

(No Model.)

3 Sheets—Sheet 1.

C. T. STETSON, Dec'd.

E. S. STETSON, Executrix.

LOOM FOR WEAVING TUBULAR FABRICS.

No. 601,215.

Patented Mar. 22, 1898.

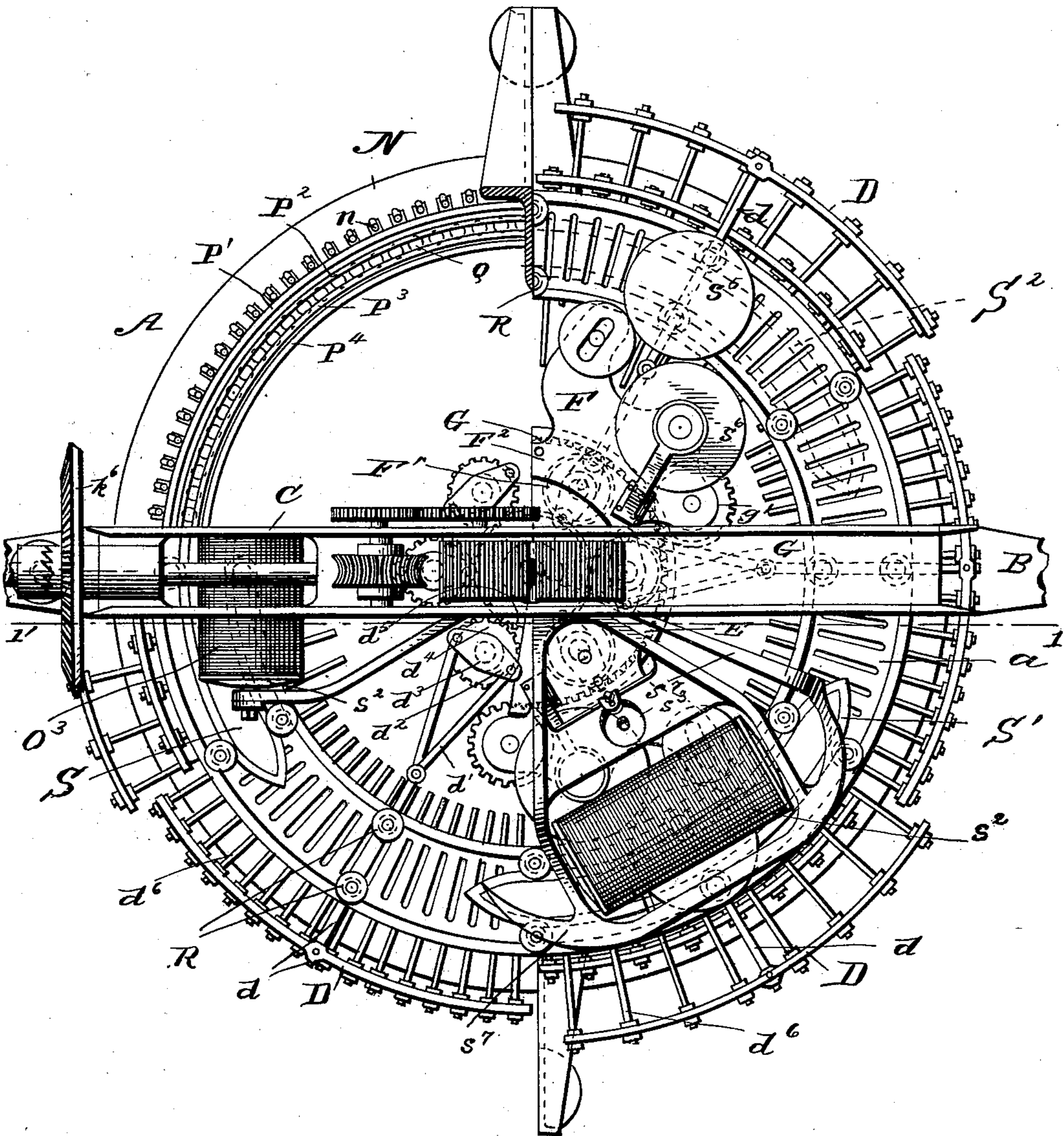


Fig. 1.

