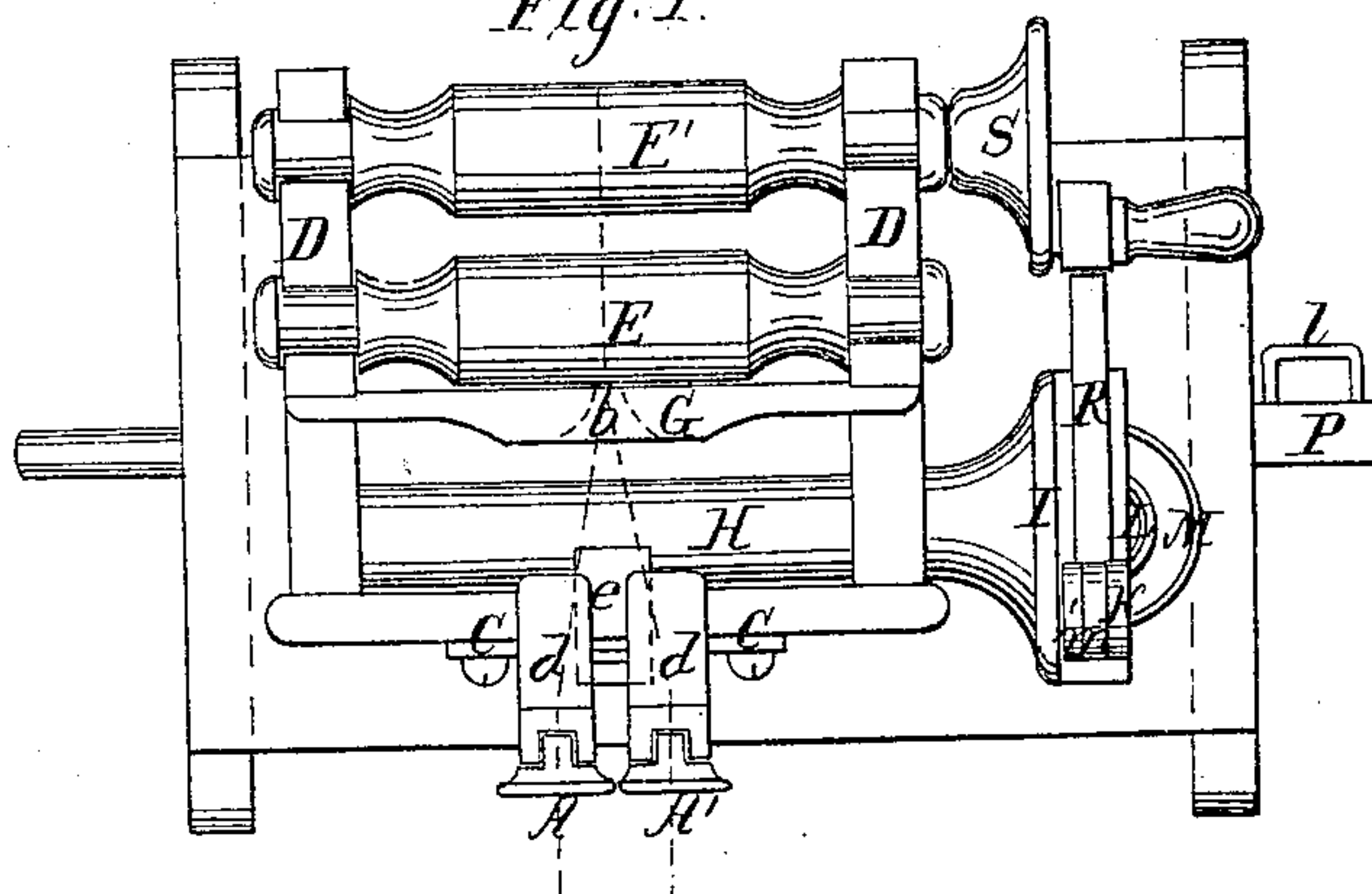


*N. E. Hale.*  
*Spinning.*

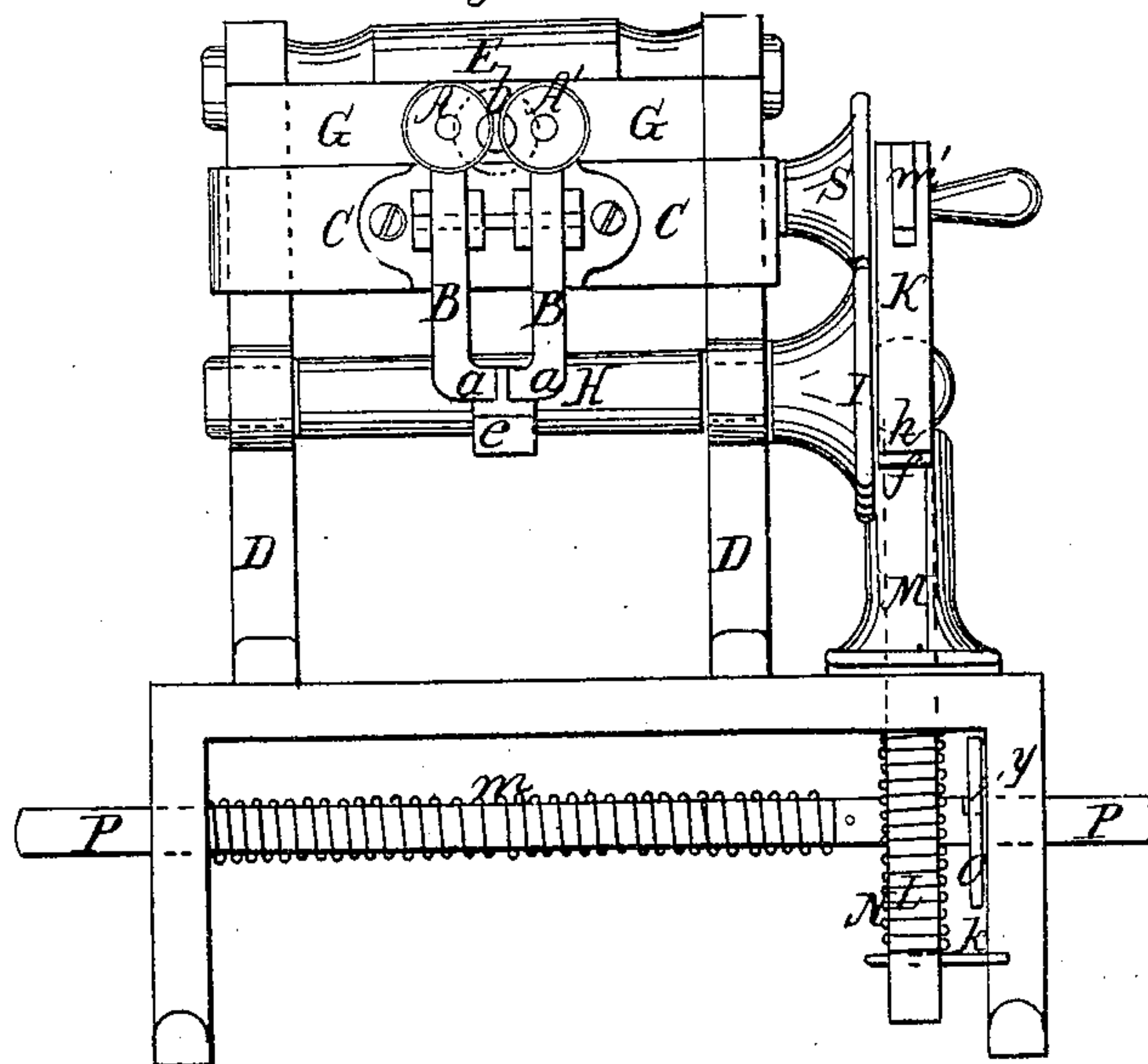
*N<sup>o</sup> 37,504.*

*Patented Jan. 27, 1863.*

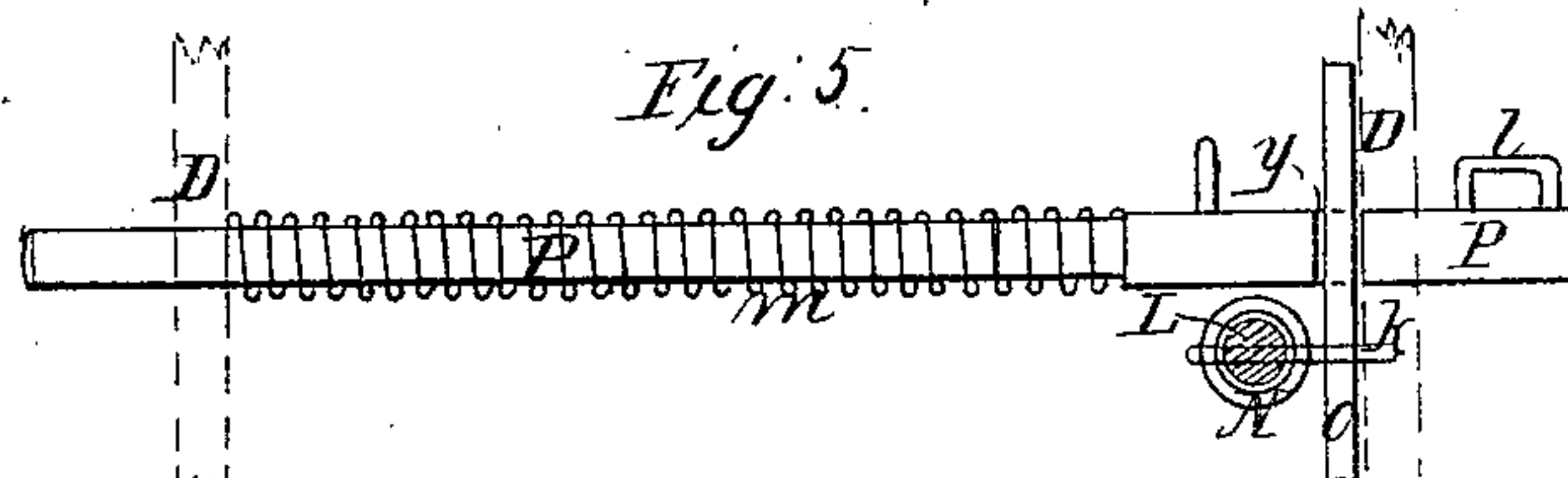
*Fig. 1.*



*Fig. 2.*



*Fig. 5.*



Witnesses;  
*George Draper*  
*Arthur Veil*

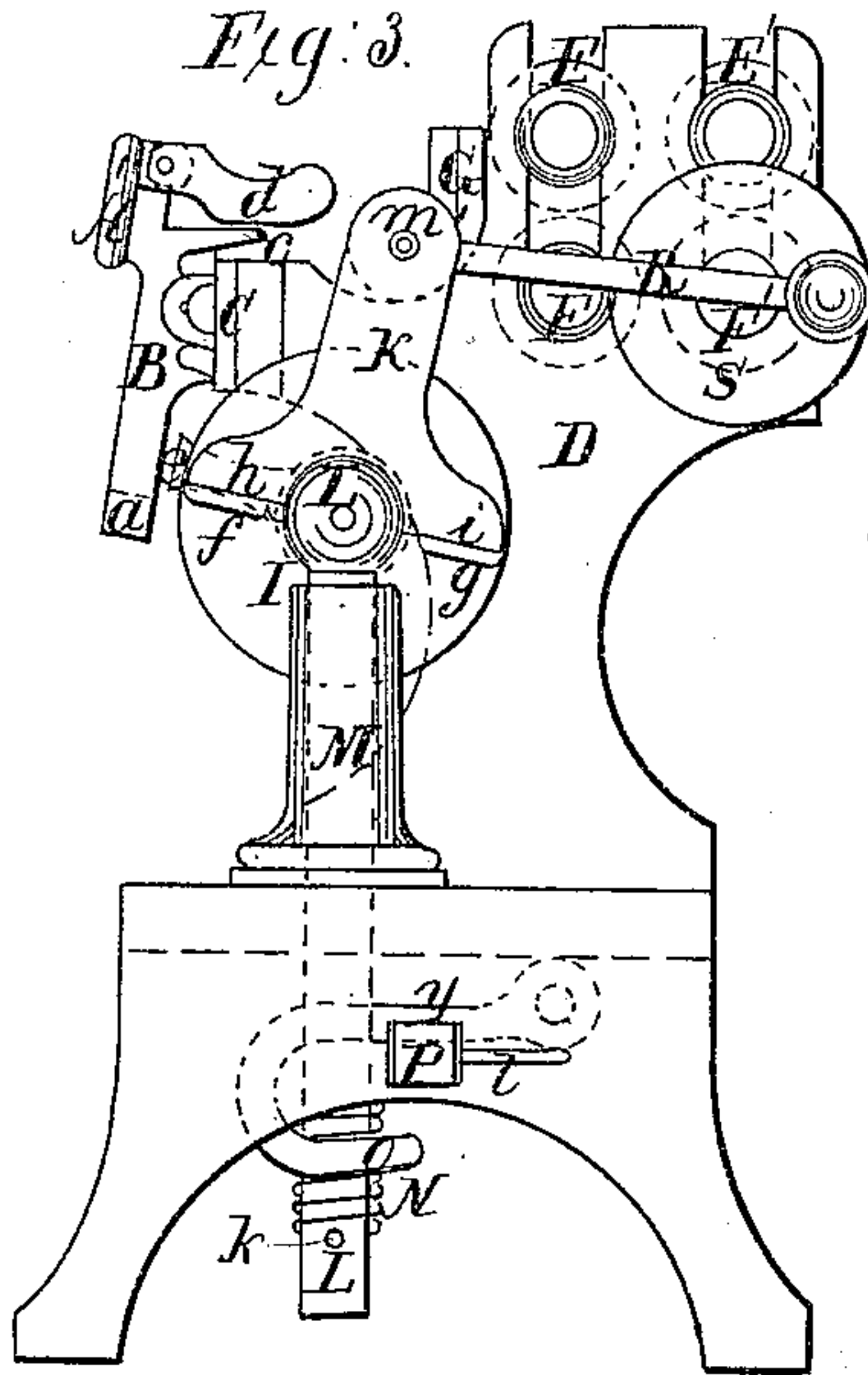
Inventor;  
*Noah E. Hale*

*N. E. Hale.*  
*Spinning.*

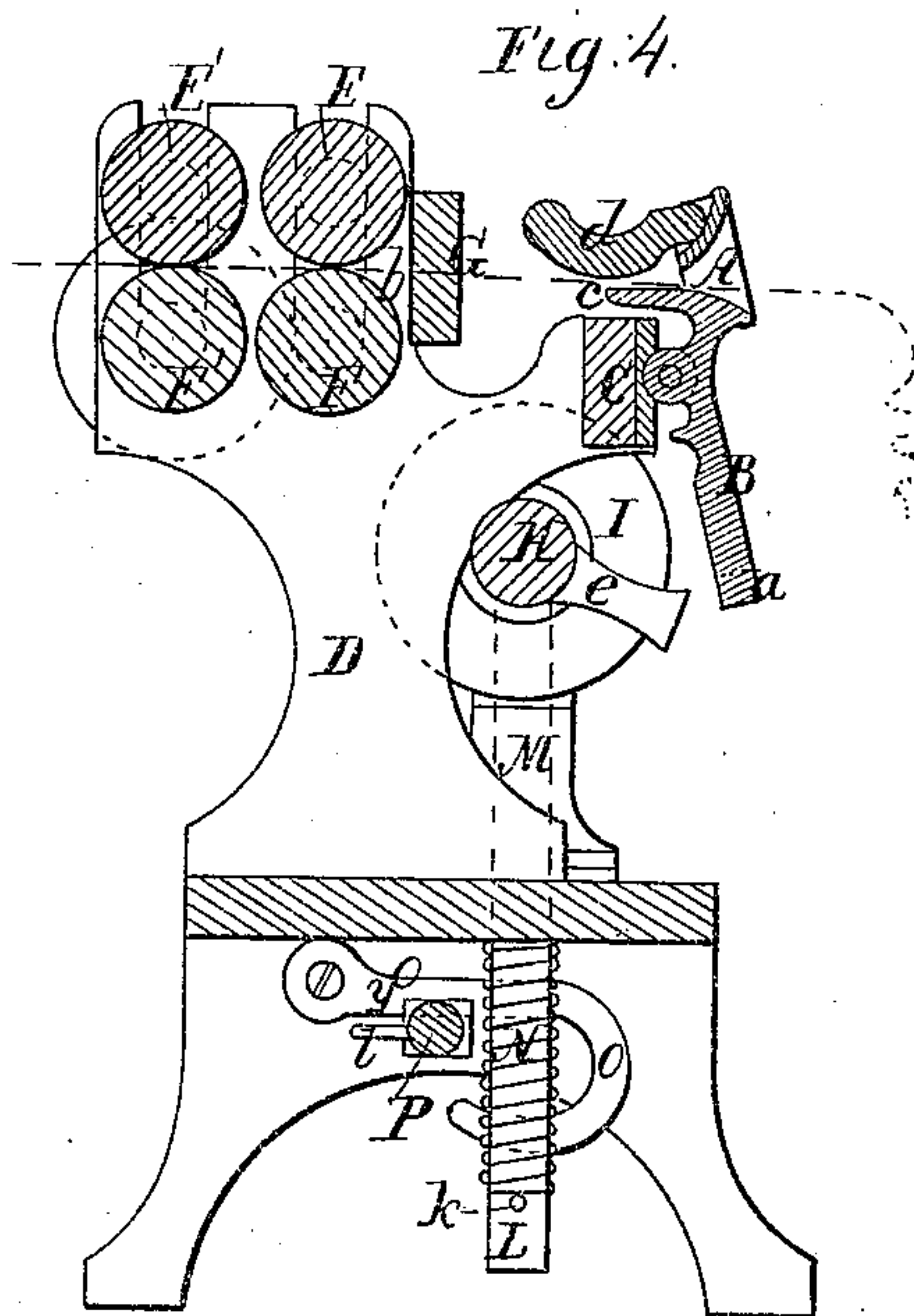
*N<sup>o</sup> 37,504.*

*Patented Jan. 27, 1863.*

*Fig. 3.*



*Fig. 4.*



*Witnesses*

*George Draper*  
*Arthur Neice*

*Inventor;*

