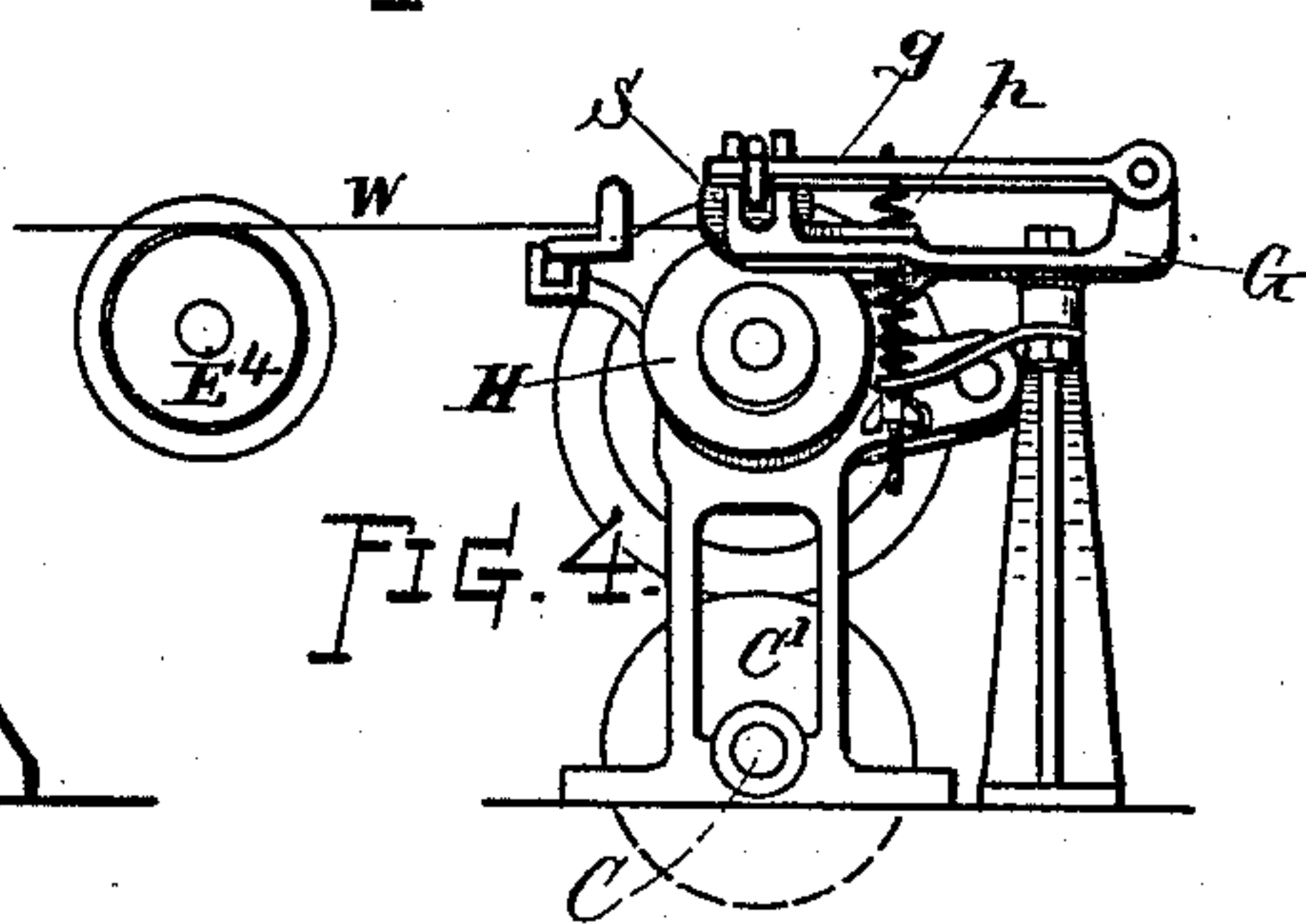
