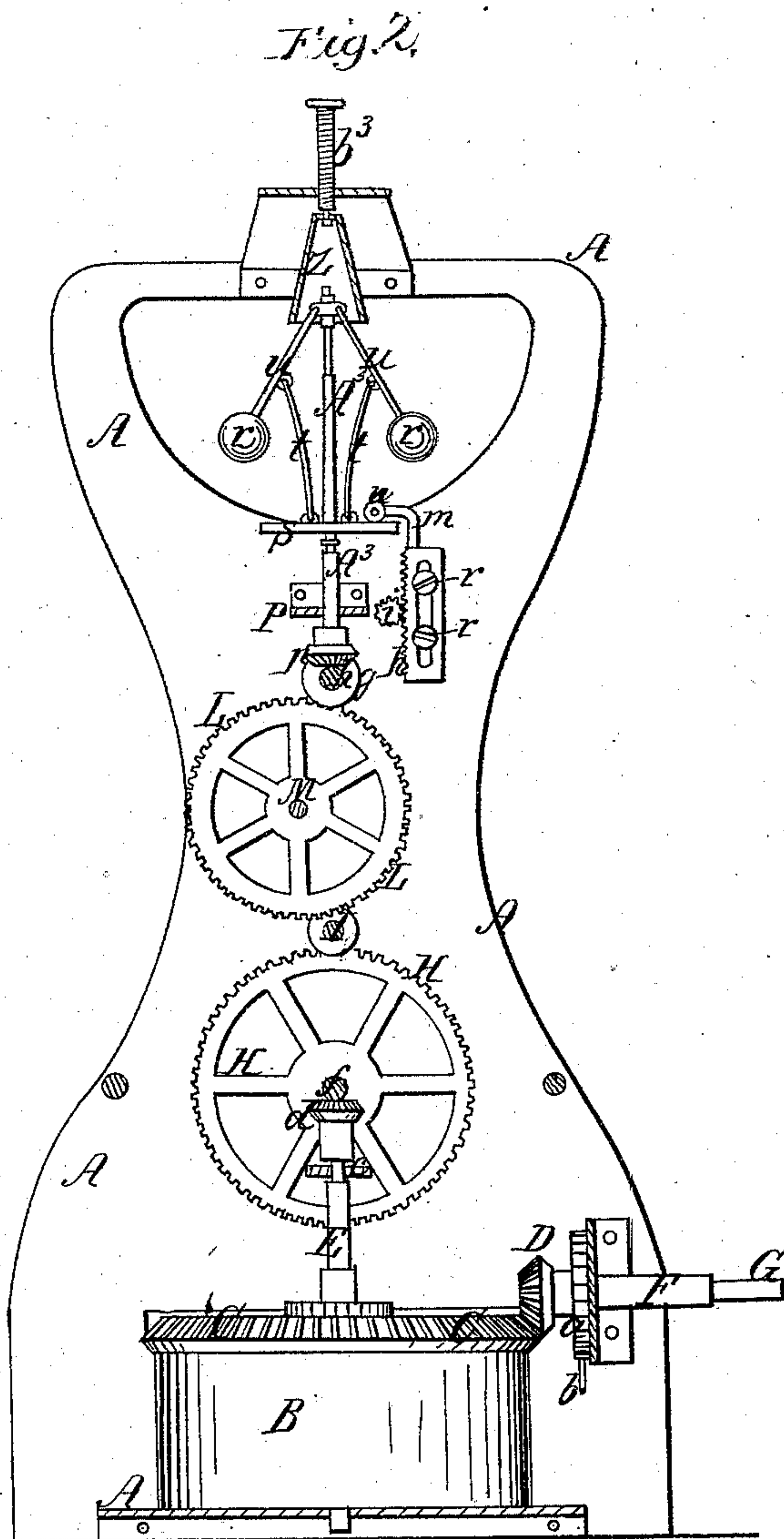
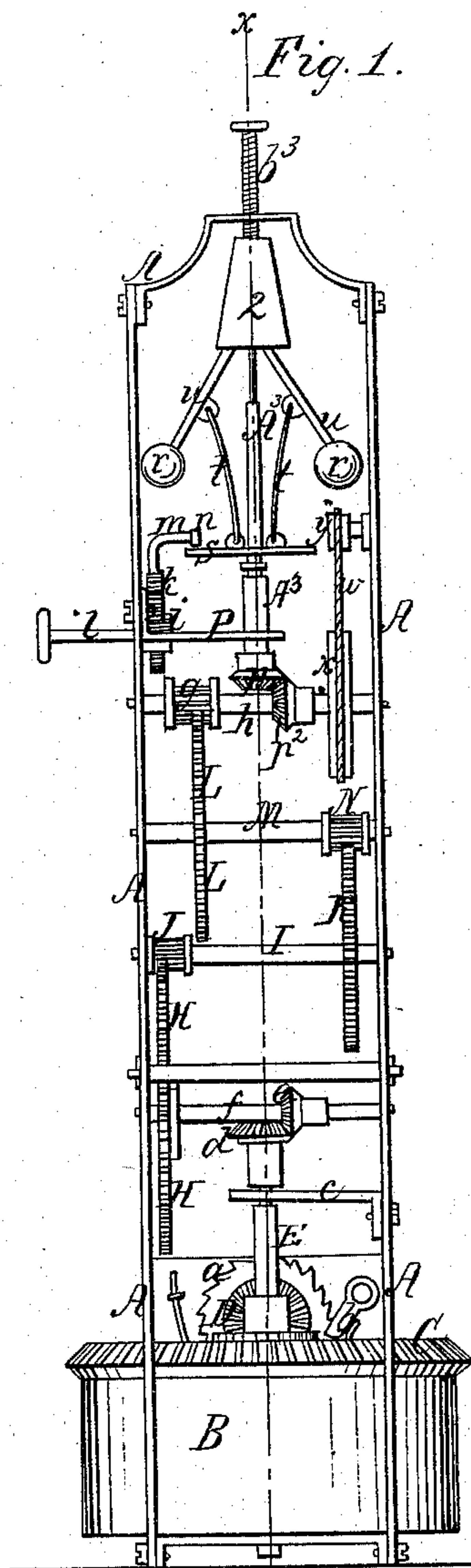


