

(No Model.)

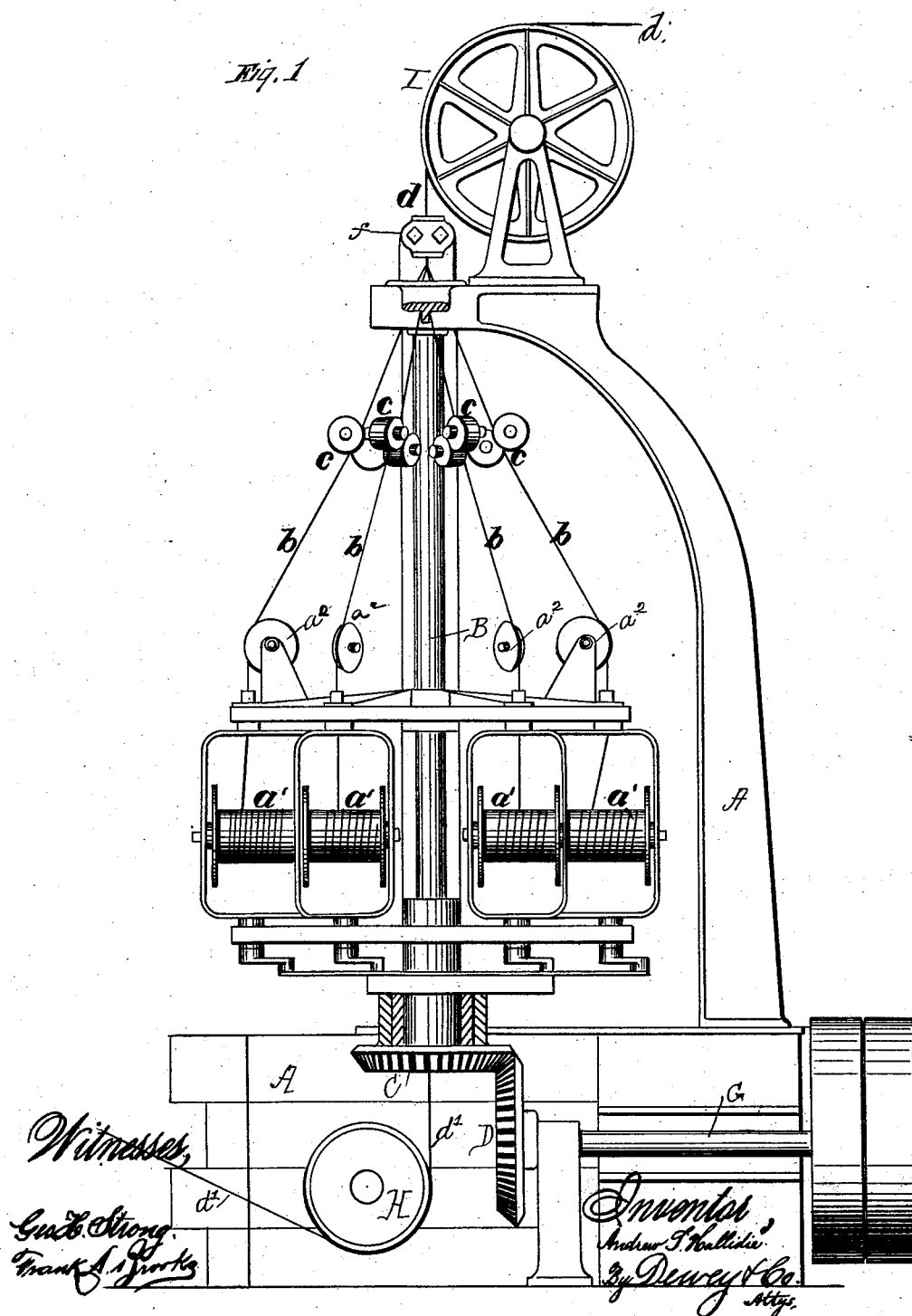
4 Sheets—Sheet 1.

A. S. HALLIDIE.

MACHINE FOR MAKING WIRE ROPE.

No. 264,529.

Patented Sept. 19, 1882.



(No Model.)