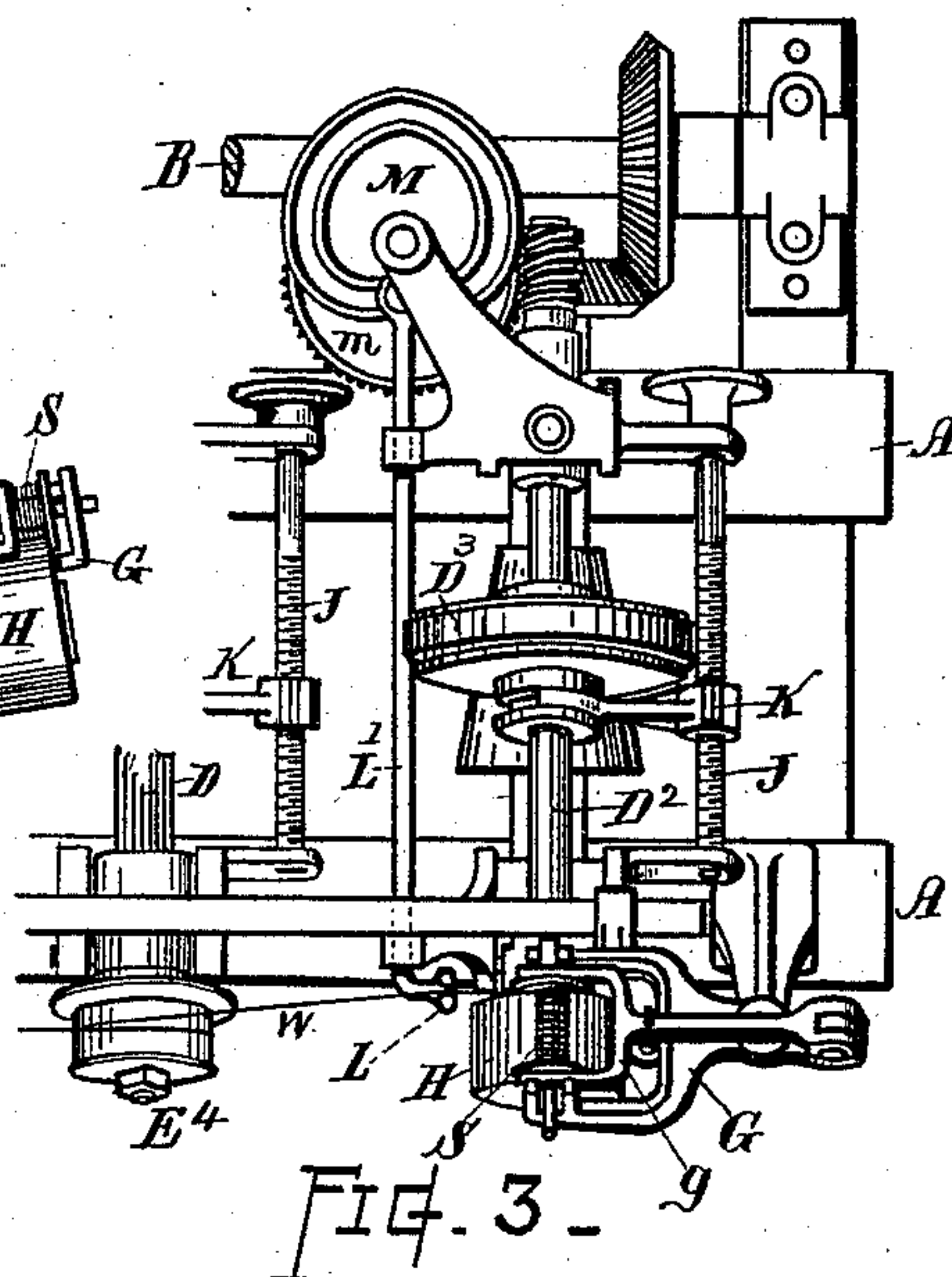
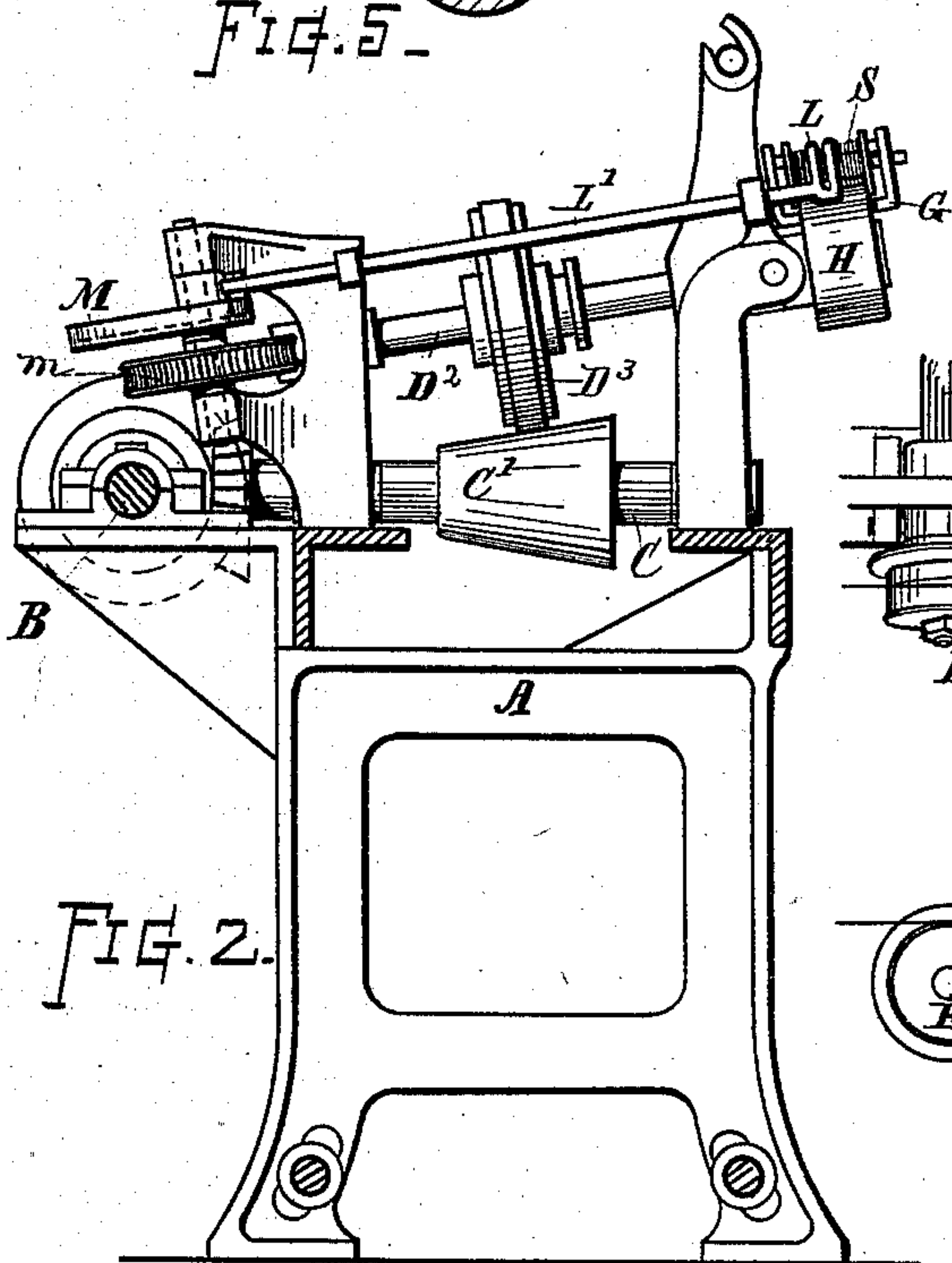
