2 Sheets--Sheet 1.

J. C. SCHOONMAKER.

Machines for Making Tubular Lightning-Rods.

No. 156,713. Patented Nov. 10, 1874.

Fig. 1.

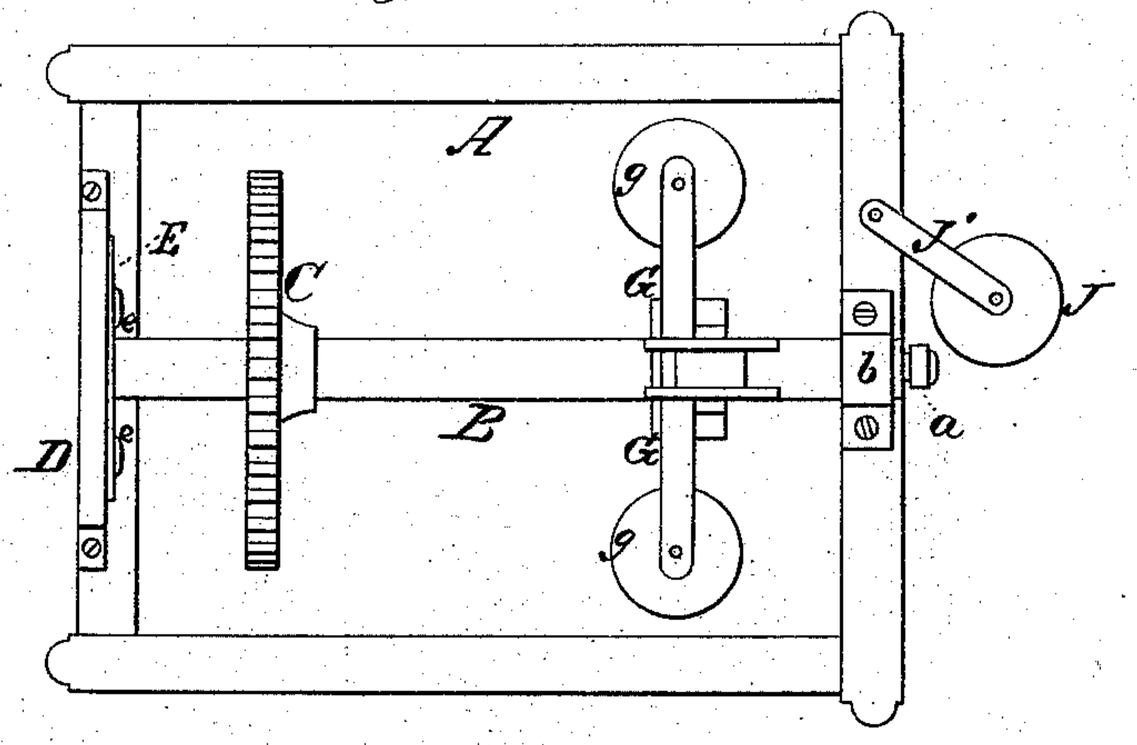


Fig. 2.

