(No Model.)

3 Sheets—Sheet 1.

A. S. HALLIDIE.

WIRE ROPE MAKING MACHINE.

No. 381,365. Patented Apr. 17, 1888.

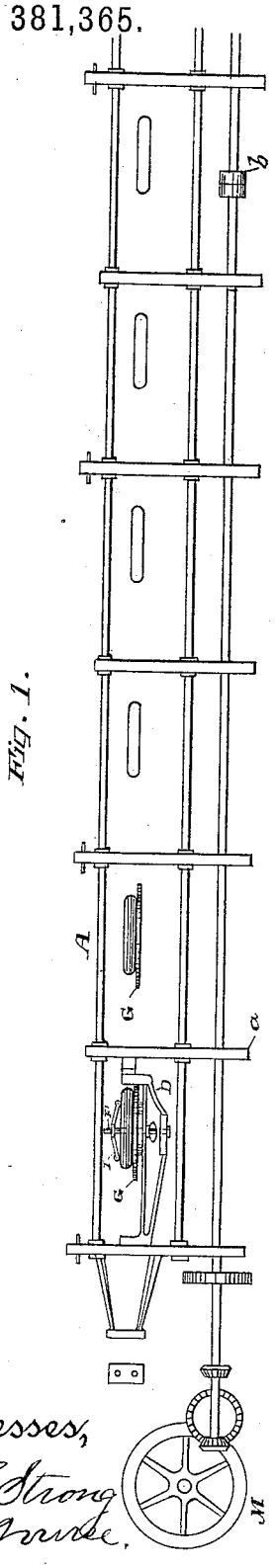

Fig. 1.

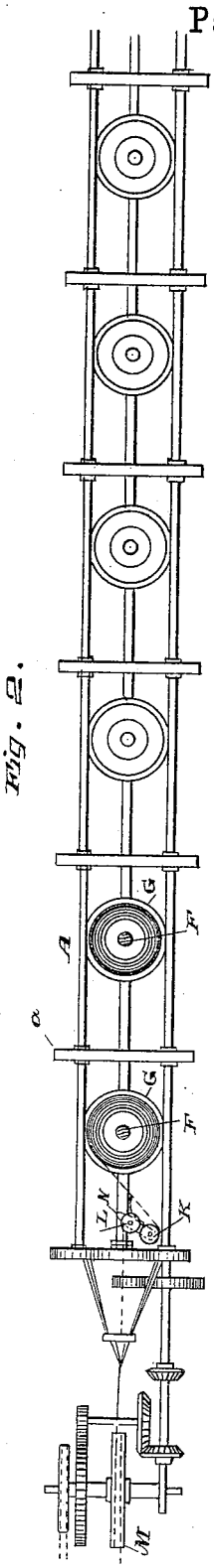

Fig. 2.

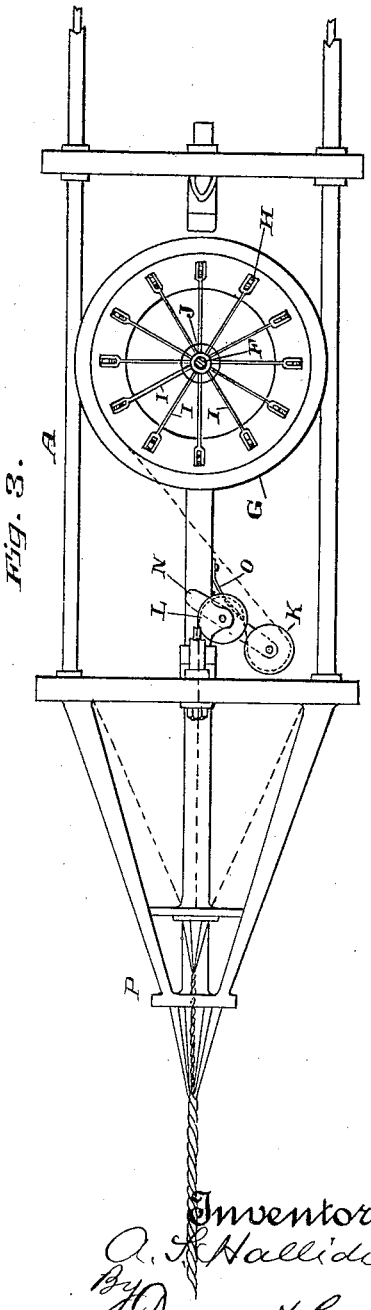

Fig. 3.