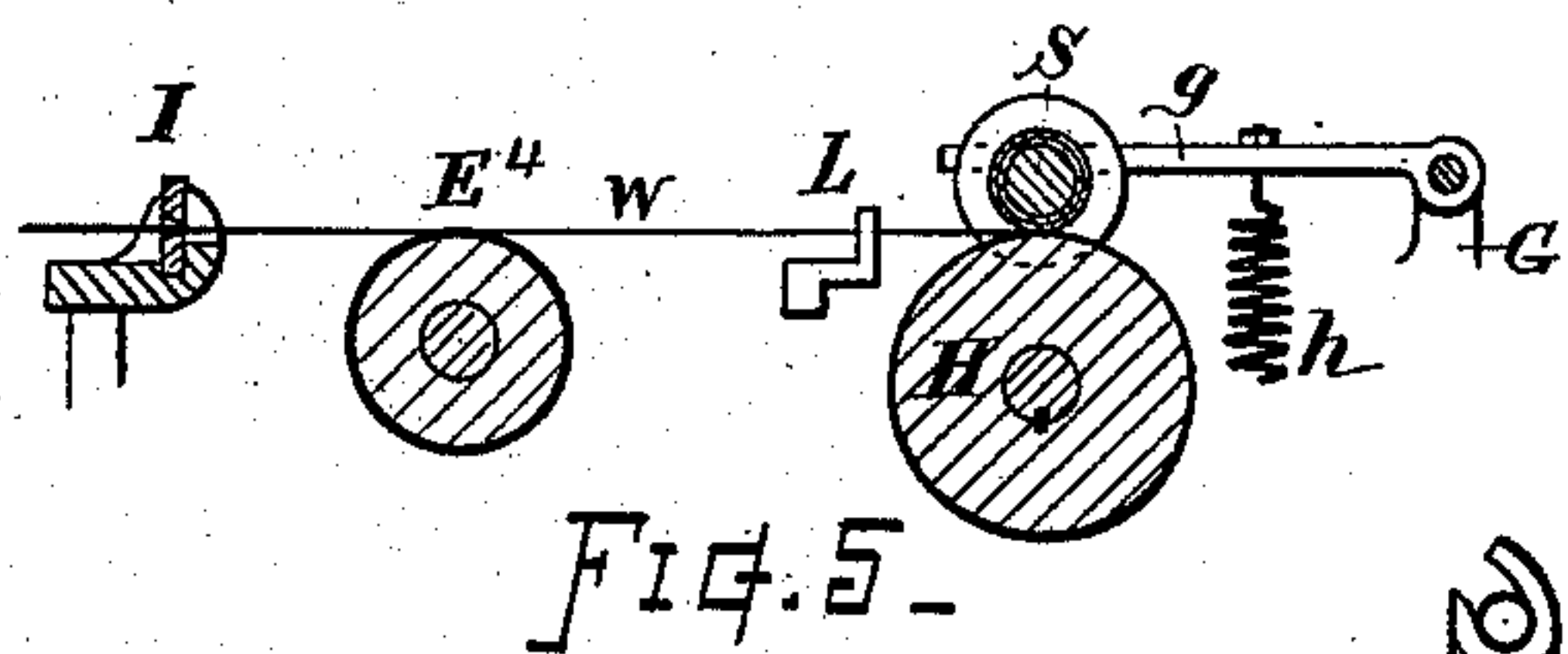
