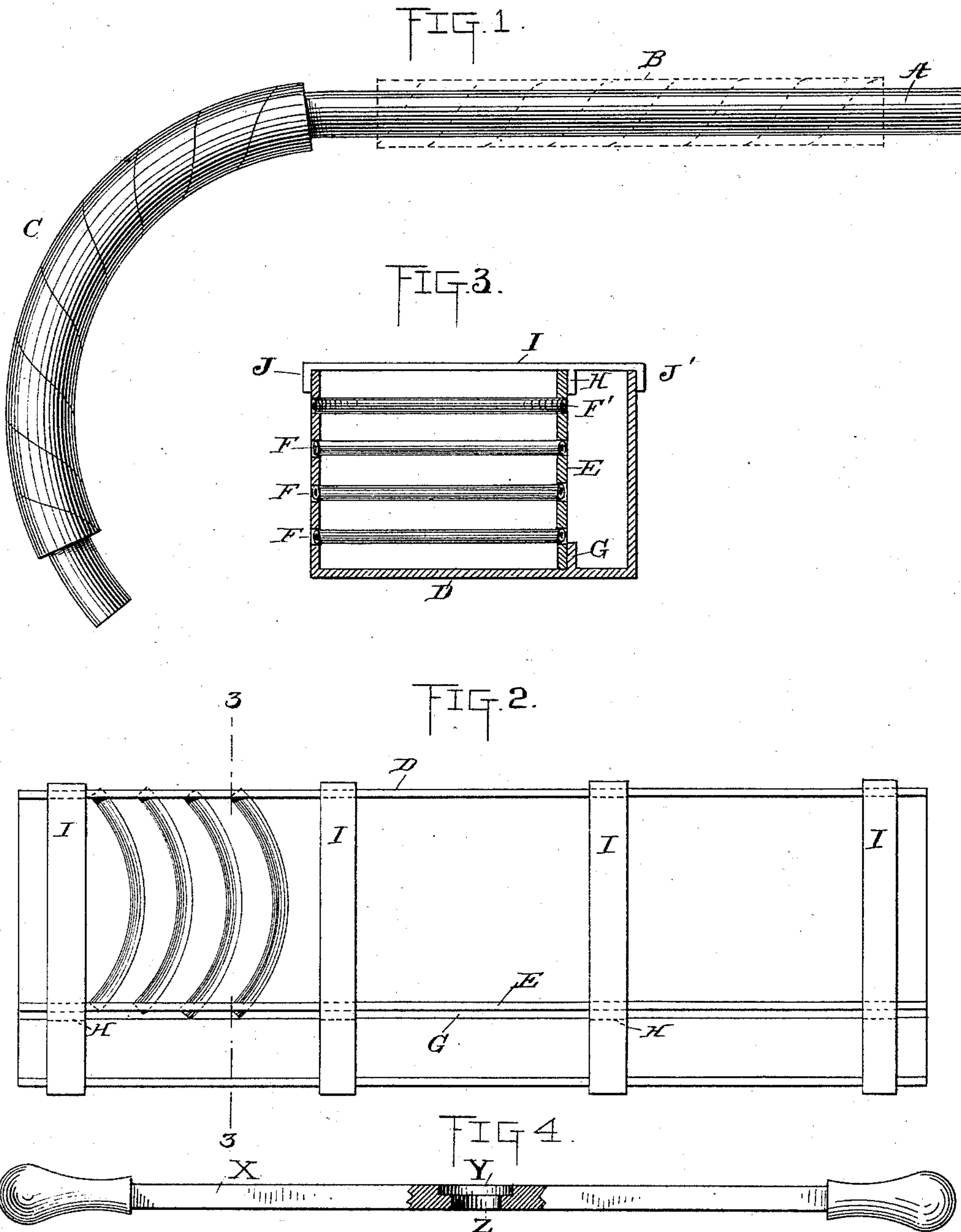


(No Model.)

E. T. GREENFIELD.
TUBULAR PAPER ELBOW OR BEND.

No. 441,836.

Patented Dec. 2, 1890.



ATTEST:

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UNITED STATES PATENT OFFICE.

EDWIN T. GREENFIELD, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE INTERIOR CONDUIT AND INSULATION COMPANY.

TUBULAR PAPER ELBOW OR BEND.

SPECIFICATION forming part of Letters Patent No. 441,836, dated December 2, 1890.

Application filed December 14, 1889. Serial No. 333,746. (No model.)

To all whom it may concern:

Be it known that I, EDWIN T. GREENFIELD, a citizen of the United States, residing at New York city, in the county and State of New York, have invented a new and useful Tubular Paper Elbow or Bend, of which the following is a specification.

The main object of my invention is the production of a tubular paper bend or elbow. Such a bend or elbow will have many uses, which its lightness and comparatively low cost will well adapt it for.

A further object of my invention is the production of an insulating water and fire proof paper bend or elbow. Such a bend or elbow is especially intended and adapted for use in interior or house wiring where a system of conduits is used to protect and cover the wires.

