

*Reyburn & Martin.*  
*Covering Lightning Rods with Sheet Metal.*  
*No 93,834.* *Patented Aug 17. 1869.*

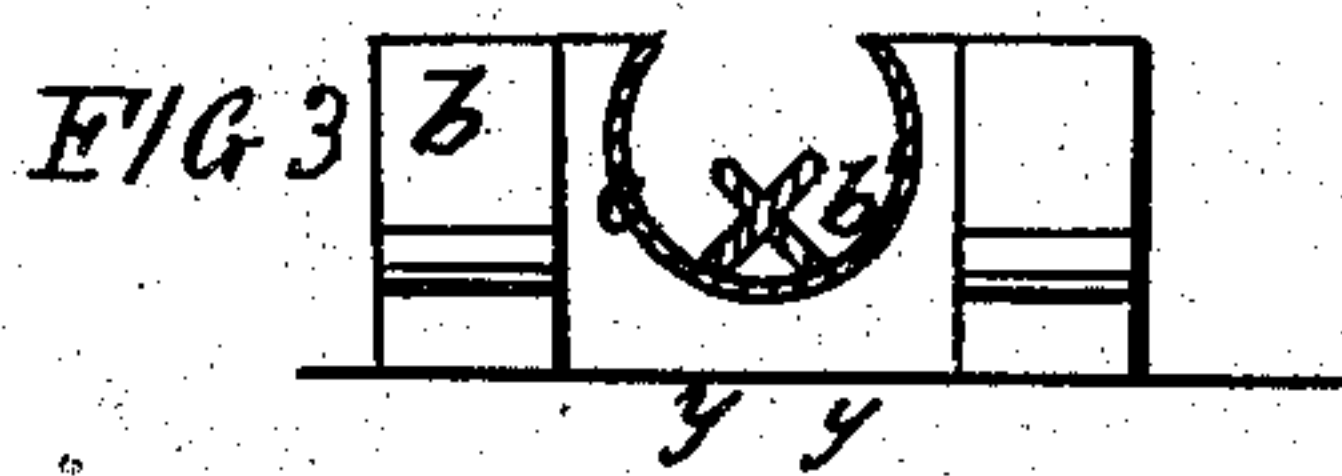
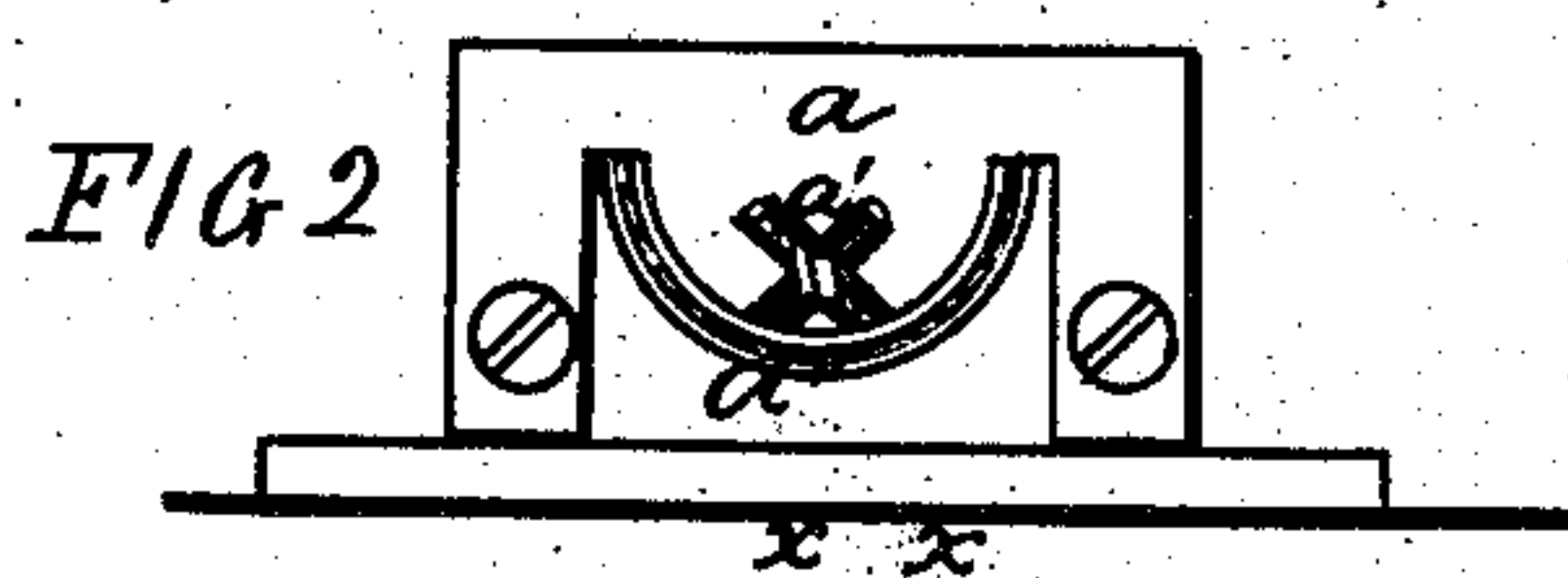