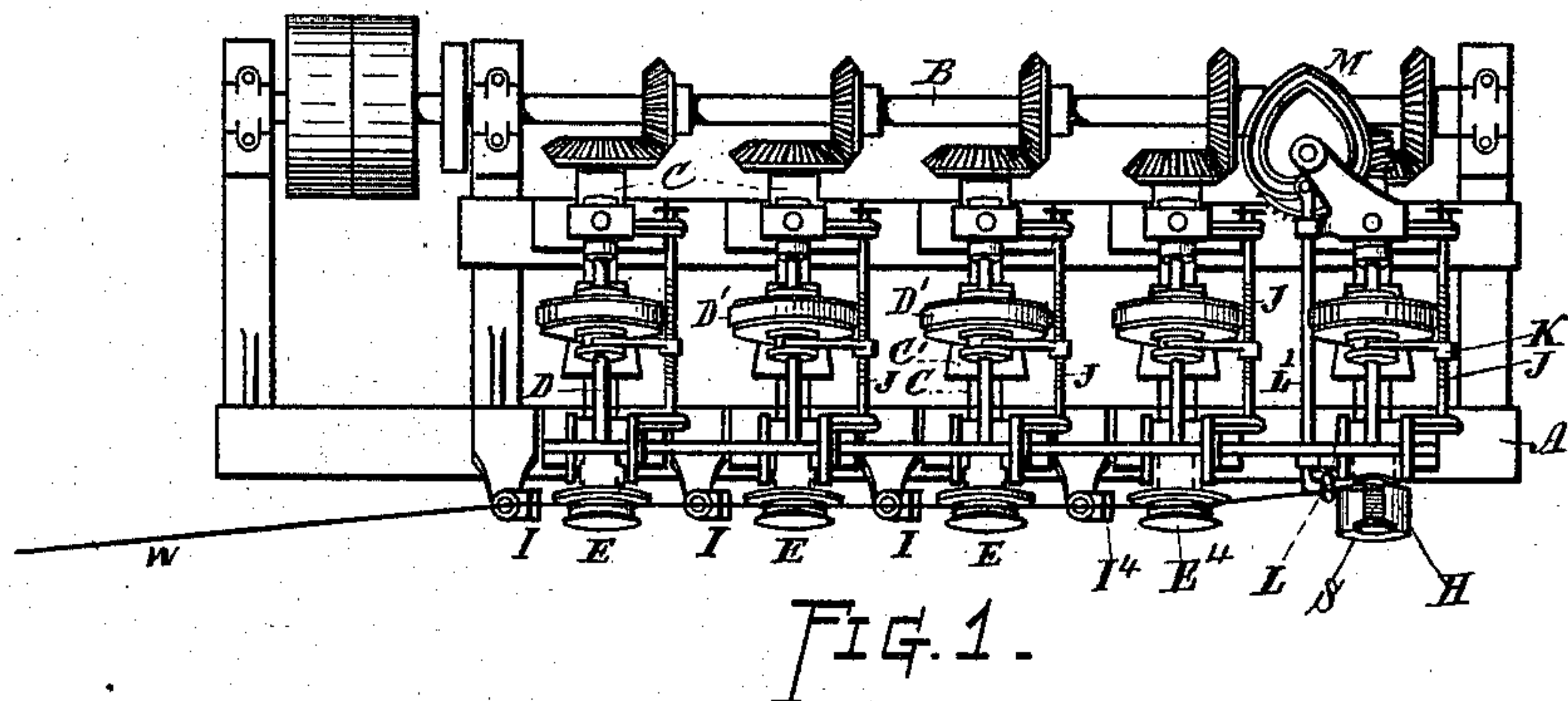