Witnesses

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J. H. [Signature]

Inventor

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Executrix of Charles T. Stetson, Deceased,
by Wm. O. Webber, Attorney

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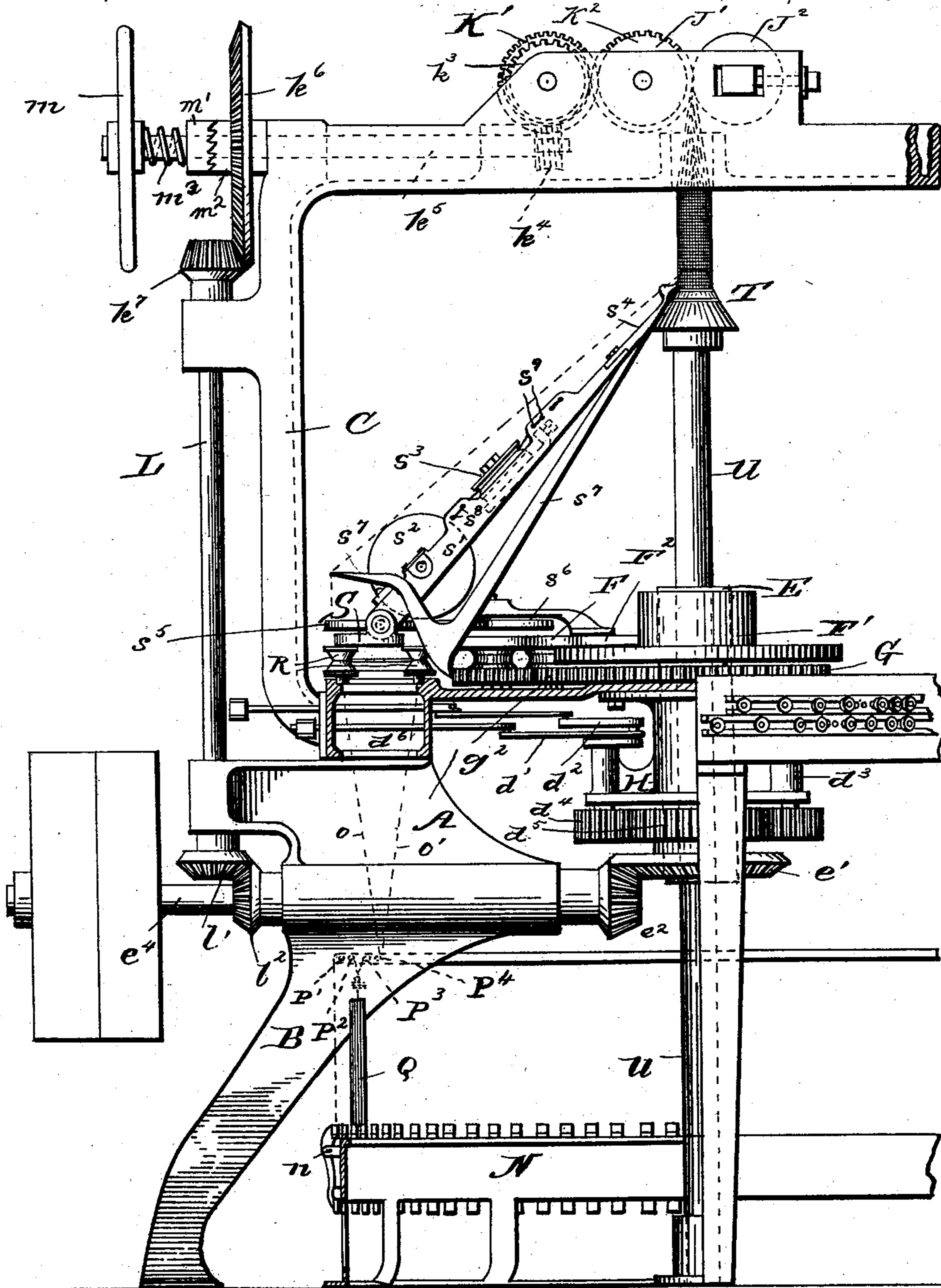


Fig. 2.

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(No Model.)