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3 Sheets—Sheet 2.

A. S. HALLIDIE.

WIRE ROPE MAKING MACHINE.

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Fig. 4.

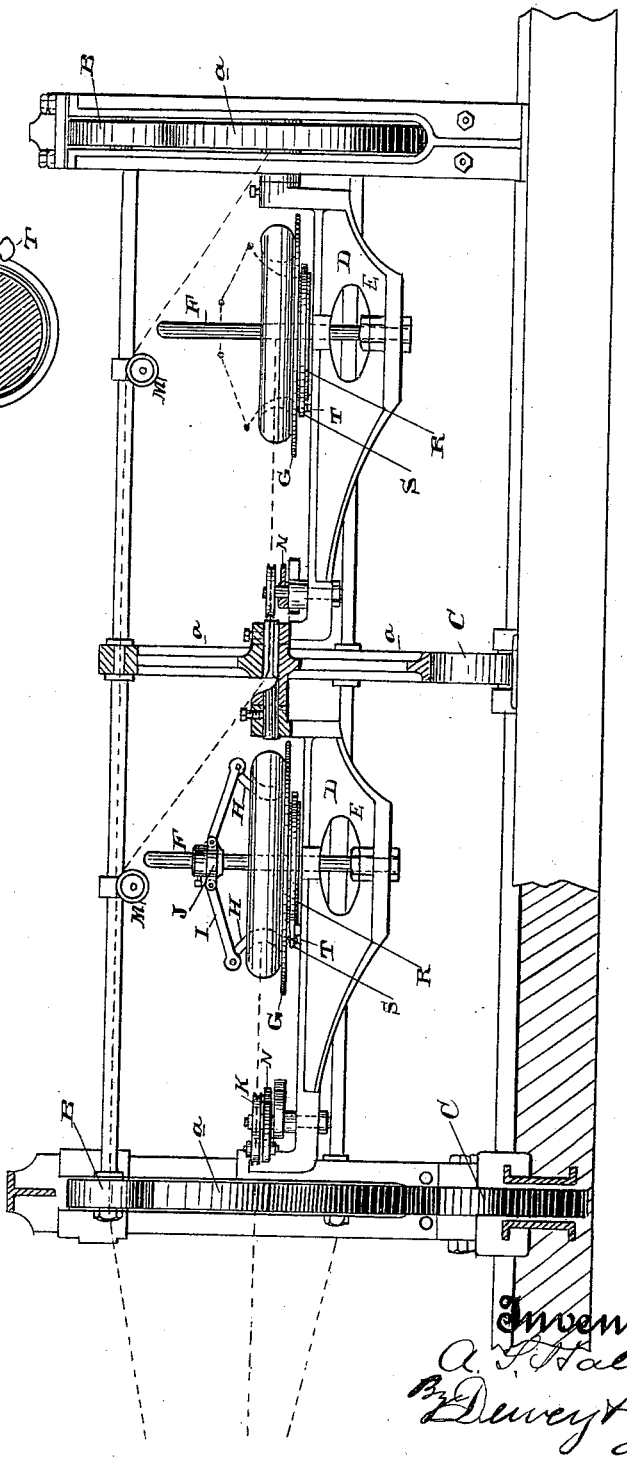
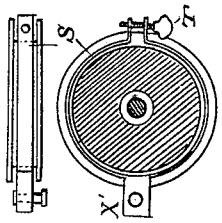


Fig. 7.



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(No Model.) 3 Sheets—Sheet 3.

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WIRE ROPE MAKING MACHINE.

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Fig. 5.