*Noah E. Hale*



# UNITED STATES PATENT OFFICE.

NOAH E. HALE, OF NASHUA, NEW HAMPSHIRE.

## IMPROVEMENT IN MACHINES FOR MAKING ROVING.

Specification forming part of Letters Patent No. 37,504, dated January 27, 1863.

*To all whom it may concern:*

Be it known that I, NOAH E. HALE, a citizen of the United States of America, and a resident of Nashua, in the county of Hillsborough and State of New Hampshire, have made a new and useful invention, having reference to machinery for making roving, such invention also being applicable to various other machinery of a like character for producing yarn; and I do hereby declare the same to be fully described in the following specification, and duly represented in the accompanying drawings, making part thereof.

Of the said drawings, Figure 1 is a top view, Fig. 2 a rear elevation, Fig. 3 an end elevation; and Fig. 4 a vertical and transverse section, of two sets of drawing-rollers, with my invention applied to them, their trumpets and belt-shifter, the said drawing-rollers being supposed to make part of an ordinary drawing-frame.

The nature of my invention or improvements consists, first, in the combination of a gravitating jaw and a yarn-rest or stationary jaw with the movable trumpet-guide and its stop-motion; and, second, in a new or improved stop motion or mechanism applied to the armed rocker-shaft, one of the draft-rollers, and the latch of the belt-shifter, the purpose of my invention or improvements being to produce a stop-motion with which the friction on the sliver may be uniform and the machine be stopped in action on the breakage of a sliver.

In order to hold forward the trumpet-guide, I do not depend on its friction on the sliver, as such friction will vary as the sliver may vary in size; but I use a trumpet-guide, having a hole or sliver-passage so large that a sliver may pass through it readily and easily without creating any forward draft on it, except it be by the gravitating jaw and its stationary fellow jaw. I would remark that by the term "stationary," as applied to the last-named jaw, I mean that the said jaw is stationary with reference to the trumpet-guide, while the gravitating jaw is movable in respect both to the said guide and the stationary jaw.

