

(No Model.)

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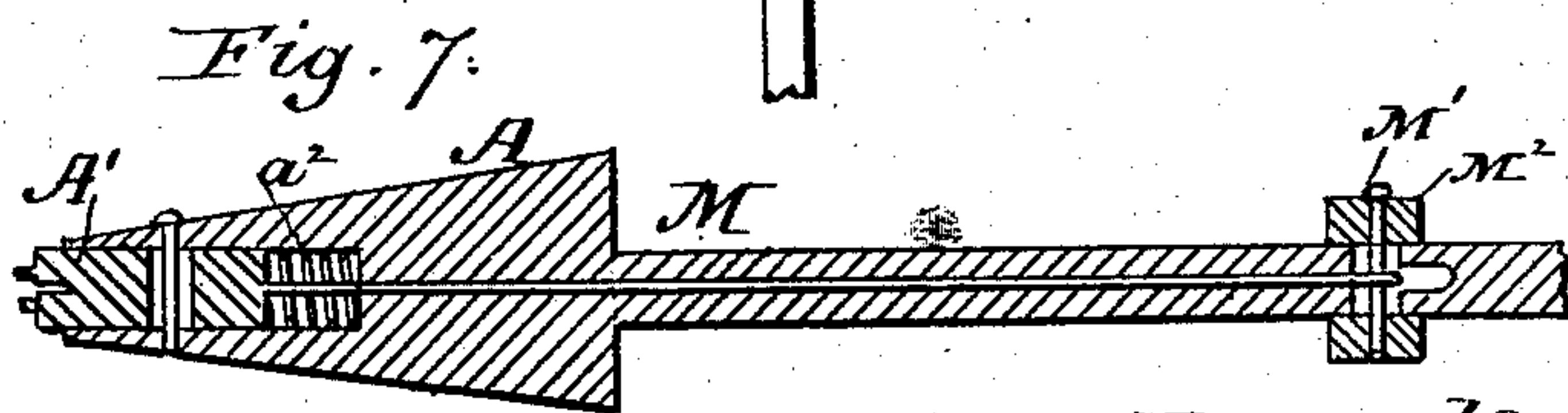