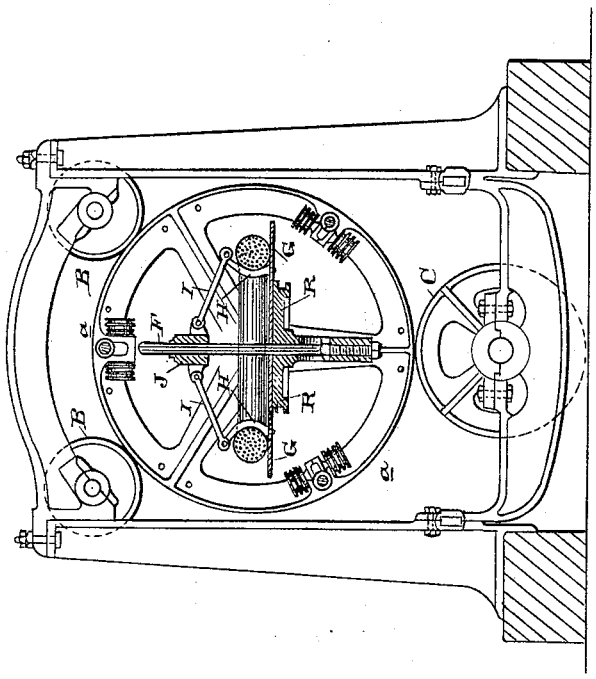
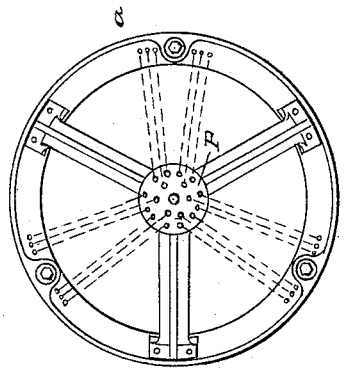


Fig. 6.



Witnesses,
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J. P. Lovell.

Inventor,
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UNITED STATES PATENT OFFICE.

ANDREW S. HALLIDIE, OF SAN FRANCISCO, CALIFORNIA.

WIRE-ROPE-MAKING MACHINE.

SPECIFICATION forming part of Letters Patent No. 381,365, dated April 17, 1888.

Application filed October 6, 1887. Serial No. 251,664. (No model.)

To all whom it may concern:

Be it known that I, ANDREW S. HALLIDIE, of the city and county of San Francisco, State of California, have invented an Improvement in Wire-Rope-Making Machines; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an improvement in wire-rope-making machines.

It consists of a horizontal rotating frame within which the wires are carried and laid up, and means for supporting and driving said frame, mechanism or swifts for supporting the wire in bundles in the place of bobbins, tension and brake mechanism, and certain details of construction, all of which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a side elevation, and Fig. 2 is a plan, of a portion of a wire-rope-making machine. Fig. 3 is an enlarged plan view of one end. Fig. 4 is an enlarged side elevation of the same. Fig. 5 is a transverse section showing the manner of supporting and driving the revolving frame. Fig. 6 is an end view of the laying-head. Fig. 7 shows detail views of the brake-band.

A is the frame of a horizontal wire-rope-making machine, in which the wires are carried and laid together without twisting the individual wires by revolving the frames between rollers, the wires being supported on frames which are prevented from revolving by gravitation.

The frame A consists of rods or bolts running the entire length of the machine and passing through disks *a*, thus forming a long cylindrical frame, which is supported and guided between rollers B B (journaled upon the stationary standard or frame A′) and C, the two upper rollers, B, being journaled opposite each other and in plane with the edges of the disks, while the lower ones, C, are fixed upon a shaft which extends the whole length of the machine, so that the edges of the disks rest upon the edges of the lower rollers and said disks are guided and kept in place by the upper rollers. Power to drive the shaft is applied by means of a pulley or gear, *b*, preferably placed midway between the ends, and it will be seen from this construction that the power from this shaft is conveyed to the revolving frame through each of the disks *a* at the points where they rest upon the supporting-rollers. This prevents the torsional strain which would result from applying the power at one end of the frame. In the construction here shown the frame is arranged to contain nineteen wire-holding or swift frames D. These frames are journaled longitudinally in the axial line of the revolving frame, so that as the revolving frame turns around these swift-holding frames may be held in one position and prevented from revolving by means of counterbalance-weights E. The swifts consist of fixed or stationary vertical spindles F, extending upward from these frames and having flat horizontal plates or disks G, upon which the bundles of wire may be laid just as they come from the wire-drawing machine. A series of curved arms, H, have their lower ends attached to or pivoted in the disk, and from their upper ends lever-arms I extend to collars J, which move vertically upon the spindles, so that when the collars are raised the upper ends of the curved arms will be drawn inwardly sufficiently to allow the bundles of wire to be laid over them upon the flat plates. When the collar is released, it slips downward upon the spindle by its own weight, and thus forces the upper ends of the arms outwardly, and as they are curved in, so as to present a concave edge or surface outwardly, it will be manifest that they will fit against the inner curve of the bundle of wire which lies upon the plate.

