

E. Kay. Stop Motion.

N^o 55,308.

Patented Jun. 5, 1866.

Fig. 2.

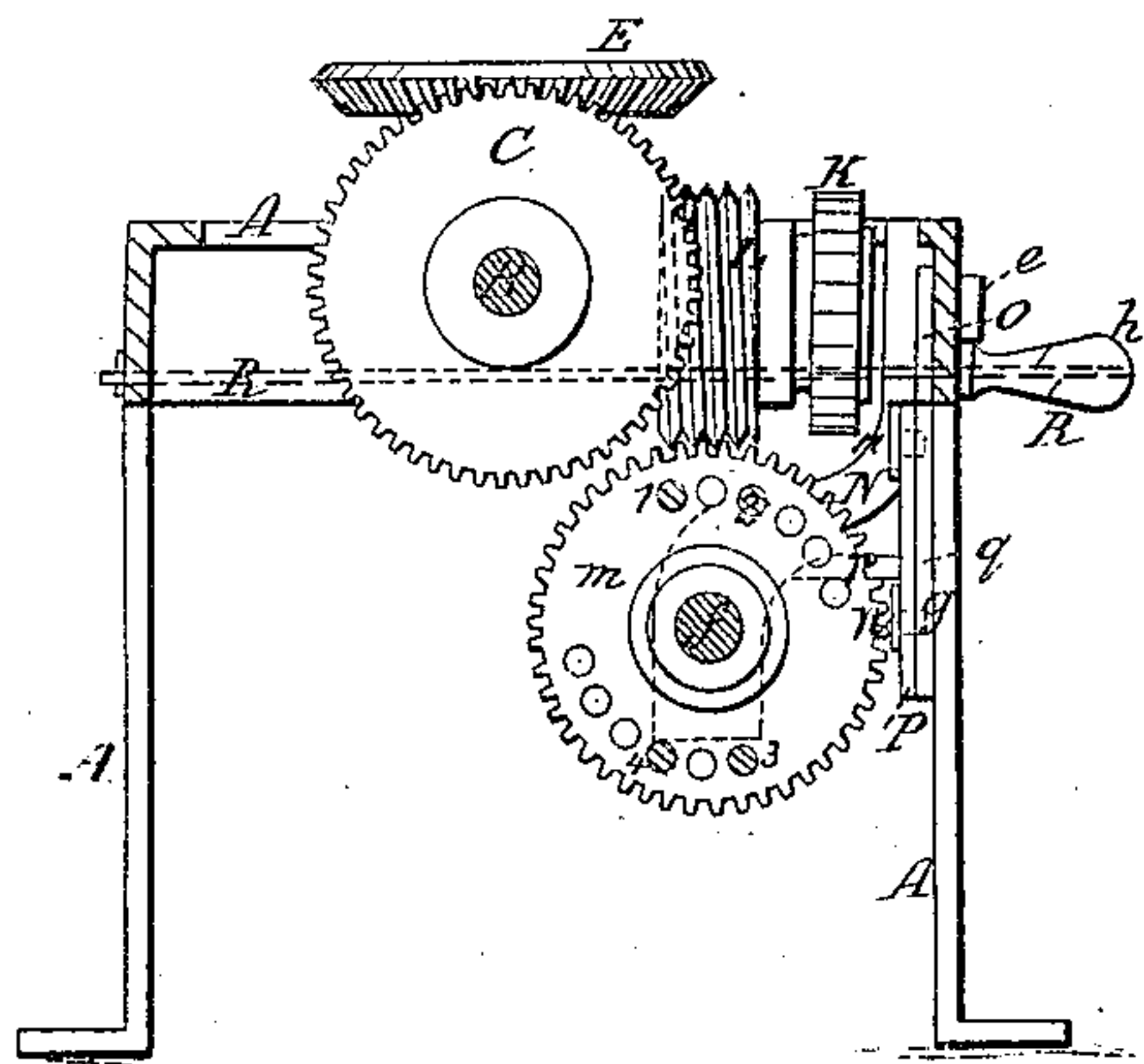


Fig. 1.