FIG 6



FIG 4

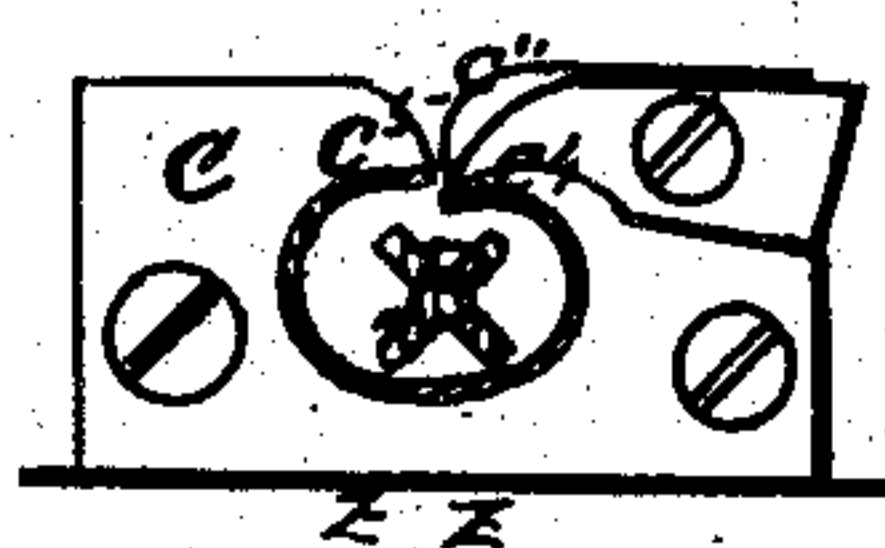


FIG 5

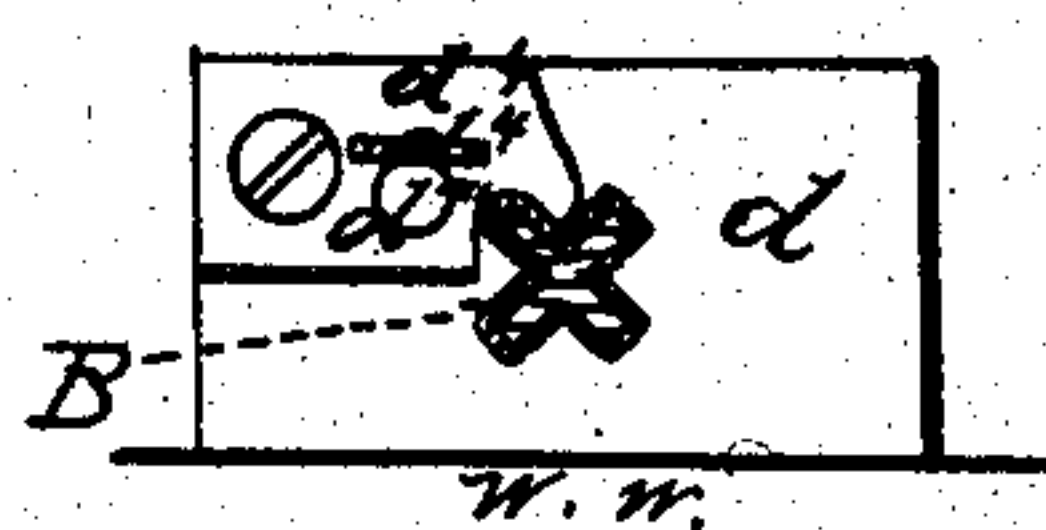
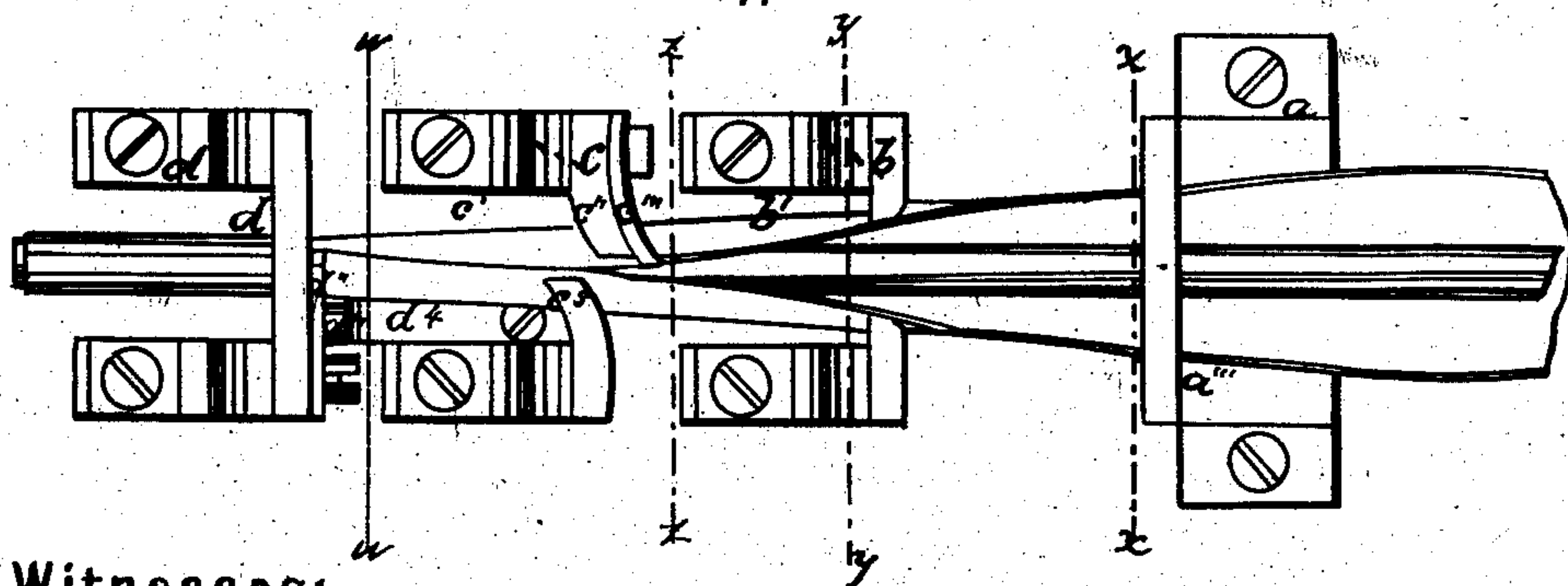


FIG. 1.



Witnesses:

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# UNITED STATES PATENT OFFICE.

WILLIAM S. REYBURN AND F. J. MARTIN, OF PHILADELPHIA, PA.

## MACHINE FOR COVERING LIGHTNING-RODS WITH SHEET METAL.

Specification forming part of Letters Patent No. 93,834, dated August 17, 1869.

*To all whom it may concern:*

Be it known that we, WILLIAM S. REYBURN and F. J. MARTIN, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and Improved Machine for Covering Lightning-Rods with Sheet Metal; and we 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 accompanying drawings, making a part of this specification, in which—

Figure 1 is a plan view. Figs. 2, 3, 4, and 5 are transverse vertical sections in the lines  $x x$ ,  $y y$ ,  $z z$ , and  $w w$ , Fig. 1, respectively; and Fig. 6 is a cross-section of the rod and sheathing when completely united.