4 Sheets—Sheet 2.

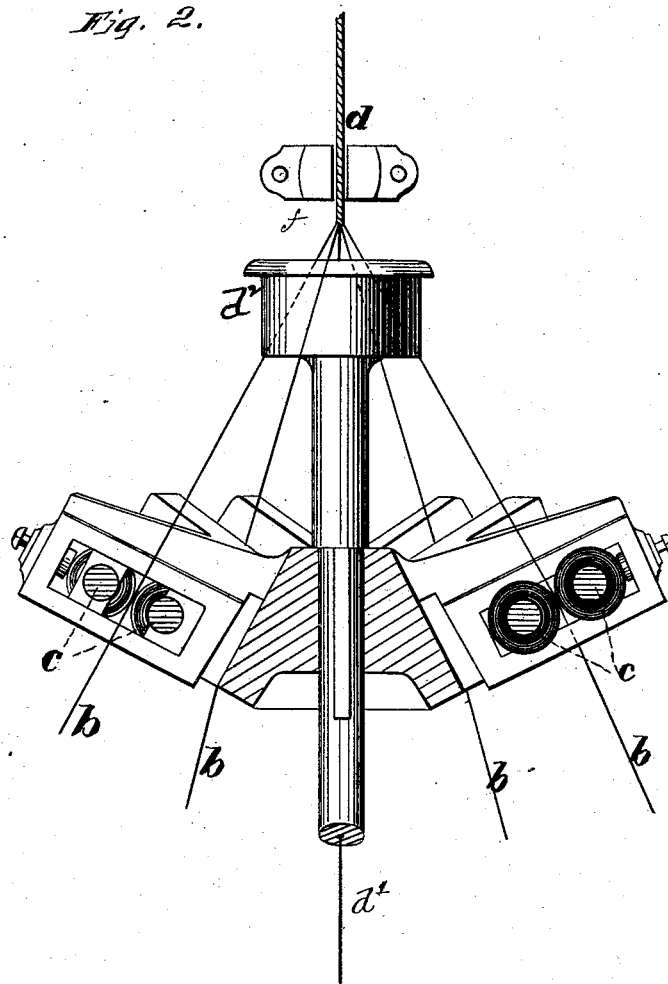
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Fig. 2.



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Fig. 3.

