

No. 641,378.

Patented Jan. 16, 1900.

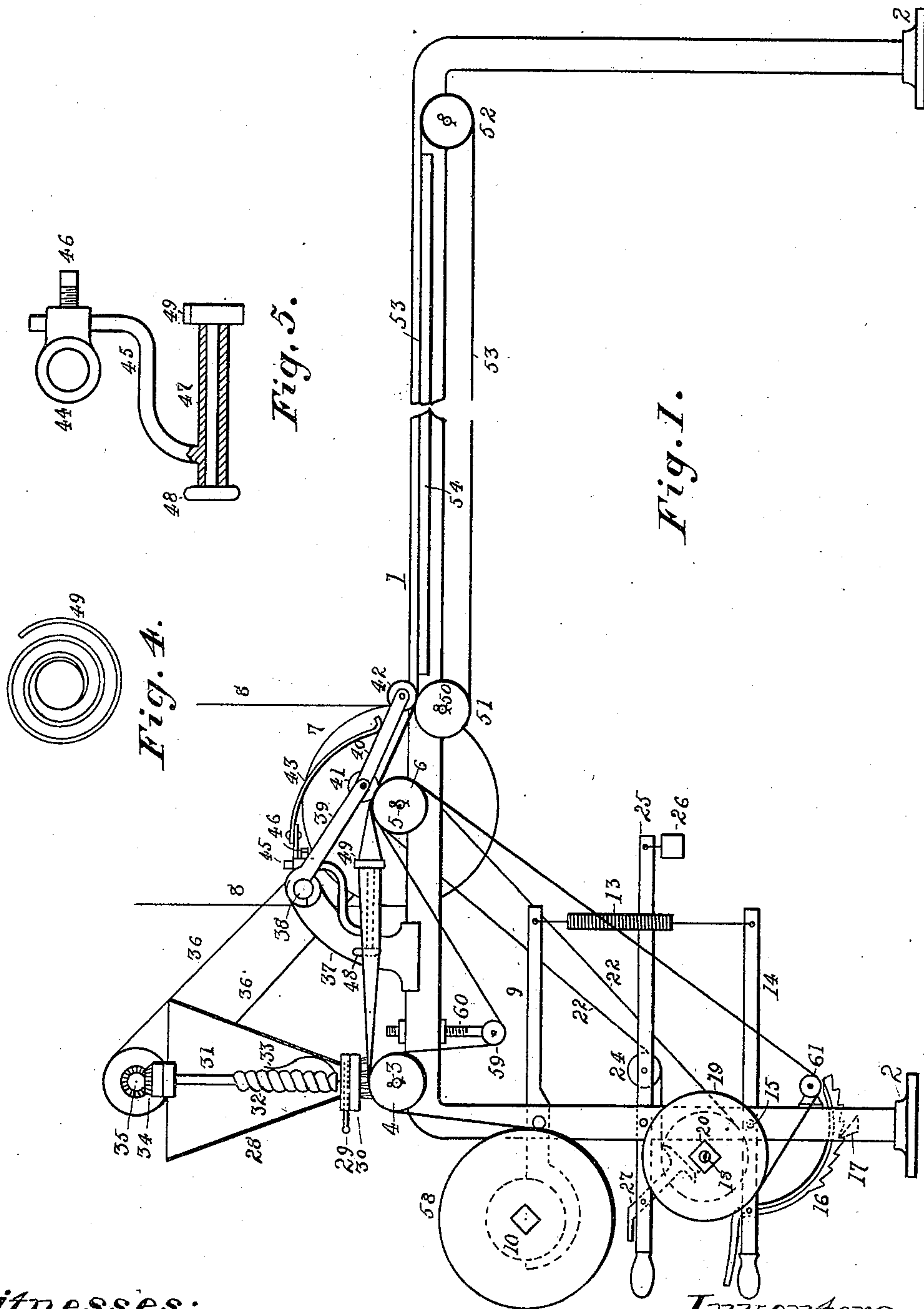
A. E. ELLINWOOD & S. S. MILLER.

MACHINE FOR FORMING INNER TUBES OF PNEUMATIC TIRES.