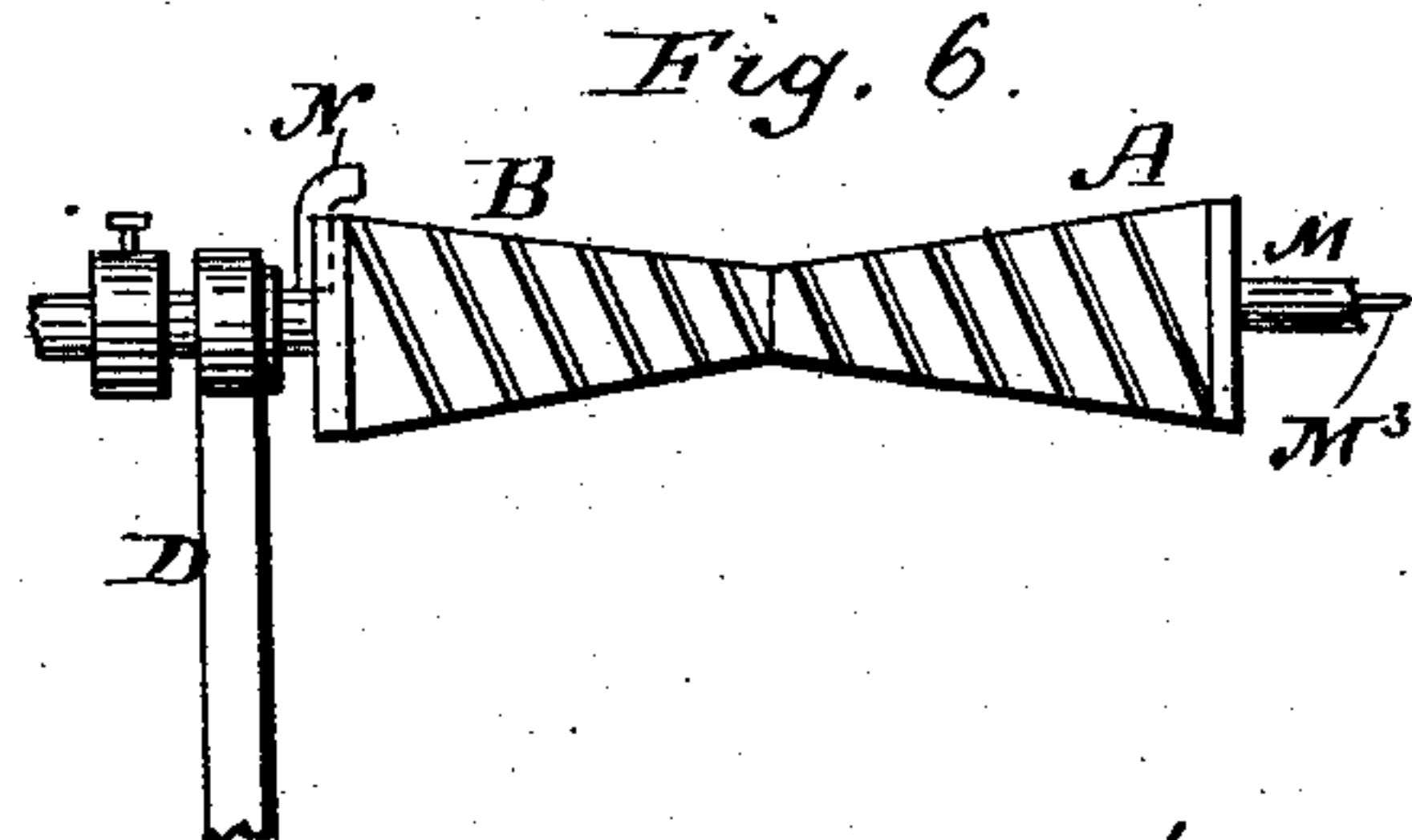
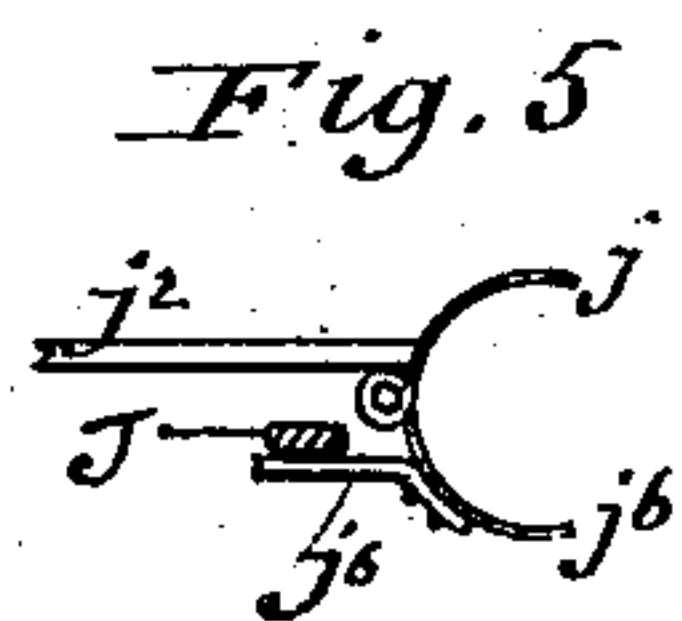
