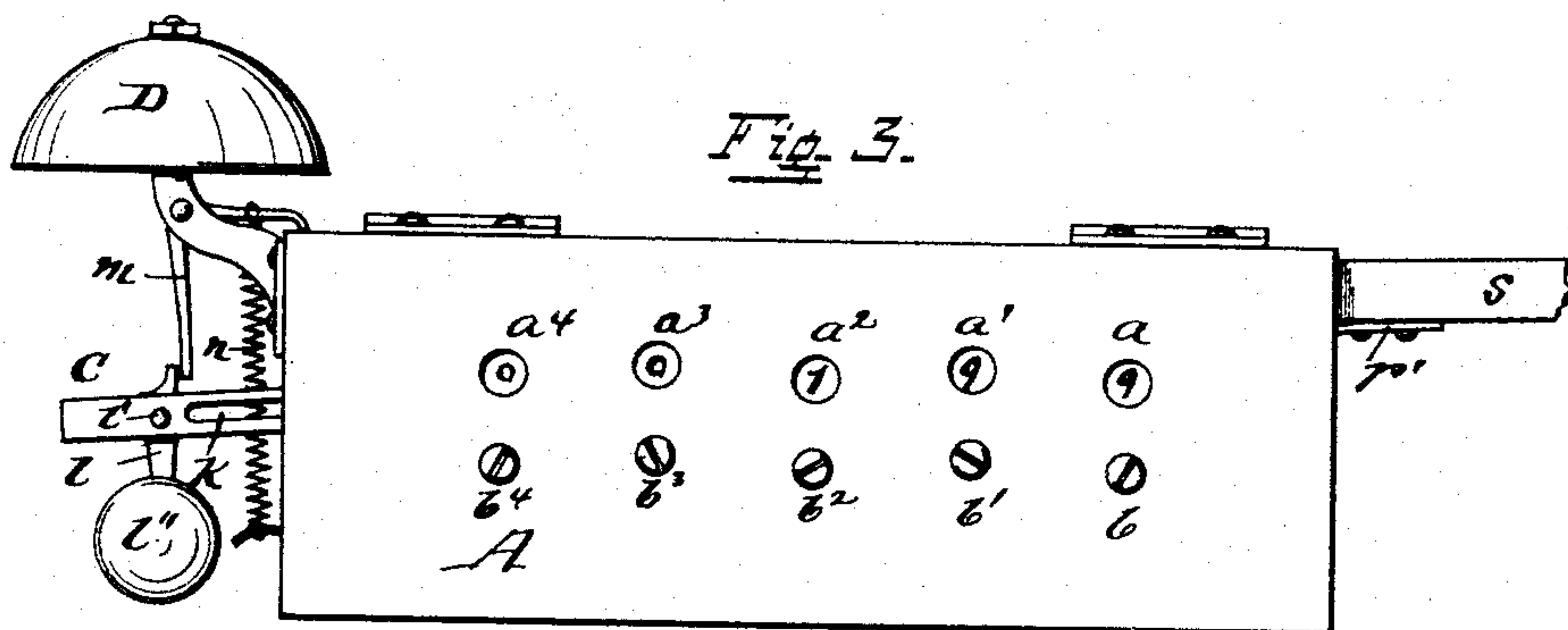
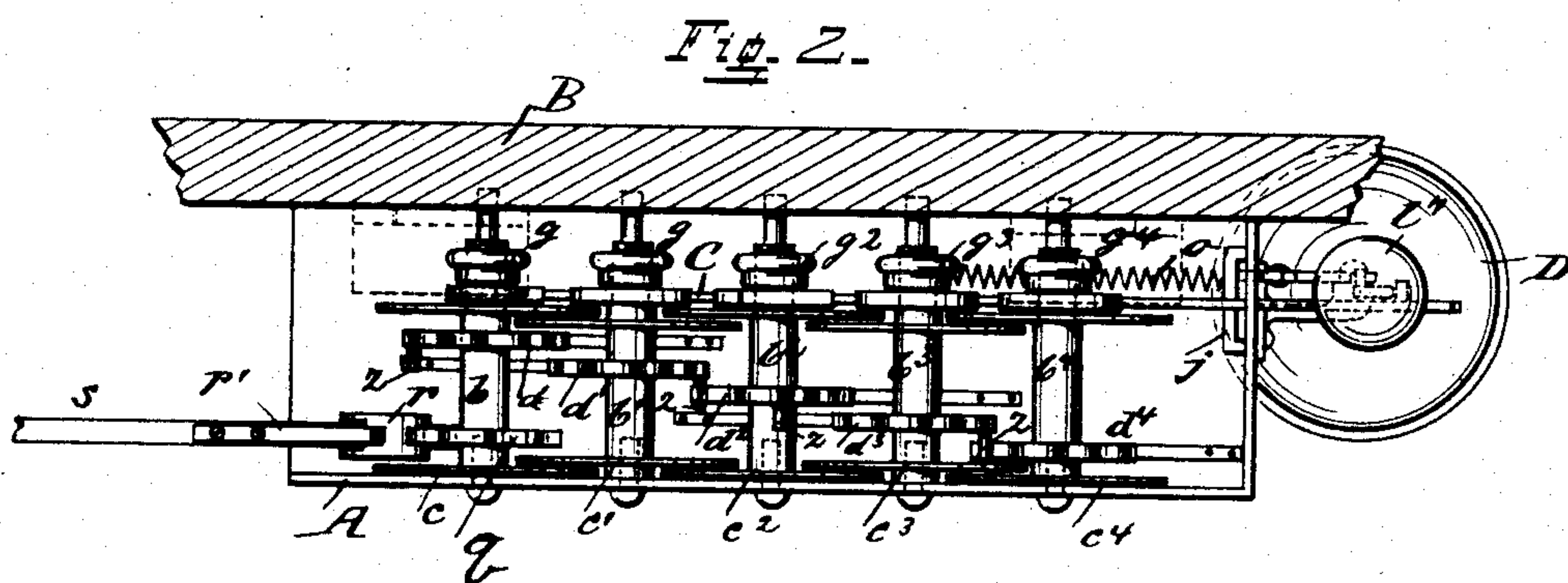
