(No Model.)

W. McMAHON.

MANUFACTURE OF ARTICLES FROM PAPER.

No. 277,593. Patented May 15, 1883.

Fig. 1,

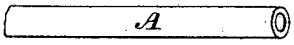

Fig. 2,

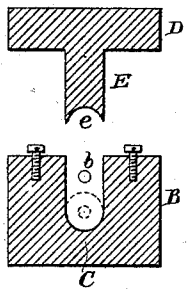

Fig. 3,

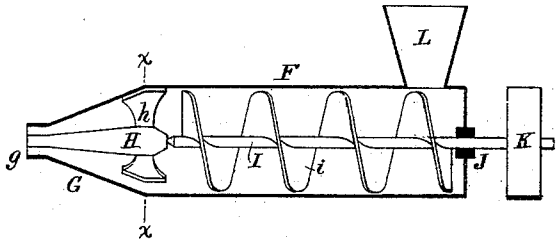

Fig. 4,

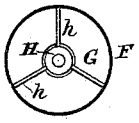

Fig. 5,

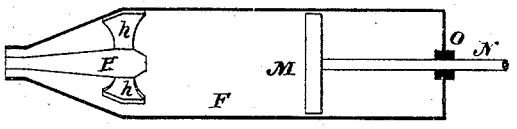

Fig. 6,

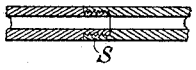

Fig. 7,

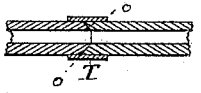

Fig. 8,

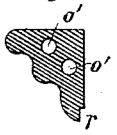

Fig. 9,

WITNESSES

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MANUFACTURE OF ARTICLES FROM PAPER.

SPECIFICATION forming part of Letters Patent No. 277,593, dated May 15, 1883.

Application filed March 5, 1883. (No model.)

To all whom it may concern:

Be it known that I, WM. McMAHON, of Rahway, in the county of Union and State of New Jersey, have invented a new and useful Improvement in the Manufacture of Molded Articles from Paper-Pulp; and I do hereby declare that the following is a full and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to an improved article of manufacture of paper and the treatment necessary thereto; and its object is to produce economically a pipe, tube, or molding, strong, durable, and suitable for use as a substitute in most, if not all, the relations in which ordinary metal, wood, cement, or composition pipes or moldings are now used.

To this end it consists in making a pipe or tube or moldings of any desired configuration of paper and directly from the pulp, and in such treatment of the pulp, prior to its formation into the finished article, as may best fit it for the uses to which the pipe, tube, or molding is to be applied, as more specifically hereinafter set forth and claimed.

In carrying the invention into effect the pulp is preferably drained to such a degree as will simply leave it a mass plastic enough to be worked. When it is intended that the product shall be used in a situation rendering it desirable that it be water-proof, the water-proofing material is then mixed with the pulp prior to its further manipulation. For instance, paraffine dissolved in naphtha is mixed with the pulp, and the naphtha then removed therefrom by evaporation or other means, leaving the paraffine thoroughly disseminated through and waterproofing every portion of the pulp. Resins—such as rosin, shellac, &c.—dissolved in a solvent or liquefied by heat, may be incorporated therewith; or a solution of bichromatized gelatine may be used for the same purpose. By thus incorporating the water-proofing material, and also, when desired, any antiseptic material, the entire article, when finished, is thoroughly saturated with the material and rendered water-proof in every portion—a result not accomplished by the ordinary method of applying the waterproofing after the article is made, and as a surfacing. After the pulp is thus treated it is subjected to great pressure in properly-formed molds or die-presses, so as to form it into the desired shape and render it firm and homogeneous. By this process a pipe, tubing, or molding can be economically formed directly from any suitable paper-pulp, firm, hard, homogeneous, of great tensile strength, impervious to moisture, substantially incombustible, and of high insulation capacity electrically. Such a pipe, tubing, molding, and machinery for the making thereof are represented in the drawings, in which—

Figure 1 is perspective view of a paper-pulp pipe or tubing. Fig. 2 is a vertical section of a die and mold by which either the pipe or molding may be made; Fig. 3, a longitudinal section, and Fig. 4 a cross-section, of a pipe-machine suitable for making the pipe or molding; Fig. 5, a modification of the machine shown in Fig. 3. Figs. 6 and 7 are longitudinal sectional views of pipes, showing different means of joining the ends; and Figs. 8 and 9 are cross-sections of moldings made from paper.