(Application filed June 7, 1899.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:

Fred. St. Burgher
Kellie M. Danforth

Inventors:

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Stephen S. Miller,
by Humphrey Humphrey Atty.

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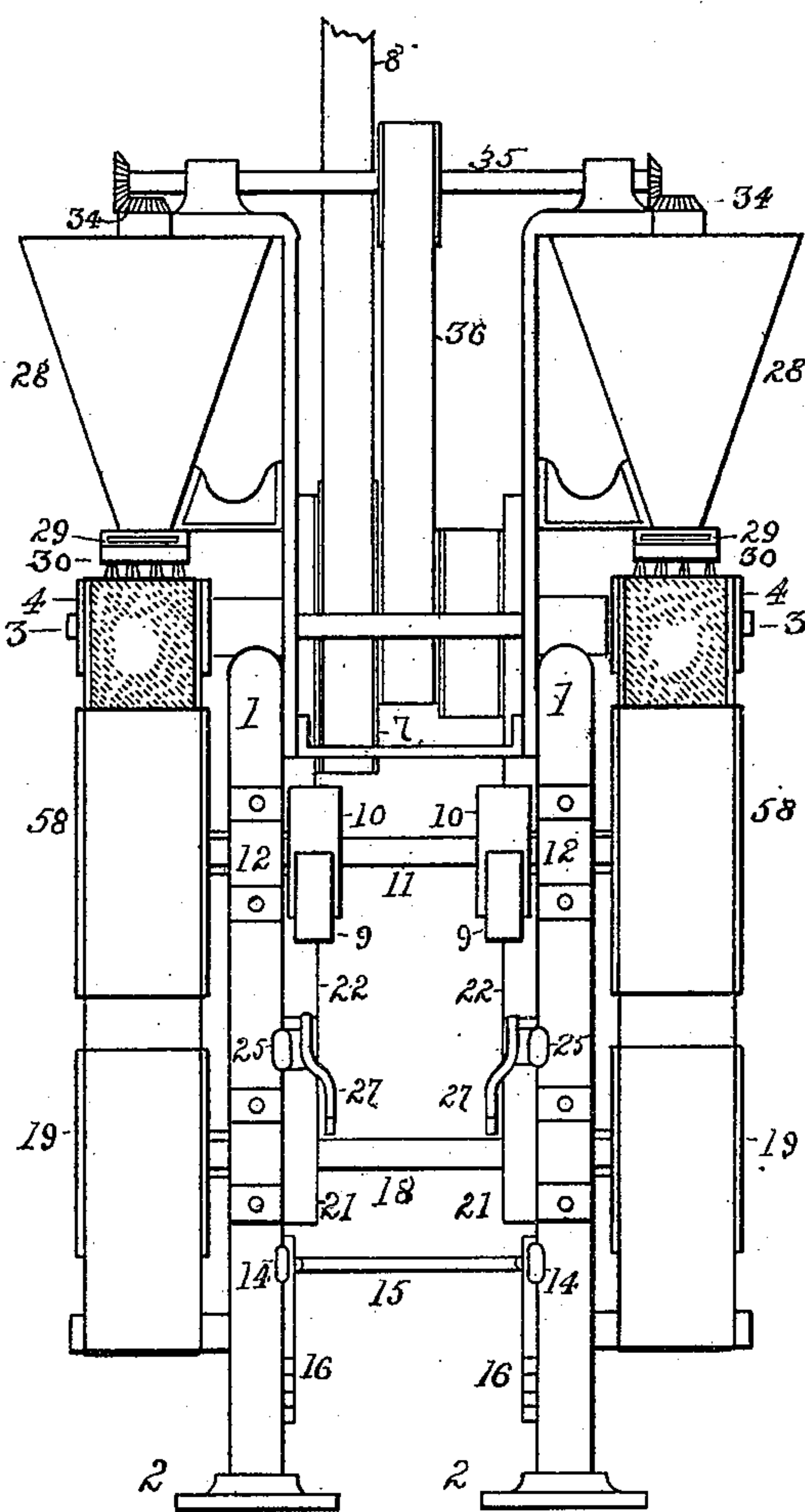


Fig. 2.