3 Sheets—Sheet 3.

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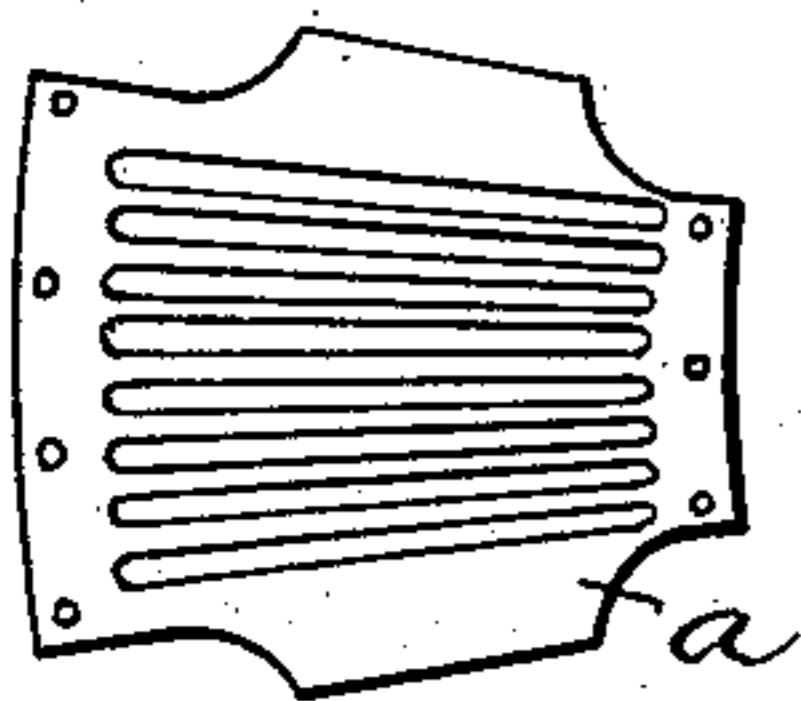