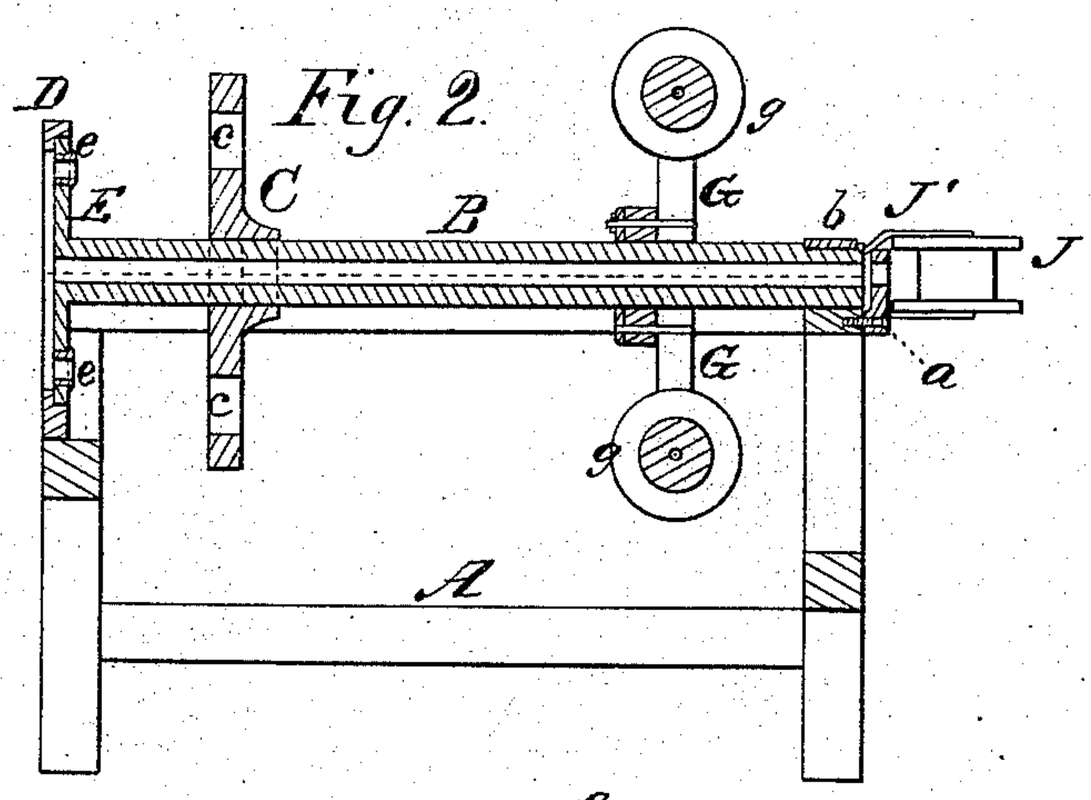
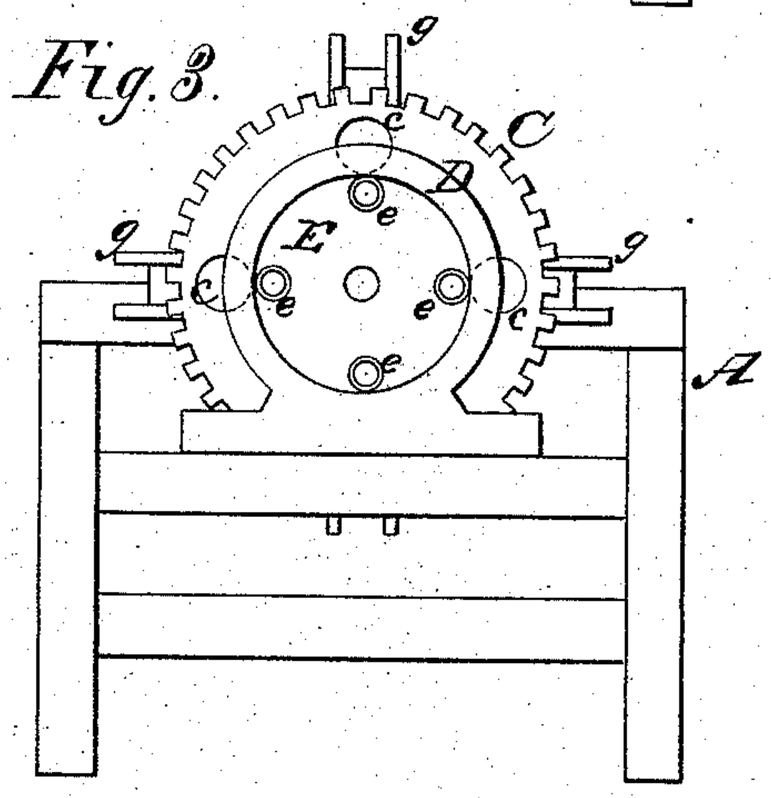


Fig. 3.



WITNESSES

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2 Sheets--Sheet 2.

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Fig. 4.