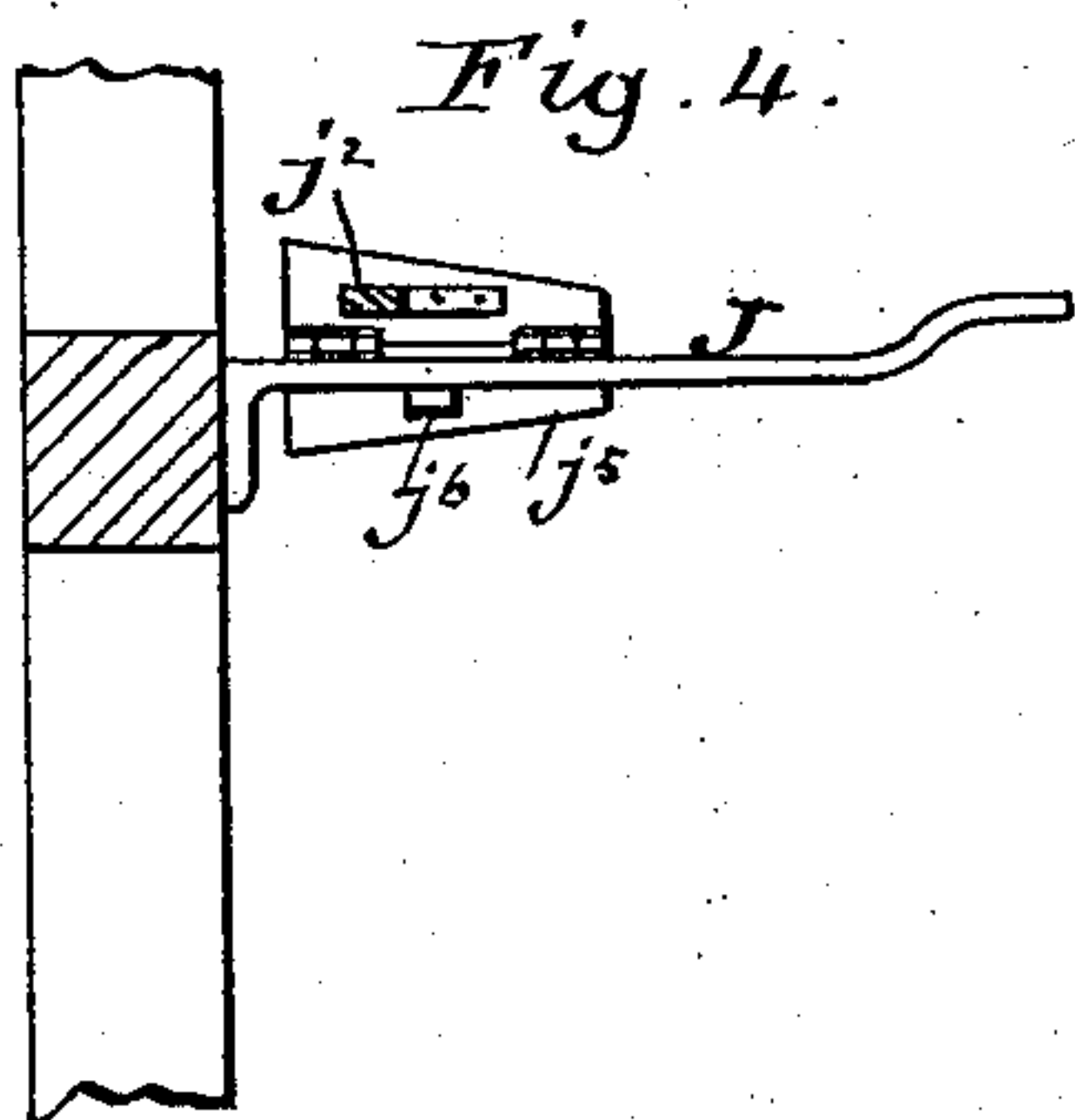
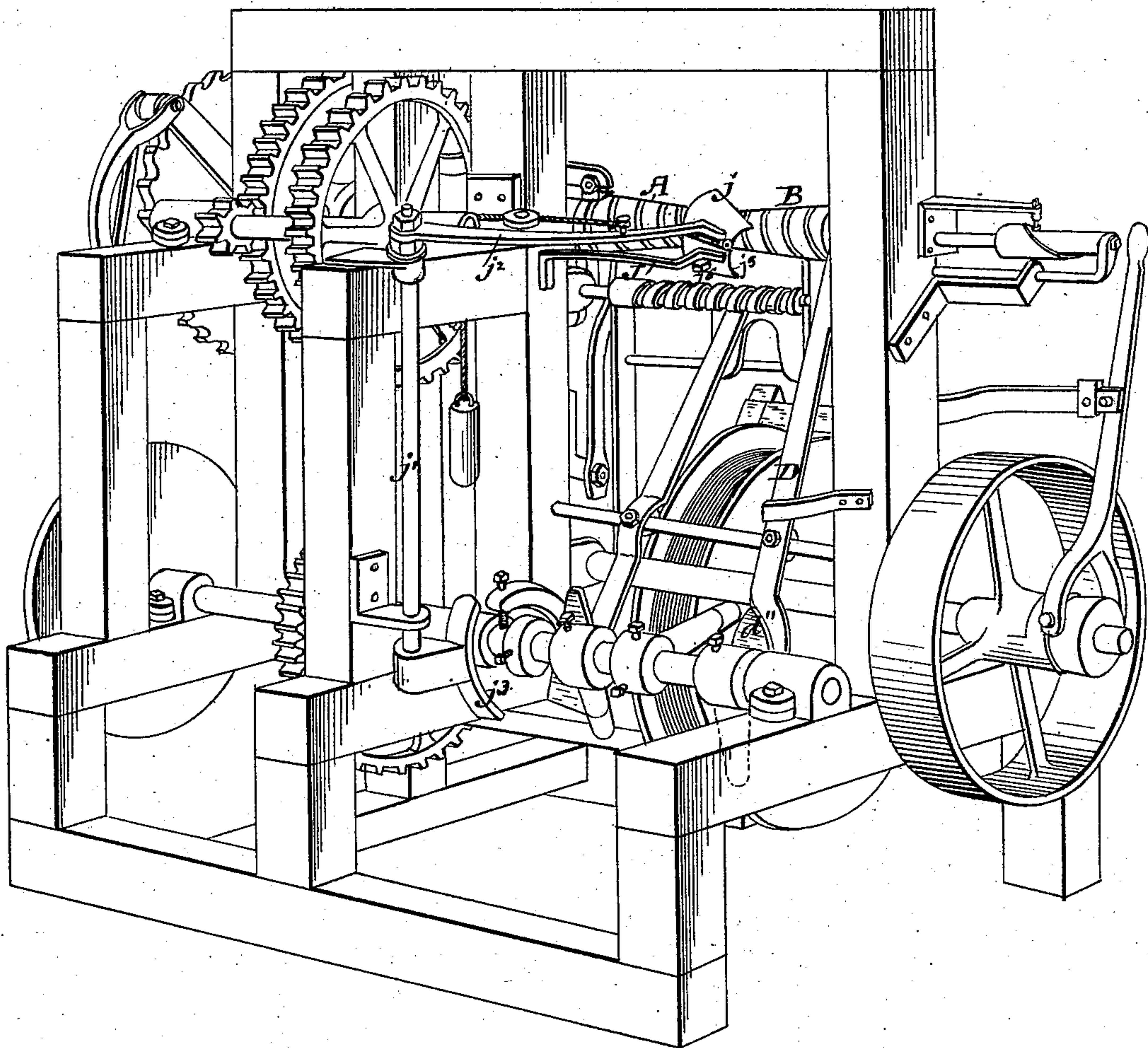
H. S. HALL.