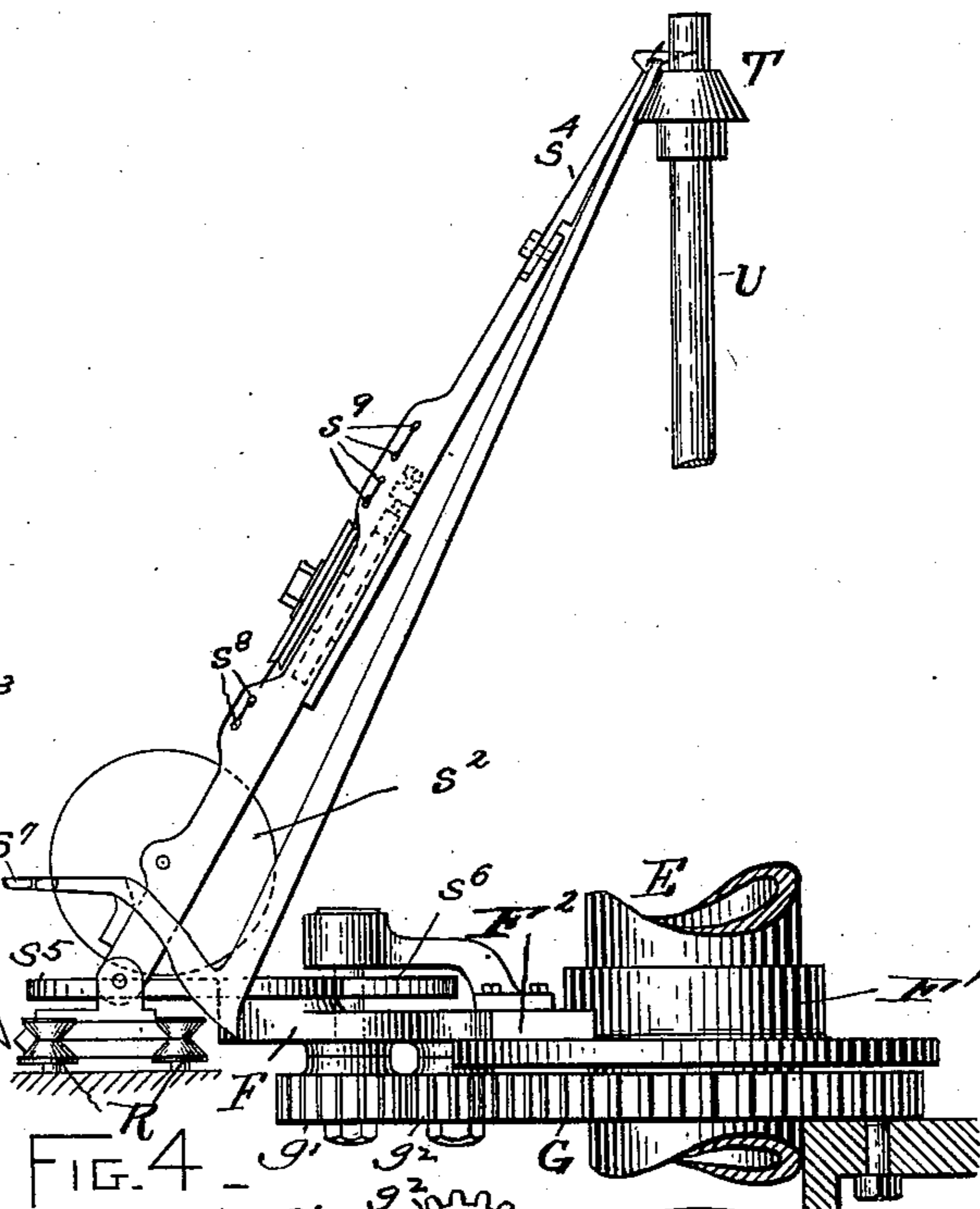
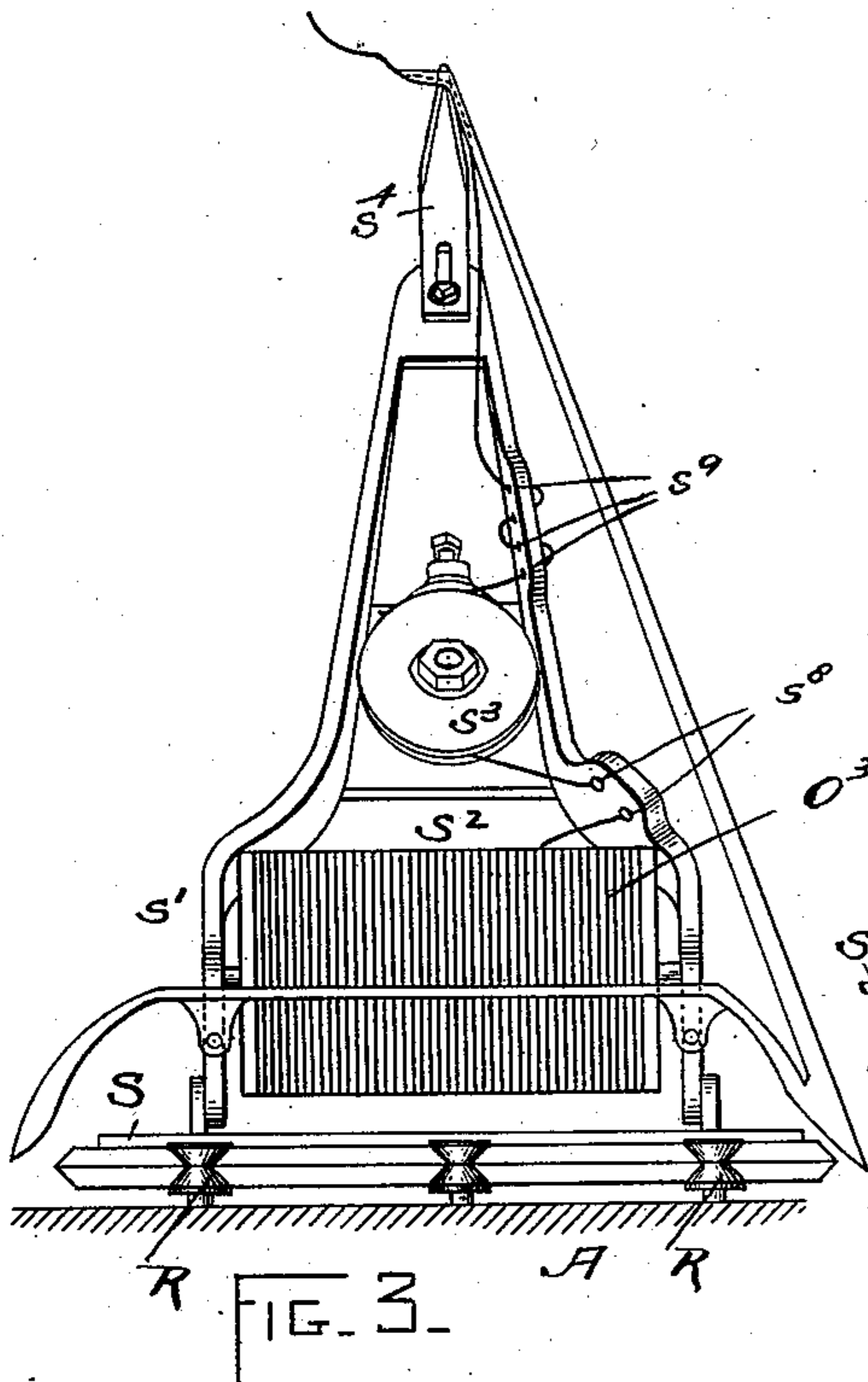