This invention relates to a compound lightning-rod composed of an iron body, to give support, and a copper sheathing, to furnish a good conducting surface; and it consists in the application of the dies and other mechanism, hereinafter described, to the purpose of combining the two parts of the rod, by successive steps, into a complete article of manufacture, as herein set forth.

In the drawings are shown four dies,  $a$ ,  $b$ ,  $c$ , and  $d$ , placed in a row parallel to each other and at suitable intervals transversely of the wooden foundation A, to which they are all securely fastened. Each of these dies has a different shape, conformable to the several offices it discharges in the manufacture of the finished rod.

The rod B that is to be covered is in four-web form, the webs projecting at right angles from a common center, as shown in Figs. 2, &c. This is furnished in lengths of about ten feet each.

The sheathing C is cut in strips of any convenient length, and of proper width to cover the rod.

The first die,  $a$ , has a central orifice,  $a'$ , correspondent to the shape of the rod B. It has also a semicircular slot,  $a''$ , outside of the orifice  $a'$ , for the reception of the sheathing. The plate in which are the orifice and slot is placed across the smaller end of a tapering channel,  $a'''$ , curved in cross-section.

The end of a section of rod is placed in the orifice  $a'$ , and the end of a section of sheathing is sufficiently bent to get it into the larger end of the channel  $a'''$ , and is then pushed

forward through the channel till it enters the slot  $a''$ . The rod and sheathing are then advanced together toward the next die,  $b$ , which is distant some two inches from the first die. The die  $b$  has one nearly circular funnel-shaped orifice,  $b'$ , of somewhat less radius than the slot  $a''$ , which orifice  $b'$  merely serves to fold the sheathing a little more closely about the rod. The next die,  $c$ , has a funnel-shaped circular aperture,  $c'$ , still smaller than  $b'$ .

The aperture  $c'$ , like  $b'$ , is not closed at the top, and the two horns of the die, or the parts above the aperture, are bent—the one forward, the other back.

The function of the horns is to turn down the edges of the sheathing, so as to completely inclose the rod, and the bending of one horn forward is to effect the turning down of one edge first, so that the other edge may be turned down upon it.

The taper principle, which we make use of with great advantage throughout the whole process, is specially applied to the horn  $c''$  by the addition thereto of a subsidiary prong,  $d''$ , which is fastened to the front side of  $c''$  by a screw, and has a groove,  $c^4$ , across its sharp end and under its tooth, which groove first receives the edge of the sheathing and bends it down sufficiently to enable it to pass under the horn  $c''$ . The opposite horn,  $c^5$ , is bent backward in order that it may not turn down the sheathing on its own side until the other side is sufficiently depressed.

The rod and its covering issue from the die  $c$  completely connected; but the sheathing is not sunk into the angles between the webs of the rod. To accomplish this object is the function of the tapering orifice  $d'$  in the fourth and last die,  $d$ , which orifice is of a similar shape to  $a'$ , only somewhat larger. In order to accommodate this orifice to rods of varying sizes, we attach to the front side of the die a subsidiary prong,  $d''$ , similar to  $c''$ , which, instead of being rigidly fastened, is pivoted to the die, and furnished with a projecting stud,  $d'''$ , upon which bears a spring-plate,  $d^4$ . The spring causes the prong to force the sheathing into close contact with a rod of any size. On emerging from the die  $d$  the rod and sheathing are formed into a finished article, as shown in Fig. 6.

Machinery of the proper sort is here pro-



vided for drawing the material through the dies.

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

1. The die *a*, provided with the orifice *a'* and the slot *a''*, in combination with the tapering channel *a'''*, constructed and operating substantially as described.

2. The die *c*, provided with the bent horns *c'' c<sup>5</sup>*, and the subsidiary prong *c'''*, arranged and operating substantially as described.

3. The die *d*, in combination with the sub-

sidiary prong *d''* and the spring *d<sup>4</sup>*, as and for the purpose set forth.

4. The combination of the dies *a*, *b*, *c*, and *d*, arranged and operating as explained.

To the above specification of our invention we have signed our hands this 14th day of May, 1869.

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Witnesses:

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