MACHINE FOR MAKING SPIRAL WIRE SPRINGS.

No. 287,827.

Patented Nov. 6, 1883.

Fig. 1.



Witnesses:
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(No Model.)

2 Sheets—Sheet 2.

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Fig. 2

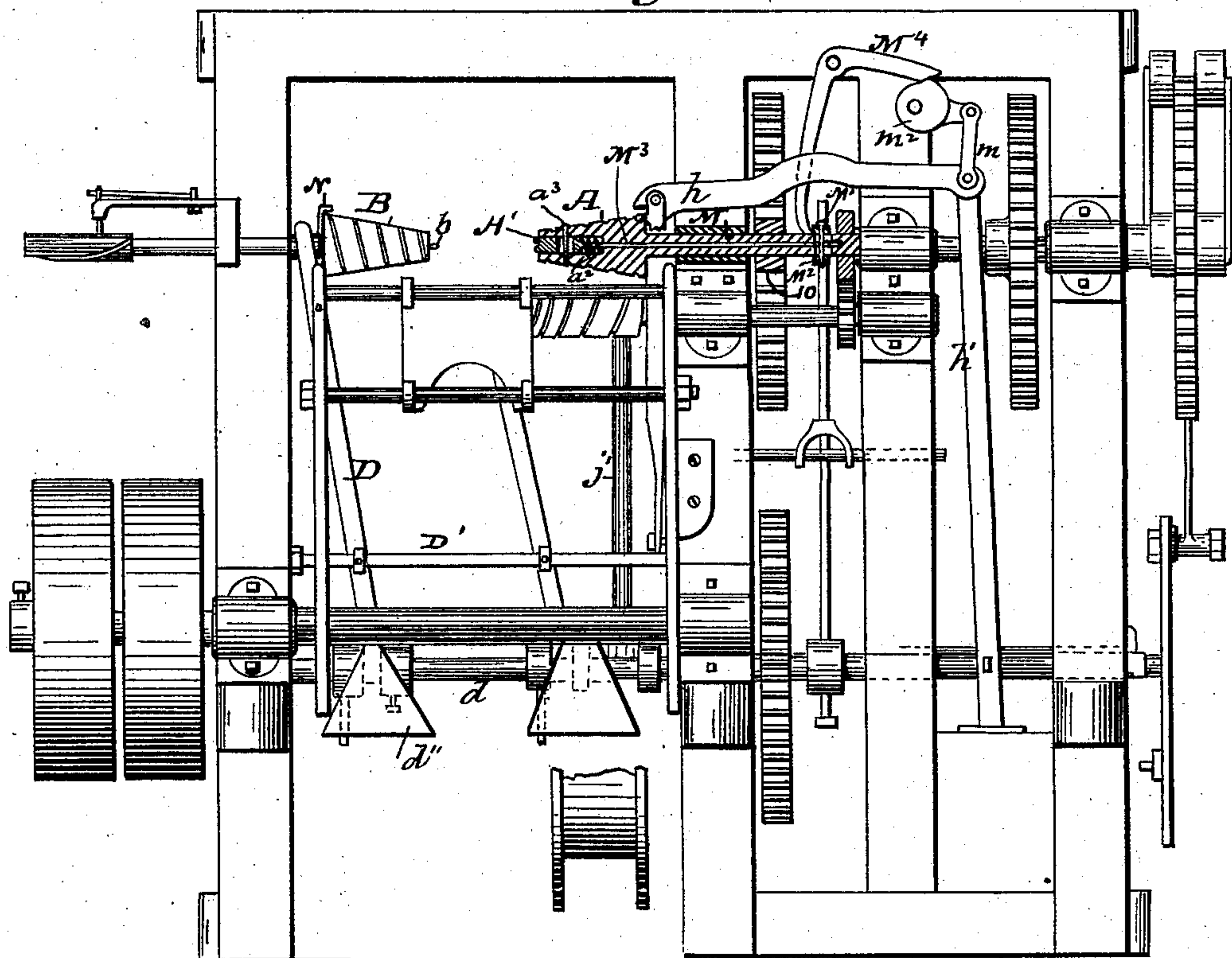
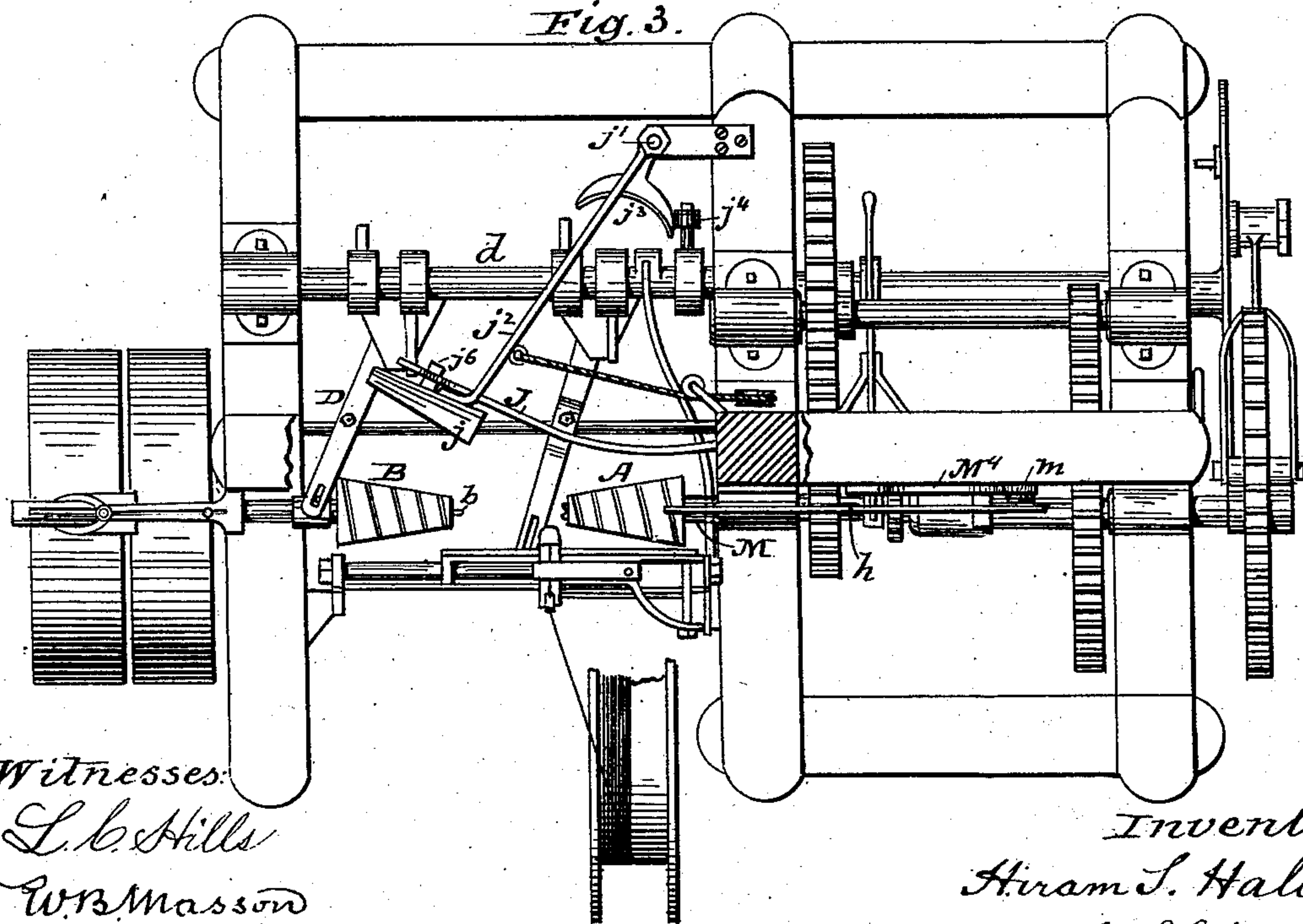