FIG. 6.

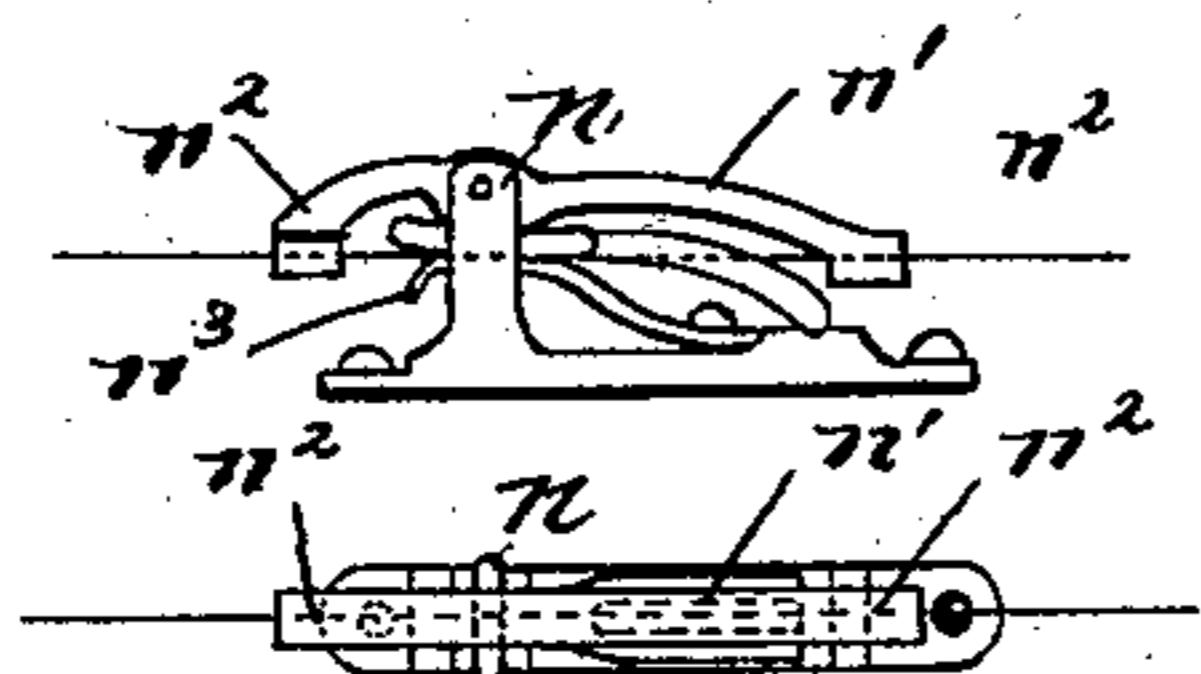


FIG. 7.