In Fig. 2 is shown a mold and die-press suitable for making the pipe or molding. In it B is the mold or base-block, of any convenient length, having a recess therein forming the mold, whose bottom is of the configuration of a part of the desired article. D is the die, having a tongue, E, fitting into the recess, and formed at its end *e* into the configuration of the remainder of the desired article. In B are fixed adjusting-screws, as shown, so that the depth to which E shall descend may be regulated. The recess is filled with pulp prepared as before directed, and through it an iron or steel rod, *b*, first oiled or paraffined, is slid. D is then brought down upon B by any suitable pressure, the tongue E entering the mass and compressing the pulp into the pipe shown in dotted lines C in Fig. 2. The rod *b* is then withdrawn, leaving the pipe shown in Fig. 1. The configuration of *e* in the tongue E and of the bottom of the recess in B may be varied so as to produce any desired article—as, for instance, the moldings shown in Figs. 8 and 9.

In Fig. 3 is shown a machine by which the pipe A may be formed in any length. F is a cylinder tapered at G to an aperture, *g*, which is the size of the exterior diameter of the pipe desired, or of the size and configuration of the

molding or other article to be produced. Within G a die or dod, H, is supported by wings or flanges *h h*, the ends thereof being the size of the bore desired for the pipe. A hopper, L, is provided for introducing the pulp into the cylinder F. Within the cylinder is a screw, *i*, mounted on a shaft, I, stepped in the head of H, and passing through a stuffing-box, J, in the head of a cylinder. K is a pulley (or it may be a gear or cog wheel) on I for communicating motion thereto. If pulp properly prepared be fed into F through L, and the screw *i* be rotated in the proper direction, the pulp is forced out through *g* and around H, forming the pipe A, the pressure thereon being in proportion, of course, to the areas of F and *g*, so that it is rendered very firm and homogeneous.

In Fig. 5 the piston M and rod N are substituted for the screw I, as thereby the pressure on the pulp in F can be regulated more certainly. By either of these means the pipe which forms the subject of this invention can be readily made. They are given herein, however, only as types, as they and other means will hereafter form the subject of separate applications. The sections or lengths of such pipes may be joined in various manners. For instance, the ends may be screw-threaded, as shown at S in Fig. 6; or the ends may be beveled, as shown at *o o*, Fig. 7, and for further security the joint be covered by a thimble or socket, T, slid or wrapped thereon. In the same method and by the same means moldings (shown typically in Figs. 8 and 9) may be made, the configuration of *e* in Fig. 2 and of *g* in Figs. 3 and 5 being varied to correspond with that of the desired product. The moldings shown in Figs. 8 and 9 may be of any desired shape and size, and be used as picture-frame moldings, or for architectural or ornamental purposes, either in interior or exterior work, a rabbet, *r*, being provided to fit them for framings, while apertures *o o*, Fig. 8, or recesses *p p*, Fig. 9, may be provided, so that wires for any purpose whatever may be secured therein, and at the same time electrically insulated.

It is evident that the method of waterproofing pipes, tubing, or molding herein described, consisting in incorporating the waterproofing material or composition with the pulp while in the condition of pulp, may be applied to any other articles of paper; hence my claim thereto is not limited to pipes, tubings, and moldings.

What I claim is—

1. As a new article of manufacture, a pipe, tube, or molding made directly from paper-pulp, substantially as set forth.

2. The method herein described of waterproofing paper articles, consisting in incorporating the waterproofing material or composition in and with the pulp prior to its formation into the finished article, substantially as set forth.

This specification signed and witnessed this 1st day of February, 1882.

WM. McMAHON.

Witnesses:
P. B. WILBER,
E. B. MALTBY.