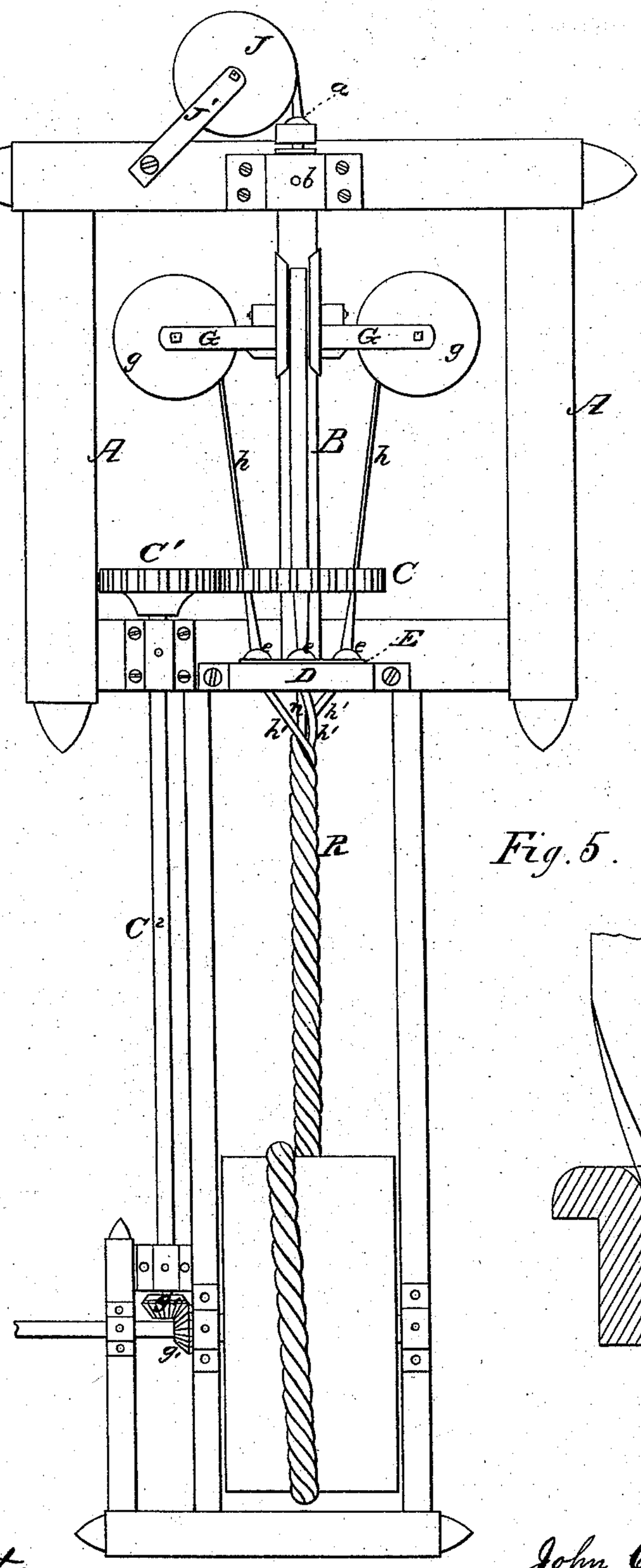
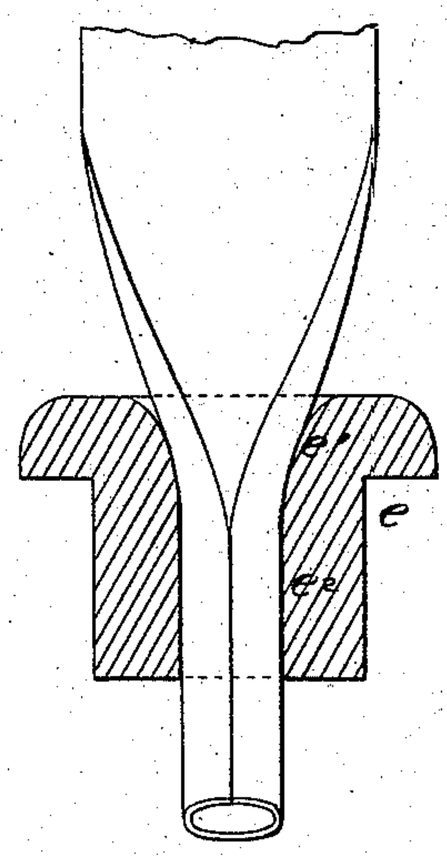


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN C. SCHOONMAKER, OF WINONA, MINNESOTA.