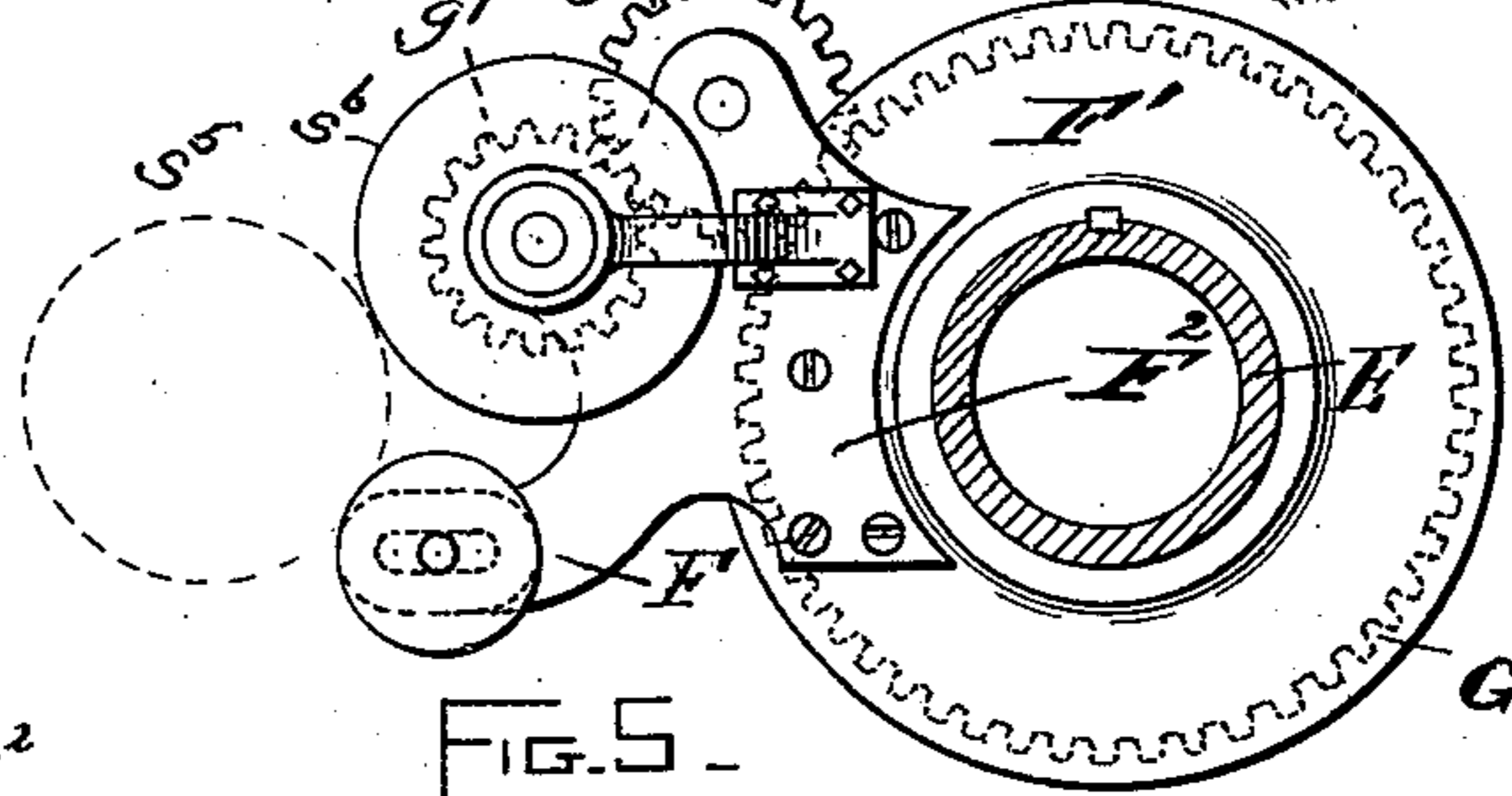


FIG. 5.

WITNESSES:

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INVENTOR

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UNITED STATES PATENT OFFICE.

ELIZABETH S. STETSON, OF HANOVER, MASSACHUSETTS, EXECUTRIX, &c.,
OF CHARLES T. STETSON, DECEASED.

LOOM FOR WEAVING TUBULAR FABRICS.

SPECIFICATION forming part of Letters Patent No. 601,215, dated March 22, 1898.

Application filed October 5, 1896. Serial No. 607,972. (No model.)

To all whom it may concern:

Be it known that CHARLES T. STETSON, deceased, late a citizen of West Hanover, in the county of Plymouth and State of Massachusetts, did invent certain new and useful Improvements in Hose-Looms or Machines for Making Tubular Fabrics, of which the following, taken in connection with the accompanying drawings, is a specification.

10 This invention relates to hose-loom or machines for the production of tubular woven fabrics; and it consists of certain improvements in the construction thereof, as will be hereinafter fully described, and pointed
15 out in the specification and claims connected hereto.

This invention is illustrated in the accompanying drawings as follows:

20 Figure 1 is a plan view. Fig. 2 shows on the left of a vertical center line a vertical section on the dotted line 1 and 1' in Fig. 1. On the right of the center line it shows a vertical elevation. Fig. 3 is a vertical elevation of the outside of one of the shuttles, looking toward
25 the center of the machine. This view shows the top edge of the frame of the machine A, the grooved or double conical rollers in which the shuttle is guided, the filling-thread-tension device, weave-pin, and beating-in hook. Fig.
30 4 is an end elevation of this same shuttle, but showing also a section of the central driving-shaft E of the machine, the stationary gear G, the driving-arm F, which is attached to a face-plate fastened to the shaft E, and the two
35 small gears g' and g'' , meshing into the stationary gear G and giving a rotary motion to the driving-wheel s^6 , which in turn drives the small wheel s^5 fastened to the shuttle. This view also shows the upper part of the station-
40 ary central shaft U, weaving-cone T, and relative position of the weaving-point and spreader thereto. Fig. 5 is a plan view of a section of the central hollow shaft, the stationary gear G, the driving-arm F, and the small gears and wheels for transmitting power to the shut-
45 tles. Fig. 6 is a plan view of one of the segments of covering-plates for the top of the main frame A and which acts as a guide for the warp-threads, which are reciprocated back
50 and forth by the heddles in the radial slots shown in this plate. This plate is designed