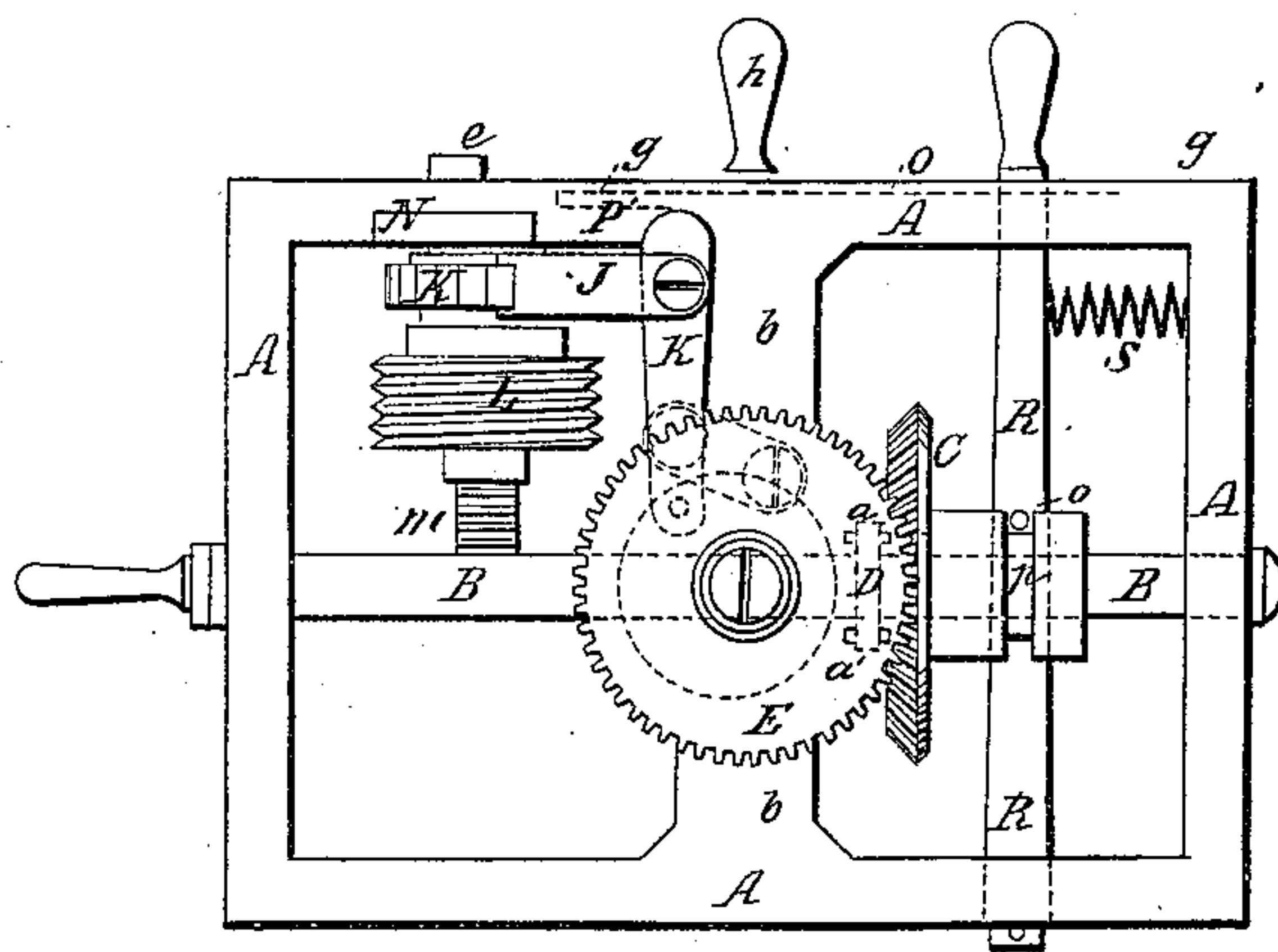


Fig. 4.