The drawings exhibit two trumpet-guides to the draft-rollers, the whole being intended for doubling two slivers and reducing them. These trumpet-guides are shown at A A', each

being supported on the upper and shorter arm of a lever, B, whose longer arm is furnished with a foot, *a*, extending from it, as shown in Fig. 2. Each lever D has the form exhibited in the drawings, and is hinged at its fulcrum to a rail, C, of the frame D of the draft-rollers E E' and F F', there being a guide-rail, G, in rear of the draft-rollers or between them and the trumpet-guides. The two slivers, after being run through the two trumpet-guides, pass together through one hole or passage, *b*, in the guide-rail G, and from thence are run between two rollers of each of the sets of draft-rollers. In rear of each trumpet-guide there extends a stationary jaw, *c*, whose upper surface is even with the lower surface of the trumpet-hole. There is also hinged to the trumpet and over the stationary jaw a movable and gravitating jaw, *d*, the hinge thereof being arranged in such manner as to enable the jaw *d* to play in a vertical plane. The sliver, after passing through the trumpet-guide, goes between the two jaws *c d*. It rests on the lower jaw and is borne down upon it by the weight of the upper or movable jaw. The friction of the jaws on the sliver is, therefore, constant and not likely to vary much, and should be sufficient to cause the draft on the sliver to draw the trumpet-guide and its lever forward and in a manner to keep the foot *a* out of contact with a vibratory arm, *e*, extending from a rock-shaft, H, arranged as shown in the drawings. On the end of the said rock-shaft H there is a wheel or disk, I, provided with two tappets, *f g*, which project from its side and underneath the two arms *h i* of a tri-armed lever, K, which is jointed to the upper end of the lifter-rod L, supported within and passing down through a vertical post or standard, M. A spring, *n*, serves to force downward the lifter-rod, which is provided with a stud or arm, *k*, extending underneath a gravitating latch, O. The said latch is applied to the frame D and operates with the belt-shifter P, which is a slide-bar carrying a staple, *l*, for the driving-belt of the machine to run through. A spring, *m*, operates the bar in a direction which will cause the belt to be shifted from the fast to the loose pulley of the machine. Furthermore, the latch when in a notch, *y*, made in the belt-shifter P, (see Fig. 5, which is a top view of the belt-shifter,) keeps the belt-shifter in a position to cause



the belt to run on its fast pulley. A connecting-rod, R, is jointed to the upper arm, *m'*, of the tri-armed lever K, and also to a crank or crank-wheel, S, applied to the shaft of the lower one of the front set of draft-rollers.

While the machine is in operation, and each of the slivers remains unbroken, each trumpet-lever will not only be drawn out of the path of movement of the arm *e* of the rock-shaft H, but the said rock-shaft will have reciprocating rotary movements imparted to it, which will be produced by the action of the tri-armed lever K on the tappets *f g* of the disk or head I; but in case of a breakage of a sliver in rear of the draft-rollers the trumpet-lever of such sliver will be caused by its gravitating power to assume such a position as will carry its foot into the path of movement of the arm *e* and so as to arrest the motion of the said arm and that of the rock-shaft H. The consequence of this will be that the tri-armed lever will be caused to so press on one of the tappets as to rise off the other and elevate the lifter L, which in turn will force the latch O out of its

notch in the belt-shifter P. Such having taken place the belt-shifter will be driven forward by its spring, and by throwing the driving-belt off the fast pulley will cause a stoppage of the machine.

I claim—

1. The stationary and gravitating jaws *c d*, or their mechanical equivalents, in combination with the trumpet guide A or A', and a stop motion or mechanism connected therewith, and operating substantially in manner and for the purpose as specified.

2. The combination of the crank S, the connecting-rod R, or mechanical equivalents therefor, the tri-armed lever K, latch-lifter L, and disk I, with tappets *f g*, the same being applied to the armed rocker-shaft H, one of the draft-rollers, and the latch of the belt-shifter in manner and so as to operate substantially as specified.

NOAH E. HALE.

Witnesses:

GEORGE DRAPER,  
F. P. HALE, Jr.