Preferably the paper tube of which I make the bend or elbow is one formed with a longitudinal seamed paper core and a spiral wrap or wrappings of the same material. Such a paper tube has been found to be well adapted to bending, its longitudinal core and spiral wrappings accommodating themselves readily to changes in form, the spiral wrapping, when an elbow or bend is formed, presenting the appearance of having been forced together on the inner side of the bend and away from one another on the outer side.

In bending a paper tube such as above described, or one of any other suitable construction, a mandrel is employed of a little less diameter than the tube, one end of which is straight and the other formed to the desired bend. A proper length of the paper tube to form the bend or elbow is taken while damp, or after having been suitably damped, and is forced on the straight portion of the mandrel and on the bent portion as far as it will go by hand. Then the straight end of the mandrel is placed in a vise, and an instrument is used to force the tube completely over the bent portion of the mandrel. When this is accomplished, the tube will have the desired elbow or bend form. It is now either artificially dried or allowed to dry naturally on the mandrel, and then treated with the impregnating compound in any suitable manner.

The above describes the process carried on to produce a single finished elbow or bend; but in practice a number are finished simultaneously. In accomplishing this the tube is bent on the mandrel, as above, but is removed therefrom before drying and is placed in a receptacle provided with walls, in holes in which the bent tubes are placed, one of said walls being adjustable toward the other, so that the bend which the tube has when withdrawn damp from the mandrel can be increased by decreasing the distance of the walls apart. When the number of elbows or bends the receptacle is adapted to receive have been placed in position and forced or adjusted to the proper form, the receptacle may be dipped with the elbows or bends into the impregnating compound, thereby simultaneously applying the same to a number of bends or elbows.

In the accompanying drawings, forming a part of this specification, Figure 1 is a side elevation of mandrel for an elbow, showing in dotted lines the paper tube in the first position and in full lines in the final position. Fig. 2 is a plan view of the receptacle in which a number of the tubes are treated simultaneously in the impregnating compound. Fig. 3 is a cross-section taken on the line 3 3 of Fig. 2; and Fig. 4 is a front elevation, partially in section, of the tool used to force the tube around the bend of the mandrel.

A is the mandrel used in carrying on the process of forming a simple elbow. It is made up of a straight portion, upon which the proper length of tube is first forced, and of a curved portion of the curvature that the finished tube is to possess and on which the straight tube is forced from the straight end of the mandrel.

B is the straight length of tube shown in dotted lines on the straight portion of the mandrel, and C (shown in full lines) is the same tube after it has been forced from the straight end of the mandrel onto the curved portion thereof. Before placing the paper tube on the mandrel it is damped, if it is not already in a damp condition, whereby it is rendered more readily pliable. It is in the damp condition forced on the straight end of the mandrel as far as it will go by hand, and

then the mandrel is introduced into a vise and a suitable tool used to force the paper tube around the curve of the mandrel. The tool is a straight piece of metal, provided with a handle at each end and at its center with a shouldered circular hole, one portion X of which is a little larger in diameter than the diameter of the tube, and the other portion Y of which is a little larger in diameter than the diameter of the mandrel. This tool is used by bringing it onto the mandrel with the portion Y of the hole facing the end of the tube, so that the shoulder abuts against the end of the tube, whereby the tube can be readily forced along the mandrel.

When the paper tube has been forced on the curve of the mandrel, as shown in full lines, Fig. 1, it is either permitted to dry in that position on the mandrel or it is removed therefrom while in the damp condition and placed, with a number of other tubes which have been similarly formed, in a receptacle, which will maintain the tubes in the proper curvature until they have undergone the finishing treatment. Such a receptacle is illustrated in Figs. 2 and 3. It consists of an oblong box D, open at the top, provided with a removable partition E. One of the side walls of the box is provided with a series of holes F, arranged at determined distances apart, and the removable partition, which fits within the box, is provided with a corresponding number of holes F' in line with the holes in the side wall. This removable partition is maintained upright in the box by a rib G, which extends the full length of the box on the bottom there-

of, and by a depending lug H on the detachable cross-plates I, which plates are provided with lips J J', fitting over the outside walls of the receptacle. The tubes after removal from the mandrel are sprung into opposite holes in the side wall and removable partition, which are distant apart about the length of the cord joining the curve of the finished tube. After the receptacle has been filled with the proper number of the formed tubes, it is immersed in a bath of suitable impregnating material or compound, and the whole number of tubes impregnated with such substance simultaneously, after which the same is allowed to dry on the tubes. They are then removed from the receptacle by taking off the plates I and dropping the removable partition to one side, when all the elbows will fall to the bottom of the receptacle and may be readily removed therefrom.

I do not claim a tube formed by the combination of a cylindrical seamed core and a spirally-wound tape covering said core throughout; but

What I claim is—

As a new article of manufacture, a tubular paper bend or elbow comprising a longitudinal seamed core of paper and a spiral wrap or wrappings of the same material, substantially as set forth.

This specification signed and witnessed this 16th day of November, 1889.

EDWIN T. GREENFIELD.

Witnesses:

W. PELZER,
D. H. DRISCOLL.