W.S. & S.B. Wells.

Mode of Driving Machinery.

N<sup>o</sup> 48,467.

Patented Jun 27. 1865.



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# UNITED STATES PATENT OFFICE.

WALTER S. WELLS, OF NEW YORK, AND S. B. WELLS, OF MIDDLEBURG, N. Y.

## IMPROVED MODE OF DRIVING MACHINERY.

Specification forming part of Letters Patent No. **48,467**, dated June 27, 1865.

*To all whom it may concern:*

Be it known that we, W. S. WELLS, of New York, N. Y., and S. B. WELLS, of Middleburg, in the State of New York, have invented a new and useful Improvement in Mechanism for Automatically Driving Light Machinery; and we do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this application.

Our invention has for its object the production of an automatic driving mechanism adapted to the successful driving of sewing-machines and other light machinery.

Previous to our invention mechanisms have been devised for such purpose, but have been found void of practical merit and unsuccessful in their application to machinery intended to be automatically driven by them. The chief difficulty encountered in this class of invention has been the irregularity of speed imparted to the machine to be driven, arising from the unequal power imparted by the motive spring or other medium of power at different times and under different degrees of tension—that is, during the different conditions of the spring from that in which it is when fully wound up and that which it assumes when run down. We have effectually overcome this great difficulty and produced a simple, practical, and successfully-working automatic driving mechanism.

Our invention consists in the employment, in combination with a motive spring, or its equivalent, and a suitable system of gearing, of a governor and adjustable friction device for regulating and controlling the speed at which the driving mechanism shall run, and thus driving the machine to which the power is to be applied at any given uniform speed, as will be hereinafter more fully explained.

To enable others to fully understand our said invention, and those skilled in the art to make and use the same, we will proceed to describe the construction and operation of one of our improved mechanisms, referring by letters to the accompanying drawings, in which—

Figure 1 is an elevation, and Fig. 2 a vertical section at line *xx* of Fig. 1, of our improved machine.

In the several figures the same part of the

apparatus will be found designated by the same letter of reference.