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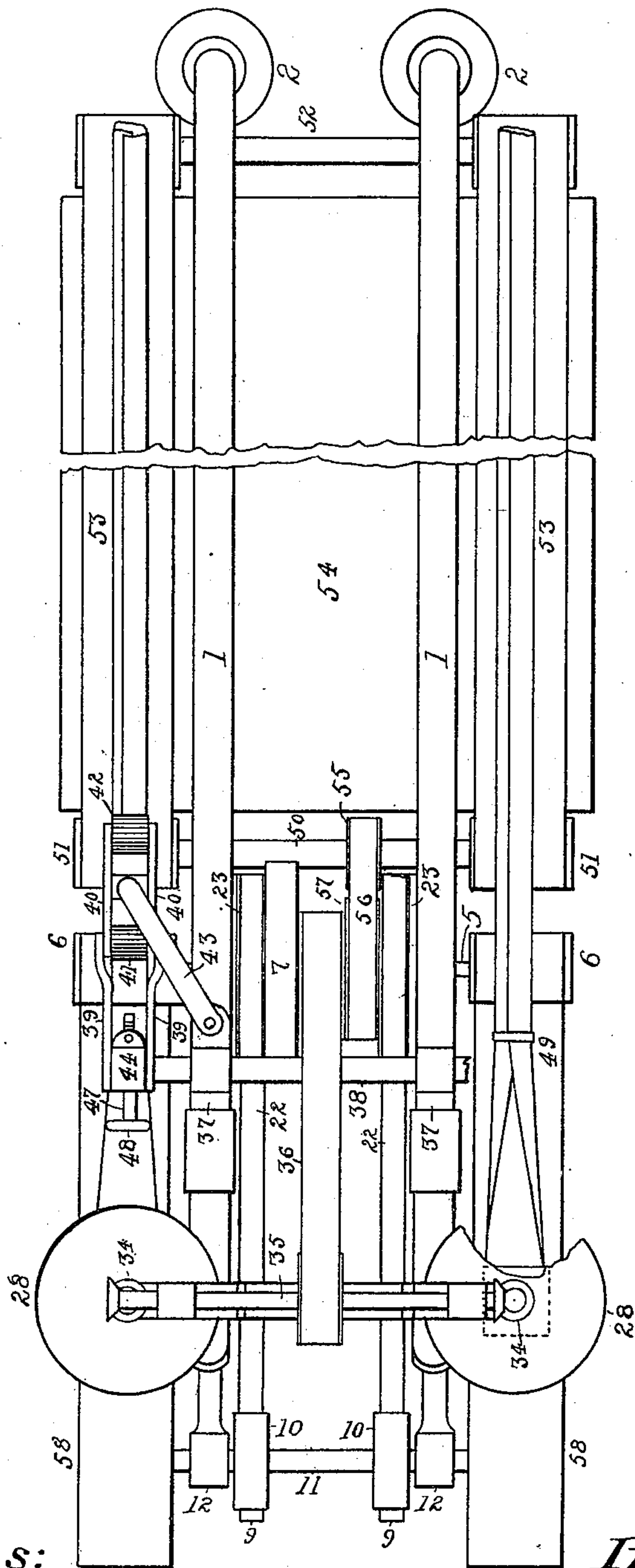


Fig. 3.

Witnesses:

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UNITED STATES PATENT OFFICE.

AUGUSTUS E. ELLINWOOD AND STEPHEN S. MILLER, OF AKRON, OHIO,
ASSIGNORS TO THE GOODYEAR TIRE AND RUBBER COMPANY, OF
SAME PLACE.

MACHINE FOR FORMING INNER TUBES OF PNEUMATIC TIRES.

SPECIFICATION forming part of Letters Patent No. 641,378, dated January 16, 1900.

Application filed June 7, 1899. Serial No. 719,643. (No model.)

To all whom it may concern:

Be it known that we, AUGUSTUS E. ELLINWOOD and STEPHEN S. MILLER, citizens of the United States, residing at Akron, in the county of Summit and State of Ohio, have invented a certain new and useful Improvement in Machines for Forming the Inner Tubes of Pneumatic Tires, of which the following is a specification.