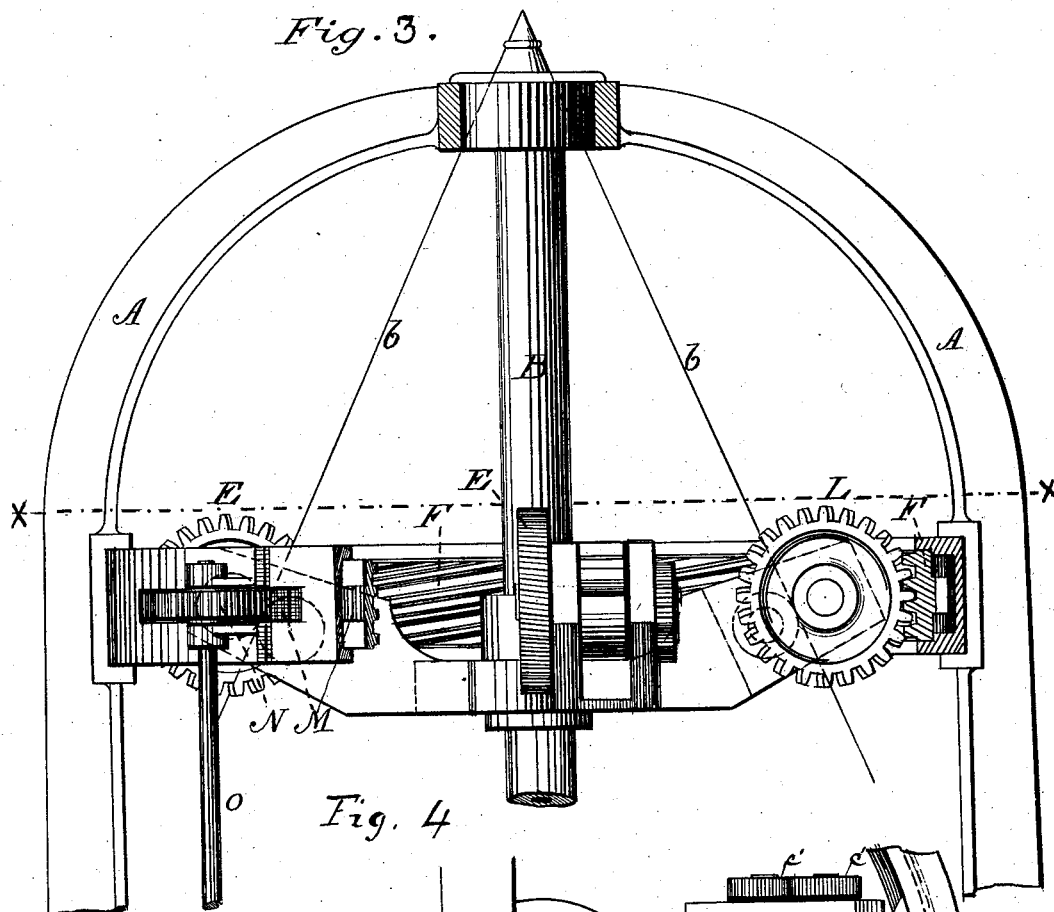
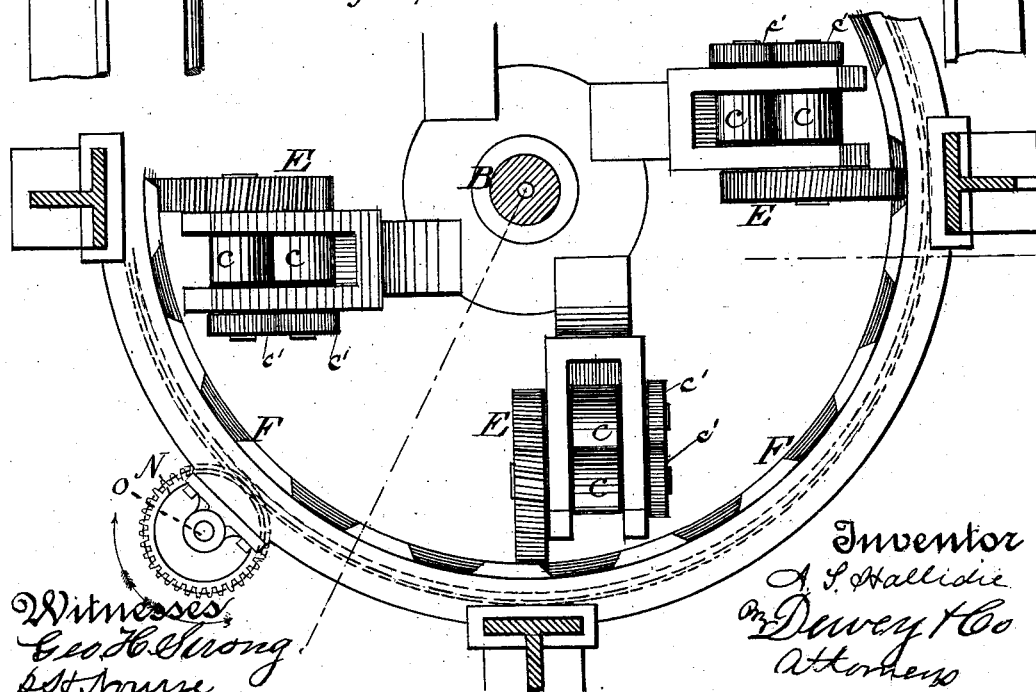


Fig. 4



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(No Model.)

