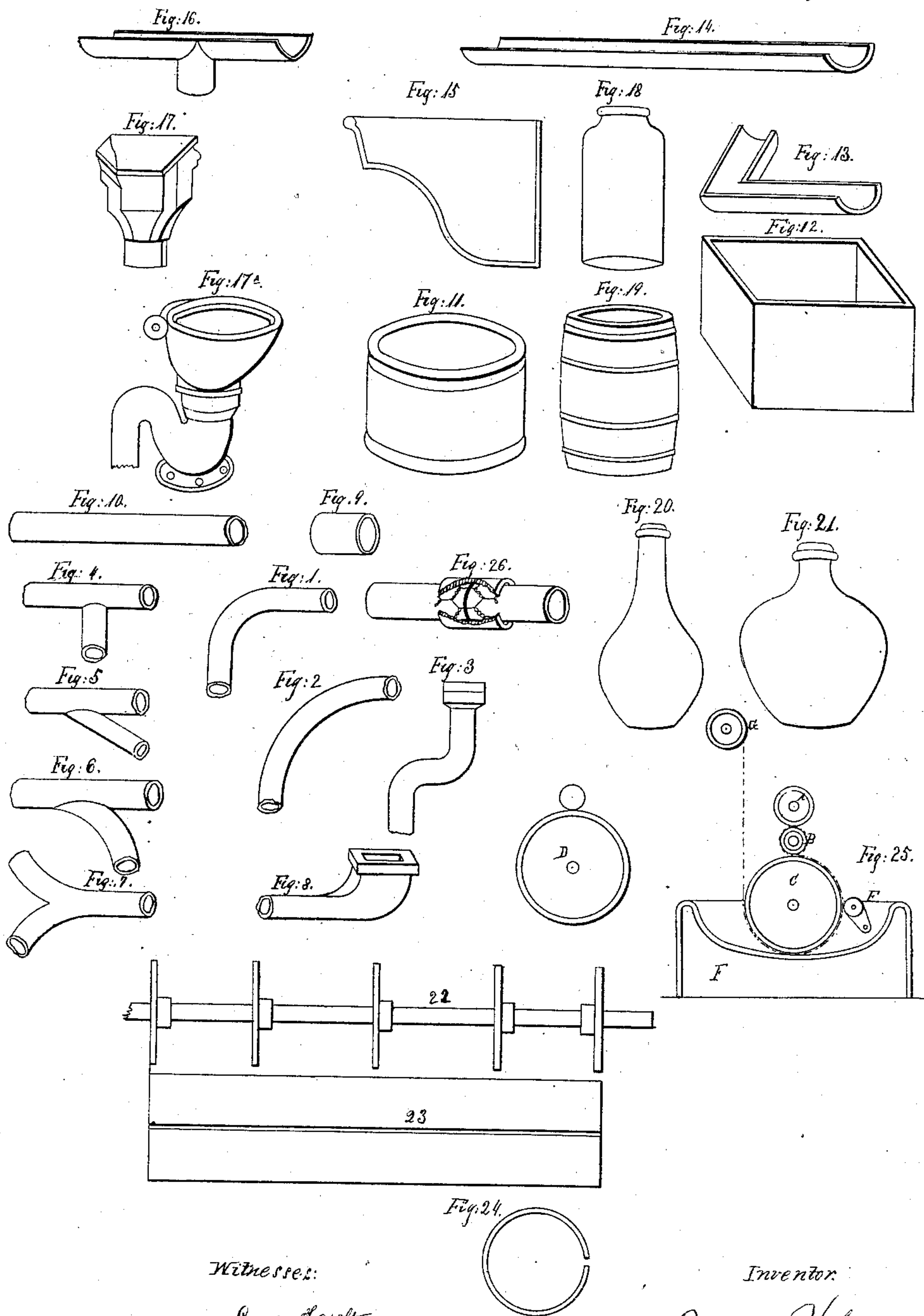


B. Rhodes,

Making Water Pipes &c,

Nº 41,351,

Patented Jan. 19, 1864.