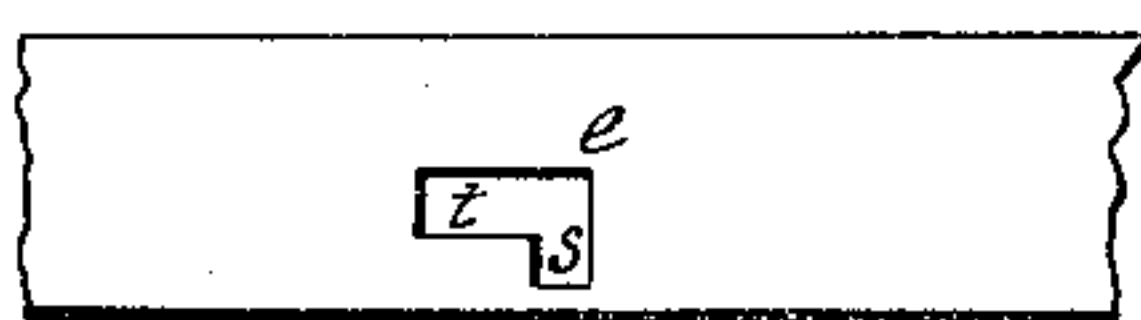


Fig. 5.

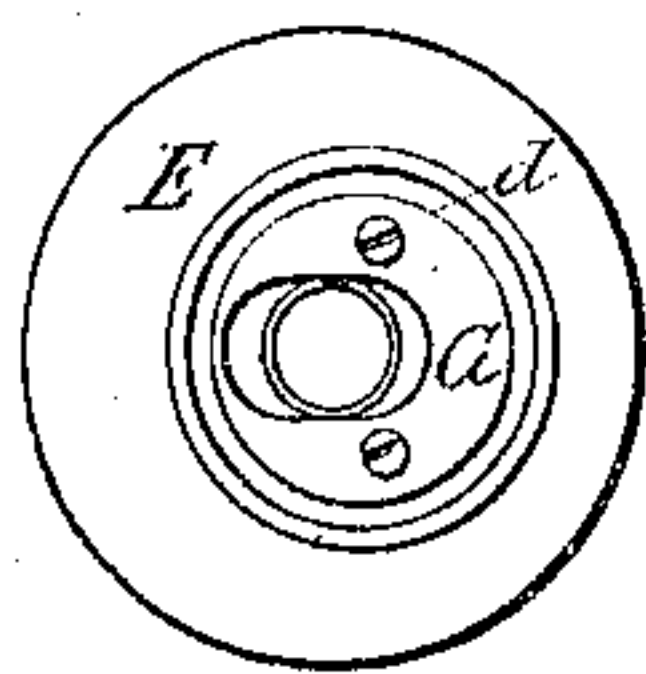
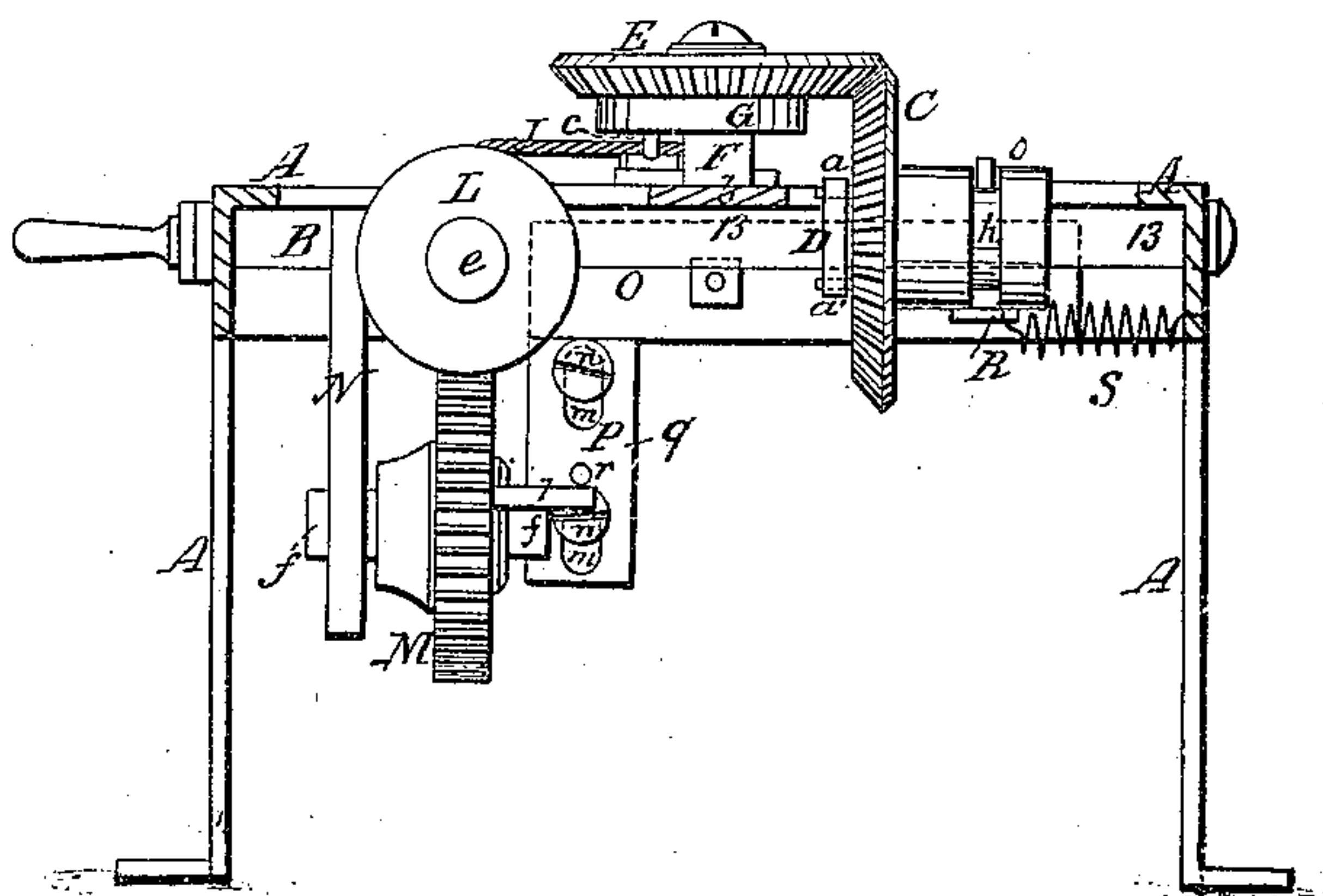