to prevent the warp-threads from being carried along by the shuttles in the direction of their movement and thereby becoming entangled one with another. Fig. 7 shows a
55 plan and vertical side elevation of the tension devices n , consisting of a pivoted guide-lever through eyes in the end of which a warp-thread is passed and a spring fastened to the stand supporting this pivoted lever and press-
60 ing up against a presser-finger interposed between the ends of this spring and the fulcrum of the pivoted lever, so as to bear upon the warp-threads at this point.

This device consists of a main annular
65 frame A, which is supported on the legs B and supporting above it the take-up frame C. Passing horizontally through the annular frame A are the heddle-frames D, which are actuated by means of the rods d , connecting-
70 links d' , double-throw cranks D^2 , which in turn receive their motion through the vertical shafts d^3 , by means of the gears d^4 and the gear d^5 , which is keyed to the main shaft E of the machine. This main shaft in turn re-
75 ceives its motion through the bevel-gears e' and e^2 and the driving-shaft e^4 . On top of the main frame A are three shuttles S S' S², the last-named shuttle S² being shown in dotted lines in Fig. 1 for sake of clearness of illus-
80 tration of the shuttle-actuating mechanism beneath. These shuttles are guided in their annular path around the top of the frame by the grooved rollers R, whose shape is that of
85 two truncated cones joined together at their smaller ends. On top of the shuttles S, S', and S² are the bobbin-carriers s' , which carry the bobbins s^2 , tension-rollers s^3 , and weaving-
90 points s^4 . These shuttles S, S', and S², which are three in number, receive their motion through the medium of the rollers s^5 and s^6 . The rollers s^6 are carried by the arms F,
95 formed integral with the frame F², which is secured to the annular plate F', keyed fast to the main shaft E, before referred to. The arms F revolve with the main shaft E from
left to right, and the rollers s^6 come up behind the rollers s^5 , which are carried on the
shuttles S, S', and S² and drive the shuttles in their circular path ahead of these arms.
100 The rotary motion from right to left given the rollers s^6 is to facilitate the passage of

the warp-threads between the rollers s^5 and s^6 . These rollers s^6 receive a rotary motion by means of the gears g' and g^2 , the gear g^2 being in mesh with the large stationary gear 5 G, which is secured fast to the top of the annular frame A. The frame or stand H, which carries the small vertical shafts d^3 , is also secured to the main annular frame A. The take-up rollers J' and J^2 receive their motion 10 through the gears K' and K^2 , the gear K' being actuated by means of the worm-wheel k^3 and worm k^4 , which is keyed to the shaft k^5 , which is in turn driven through the bevel-gears k^6 and k^7 , which latter in turn receives 15 its motion through the vertical shaft L and miter-gears l' and l^2 , which latter gear receives its motion from and is keyed fast to the shaft e^4 . The take-up shaft k^5 is also provided with a hand take-up wheel m and engaging 20 clutch-face m' , which meshes with the face of a similar clutch-face m^2 , which is an integral part of the bevel-gear k^6 . The engaging clutch-face m' is held in contact with the opposite clutch-face m^2 by means of the spring 25 m^3 . The gear k^6 is not keyed to the shaft k^5 , but drives through the medium of the clutch-face m' , which is splined upon the shaft k^5 and has a lateral motion upon this shaft.

Upon the floor between the the legs B are 30 the warp-tension and controlling devices comprising tension-frames N, which carry the tension-fingers n , which are preferably constructed as a pivoted lever n' , through eyes n^2 , in both ends of which the warp-threads 35 are passed, and the tension is produced by a spring n^3 underneath this lever bearing up against the warp-threads. These levers are pivoted, so as to insure their being kept in line with the axis of the warp-threads. The 40 warp-threads O and O' come up through the floor beneath the machine, pass through the tension-fingers n up over the take-up rods P' P^2 , down between the rods P^2 and P^3 , through the take-up weight Q, over the rod P^3 , under 45 the rod P^4 , then up through the eyes in the heddles d^6 in the heddle-frames, then through slots in the guide-plates a , (see Fig. 6,) which form the top to the annular frame A, passing either side of the shuttles S' and S, being dis- 50 tended on the outer side, so as to clear the bobbin s^2 by the spreader s^7 . The point of this spreader is designed to enter between the opening of the warp-threads in advance of the shuttles, force them apart, so as to pre- 55 clude their catching upon any point of the shuttle, and to allow them to fall back in place over the tail of the spreader, as shown, and so to the weaving-points s^4 , where they are brought in contact with the weaving-pin T, 60 which is carried by the internal rod U, inside of the revolving shaft E.