Fig. 3.



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UNITED STATES PATENT OFFICE.

HIRAM S. HALL, OF JAMESTOWN, NEW YORK.

MACHINE FOR MAKING SPIRAL WIRE SPRINGS.

SPECIFICATION forming part of Letters Patent No. 287,827, dated November 6, 1883.

Application filed September 12, 1883. (No model.)

To all whom it may concern:

Be it known that I, HIRAM S. HALL, a citizen of the United States, residing at Jamestown, in the county of Chautauqua and State of New York, have invented a new and useful Improvement in Machines for Making Spiral-Coiled Wire Springs, of which the following is a specification.

My invention relates to improvements upon a machine for coiling wire, for which I obtained a United States Patent July 11, 1882, No. 260,752; and the objects of my improvements are, first, to provide, in a machine for forming double-cone springs, a device for unlocking the cones an instant before the shears cut off the coiled spring, to allow the loose or driven cone to revolve backward, and thus release the wire of strain, and thus prevent its locked end from straightening itself out of shape; second, to provide for the coiled spring a shield, the lower half of which is adapted to drop out of the way at the proper time and release the spring. I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a rear perspective of the machine. Fig. 2 is a front elevation with the cones and cone-shaft in section. Fig. 3 is a plan of the machine, in which a portion of the upper beam of the frame is removed to show the shield-guide. Fig. 4 is a rear view of the shield-guide and shield, and Fig. 5 is a transverse section of the same. Fig. 6 is a side view of the cones. Fig. 7 is a section of one of the cones on an enlarged scale.

Similar letters refer to similar parts throughout the several views.

I will first describe the devices for unlocking the cones, and use, when possible, the same letters of reference as in my Patent No. 260,752.

