

April 13, 1954

R. J. TROUT ET AL

2,675,333

PIPE APPARATUS

Filed Dec. 17, 1949

FIG. 1.

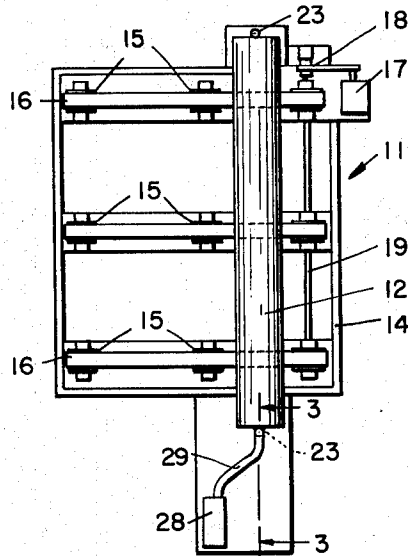


FIG. 4.

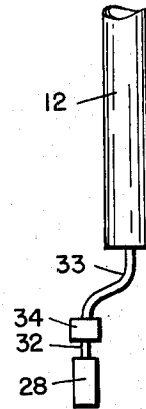


FIG. 2.

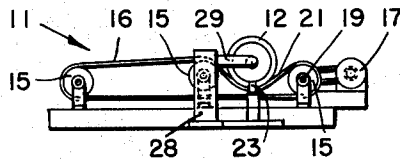
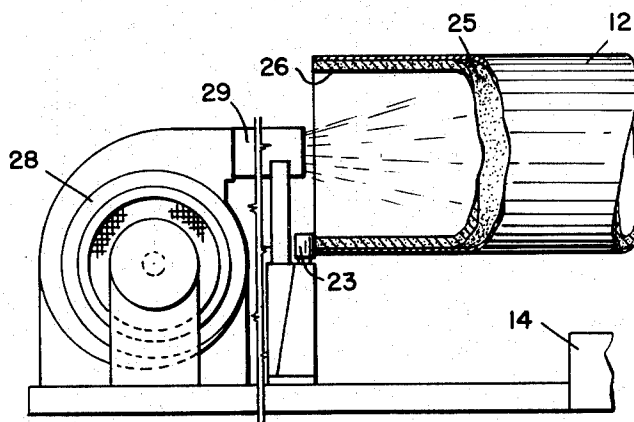


FIG. 3.



INVENTORS

RALPH J. TROUT

CHARLES H. BRANNEN

BY

Mason & Graham

ATTORNEYS

UNITED STATES PATENT OFFICE

2,675,333

PIPE APPARATUS

Ralph J. Trout, Pittsburg, and Charles H. Brannen, Hayward, Calif., assignors to American Pipe and Construction Co., a corporation of Delaware

Application December 17, 1949, Serial No. 133,544

1 Claim. (Cl. 117-97)

1

This invention has to do generally with the making of centrifugally spun concrete pipe or pipe having a centrifugally spun concrete lining.

In the art it is common practice to make concrete pipe and pipe having a concrete or cementitious lining in a metal shell or casing by introducing a slurry or wet mix of concrete or cement into a form such as a metal shell and rotating the form to distribute the cementitious mass evenly over the interior thereof. The form, which may or may not become a part of the completed pipe, is supported on and rotated by horizontally disposed endless belts or bands which are driven by a suitable power source.

One of the problems in manufacturing such pipe has been the difficulty of removing the water from the slurry or mix as the water leaves the compacting mass of cementitious material and collects on the inner surface. In large diameter pipe the problem has been particularly acute in that large drops of water fall from the upper part of the pipe pitting the surface below where they strike. While attempts have been made to brush the water out and to remove it by tipping the pipe, these methods have not proved entirely satisfactory. In many cases it was found necessary to scrape or trowel the lining smooth after such an operation.

It is therefore an object of our invention to provide a novel improved method of removing water from the concrete pipe or pipe lining while the pipe is spinning.

Another object is to provide such a method which is easy to carry out and which tends to improve the character of the interior finish of the pipe.

A further object is to provide such a method which requires no mechanical or physical contact of a brush or tool with the surface of the pipe and which requires no tipping of the pipe or special manipulation thereof.