(No Model.)

F. H. DANIELS.
WIRE DRAWING MACHINE.

No. 412,477.

Patented Oct. 8, 1889.



WITNESSES:

Ella P. Glenn
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UNITED STATES PATENT OFFICE.

FRED H. DANIELS, OF WORCESTER, MASSACHUSETTS.

WIRE-DRAWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 412,477, dated October 8, 1889.

Application filed May 24, 1889. Serial No. 311,963. (No model.)

To all whom it may concern:

Be it known that I, FRED H. DANIELS, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Wire-Drawing Machines, of which the following, together with the accompanying drawings, is a specification sufficiently full, clear, and exact to enable persons skilled in the art to which this invention appertains to make and use the same.

The object of this invention is to provide in a continuous wire-drawing machine a practical and efficient mechanism for winding the wire directly upon spools as it is drawn, and to afford therein facilities for rotating the spool at such speed as will lay the wire thereon at uniform tension, means for guiding the wire to the spool, and facilities for regulating and adjusting the speed of the spooling mechanism in relation to the drawing mechanism; also, to provide in a machine of the class named a draft-puller in advance of the spooling mechanism, whereby the strain required for drawing the wire through the die is exerted and the spool relieved from all strain on the wire, except such as is required for giving the desired degree of tension for laying the wire thereon. These objects I attain by mechanism the nature, construction, and operation of which is herein explained, the particular subject-matter claimed being hereinafter definitely specified.

In the drawings, Figure 1 is a plan view of so much of a continuous wire-drawing machine as will illustrate the nature of my invention. Fig. 2 is a vertical section. Fig. 3 is a plan view of one end of the mechanism, showing the spool and its operating mechanism. Fig. 4 is a front end view of the same; and Fig. 5 is an outline diagram showing the relative arrangement of the spooling devices, the advance draft-pulley, and finishing-die.

In referring to parts, A denotes the frame; B, the main shaft; C, the operator or transverse shafts; C', the conoidal drums with frictional surfaces; D, the draft-arbors; E, the draft-pulleys; D', the friction-wheels on the draft-arbors for engagement with the operator-drums; I, the wire-drawing dies, and J the screws for adjusting the friction-wheels on their arbors to vary the speed of the draft-

pulleys. All of the above parts can be constructed and arranged for operation in suitable well-known manner or as described in my previous application for Letters Patent, Serial No. 293,773.

At the end of the machine I arrange a rotatable cylindrical drum H, on the peripheral surface of which the spool S is supported for receiving and winding the wire. Said spool rests upon the face of the drum, while its axis is confined in a suitable bearing or slotted hanger G, that retains the spool in proper relation to the drum, while allowing it to roll on the surface thereof.