IMPROVEMENT IN MACHINES FOR MAKING TUBULAR LIGHTNING-RODS.

Specification forming part of Letters Patent No. **156,713**, dated November 10, 1874; application filed December 13, 1873.

To all whom it may concern:

Be it known that I, JOHN C. SCHOONMAKER, of Winona, in the county of Winona and State of Minnesota, have invented a new and valuable Improvement in Lightning-Rod-Making; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a representation of a side view of my device. Fig. 2 is a sectional, and Fig. 3 an end, view of the same. Fig. 4 is a plan, and Fig. 5 a detail, view of the same.

This invention has relation to the manufacture of lightning-rods which have central cores covered with hollow wires.

The nature of my invention consists in combining, with a machine which will wind the covering-tubes around the central core-tube, certain means, hereinafter explained, which will form said tubes from blanks of thin sheet metal during the operation of making the lightning-rods, as will be hereinafter explained.

The following is a description of my improvements:

In the annexed drawings, A represents a supporting-frame; B, a tubular shaft, which is applied in bearings *b* D on said frame, and which has a bore through it of greater diameter than that of the core-wire in the lightning-rod R. The bearing D is adapted to receive a circular twisting-plate, E, through which holes are made, for the purpose of receiving dies *e*, for forming the blanks into tubes. Each one of the dies *e* is constructed as shown in the enlarged sectional view, Fig. 5, and consists of an entering-passage, e^1, of tapering form, terminating in a cylinder, e^2. The flaring or tapered passage e^1 will gradually draw together the edges of the blank while entering the die, and the cylindrical bore e^2 will complete the work of closing the edges of the blank, and leave the tube of uniform thickness throughout. It is important that the strips or blanks should have a breadth equal to the circumference of the tube required, and less than the circumference of the cylindrical portion of the die.

If the twisting-plate E is made of steel, the die-passages may be made in this plate instead of in the separate pieces above described.

G G represent arms, which radiate from the shaft B, and which have reels *g* applied to their extremities, around which the metal blanks or strips *h* are coiled, out of which the covering-tubes are made.

If desired, the reels *g* may be keyed on their axes, and cranks applied on these axes, which will allow the blanks to be readily wound upon them.

Between the reels and the forming-dies *e* a spur-wheel, C, is keyed on the hollow shaft B, which wheel serves two purposes: it receives motion from a winding-drum shaft through the medium of a spur-wheel, C^1, a shaft, C^2, and bevel spur-wheels g' g', and it is perforated at *c c* for the purpose of supporting the blanks or strips out of which the tubes are formed on their way to the twisting-plate E. If the holes *c* be made tapering they will give a preliminary bend to the blanks or strips, and thus facilitate the final operation of forming the blanks into cylindrical tubes. The core *n*, around which the tubes h' are wound, is also tubular, and is formed out of a narrow strip of metal by means of a die, *a*, constructed precisely like the dies *e*. The die *a* is applied in a suitable holder, and arranged between the reel J and the entering end of the shaft B. The reel J is applied to a bearing, J′, secured to the frame A, and the die *a* is so arranged that its axis coincides with the axis of the shaft B, so that the core-tube which is formed thereby will be conducted centrally through shaft B and twisting-plate E, and properly receive around it the covering-tubes, which are formed by the dies in this plate, as described.

It will be seen from the above description

that the tubes for the core and covering are all formed on their way to the point of twisting; also, that the core-tube is produced by the same means employed to produce the wrapping or covering tubes.

What I claim as new, and desire to secure by Letters Patent, is—

In combination with the hollow shaft B, the twisting-plate E, having dies *e*, either drilled or inserted therein, reels *g*, die *a*, and reel J, arranged and operated substantially as described.

In testimony that I claim the above I have hereunto subscribed my name in the presence of two witnesses.

JOHN CHARLES SCHOONMAKER.

Witnesses:
WM. S. DREW,
D. OLMSTED.