These and other objects will be apparent from the drawing and the following description thereof.

Referring to the drawing:

Fig. 1 is a plan view, largely diagrammatic, of an apparatus for rotating the pipe and for carrying out the method of the invention;

Fig. 2 is an elevational view of the apparatus of Fig. 1;

Fig. 3 is a sectional view on line 3-3 of Fig. 1; and

Fig. 4 is a schematic or diagrammatic view of a modified form of apparatus for carrying out the invention.

2

In a general way our method utilizes a moving stream of air for removing the water from the pipe as the lining is formed. More particularly describing the invention, in Fig. 1 we show at 11 an apparatus which is commonly used for supporting and rotating pipe or forms to be lined with concrete. This apparatus includes a base 14 upon which is mounted a plurality of sets of pulleys 15 over which extend belts 16. The belts are driven by a motor 17 through gearing 18 and shaft 19 which supports the endmost pulleys.

The pipe shell or form 12 which is usually of steel is cradled in the upper run 21 of the belts as shown in Fig. 2.

As the belts are driven the shell 12 is rotated and the desired lining material of concrete or the like introduced into the shell as the same is rotated. The pipe-supporting and rotating apparatus may include end thrust rollers 23 which are mounted for rotation about vertical axes and against which the ends of the pipe abut to prevent axial migration of the pipe.

In Fig. 3 the pipe shell 12 is shown provided with a cementitious lining 25. As this lining is compacted during rotation of the shell the water moves inwardly and gathers on the inner surface 26 of the layer 25.

In order to remove this water we introduce a strong current or blast of air into the pipe at one end. This may be done by providing a motor-driven blower unit 28 adjacent one end of the pipe. We prefer to locate the blower to one side of the axis of the pipe and to provide the blower with a flexible hose 29 which may be adjustably positioned centrally of the pipe to direct the stream of air axially of the pipe. With the blower unit located to one side, the hose 29 may be moved out of the way to permit the introduction of concrete slurry into the pipe, an operation which is usually accomplished by means of troughs which are moved axially into the pipe and then inverted to dump their contents.

We have found that by causing a current of air to be passed through the pipe as the pipe is rotating, the water, as it accumulates on the inner surface of the cementitious lining, is forced along the pipe axially thereof by the air. Some of the water flows out the end of the pipe. At the same time, considerable water is evaporated. Also, we have found that the quality of the lining is improved and that the surface thereof is much smoother than results from the conventional methods of making this type of pipe. By way of example, we have found that very satisfactory results were obtained by passing approximately

8000 C. F. M. of air through pipe of 36" diameter.

In carrying out the process we prefer to use relatively warm dry air in order to evaporate a large proportion of the water from the cementitious mass as the water leaves the mass during spinning of the pipe. In many geographical areas and under certain weather conditions the atmospheric air present is suitable. However, there are many locations and many times when the humidity of the air is relatively high and when such is the case, we prefer to heat the air before passing it through the pipe. In Fig. 4 of the drawing we show the apparatus for accomplishing this. In this figure, numeral 12 indicates the pipe, 28 the motor-driven blower unit. A conduit comprising the two sections 32 and 33 conveys air to the pipe after the air has been heated by passage through a heater 34. Any conventional heat transfer device may be used.

Although the invention has been particularly shown and described, it is contemplated that various changes and modifications may be made without departing from the scope thereof as indicated by the following claim.

We claim:

In the manufacture of pipe having a cylin-

drical concrete wall formed within a cylindrical metal shell, the steps of introducing wet concrete material into the shell, spinning the shell about its longitudinal axis at a speed sufficient to spread and compact the material into a relatively dense cylindrical layer within the shell, and simultaneously removing water from the entire inner surface of the layer by passing air through the shell axially from end to end while the shell is spinning, the humidity of said air being well below the saturation point.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
652,732	Ransome	June 26, 1900
1,768,451	Hume	June 24, 1930
1,837,324	Hume	Dec. 22, 1931
2,484,018	Crom	Oct. 11, 1949
2,528,643	Dubbs	Nov. 7, 1950

FOREIGN PATENTS

Number	Country	Date
21,824	Australia	Aug. 8, 1929