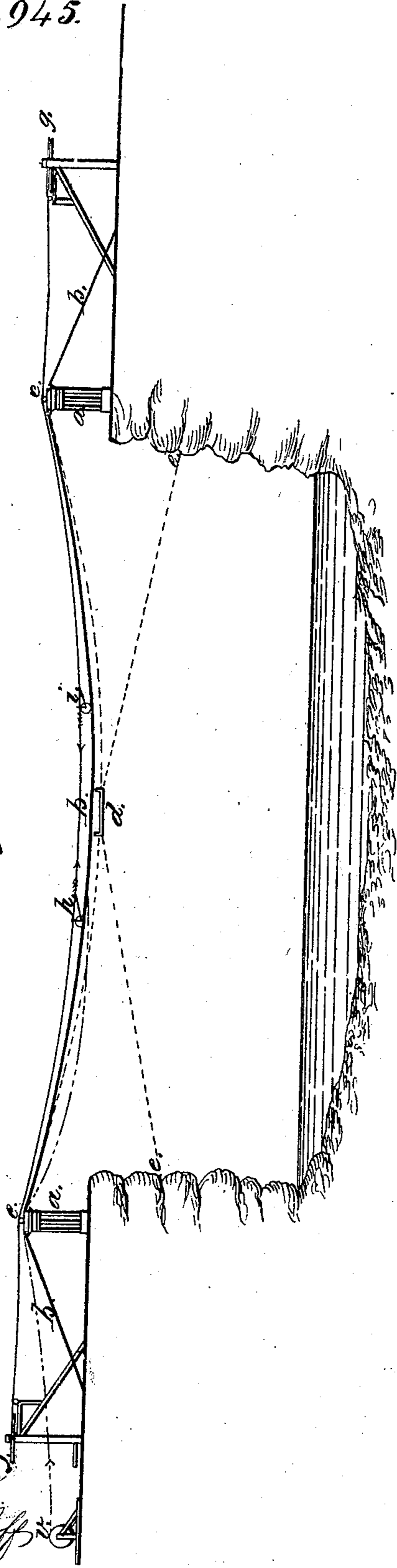


*J. A. Roebling.*  
*Suspension Bridge.*

*N<sup>o</sup> 4,945.*

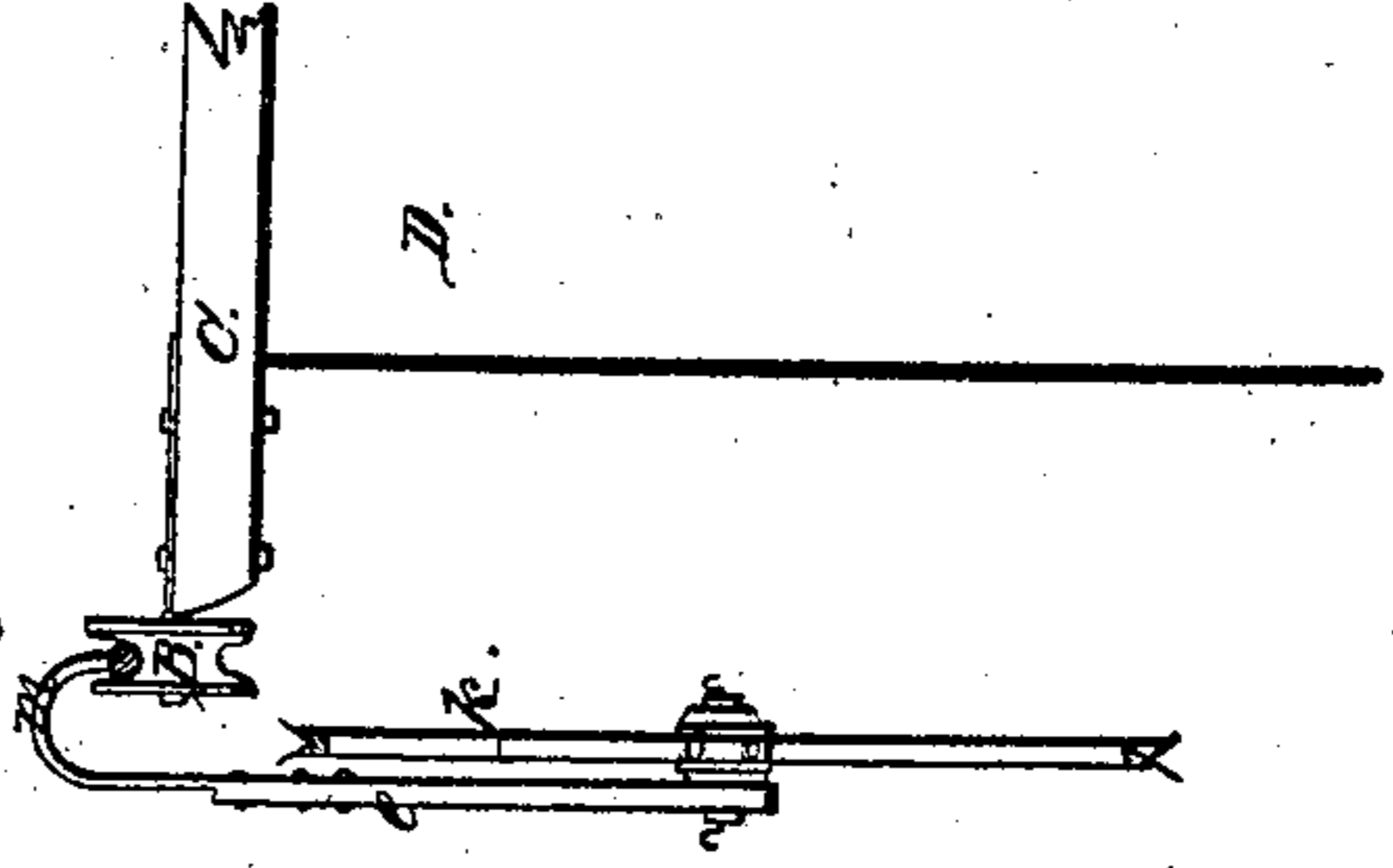
*Patented Jan. 26, 1847.*

*Fig. 1*

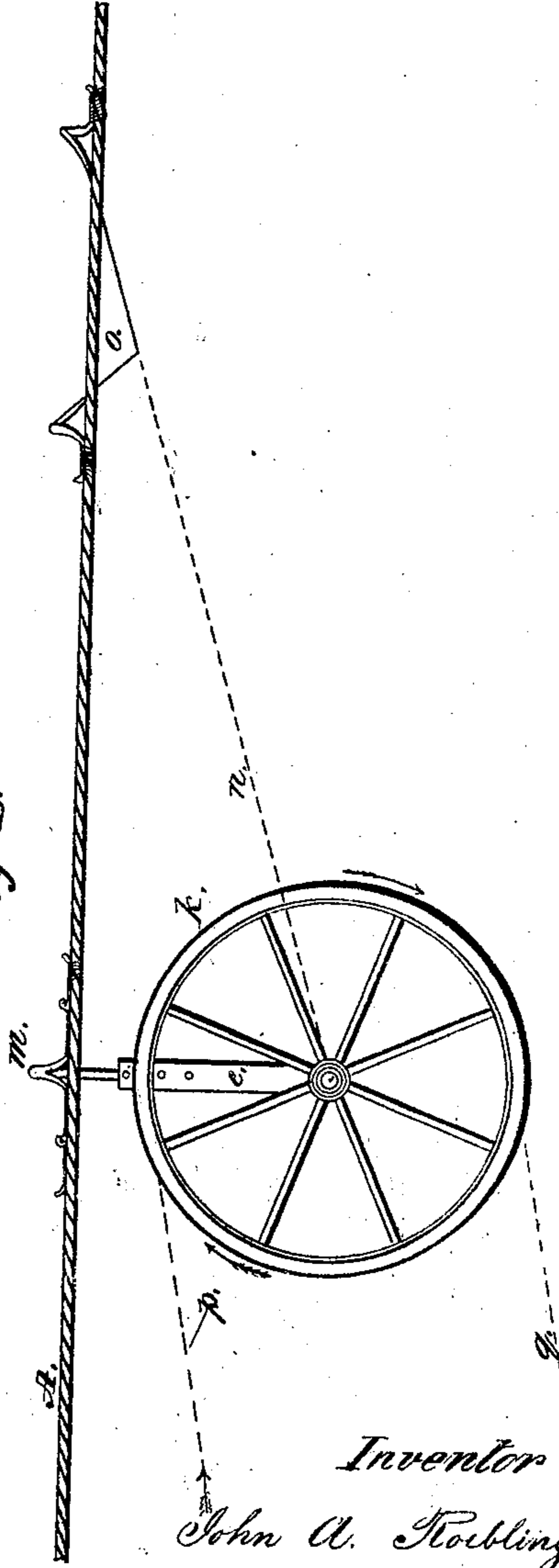


*Witness*  
*E. Maurhoff*

*Fig. 3*



*Fig. 2*



*Inventor*  
*John A. Roebling.*

# UNITED STATES PATENT OFFICE.

JNO. A. ROEBLING, OF PITTSBURGH, PENNSYLVANIA.

APPARATUS FOR PASSING SUSPENSION-WIRES FOR BRIDGES ACROSS RIVERS, &c.

Specification of Letters Patent No. 4,945, dated January 26, 1847.