A is the frame of the machine, near the base of which is located a drum, B, in which is arranged a coiled spring (after the fashion of a clock-spring) of any desirable strength or capacity, and being attached to the vertical stud or shaft E, which is mounted in suitable bearings and has secured to it the horizontal bevel-gear C. This gear C meshes into a bevel-pinion, D, which is keyed to the horizontal shaft F, which shaft is mounted in a portion of the main frame of the machine, and is provided with a ratchet-wheel, *a*, and pawl *b*, and has its outer end squared, as seen at G, to fit a key, (similar to a clock-key,) by the application of which said shaft F may be rotated, and through the medium of its pinion D and gear C the motive spring in drum B be wound up.

*f*, I, M, and *h* are a series of horizontal shafts arranged about parallel with each other and provided with a system of gears and pinions, H L K and *d e J N g p p*<sup>2</sup>, by means of which the rotatory motion imparted by the driving-spring to shaft E is conveyed, gradually increasing in velocity, to the vertical shaft A<sup>3</sup>, on which is arranged the regulating mechanism, and also to the main driving-pulley *x*, (see Fig. 1,) which may be belted to the driving-pulley of a sewing-machine or any other machine which it is desired to drive automatically. We have shown pulley *x* belted at *w* to a pulley, *y*.

Near the upper end of shaft A<sup>3</sup> are pivoted the upper ends of the rods *u u* of a governor, to the lower ends of which rods are secured balls or weights *v v* in the ordinary way. Near the middle of each rod *u* is pivoted one end of a rod, *t*, the other end of which is pivoted to the upper surface of a circular disk, *s*, which is formed with a hollow shaft or sleeve, as seen in the drawings, fitting easily around shaft A<sup>3</sup>, and so arranged as to slide freely longitudinally on said shaft.

Z is a thimble which is hung so as to freely turn on it, to the lower extremity of a screw-stud, *b*<sup>3</sup>, mounted in a nut in the upper part of frame A, and immediately over or coincident with the axis of shaft A<sup>3</sup>.

*k* is an adjustable rack, having a slot in it and arranged to slide vertically around guide-



pins *r r*. (See Fig. 2.) From the upper end of said rack projects a bent arm, *m*, in the end of which is arranged an anti-friction roll, *n*, which rests on the upper surface (in a manner to be explained) of the disk *s*, before alluded to. Into the teeth of rack *k* mesh the teeth of a pinion, *i*, which is fast on a shaft, *l*, that projects a short distance beyond the main frame *A* of the machine, (in which it has its bearings,) and is provided with a small hand-wheel or knurled head, by means of which said shaft *l* and its pinion *i* may be readily turned by the attendant to effect the requisite movements of the rack *k*.

The operation of our improved driving mechanism will be understood to be as follows, viz: The spring being wound up and the driving-belt from pulley *x* applied to the pulley of the machine to be driven, the mechanism is set in motion. The rotation of shaft *A*<sup>3</sup>, carrying with it the arms of the governor, creates a tendency in the balls *v v* to fly off at a tangent, and the farther they distend the more the disk *s* is elevated or caused to slide upward around shaft *A*<sup>3</sup>; but as the disk *s* moves upward its top surface comes in contact with the anti-friction roll *n* and the velocity of the disk *s* (and consequently that of the shaft *A*<sup>3</sup>) is checked. The inertia, however, of the balls of the governor equalizes the motion, after the fashion of a fly-wheel, of the rotating shaft *A*<sup>3</sup> and that of the main driving-pulley *x*.

The rack *k* is adjusted, at the discretion of

the operator, so as to control the speed at which the governor shall run, and hence the speed of the machine, while the governor equalizes the speed or keeps the machine running at a uniform speed.

The thimble *Z* is intended to limit the extent of motion of the governor-arms outward or away from the shaft *A*<sup>3</sup>, and thus vary the capacity of the balls *v v* by varying their distance from the center of motion to increase the speed of the said shaft.

It will be understood that we may change the details of construction of our machine without departing from the spirit of our invention.

Having thus fully explained our invention, what we claim as new, and desire to secure by Letters Patent, is—

The employment, in combination with a motive spring and the system of gearing, a governor and friction controlling and regulating device, substantially as and for the purposes hereinbefore set forth.

In testimony whereof we have hereunto set our hands and seals.

WALTER S. WELLS. [L. S.]  
SAML. B. WELLS. [L. S.]

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