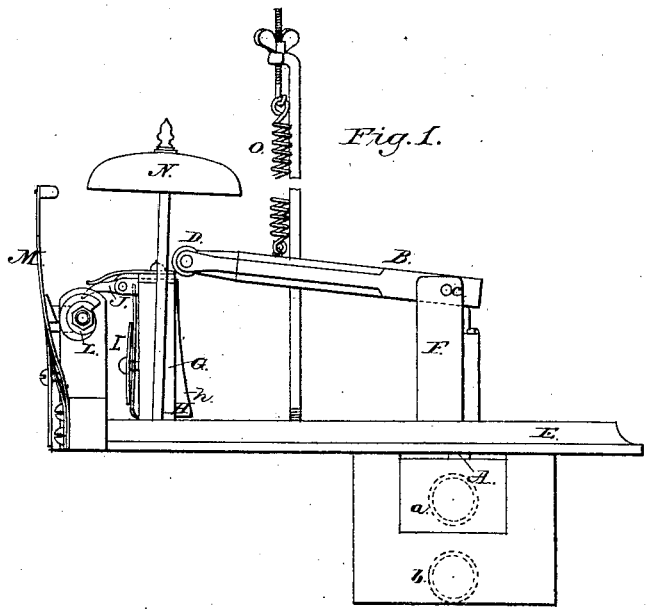


Fig. 2.

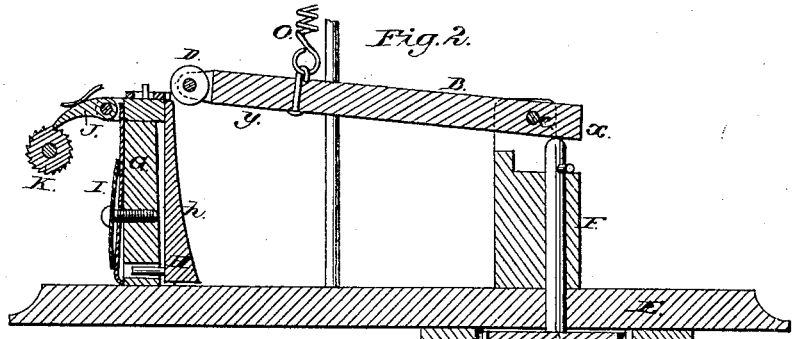


Fig. 4.

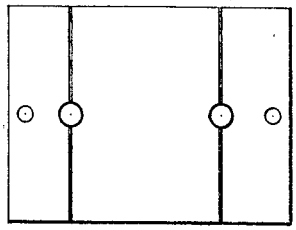
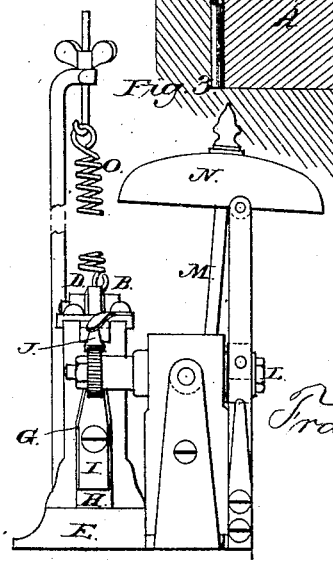


Fig. 3.



Attest:

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UNITED STATES PATENT OFFICE.

FRANCISCO L. BURNS, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF HIS RIGHT TO SPAULDING & CO., OF SAME PLACE.

IMPROVEMENT IN COUNTING ALARM APPARATUS.

Specification forming part of Letters Patent No. **184,954**, dated December 5, 1876; application filed June 2, 1876.

To all whom it may concern:

Be it known that I, FRANCISCO L. BURNS, of the city of Boston, in the State of Massachusetts, have invented a new and useful Improvement in Alarm-Bell Apparatus; and that the following is a full, clear, and sufficient description thereof, when taken in connection with the drawings thereof hereto attached, to enable others skilled in the art to construct and use the same.

Like letters in the figures indicate like parts.

Figure 1 is a side view of my machine. Fig. 2 is a vertical section. Fig. 3 is an end view. Fig. 4 is a top view of the journal-boxes, showing the guides on which box A′ works.

My invention consists in a new and improved machine for counting the sheets of paper, or other similar material, as they pass between rolls *a* and *b*, or between a roll and a plane surface, and which also gives periodical notice of the number of sheets so passed.