A represents the cone, rotated by the shaft M. The small end of this cone is recessed, to receive a steel plug, A', having two clutching-prongs on its outer end, to engage into corresponding recesses into the small end of the cone B, and the latter carries a center pin, b, to enter a center hole in the outer end of the plug A'. A coiled spring, a², is placed within the recess of the cone A, to bear against the inner end of the plug A' and press its prongs into engagement with the cone B. To

prevent the plug A' from rotating independently of the cone, a pin, a³, is made to pass transversely through the cone, and through a mortise through said plug, a mortise being required, instead of a round hole, to allow the plug to move lengthwise into its recess. To retract the plug and unlock the cone B an instant before the shear h cuts off the end of a coiled spring, the retracting mechanism is attached to the outer end of the shear-arm, and operated by the same bar, h', thus allowing the released cone B to revolve backward, relieving the strain on the wire, and thus preventing the end of the spring held in the lock N of said cone from uncoiling so rapidly as to straighten itself out of shape. The unlocking and cutting off follow in quick succession, but not so quick as to interfere with the desired result. To retract the clutching-plug, the cone A is axially bored, and also its shaft M, to a point beyond its driving-pinion 10. At this point the shaft M has a small longitudinal mortise, to receive a pin, M', passing diametrically through said shaft, and through a loose collar, M², thereon. The pin M' passes, also, through a hole in one end of a light rod, M³, having its opposite end carried by the plug A'. The latter can thus be retracted by the collar M². To retract said collar, there is pivoted to the extremity of the shear-arm h, or of its operating-bar h', a rod, m, having its upper end pivoted to one arm, m', projecting from the periphery of a cam, m², pivoted to the frame of the machine. Said cam bears against the under side of a bell-crank lever, m⁴, pivoted to the frame at m³, and the opposite end of said bell-crank bears against the side of the loose collar M², and disconnects the cones before the outer end of the shear-arm h has been sufficiently lifted to cut the wire at the end of the spring. The shaft B and its cone are then retracted by means of the lever D. Said lever is adjustably pivoted upon the horizontal rod D', and carries at its lower end either a triangular plate, d'', or an arm pivoted and adjustably secured on each side, and forming an acute angle with said lever, so as to regulate the throw of the lever according to the length of the spring desired.

The second part of my improvement relates to the shield j, which holds and carries off the spring when made. This shield is found most

suitable for double-cone springs. In this improved form, although nearly similar (when closed) to the shield in my former patent, it is differently constructed, and releases the spring in a different manner. It is cut longitudinally or formed of two segments hinged together, one above the other, so that when the spring is carried off to the proper point the lower half of the shield falls or opens and allows the spring to drop out. To accomplish this, the upper half of the shield is riveted or otherwise secured to the horizontally-swinging arm j^2 , (the swinging of said arm being produced by the upright shaft j' having the curved plate j^3 at the bottom and the pin j^4 on the counter-shaft d .) The lower half, j^5 , of the shield is hinged to the upper half and carries a lug, j^6 , which projects outwardly and has its top side bearing against the under side of a long curved guide-rod, J. One end of this guide-rod is secured to one of the inner posts of the frame and extending horizontally nearly its whole length; but adjoining its outer end it has a short upward curve, so that as the shield swings out it is held closed till this upward curve is reached, then the lug on the lower half of the shield follows up this curve and allows this lower half to open of its own weight. The long curve of the guide-rod J is a portion of a circle corresponding with the circular curve described by the shield swinging at the end of its arm j^2 .

The drawing of the wire from the reel, the feeding thereof to the double-forming cones, and the mode of transmitting power from the main pulley to the different parts of the machine, having been fully shown and described in my patent No. 260,752 of July 11, 1882, need not be repeated in the description of this improvement.

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

1. In a wire-coiling machine, the combination of the cone A and plug A' therein, adapted for interlocking with cone B, with the hollow shaft M, its central rod and loose collar, substantially as and for the purpose set forth.

2. The combination of the shear-arm h , its operating-bar h' , cam m^2 , and connecting-rod m , with a pivoted lever and a loose collar on the cone-shaft, substantially as and for the purpose described.

3. The combination of the longitudinally-movable shaft having pin b in the end thereof, and a cone having the plug A' therein, and rod M³, attached to said plug, with the shear-arm and means for connecting the latter to the plug-rod, substantially as described.

4. In a wire-coiling machine, the combination of the horizontally-swinging arm j^2 , shield j , formed of two segments hinged together, one segment above the other, and lug j , projecting from the lower segment, with stationary guide-rod J, having the shield-lugs j bearing against its under surface, substantially as and for the purpose described.

5. In a machine for making coiled-wire springs, the shield j , formed of two segments hinged together, one segment above the other, in combination with means for keeping the shield closed, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

HIRAM S. HALL.

Witnesses:

FRED. P. TODD,
GEO. B. TODD.