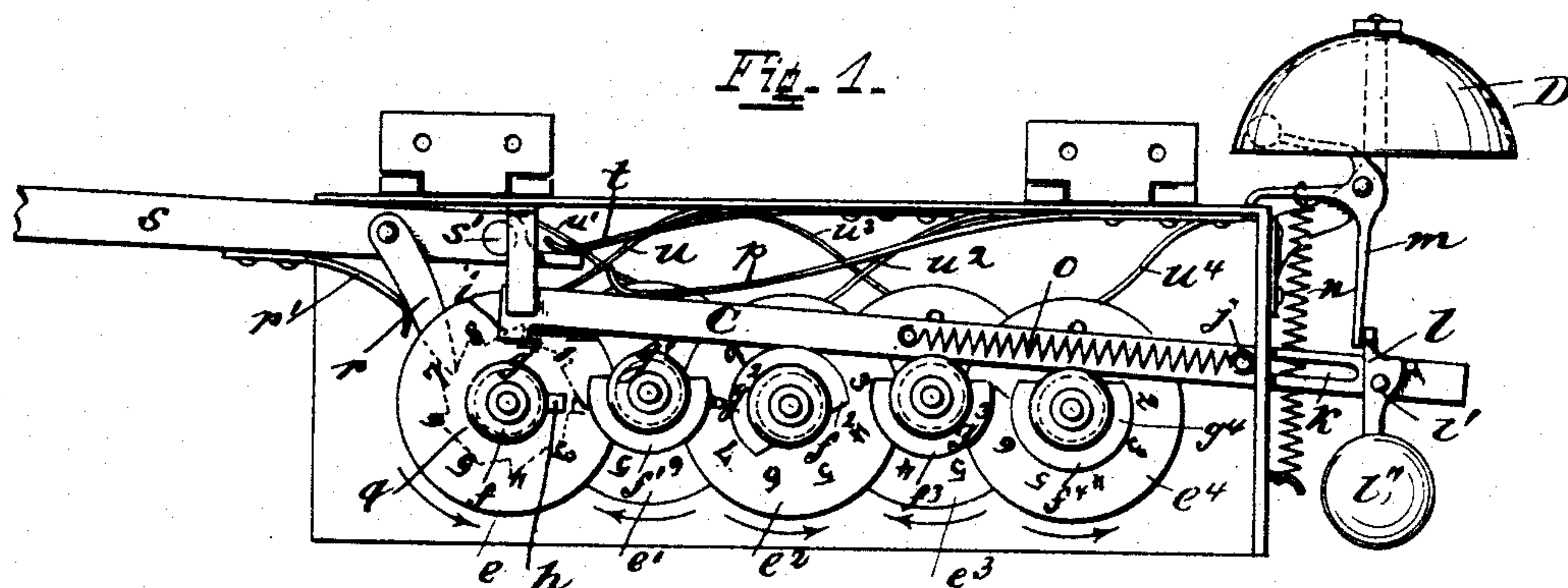


