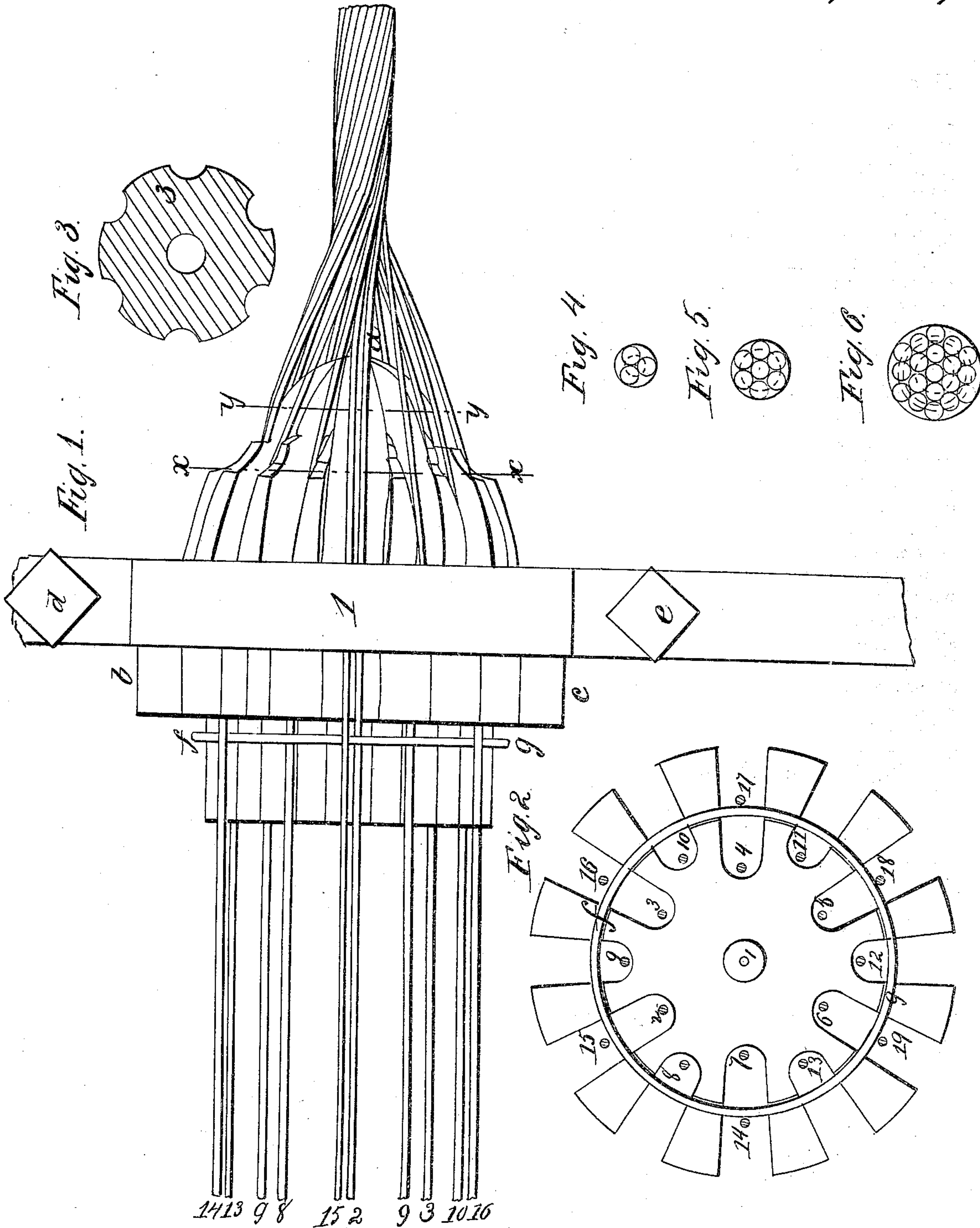


*J. A. Roebling.*

*Wire Rope Mach.*

*Nº 6,082*

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# UNITED STATES PATENT OFFICE.

JOHN A. ROEBLING, OF SAXONBURG, PENNSYLVANIA.

## IMPROVEMENT IN TOPS FOR WIRE ROPES.

Specification forming part of Letters Patent No. 6,082, dated February 6, 1849.

*To all whom it may concern:*

Be it known that I, JOHN A. ROEBLING, civil engineer, of Saxonburg, Butler county, Pennsylvania, have invented a new and Improved Top for the Formation of Wire Strands which are to Compose Wire Rope; and I do hereby declare that the following is a full and exact description.