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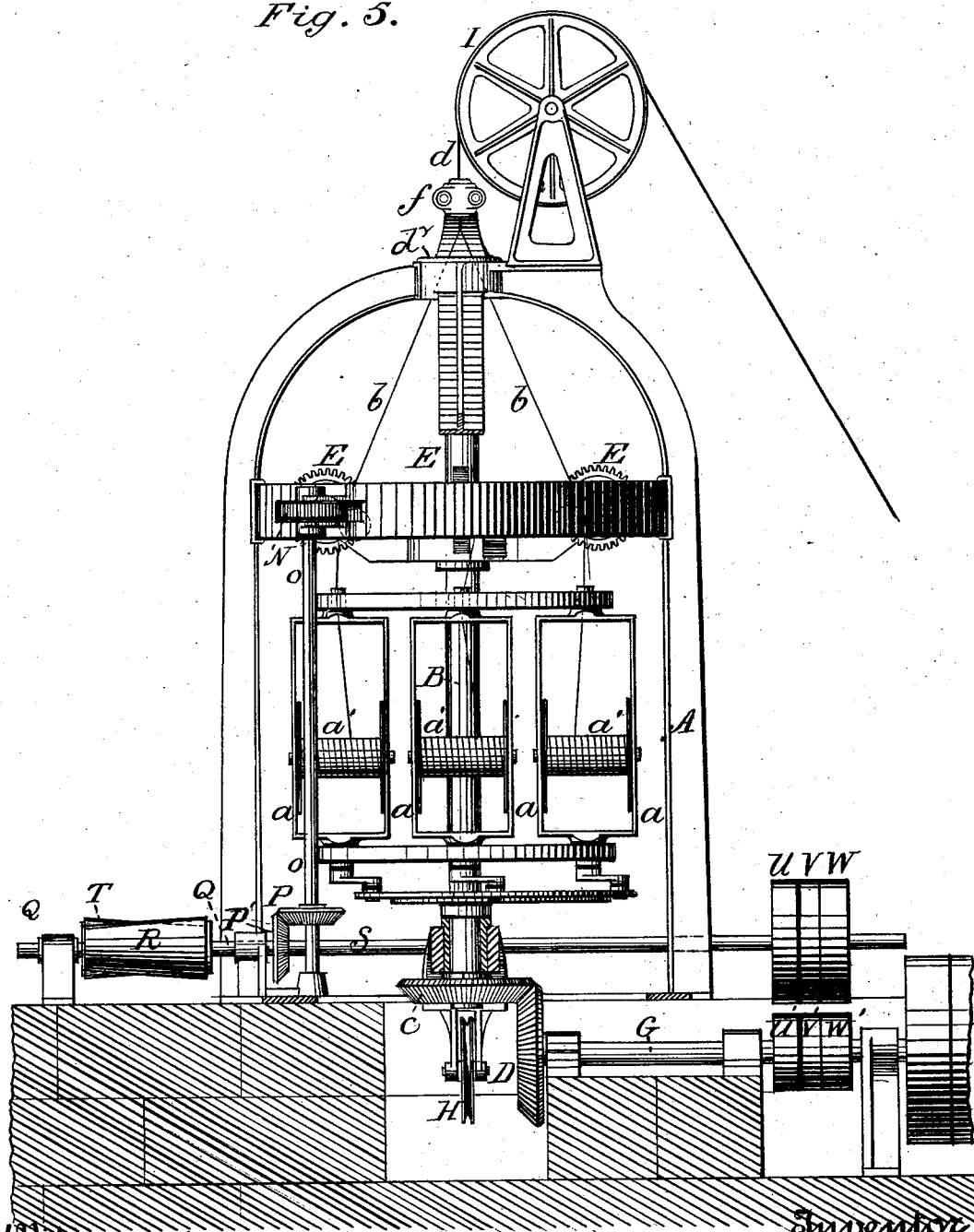
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Fig. 5.



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UNITED STATES PATENT OFFICE.

ANDREW S. HALLIDIE, OF SAN FRANCISCO, CALIFORNIA.

MACHINE FOR MAKING WIRE ROPE.

SPECIFICATION forming part of Letters Patent No. 264,529, dated September 19, 1882.

Application filed February 23, 1881. (No model.)

To all whom it may concern:

Be it known that I, ANDREW S. HALLIDIE, of San Francisco, California, have invented certain Improvements in Machines for Making Wire Rope; and I do hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, making part of this specification, in which—

- 10 Figure 1 is a side elevation, partly in section, of a machine to which my improvements have been applied, one of the supports, A, being broken away in front in order to better illustrate the device, the driving-gear for rotating the die-wheels, and the means for supporting said wheels, means for driving screw-gear F, and the two front standards of rollers α being omitted. Fig. 2 is an enlarged partially-sectional view of the head of the machine, showing the wire rolls and strand. Fig. 3 is an enlarged sectional view of the head of the machine, showing the arrangement of the rolls, dies, and the driving-gear for the same. Fig. 4 is a detail view, in section, on a plane indicated by line $x x$ of Fig. 3. Fig. 5 is a side elevation of the complete machine, without guide-pulleys for the bobbin-wires, and with the driving-sleeves surrounding the lower end of the main spindle in section.
- 30 To enable others skilled in the art to make and use my invention, I will proceed to describe the manner in which I have carried it out.

In the said drawings, A represents the supporting-frame of the machine, carrying at its upper end the forming-die d^2 . In the said frame bearings are provided for a vertical revolving shaft, B, upon which is carried the principal elements of my device. The shaft B is rotated by its gear C meshing with the gear D upon the pulley-shaft G, by means of which power is applied. The central portion of shaft B is made hollow, in order that the central strand, d' , of the rope may pass therethrough, it being guided thereto by guide-wheel H.