(No Model.)

F. R. PHILLIPS.
COUNTING APPARATUS.

No. 414,325.

Patented Nov. 5, 1889.



Witnesses
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UNITED STATES PATENT OFFICE.

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COUNTING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 414,325, dated November 5, 1889.

Application filed January 18, 1889. Serial No. 296,750. (No model.)

To all whom it may concern:

Be it known that I, FRANK. R. PHILLIPS, a citizen of the United States, residing at Covington, in the county of Kenton and State of Kentucky, have invented a new and useful Improvement in Counting Apparatus, of which the following is a specification.

My invention relates to counting apparatus adapted to be attached to machinery to register the number of particular operations or series of operations of such machinery; and it consists in a novel counting apparatus having an automatic signaling attachment to indicate a certain predetermined number of operations of the machinery.

Referring to the drawings, Figure 1 is a rear elevation of one of my improved counting devices, the rear plate being removed. Fig. 2 is a bottom view of the same. Fig. 3 is a front elevation.

A represents one side or the front of a counting apparatus; B, the opposite side or rear.

$a, a', a^2, a^3,$ and a^4 are observation-holes in the side A.

$b, b', b^2, b^3,$ and b^4 represent shafts bearing in the side pieces A and B. These shafts have mounted thereon dials $c, c', c^2, c^3,$ and c^4 , numbered round the face with the figures 0 to 9 in such manner that as the dial is turned these figures may be seen through the observation-holes; also, wheels d, d', d^2, d^3 and d^4 , with cogs on their periphery, so that when the wheel is turned one cog the next figure is made to appear at the observation-hole; also, dials $e, e', e^2, e^3,$ and e^4 , numbered similarly to dials $c, c', c^2, c^3,$ and c^4 , and cams $f, f', f^2, f^3,$ and f^4 , adjustable with reference to the dials $e, e', e^2, e^3,$ and e^4 .

$g, g', g^2, g^3,$ and g^4 are thumb-screws for adjusting the cams. Each cog-wheel has a projection z thereon adapted to engage at each revolution of the wheel a cog in the next succeeding wheel and to move it so that the next figure on the dial on the same shaft may be seen through the corresponding observation-hole. The cam f has on it a projection h , adapted to engage a projection i on an arm C. This arm is pivoted by a pin j , which takes through a slot k in the arm. This allows the arm to be moved longitudinally when engaged by the projection h . The arm is forced against

the cams f, f', f^2, f^3, f^4 by means of spring p . The projection i on the arm is held out of the path of projection h , except when the straight or depressed surfaces of the cams bear against the arm at the same time. When this occurs, the projection i comes into the path of projection h , which engages it and carries the arm longitudinally. This operates a signal, as ringing a bell D, through the intervention of a lever l , bell-tongue lever m , and spring n . The arm is returned to its first position by a spring o . The lever l is pivoted at l' so as to pass the bell-tongue lever in its return-stroke, and weighted at l^2 to bring it into a vertical position ready for a second signal. The shaft b is further provided with a ratchet-wheel q , having a pawl r engaging it, which pawl is actuated by a spring r' and a pawl-lever s , pivoted at s' . The pawl-lever is connected with and operated by the machinery whose operations are to be registered. The spring t tends to hold the lever s in position. Spring-pawls $u, u', u^2, u^3,$ and u^4 take into the cog-wheels $d, d', d^2, d^3,$ and d^4 and prevent their turning backward.

The operation of the device is as follows: The cams are set by means of the thumb-screws so that the straight surface of each is directly under the number which shall appear in the observation-hole when the signal is to operate, the hole a denoting the units, a' the tens, a^2 the hundreds, a^3 the thousands, &c. When no digit is to appear at the observation-hole, the cam is set at zero. The shafts are then turned so that zero appears at each observation-hole. The pawl-lever s is attached to the machine whose operations are to be registered. As the lever s is carried downward by the operation of the machine it moves the units-dial one figure. The lever is returned to its position by the spring t . By the next operation it is carried one figure farther. When the units-dial has made one revolution, the projection z engages the cog-wheel on the shaft b , registering the tens figure. In this way the machine will register until the predetermined number has been reached, when the straight surfaces of all the cams will be directly against the arm C and the projection h will engage with the projection i and operate the signal, as heretofore described.

This device may be applied to printing-presses, envelope or paper-bag machinery, and other classes of machinery where it is desirable to keep a register of the number of operations of the machine; and any kind of a signal may be used, such as ringing a bell, turning a colored surface, or tripping a weighted lever to automatically throw the machine out of gear, or other signals if one desires.

10 I claim—

1. The combination, in a counting apparatus, of a signaling device, a sliding arm, and a series of adjustable cams, whereby said signal is made to operate at a predetermined number of operations of the machinery, substantially as and for the purpose specified.

2. The combination, in a counting apparatus, of a series of adjustable cams, a sliding arm operated by one or more of the cams, and an automatic signaling device, substantially as and for the purpose specified.

3. The combination, in a counting apparatus, of adjustable cams, a sliding arm, lever l, and a signaling device, substantially as and for the purpose specified.

4. The combination, in a counting appa-

ratus, of the numbered dials, adjustable cams, sliding arm, and signaling device actuated thereby, substantially as and for the purpose specified.

5. The combination, in a signaling apparatus, of a series of adjustable cams, a pawl-lever, a sliding arm, lever l, and a signaling device, substantially as and for the purpose specified.

6. The combination, in a counting apparatus, of a signaling device, lever l, sliding bar, a spring actuating the same, and a series of adjustable cams, substantially as and for the purpose specified.

7. The combination, in a counting apparatus, of the numbered dials, cog-wheels, cams adjustable with reference to the numbered dials, a sliding arm, and a signaling device operated by said mechanism at a predetermined number of operations of the machinery, substantially as and for the purpose specified.

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