Our invention has relation to improvements in machines for forming the inner tubes of pneumatic tires; and it has for its object the production of mechanical devices which shall take the ribbon of rubber from a spool, cover the part that is not intended to cohere with soapstone powder, carry it to devices that will form the fold, press the lap of ribbon together and convey it forward to be cut either mechanically or by hand into suitable lengths, and generally to cause these several devices to simultaneously coact to perform their successive offices in the production of the tube.

To the aforesaid object our invention consists in the peculiar and novel construction, arrangement, and combination of parts hereinafter described and then specifically pointed out in the claims, reference being had to the accompanying drawings, forming a part of this specification.

In the accompanying drawings, in which similar reference-numerals indicate like parts in the different views, Figure 1 is a side elevation; Fig. 2, an end elevation looking from the left of Fig. 1; Fig. 3, a plan, and Figs. 4 and 5 enlarged details of parts of the machine hereinafter described.

Referring to the drawings, 1 is the supporting-frame, which may be of any desired material and construction that will subserve the purpose; but the form shown and constructed of solid or hollow rods will be found suitable and is a preferred manner of construction. Journaled in the horizontal portion of this frame, at the left in Fig. 1, is a shaft 3, bearing at its ends small pulleys 4, and toward the right a similar shaft 5, having small pulleys 6 on its ends in alinement with the pulleys 4, and a large driving-pulley 7, driven by a belt 8 from above, as indicated in Fig. 2.

In the left uprights of the frame are pivot-

ally mounted two oppositely-disposed levers 9, having their outer ends curved to rest against and form brakes for small pulleys 10 on a shaft 11, journaled in brackets 12, extending from the left uprights of the frame. The inner ends of the levers 9 are connected by means of wires 13, having the intermediate portion coiled, with the inner ends of two hand-levers 14, pivoted on a rod 15, fastened in and extending between the uprights, and each lever has a pivoted curved ratchet 16, arranged to engage a fixed pawl 17 on the upright, said ratchet having a handle adjacent to the handle of the levers 14, by which they may be rocked up out of engagement with the pawls.

Between the levers 9 and 14 is journaled a shaft 18, the outer ends of which are arranged to receive empty spools 19, on which the cloth strip on which the rubber ribbon was previously laid, as hereinafter explained, is rewound as the rubber is removed, and these spools are removably fastened on the square shank end 20 of the shaft 18. This shaft 18 bears two pulleys 21, driven by belts 22, that run on pulleys 6 on the shaft 5. These belts are normally slack, but are tightened when desired by idlers 24, that run on wrists on the levers 25 drawn down by a weight 26. To release this tension, levers 27 are pivoted in the levers 25, having their upper ends adapted to be pressed down by the hand and their lower ends hooked to catch under the shaft 18 when it is desired to remove and replace the rewinding-spools 19.

Supported directly above the pulleys 4 are hoppers 28, adapted to be closed and their discharge regulated by gates 29, and bearing beneath said discharge annular brushes 30, that bear lightly on the rubber ribbon running over the pulleys 4 and serve to spread along its surface, excepting a narrow strip at one edge for the lap, powered soapstone, with which the hoppers are supplied. Within the hoppers are centrally journaled vertical shafts 31, each bearing on its lower portion a spiral fillet 32 and a curved sweep-arm 33 to agitate the powdered soapstone and feed it downward. The shafts 31 bear at their upper ends bevel-gears 34, that mesh with and are

driven by like gears on a horizontal shaft 35, that bears a central pulley driven by a belt 36 from a pulley centrally located on the shaft 5.

5 Between the shafts 3 and 5 there is attached to each side of the frame a rigid arm 37, between which arms and supported thereby is a cross-rod 38. On each end of this rod and slightly separated are freely-hinged pairs of
10 bars 39, with their free ends slightly bent and spread apart. Between these spread ends are pivotally connected two parallel bars 40, bearing between their ends rollers 41 and 42, the first whereof is arranged to bear on the
15 rubber tube passing over the pulley 6 and the other to similarly act above a roller hereinafter described. A spring 43, mounted on each arm 37, is arranged to press on a central block connecting the bars 40, and thus
20 cause the rollers 41 and 42 to bear firmly on the tube.