Fig. 3.



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IMPROVEMENT IN STOP-MOTIONS FOR KNITTING-MACHINES.

Specification forming part of Letters Patent No. 55,308, dated June 5, 1866.

To all whom it may concern:

Be it known that I, EDWARD KAY, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented an Automatic Stop for Knitting-Machines; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of my invention consists in a novel combination, construction, and arrangement of mechanism for stopping, at the proper moment, the working of the needle-cylinder of a knitting-machine upon which a fabric is being knitted, in which unequal portions of its length are knitted, each of different colored yarns.

In order to enable skilled mechanics to make and use my invention, I will proceed to describe its construction and operation.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 is a plan view. Fig. 2 is an end elevation sectioned. Fig. 3 is a side elevation sectioned. Fig. 4 is a side view of the framing, showing the angular opening *l*; and Fig. 5 is a bottom view of the gear-wheel *E*, showing the eccentric *G*.

Similar letters refer to similar parts in the several views.

A is the framing. *B* is a driving-shaft. *C* is a loose gear on the shaft *B*. It receives motion from it by sliding it forward until the pins *a a'*, fixed to its hub, take into corresponding recesses in the collar or swell *D* of the shaft.

E is a gear revolving on the fixed stud *F*. It carries the needle-cylinder on which the stockings are knitted, and has the eccentric *G* fixed or formed to its under side.

H is a lever whose fulcrum-pin is attached to the cross-piece *b*. From one end of it a pin, *c*, projects into the groove *d*, Fig. 5, in the eccentric. To the other end the pawl *I* is pinned or jointed, the end of which takes into the teeth of the ratchet-wheel *K*, which revolves on the stud *e*. A worm, *L*, is so connected on the same stud to the ratchet-wheel as to revolve coincidentally with it. It gears into a worm or pin-wheel *M* revolving on the stud *f* of the hanger *N*. This worm or pin wheel has a number of pin-holes, 1 2 3 4 &c., arranged in a concentric circle adjacent to its circumference.

O is an L-shaped plate sliding against the in-

ner side of the framing at *g*. *h* is a handle or catch attached to it, which projects through the framing in an angular opening, *l*, Fig. 4. A lifting-plate, *P*, slides against the projection *q* of the plate *O*. It has two longitudinal openings, *m m*, through which the bolts *n n*, fixed to the part *q*, project. These bolts, while they serve to keep it in place, at the same time allow it a perfectly free vertical motion.