45 The stands a support the bobbins a' a' , which carry the wire and are supported upon a frame secured to shaft B, so as to revolve therewith. From these bobbins the wire is led over guide-pulleys a^2 upon the bobbin-frame.

$c c$ are pairs of roller-dies, of which there are

a series, one set or pair for each strand or wire. Their supporting-frame is keyed to the shaft B, so as to revolve with it. The dies are suitably grooved to give the proper shape to the wires as they are drawn through. I prefer to give a flattened shape to one side of each wire. Motion is imparted to the dies by means of the gear-wheels E E, attached to one of each of the sets of roller-dies, and gears E are operated by the worm or screw-gear F, the two rollers of each set being caused to rotate in unison by means of the gears $c' c'$, secured to the ends thereof.

The screw-gear F consists of a ring having a single or multiple thread cut on its inner periphery, and it may be made stationary, or it may be made to revolve in one or the other direction, in order to regulate the degree of twist given to the completed rope. In order to accomplish this revolution of the screw-gear F the edge or back of the same is provided with gear-teeth M, into which a toothed pinion, N, may mesh. This pinion is secured to a vertical shaft, O, turning in suitable steps or boxes and driven by a bevel-gear, P, fixed to shaft O and meshing with a bevel-gear, P', fixed to a horizontal shaft, Q, carrying the cone-pulley R. A second shaft, S, lies parallel with the shaft Q, at a little distance from it, and carries the cone-pulley T, the position of which is reversed with reference to the cone R, so that by means of a belt extending between the cones the speed of the shafts Q and O and the gear F may be varied by moving the belt from one end to the other of the cones. The shaft S has the pulleys U V W fixed to it, and corresponding pulleys, U' V' W', are fixed to the driving-shaft G. The usual direct and cross belts connect these pulleys, so that a direct or reverse motion may be given to the shaft S by running either one belt or the other upon the fast pulley V, the other running upon the loose pulley.

I is a wheel, over which the rope d is drawn when completed by any suitable drawing-off mechanism. (Not shown.) The wire being continually drawn over said wheel I, it is twisted into shape by the revolution of the supporting-shaft B, and the bobbin-frames and roller-dies c carried thereby, in the manner shown, and in such manner also that the flat-

tened sides of the strands are outwardly presented. The point at which the strands of wire are finally wrapped around the core or central strand, d' , is located between the wheel I and the top of the shaft B and below the guide-block f . The roller-dies $c c$ give to the strands their flattened shape, and the revolving shaft on which they are supported gives the twist necessary to wrap the outside strands upon the central strand as it is drawn through over wheel I.

In operating my machine power is applied to the pulley-shaft G. This will cause the vertical shaft B to revolve through the medium of gear-wheels C D. As the supporting-frame of the roller-dies $c c$ and that of the bobbin-carriers $a' a'$ are keyed to the same shaft B, it is evident that they will revolve at the same rate of speed, and consequently the strands of wire $b b$ will always retain the same relative position to each other until after they pass through said roller-dies $c c$ and leave the top of shaft B. The central strand, d' , is not modified by the dies.

It is not absolutely essential that guide-pulleys a^2 for the wires should intervene between the bobbins and the roller-dies, and consequently in Fig. 5, I have illustrated the machine without such guide-pulleys.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The carriers or stands $a a$, adapted to support the bobbins which carry the wire, and the forming-die d^2 , in combination with a series of dies, $c c$, interposed between the bobbin-stands and the forming-die, for the purpose of changing the form of the wire after it leaves the bobbins, substantially as described.

2. The frames $a a$, adapted to support the bobbins which carry the wires, the dies $c c$ for shaping the strands, a shaft for supporting such devices, and mechanism for rotating the same, in combination with the wheels E and the worm or screw F for imparting motion to the dies, substantially as set forth.

3. The stands $a a$, adapted to support the bobbins which carry the wire, and the dies $c c$ for shaping the strands of the rope, a vertical shaft upon which said bobbin-stands and dies are mounted, and mechanism for rotating said shaft, in combination with wheels E, worm or screw-gear F, and means for moving said gear F for the purpose of regulating the speed of the dies, substantially as described.

In witness whereof I have hereunto set my hand.

ANDREW S. HALLIDIE.

Witnesses:

GEO. H. STRONG,
S. H. NOURSE.