My machine is placed over the journal-box of a roller under which the sheets of pasteboard or other material pass, and which journal-box is elevated slightly at, and during the passage of, each sheet of pasteboard, sinking slightly during the interval between the passage of the sheets. My machine is rigidly fixed over the journal-box, for example, of the machine in which it is to be used, and the vertical rod A rests upon one of the journal-boxes of the rollers. (Shown at A′ in Fig. 2.) When a sheet of pasteboard passes between the two rollers shown at *a b* of Fig. 1, they will be slightly separated, the journal-box A′ will be raised, and the rod A made to raise one end of a horizontal lever, B, bearing against it at a point just back of the pivot C, upon which the lever B turns. The lever B is made so that it shall have arms of unequal lengths, as at *x*, which is the short arm, and at *y*, which is the long arm. When the rod A raises the end of the short arm *x* of the lever through a small space, the end of the long arm will be depressed through a large space. At the end of the long arm of this lever a roller, D, is fixed. The pivot of the lever is supported in lugs, which project upward from the bed-plate E of the machine, as seen at F. Between the lugs G, and guided by them, is a piece of metal, (seen at H,) and which is arranged so that it may slide horizontally backward and forward, being pressed backward by the spring I. One of the vertical sides of the radius-block H, as at *h*, is curved, as shown in the drawing, the proper curvature being obtained by striking a circle on the piece of metal H, when pressed forward against the spring, the center of the circle being at the pivot of the lever B. At the top of the piece of metal H is arranged a pawl, J, hung on a pin, and pressed upon from the top by a spring. A ratchet-wheel, K, is fixed, as shown in the drawing, so that it may be turned, and it is provided with any desired number of teeth—twenty or more.

To prevent the too free turning of the ratchet-wheel K, a spring is arranged to bear upon its shaft, and it should exert considerable friction thereon. At the opposite end of the shaft of the wheel K is a cam, L, (seen in the drawings,) which is revolved by the wheel K, and which cam is spiral, and has a sudden fall radially from its largest diameter to its smallest. A spring, M, fixed at its bottom, has upon it a projection which bears against the spiral surface of the cam L, being moved from the center of the cam as it revolves, and suddenly, when the radial depression of the cam is reached, springing inward toward the center of the cam. The upper part of the spring M has attached to it a hammer, intended to strike upon the bell N, which is attached to the machine in the proper position and by some suitable means. A spring, as at O, continually exerts its force, pulling the long arm *y* of the lever B upward. This spring may, however, be arranged in some more convenient manner, and must elevate the long arm of the lever, or depress the short arm, keeping the rod A pressed firmly downward upon the box of the roller *a* of the strawboard or other machine.

If it is desired to keep an account of the number of sheets of paper or other material that pass through the machine in any given time, I attach one of the many well-known registering devices to the outer end of the

spindle, upon which the cam and ratchet wheel are attached, or in any other suitable manner.

The operation of the machine is as follows: The rod A is pushed up more or less, as the case may be, depending upon the thickness of paper or pasteboard passing under the roller. This elevates the short arm *x* of the lever B, and depresses the end of the longer arm *y*, carrying the roller D. This roller D is arranged in relation to the radius-piece H, so that when the former is pressed downward, even slightly, the radius-piece H will be pushed forward against the springs I, carrying the pawl J against the teeth of the ratchet-wheel K, which will, therefore, be revolved through a space equal to one tooth, the cam L being, of course, simultaneously moved. If the piece of pasteboard passing between the rollers *a b* is very thin, it will, nevertheless, so depress the roller D as to cause the pawl to act and move the ratchet-wheel one tooth, and if the pasteboard is very thick the roller will likewise, through the radius-piece, act upon the ratchet-wheel to the same extent only—the greater thickness of the pasteboard causing the lever to fall lower, but not to register more than one tooth of the ratchet-wheel, the radius-block H being pressed forward during the upward and downward passage of the roller D. Were this not so, two teeth of the ratchet-wheel would be moved at each vibration of the lever.

If the ratchet-wheel K has twenty teeth, then twenty vibrations of the lever will cause the bell to ring, and this will be the case if the paper or pasteboard is thick, causing large vibrations, or thin, causing very slight vibrations. An elevation of a few thousandths of an inch of the rod A will depress the end of the long arm of the lever sufficiently to cause the roller D to press forward the radius-piece, which is all that is necessary to move the ratchet-wheel one tooth. The roller D will remain in contact with the surface of the radius-piece H during the passage of each sheet, be it long or short, thick or thin.

What I claim as my invention is—

1. The rod A, the lever B, the radius-piece H, with its pawl J, ratchet K, and cam L, combined and operating substantially as described.

2. In a machine which feeds paper or other material between rolls, or between a roll and a flat surface, the combination of a roll, which is free to move upward and downward with a rod actuated by the upward and downward movement of the roll, which operates a lever at its shorter end, which lever is retracted by a spring, with a ratchet and pawl, arranged to move the ratchet but one tooth at each vibration of the lever.

3. In a registering apparatus, substantially as described, a rod to receive and transmit an upward and downward motion, a lever having a long and a short arm, and a bell.

FRANCISCO L. BURNS.

Witnesses:

GEO. H. TEWKSBURY,

EMERY M. LOW.