The tool used in hemp-rope making and known by the name of "top" is generally formed of a conical piece of wood or metal with furrows on its surface for the admission of three or four strands, of which a rope is to be composed. A hemp rope is made of hemp strands, the strands being either made of smaller strands or yarns.

For the laying of yarns into strands a plate perforated with holes arranged in concentric circles is used instead of a top. Wire strands, on the other hand, are formed of a number of wires, which number must be either three, seven, nineteen, thirty-one, &c., so that their union forms a circle or a six-sided polygon, which is next to a circle.

In the accompanying drawings, Figure 4 shows the section of a strand composed of three wires. Fig. 5 shows a strand composed of seven wires, and Fig. 6 one of nineteen wires.

Strands of three or seven wires I denominate "simple," and those of nineteen or thirty-one wires "compound."

If wires could as easily and readily be united as hemp yarns, then a simple perforated plate with holes arranged in concentric circles, and such as is used in the manufacture of hemp strands, might be applied to advantage.

Before I introduced my improved top I made use of a similar tool, but found its application attended with much labor and loss of time in order to attain that degree of perfection which is so indispensable in the laying of wire strands.

Fig. 1 in the accompanying drawings shows a side view of my improved top, together with a wire strand of nineteen wires, in the process of laying on a full scale. Fig. 2 shows a back view, exhibiting the nineteen wires in section. Fig. 3 is a cross-section taken at Y Y near the point *a*. The general form of my top is that of an egg cut off at one end. The nine-

teen wires exhibited in Fig. 2 are marked from 1 to 19. The center wire is passed through a hole bored through the center or axis. Around this hole twelve deep notches will be observed, which are cut in the surface of the top, one half of which vary from the other half in point of depth and extent. This latter difference is of great importance. Six of the deepest notches are continued to the point, and therefore appear plainly in the section represented by Fig. 3. The other six, less deep, run out at the line X X, so as to leave the surface of the top from this line to the point smooth between the former notches. The object of this arrangement is to facilitate the laying of several concentric circles of wires around each other, as is shown in the section of a compound strand represented by the sixth figure. The projection *bc* serves as a shoulder against the clasp *de* when the latter is pushing the top forward.

The top is used in the following manner: The center wire (marked 1) is first passed through the center hole. The six next wires, which compose the inner or first circle around the center, (marked from 2 to 7,) are then dropped into the deepest notches. Next comes the second circle of wires, (marked from 8 to 13,) which are passed in the six other notches, which are less deep than the former. A band of wire (marked *fg*) is then laid around the twelve wires, so as to secure them in their respective notches. The next six wires, which compose the third or outside circle, are then laid in the deep set of notches, but on top of the wire band *fg*, for the purpose of separating the second and third circle of wires. The clasp *de* is then put around the whole and so as to rest against the shoulder *bc*. It is evident that the first set of notches, which receive the first circle of wires, should be deeper and farther extended toward the point than the second set. By this arrangement the wires of the first circle will unite and close around the center wire before they come in contact with the second course, and therefore no commingling can take place. The first circle being closed, the wires of the second and third circle will readily follow, and without any tendency to displace each other, as they are kept properly apart and distinct by the ridges which separate the



notches. If the two sets of notches were of the same depth and continued equally far toward the point, the wires of the first circle would be constantly intruded upon and displaced by those of the second and third circle. In place of the wire band *fg* a third row of notches may be cut on the surface of the top for the reception of the third circle of wires; nor is it material that in this case the second and third sets of notches should vary in depth and extent, provided the first set is deeper and of a greater extent than the rest. When, however, more than nineteen wires are to be united—for instance, thirty-one—then it becomes necessary that the second set of notches should be deeper and further extended toward the point than the third set. The fourth and fifth sets, however, may in that case be of the same depth, but both of less depth and extent than No. 3.

In my manufacture, when making a strand of nineteen wires, I sometimes use the wire band *fg*, and I place the second circle of wires outside of this band in the deepest notches and the third circle in the shallow notches under the band.

The top may either be carried by two men or it may be mounted on a carriage which is moving on a railway and may be propelled by machinery. Tops for the laying of wire should be either cast of hard metal or chilled.

What I claim as new and as my original invention is—

1. The construction of a conical top with two or more circles of notches which vary in depth and extent, so as to suit the passage of the different circles of wires which are to compose a compound strand, thereby uniting the advantages of a perforated plate with the easy curves of a common top.

2. The application of one or more rings or bands similar to *fg* for the purpose of keeping the different circles of wires apart, as well as to keep the wires separate among themselves, the whole to be arranged and to work in substance as above described.

JOHN A. ROEBLING.

In presence of—

C. W. M. KELLER,

E. P. MCCREA.