One end of the wire may be attached to one of the arms or to the spindle, and the other end of the wire is then carried out around the pulley K and around the pulley L, and thence through the hollow journal of the swift-frame to the grooved pulley M upon the outer surface of the revolving frame, and from this it is led along the frame to the laying-plate. The pulleys K and L are journaled in a lever-arm, N, which is fulcrumed to the frame supporting the swifts, and has a spring, O, which presses it, so as to cause it to stand at an angle, as shown in Fig. 3. The pulley K is attached to its outer end and the pulley L is journaled upon the fulcrum-pin about which the lever turns.

A brake-wheel, R, is attached underneath

the plate that supports the bundle of wire, and a brake-band, S, held by a stop, X, and adjustable by a fly-nut and screw, T, regulates the tension on the wire.

The operation of the machine will then be as follows: The bundles of wire of which the rope is to be formed are laid upon the swifts in each of the nineteen sections of the revolving frame, and as the frames supporting these swifts are journaled at each end in line with the axis of the revolving frame and are provided with a heavy counter-weight, it is manifest that while the outer frame revolves these swift-supporting frames will remain stationary with the bundles of wire uppermost. From these bundles the wire passes around the pulleys of the tension device, the elasticity of which allows for any irregularity in the taking off of the wire. From this tension apparatus the wire passes through a hole in the end of the swift-supporting frames, and is led thence outward to the pulleys on the sides of the revolving frame, being guided by these pulleys until it reaches the laying-head P, a face view of which is shown in Fig. 6. A single wire or core passes through the center of this plate and is covered by six wires, which are laid around it. These six wires, forming what is termed the "strand-core," are again covered by twelve wires, which are laid on from the outside in the well-known manner of laying up strands or ropes in this class of machines, which is plainly shown in Fig. 4.

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

1. In a wire-strand-making machine, an outer revolving frame and supplemental frames journaled in the axis of the outer frame and counterweighted to prevent their revolution, in combination with the vertical spindles, the disk or plate upon which the wire bundles are supported, the hinged or pivoted arms, and the levers connecting their upper ends with the central collar which slides upon the spindle, substantially as herein described.

2. In a wire-strand-making machine, the outer revolving frame, supplemental frames journaled longitudinally in the axis of the revolving frame and counterweighted to prevent their revolution, the wire-bundle-supporting plate or disk turning upon a vertical spindle, the hinged arms, levers, and sliding collar, in combination with the tension-rollers and the hinged spring-actuated lever, substantially as herein described.

3. The wire-strand-making machine, consisting of the outer revolving frame and the supplemental counterweighted wire-supporting swifts, the frames of which are journaled longitudinally in the outer main frame, in combination with levers fulcrumed in said supplemental frames, having pulleys journaled upon the levers, and a spring acting upon the lever, substantially as herein described.

4. In a wire-strand-making machine, the outer revolving frame, the inner swift-supporting counterweighted frames journaled in the axis of the outer frame, and the tension-pulleys and lever, in combination with the brake acting upon the revolving swifts, substantially as herein described.

5. In a wire rope or strand making machine, an outer revolving frame composed of disks with rods extending horizontally from end to end of the frame and uniting the disks, supplemental counterbalanced frames journaled in the axis of the outer revolving frame, and swifts upon which the bundles of wire are supported, journaled loosely on vertical spindles fixed in the frames D, in combination with the counter-shaft extending longitudinally beneath the center of the frame A, pulleys or rollers secured to said shaft beneath the disks of the revolving frame A and by which said disks are supported and driven, and corresponding guiding pulleys or rollers journaled in the fixed frame or standards, so as to press upon the upper portion of and guide the disks, substantially as herein described.

6. In a rope-machine, the horizontal revolving frames within which the counterbalanced supports are journaled, in combination with a horizontal driving-shaft extending beneath the revolving frames, with rollers by which the disks of the frame are supported and driven, and guide-rollers journaled upon the stationary frame or standards, so as to steady and support the upper edges of the disks, substantially as herein described.

In witness whereof I have hereunto set my hand.

ANDREW S. HALLIDIE.

Witnesses:
F. O. WEGENER,
F. REUHLING.