The spool-supporting hanger is best provided with a hinged tongue or fork *g*, that bears upon the axis at the ends of the spool and presses the spool downward against the surface of the drum. A spring *h* is connected therewith for giving the requisite or desired pressure, said spring being preferably made adjustable for varying the tension or giving greater or less friction between the spool and its operating-drum H. The peripheral surface of the drum H, running against the barrel of the spool or the wire wound thereon, rotates the spool for winding up the wire directly and as fast as it comes from the series of drawing-dies. The spool can be readily taken out and replaced by lifting the tongue *g* and raising the spool-axis from the slots in the hanger.

The drum H is mounted upon an arbor D², similar to those employed for the draft-pulleys E, said arbor being furnished with an adjustable friction-wheel D³, and a screw J and arm K are provided for shifting the friction-wheels for varying the speed of the drum H, to give quicker or slower winding action on the spool.

In front of the spool a guide L is arranged, which in the present instance is fixed on the end of a laterally-reciprocating bar L', that is operated by a heart-shaped cam M, mounted on an upright shaft, as indicated, and driven by a worm and worm-wheel *m* at the rear of the arbor D².

In advance of the spool and spool-operating drum, between the guide L and the finishing-die I⁴ or die which gives the final reduction on the wire, I arrange a drawing head or pulley E⁴, around which the wire is

wrapped a sufficient number of times to enable said drawing pulley or head to exert on the wire all the strain necessary for pulling the wire through the die, so that the wire will
5 be delivered to the spool without strain other than such as may be required for winding the wire upon the spool, and which is imparted by the friction on the surface of the drum H.

By the means herein described I am enabled to practically and successfully wind the
10 wire directly upon spools on the wire-drawing machine and to produce a spool of wire evenly and uniformly wound, the wire being laid upon the spool at uniform tension and
15 in a smooth, regular, and perfect manner.

The speed at which the wire is wound upon the spool depends upon the rolling of the spool on the peripheral surface of the drum H, so that the tension on the wire and peripheral
20 speed of the spool are not varied as the size of the spool increases by the winding on of more or less wire.

I do not confine myself to the particular form of hanger shown for retaining the spool
25 in proper relation to the drum, as any suitable hanger or device can be used which will maintain the spool at the desired position and give the necessary pressure on the drum, and also permit of the convenient doffing and
30 changing of the spools as they are filled with wire.

I am aware that in the present state of the art it is not a new idea to spool wire upon a wire-drawing machine; but the mechanism as
35 heretofore constructed for effecting the spooling operation is essentially different in its nature and manner of operation from the improved mechanism herein illustrated, described, and claimed.

40 I claim as my invention, to be herein secured by Letters Patent—

1. In a wire-drawing machine, a spool and an operating-drum for supporting and revolving the spool at uniform speed as the coil of
45 wire thereon increases, a guide for directing the wire onto the spool, and means; substantially as described, for moving said guide, in

combination with a series of wire-drawing dies and rotatable draft-pulleys arranged for reducing the wire in continuous successive
50 order.

2. In a wire-drawing machine, the combination, with the series of wire-drawing dies and draft-pulleys, of a winding-on spool, an advance draft-pulley between the finishing-die
55 and spool, and a traversing guide for leading the wire onto the spool.

3. In a wire-drawing machine, the combination of a spool, an operating-drum for revolving the spool by peripheral contact with the
60 barrel of the spool or wire wound thereon, and an advance draft-pulley disposed between the spool and the final wire-drawing die for exerting the strain required for drawing the wire, substantially as set forth.

4. In a wire-drawing machine, the combination of a spool, an adjusting support or hanger for retaining the spool-axis, and an operating
70 drum or roll for revolving the spool at uniform peripheral speed as the coil of wire thereon increases in diameter, as set forth.

5. In a wire-drawing machine, the combination of a spool and operating-drum for revolving the spool by peripheral contact, a hanger
75 for maintaining the spool in proper relation to the drum, and a spring for giving pressure of the spool against the surface of the drum, substantially as and for the purpose set forth.

6. In a wire-drawing machine, the combination, with a series of wire-drawing dies and
80 draft-pulleys, of a spool for winding the finished wire, an operating-drum for revolving said spool by peripheral contact, an adjustable frictional operating-wheel for imparting rotative motion to said drum, and means, substantially as set forth, for adjusting said frictional operating-wheel for varying the speed
85 of the drum, as and for the purpose set forth.

Witness my hand this 20th day of May, A. D. 1889.

FRED H. DANIELS.

Witnesses:

CHAS. H. BURLEIGH,
ELLA P. BLENUS.