Witnesses:

George Haseltine
Arthur G. Damm

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UNITED STATES PATENT OFFICE.

BENJAMIN RHODES, OF BOW, ENGLAND, ASSIGNOR TO JAMES McGEARY,
OF SALEM, MASSACHUSETTS.

IMPROVEMENT IN MAKING AND COATING PIPES, JOINTS, BOTTLES, CASKS, AND OTHER VESSELS.

Specification forming part of Letters Patent No. **41,351**, dated January 19, 1864.

To all whom it may concern:

Be it known that I, BENJAMIN RHODES, of Bow, in the county of Middlesex, Kingdom of Great Britain, have invented a new and Improved mode of, and apparatus for, making and coating pipes and vessels of various forms; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters marked thereon.

Elastic fabrics, in combination with bitumen or bituminous mastics or compositions, are employed by me for the purpose of forming pipes and vessels of various kinds of regular and irregular shapes, and also for coating or covering them for the purpose of rendering them capable of resisting the action of moisture or atmospheric influence, and at the same time making them more perfect non-conductors of electricity.

Instead of forming bent pipes or elbows employed for altering the direction in which pipes may be laid in any of the modes or methods which have heretofore been described, and whether such bends or elbows be of metal or formed or made up of sheets of paper or other material, layer upon layer, wound or coiled around or wrapped up in combination with bitumen or a bituminous or other compound or composition, I take an elastic or looped fabric of cotton, hemp, flax, or other suitable material, circular in form. I draw such elastic fabric over a core-piece of the requisite pattern, such as that for an elbow, bend, or other hollow form, or it may be a bottle, jar, or such like vessel; and as from the nature of the fabric it will accommodate itself to the variations in the shape and configuration of the pattern, core, or mold, I then dip the core or pattern thus surrounded into a bath of bituminous mastic or composition, and then proceed to draw on a second elastic coating, and again dip or immerse it, and so on, until the requisite thickness and shape or form is obtained.

For the purpose of forming T-shaped junction-pieces and other compound figures, I employ the circular elastic or looped fabric before referred to, either alone or in combination with sheets or webs of the same material, and secure the overlappings or junctions of such pieces of material by the aid of wire

binding, or by means of sewing or stitching with wire, thread, or any other material, and each coating or envelope thus applied is dipped in a bath of, or otherwise coating with, liquid bitumen or bituminous composition.

In the accompanying drawings I have shown at Figures 1 to 21, inclusive, several descriptions of vessels to the manufacture of which my present invention is adapted.

For the purpose of giving the requisite final shape or finish of articles produced, as described, I form hollow molds, which may be halved or otherwise divided, and secured together and be capable of giving the requisite pressure for that purpose.

In making long tubes or pipes, or other such articles, I employ two hollow pressure-cylinders in contact with the core or mandrel, so that the core or mandrel and its covering are uniformly supported throughout their length, and one of such hollow cylinders should have a current of cold water flowing through it. I also employ a third roller or cylinder, so arranged as to act upon the sheet of looped fabric or other material immediately on its rising out of the bath of bituminous mastic, and by means of elastic springs applied to the axle of the said roller it is made to press upon the material, so as to effectually squeeze and press out all the superfluous bitumen, which greatly improves the pipe in solidity and strength, and also regulates the thickness of the pipe without being, as at present, chiefly dependent upon the temperature of the mastic.

In making tubes of large diameter I form the cylinders or cores upon which the material is wound or made to surround it in the following manner: Instead of the ordinary drum-like cylinder, core, or mandrel, with the boss and arms as part thereof, I make a framework and surround it with a sheet of steel or thin iron as a cover, which may be readily removed by expanding it and taking it off, or by springing it sufficiently large to slip off at one end, there being a longitudinal division in the outer skin or cylinder. This I have shown at Figs. 22, 23, and 24.