To all whom it may concern:

Be it known that I, JOHN A. ROEBLING, civil engineer, of Pittsburgh, Allegheny county, State of Pennsylvania, have invented a new Method of Traversing Wires Across Rivers or Hollows for the Purpose of Forming Suspension-Cables for the Support of Bridges; and I do hereby declare that the following is a full and exact description.

For the sake of illustration, I have in the accompanying drawing presented a section of the Niagara River above the whirlpool, where a bridge is contemplated, and where my system of forming wire cables, may be applied to the best advantage.

*a a* represent the two towers for the support of the wire cables *b b b*, to which the floor is to be suspended; the cables are supposed to be in the course of construction.

*c d c* is a double wire rope, which is suspended across the chasm for the support of a small platform *d*, upon which those persons are stationed, whose business it is to regulate the tension of the wires. As there will always be two cables to be manufactured, opposite each other, this platform is to extend from one to the other; and in order to steady it horizontally, it is held by four wire stays, indicated by the dotted lines *d e d e*, which are anchored in the sides of the bluffs.

*f* is a horizontal wheel or sheave 16 to 20 feet in diameter, attached to a vertical shaft, which is to be turned by horsepower. This wheel has on its periphery a groove, for the reception of the endless rope *f c h i c g*. On the opposite bank of the river, a similar wheel, marked *g* is put up, around which the endless rope passes. In case the towers are built separately for the support of the cables, and not connected with each other, the endless rope may be worked between the towers. But where the towers are connected, as is supposed in the case before us, the endless rope has to be passed over the summit and outside of the towers, and should be supported on rollers, as is exhibited by Figure 3. This rope may be of hemp, but a wire rope, which will not stretch, is much preferable. Two traversing or traveling wheels, marked *h* and *i*, by which the wires are passed from shore to shore, are attached or suspended to the endless rope. The mode of construction of these wheels is represented in Figs. 2 and 3 on a larger scale.

A Fig. 2 exhibits a portion of the endless rope. A single rope might be substituted in place of the endless one and only one traveling wheel worked in place of two. A double or endless rope and two wheels are however much more expeditiously.

*K* represents a wheel of from 4 to 5 feet diameter, constructed of wood very light, its rim is furnished with a large groove made of sheet tin. It revolves freely around an accurately turned off spindle, which is attached to a vertical arm *l*, either made of wood or iron, and which terminates at its upper end in a neck, bent like a bow, and marked *m*, which is attached to the rope *A* by means of twine or wrapping wire. The object of the neck *m* is to clear the rollers *B* at the towers or upon piers, if there are any. Where there are piers, I put up on each a frame for the support of two rollers, to support and work the endless rope.

*n* indicates a pair of wires, which with one end are fastened to the ends of the spindle at the center of the wheel, with the other to the lower point of a small triangle *O*, made of inch pine board, and armed with two iron necks, bent like the neck *m*, for the purpose of cleaning the rollers *B*. The triangle with the wires *n* are to pull the wheel along and preserve its vertical position.

The operation of the whole apparatus is as follows: The skeins of wire, of which the cables are to be formed, are in the first instance united by splicing their ends, and reeled on large reels, capable of holding 1,500 pounds of wire or more. One of these reels is marked *v* in Fig. 1. It may further be mentioned, that a cable is usually formed of one single endless wire (which is composed of a great number of skeins, spliced) which is passed around a cast iron shoe or segment, at each end of the cable. When a cable is to be commenced, the end of a wire is fastened to the segment next to the reel, then passed around the groove of the traveling sheave; the horse is then started, which sets the endless rope in motion and causes the traveling sheave to advance. But as the one end of the wire is fast, the other must play off the reel and pass around the traveling sheave, which thus keeps on revolving until it reaches the opposite shore, where the machinery is stopped. A double wire has now been traversed from one shore to the other, it is then taken off the traveling sheave, by detaching one of the pulling

wires  $n$ , passed around the segment and adjusted. While this is accomplished, the two traveling sheaves on the other side receives a wire from another reel, and is started across  
5 the river, the first traveling sheave returning empty. The rope is therefore worked reciprocally and the horse reversed at the end of every trip.

Those persons, who are stationed on the  
10 suspended platform  $d$ , make their passage in a basket or box, suspended to the endless rope, the box being taken off, when wire is running. Or the basket may be suspended to a separate rope, which may be worked by  
15 a windlass.

The above mode of traversing wires, has in its main features been successfully ap-

plied in the formation of the cables of the suspension aqueduct at Pittsburgh, constructed by me. 20

What I claim as my original invention, and wish to secure by Letters Patent, is—

The application of traveling wheels, suspended and worked, either by a double end-  
less rope, or by a single rope, across a river  
25 or valley, for the purpose of traversing the wires for the formation of wire cables, the whole to be in substance and in its main features, constructed and worked, as above described, and illustrated by the drawings. 30

JOHN A. ROEBLING.

Witnesses:

JOHN E. HERBET,  
LEONARD S. JOHN.