Between the bars 39 on the rod 38 are mounted sleeves 44, each having at one side a perforated lug, in which is fitted a rod 45, adjustably retained by a set-screw 46. The rod
25 45, for convenience of carrying its lower end toward the shaft 3, is offset in that direction and carries a tube 47, having at the left end an annular fillet 48 and at the other an open
30 involute metallic band 49 (shown enlarged in Fig. 4) and having its inner end fastened thereto. At the left of the center is a shaft 50, bearing pulleys 51, similar to pulleys 4 and 6, and at the extreme right a like shaft
35 bearing pulleys 52. On these pulleys run endless belts 53, beneath the upper halves of which and preferably extending across the machine is a platform 54. These belts are moved by a pulley 55 on the shaft 50, turned
40 by a belt 56 from a pulley 57 on the shaft 5, and these pulleys are arranged by the driving-belt and pulleys to have a surface motion slightly exceeding the surface motion of the pulleys 6, so as to draw the folded ribbon
45 forward, this peculiar action being necessary to insure the successful operation of the machine.

In operation the rubber ribbon is laid on strips of cloth and wound on large spools 58
50 and mounted as wanted on the ends of the shaft 11. The cloth strip and rubber ribbon are then led over the pulley 4, where they are separated, the cloth running under an idler 59, supported by a bolt 60, thence around the
55 pulley 6, and thence around a guide-roller 61 to be rewound. In passing under the hoppers 28 the rubber ribbon, except a strip to form the lap, is dusted with powdered soapstone, as hereinbefore stated, and thence carried to the right of the machine under the
60 fillet 48 to and through a determined part of the involute 49. The part of the involute through which the ribbon is drawn will depend upon the width of the latter, regulated
65 by the size of the tube to be made, this device permitting of a wide diversity of sizes

and will be selected, so that the issuing ribbon will have the edges that lap slightly separated, but in position to be pressed together. The ribbon thus formed passes over the pulley 6 and under the rollers 41, by which the lap is pressed together and continues over the rollers 51 and under the roller 42, by which the lap is again pressed. From these latter rolls it passes to the right along the platform
75 54, where it is cut off in determined lengths to form tires, by hand or mechanically-actuated shears, as desired, when it is ready to have the ends joined to complete the tire.

Having thus described our invention, what
80 we claim, and desire to secure by Letters Patent, is—

1. In a machine of the kind specified, the combination in a supporting-frame of devices to support the fabric and rubber-ribbon spool; mechanism to lead forward the fabric and ribbon; hoppers and brushes to coat a part of said ribbon with a non-adhering dust; devices for separating and leading forward the ribbon, and folding the same to lap the edges;
85 and rollers to press the lapped edges; all constructed and arranged to simultaneously coact to successively perform their several functions, substantially as shown and described.

2. In a machine for forming the inner tubes
95 for pneumatic tires, the combination of a supporting-frame, a spool to hold a strip of fabric and a superimposed band of rubber, of a pulley to lead said band and strip forward in tension, tube-forming mechanism to receive
100 the rubber band, pulleys to divert said strip from said band at said pulley to a rewinding-spool, and a rewinding-spool to receive said strip, all constructed to simultaneously coact, substantially as shown and described.

3. In a machine of the kind designated, the combination with devices for separating the fabric strip and rubber ribbon; a spool for rewinding the fabric strip, and a belt for turning said spool; of a pulley-carrying arm to
110 regulate the tension of said belt, and a latch to release the pressure of said arm and pulley, substantially as shown and described.

4. In a machine of the kind designated, the combination with means for forming a fold
115 of rubber ribbon with lapped edges, and a pulley and pressure-roller to receive and compress said folded edges; of a pulley to convey said folded ribbon from said pulley and pressure-roller, and arranged to run at a surface speed in excess of the surface speed of the pulley on which the edges are compressed, substantially as shown and for the purpose specified.

In testimony that we claim the above we
125 hereunto set our hands.

AUGUSTUS E. ELLINWOOD.
STEPHEN S. MILLER.

In presence of—

C. P. HUMPHREY,
C. E. HUMPHREY.