R is a shifting lever, jointed or hinged to the framing and crossing beneath the shaft *B*. It passes snugly through the sliding plate *O*, and also through a longitudinal slot or opening in the framing. *o* is a pin attached to it which takes into the groove *p* in the hub of the wheel *C*.

S is a spiral spring, one end of which is secured to the shifting-lever *R* and the other to the framing.

r is a lifting-pin attached to the lifting-plate *P*. It serves for a handle or tappet whereby the pins in the pin-wheel lift the lifting-plate and cause it to raise the sliding plate *O* until the handle *h* is released from the vertical part *s* of the angular opening *l*.

The number of pins in the pin-wheel *M* is always one greater than the number of different-colored parts or sections in the stocking. The distance between any two pins is governed by the distance it is desired to knit with a given colored yarn. Two stockings are knitted successively in one fabric at each revolution of the pin-wheel, the toe of one connecting with the toe of the one just previously knitted, and the top of the one next knitted connecting with the top of the third stocking. Any number of stockings can be knitted in one stretch, and afterward divided. At the first starting of the machine pins Nos. 1 and 2 are so distanced that the needle-cylinder shall knit but one top, but at the succeeding revolutions their distance is fixed so that two tops will be knitted in one stretch. While the pin-wheel is revolving the space included between the pins Nos. 1 and 2 the needle-cylinder is knitting two tops; between the pins Nos. 2 and 3, one leg and foot; between the pins Nos. 3 and 4, two toes, and between the pins Nos. 4 and 1, one leg and foot.

Before proceeding to knit, pin No. 1 is set directly above the lifting-pin *r*, the plate *P* being at its lowest point—that is, the tops of the openings *m m* are resting on the bolts *n n*.

To put the stop in gear with the needle-cylinder the shifting-lever R is thrown forward until the wheels C and E are in gear, and the pins *a a'* are received into the openings in the collar D. The sliding plate *o* is carried forward at the same time and by the same means until its handle *h*, moving along the horizontal part *t* of the angular opening *l*, drops into the vertical part *s* of the same and hold the stop in gear. Upon the machine being started the wheel C transmits the motion it receives from the shaft B to the wheel E, causing the needle-cylinder to commence knitting. At the same time the pawl I, having a reciprocating rectilinear motion imparted to it through the medium of the eccentric G and the lever H, gives motion to the ratchet-wheel K, which causes the worm L and the pin-wheel M to revolve. When the pin No. 2 comes in contact with the lifting-pin *r* it gradually lifts the plate P until the bottoms of the openings *m m* bear against the pins *n n*, thereby raising the sliding plate O sufficiently high to release its handle *h* from the vertical part *s* of the angular opening *l*. The tension now being taken off the spring S, it acts by forcing back the shifting-lever R, which carries with it the gear C and the sliding plate O. The needle-cylinder, being now out of gear, ceases to knit, and the thread is changed to the color required for the next length, the shifting-lever being again thrown forward, putting the stop in gear. The pin-wheel revolves until pin No. 3 comes in contact with the lifting-pin *r*. The plates P and O are again lifted until the handle *h* is released from the vertical part of the angular opening. The spring S carries the shifting-lever back, putting the stop out of gear with the needle-

cylinder, when the thread is changed to the color required for the next course. The same operation is observed during the whole process of knitting.

The plate P, being released from the support of the pin in the pin-wheel, falls on the bolts *n n* in a direct line and between the releasing-pin and the one immediately following. I endeavored to do away with the lifting-plate P by attaching the lifting-pin *r* directly to the plate O, but found that the lifting-pin, upon the stop-motion devices being put in gear, came into the same position that it was in at the instant the needle-cylinder was thrown out of gear—that is, upon the top of the pin from which it had just been disengaged, instead of between it and the one immediately following.

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

1. The machine as a whole, composed of the parts combined, arranged, and operating substantially as set forth.
2. The pin-wheel M, the sliding plate O, and the lifting-plate P, combined and arranged substantially as set forth.
3. The sliding plate O, the lifting-plate P, and the shifting-lever R, combined and arranged as herein specified and described.
4. The sliding plate O, the shifting-lever R, and the spring S, combined and arranged substantially as set forth.

In testimony whereof I hereunto sign my name to this specification in presence of two subscribing witnesses.

EDWARD KAY.

Witnesses:

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GEO. W. A. SCORR.