The filling-threads O³ are wound on the bobbins s^2 and pass through the guide-eyes s^8 , guide-eyes s^9 , tension-wheel s^3 , and so to 65 the weaving-points s^4 , where they are forced in between the warp-threads O and O', the fabric being drawn upward by the take-up

rollers J' and J^2 . There are three sets of shuttles and shuttle-driving mechanisms, as 70 described above, and six sets of heddles working in alternate order with the set of heddles immediately preceding and succeeding them. The object of the design of this machine is to so construct a machine that all 75 of the reciprocating parts occupy as low a position as possible and also to make them as direct acting and compact as possible, so as to both concentrate and lower the center of gravity of the machine, thereby insuring 80 its stability and permit of its being run at very high speed with a minimum amount of jar and oscillation. To insure this result, the heddles, heddle-actuating mechanism, main driving mechanism, warp-thread take-up, and 85 tension are all placed below the path of the shuttles, there being nothing above the horizontal line of the shuttles excepting the take-up frame C and its mechanism, which is made as light and simple as possible, so as not to 90 carry much weight up into the air and also so as to present the least-obstructed view and freest means of access to the weaving-point of the fabric being constructed, which is 95 therefore at all times easily accessible for the inspection of the person in charge of the machine. It is also designed to accomplish, by the use of the three or more shuttles, a machine which will form tubular fabrics of com- 100 paratively small diameters with the utmost rapidity. In fact, the whole design of the machine is to secure one which can be run at the highest possible speed and produce the greatest amount of fabric in a given time.

Having thus fully described the construction and method of operation of this machine, 105 what is desired to be claimed and secured by Letters Patent is as follows:

1. In a circular loom for the production of tubular fabrics, the combination with a supporting-frame provided with grooved rollers 110 by which the shuttle is supported and between which it runs, of a series of shuttles mounted therein, a central stationary gear, a frame secured to the driving-shaft and revolving in proximity to said stationary gear, 115 pinions mounted on said frame meshing with said stationary gear, and rollers or disks driven by said pinions as said frame revolves and which bear against said shuttles and cause them to run. 120

2. In a circular loom for the production of tubular fabrics, the combination with the supporting-frame A, of a shuttle-race formed with a series of grooved guiding-rollers R, of shuttles S, S', S², mounted in said race, mech- 125 anism for driving said shuttles, and a series of radially-disposed heddle-frames supported by the frame A, the central driving-gear d^5 , the pinions d^4 meshing with said central gear, the shafts d^3 driven by said pinions d^4 , the double 130 crank-arms d^2 carried by shafts d^3 , the heddle-actuating rods d , the links d' connecting said crank-arms d^2 and rods d , the warp-tension devices n , annular take-up rods p, p' and

p^2 , and the take-up weights Q hanging between rods p' and p^2 , all lying below the plane of the shuttle-race and within the circumference of the supporting-frame.

5 3. In a circular loom for the production of tubular fabrics the combination with a supporting-frame, of shuttle-driving mechanism, heddles and their operating devices, warp-
10 tensions and controlling devices all situated below the shuttle-race, a shuttle-race composed of grooved rollers between which the shuttles run, filling-thread bobbins carried
15 above the shuttle-race, and a take-up device for the finished fabric consisting of two centrally-located rollers above the weaving-point, a pinion by which one of said rollers is driven, a worm for turning said pinion, a shaft on which said worm is mounted, a sleeve loosely

mounted on said shaft, a gear-wheel carried by said sleeve, clutch mechanism to lock said 20 sleeve and gear-wheel to said shaft, a hand-wheel carried by said shaft, and connections between said gear-wheel and the main driving-shaft.

In testimony whereof I, ELIZABETH S. STET- 25 SON, have signed my name to this specification, in the presence of two subscribing witnesses, on this 11th day of September, A. D. 1896.

ELIZABETH S. STETSON,
*Executrix, &c., of the estate of Charles T.
Stetson, deceased.*

Witnesses:

CHAS. W. HOWLAND,
WILLIAM O. WEBBER.