For the purpose of coating various articles with a water-proof covering or envelope, and also for the purpose of better insulating and preserving telegraph-posts, I apply an envelope of elastic material, in combination with bitu-

ne, similarly applied, and as before described. In like manner other articles and things may be coated or covered for the purpose of protecting them, rendering them capable of resisting the action of moisture and the injurious action of atmospheric influences, by the combined use of the elastic fabric and bitumen or bituminous compound, as before described.

I have also shown in the accompanying drawings, at Fig. 25, an arrangement of machinery and apparatus for making straight pipes according to my present invention, of which machinery or apparatus the following will serve as the description.

A is a smooth hollow pressure-roller, having a current of cold water circulating through it, this roller being caused to rotate upon the core or mandrel B so as to cool and compress the material wound thereupon as it leaves the bitumen bath or pan. C is a large cylinder or roller, which revolves in the bitumen bath or pan F, and brings down and passes through the bitumen a sheet of elastic fabric or other material employed in the manufacture of the pipes, indicated by a line in red at Fig. 25. D is the final finishing or polishing cylinder or roller, to which the pipe or tube, which has been formed of the requisite thickness upon the core or mandrel B, is brought by means of a movable carriage, endless chain, or other suitable contrivance, and with which it revolves in contact until the pipe or tube has become cool and hard. E is a gaging or pressing roller, employed for the purpose of removing the superfluous bitumen from the sheet of material as it emerges from the bath or pan, and by which means, also, regularity and uniformity in the thickness of the pipe are insured. F is the bitumen bath or pan, kept fully supplied with bitumen maintained in a melted state by means of a fire placed underneath the bath or pan. G is the supply roller or cylinder, from which the elastic or other material employed in the manufacture of the pipe is gradually unwound.

I wish it to be understood that instead of the pressure-roller A, Fig. 25, immediately above the core or mandrel, as shown in the drawings, two pressure-rollers may be used or employed, as hereinbefore described, and a current of water may be made to flow through one or both of them.

The manner of joining the sections of pipe is illustrated in Fig. 26, and is as follows: The ends of the two sections to be joined are placed together, and a netting of stout wire is slipped over the joint. A collar of the same material as the pipe, with an opening at the top and center, is then slipped over this wire-netting and also over the joint. The space between the pipe and the collar, at the

ends of the latter, is filled with putty or other suitable material, and any suitable cement poured in at the opening before mentioned, until the vacuum between the collar and the pipe is filled. The cement, hardening, forms with the wire-netting a firm and durable joint.

When the pipes are to be used for conveying gas, I coat the inside with a cement, which is not, like the bitumen, liable to be dissolved by the action of the solvents deposited by the gas. This cement I make of the materials and in the proportions given below: one hundred pounds of sulphur or brimstone, twenty-five pounds black-lead, twenty-five pounds pulverized clay, and ten pounds third separation of gas-tar, known as "martule." These ingredients are boiled slowly for ten hours, and amalgamate to form the cement.

I do not design to confine myself to the proportions above given, or to the use of all the materials mentioned. I may combine them in different proportions, or may use sulphur or brimstone in combination with any one of the other materials.

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

1. The mode or method herein described of molding and forming elbows, bends, and other hollow vessels, articles, and things, by the combination of elastic fabrics with bitumen, bituminous compounds, or mastic, as herein set forth.

2. The mode or method of forming hollow vessels and other articles by means of elastic fabrics, in combination with strips of paper, canvas, or other materials, and bitumen, bituminous compounds, or mastics, for the purpose of combining the layers together and rendering them impervious to water.

3. The cement used for coating tubes for conveying gas, and for other purposes, made substantially of the materials and in the manner set forth.

4. The machinery or apparatus herein described for making long pipes or tubes.

5. The use of sulphur or brimstone in combination with any of the materials before named, for the purpose set forth.

6. The mode or method of constructing mandrels or cores for making tubes or pipes, as herein set forth, and as illustrated by Figs. 22, 23, and 24.

7. The application of wire netting, substantially as shown in Fig. 26, for the purpose of giving additional strength to the connections or joints of pipes and vessels.

BENJAMIN RHODES.

Witnesses:

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