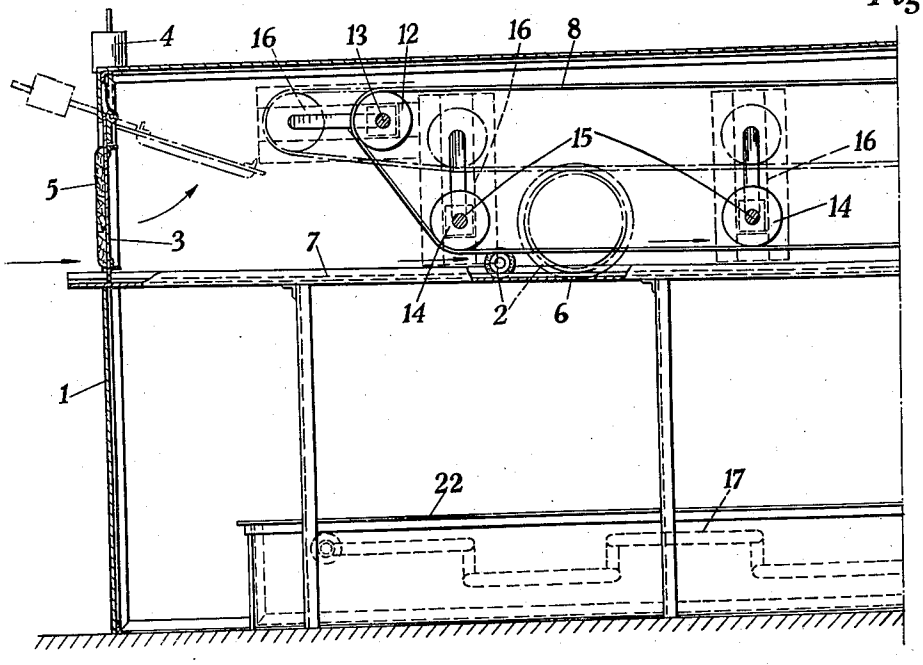
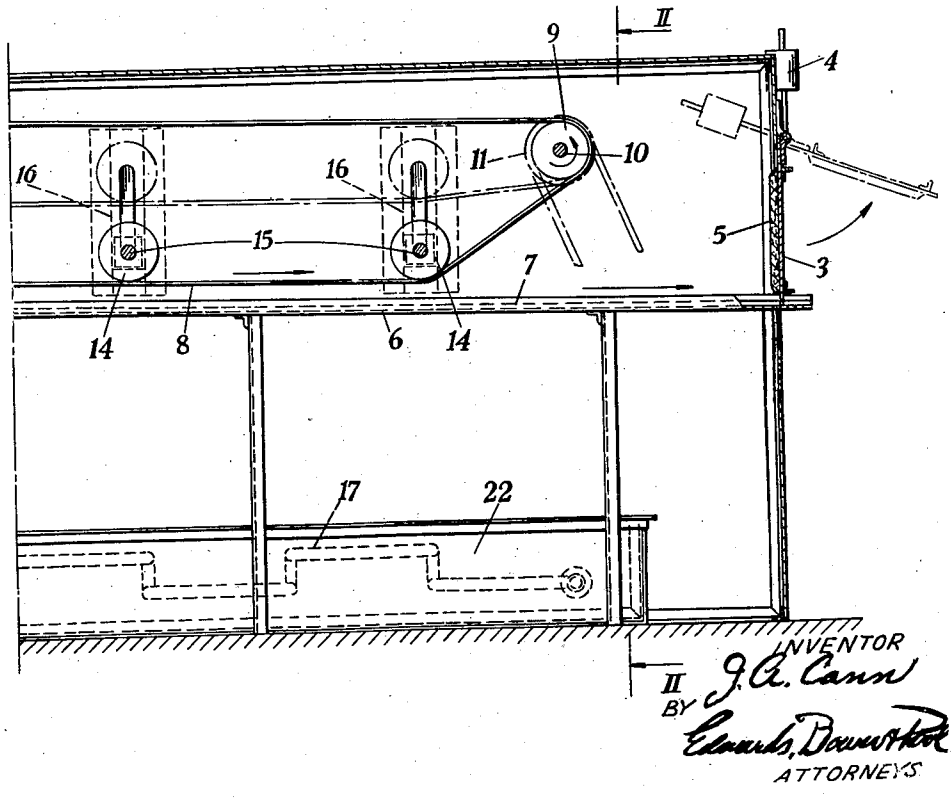
Sept. 14, 1943. J. A. CANN 2,329,184

APPARATUS FOR CURING ASBESTOS-CEMENT PIPE

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Fig. 1.





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APPARATUS FOR CURING ASBESTOS-CEMENT PIPE

Filed May 23, 1941 4 Sheets-Sheet 2

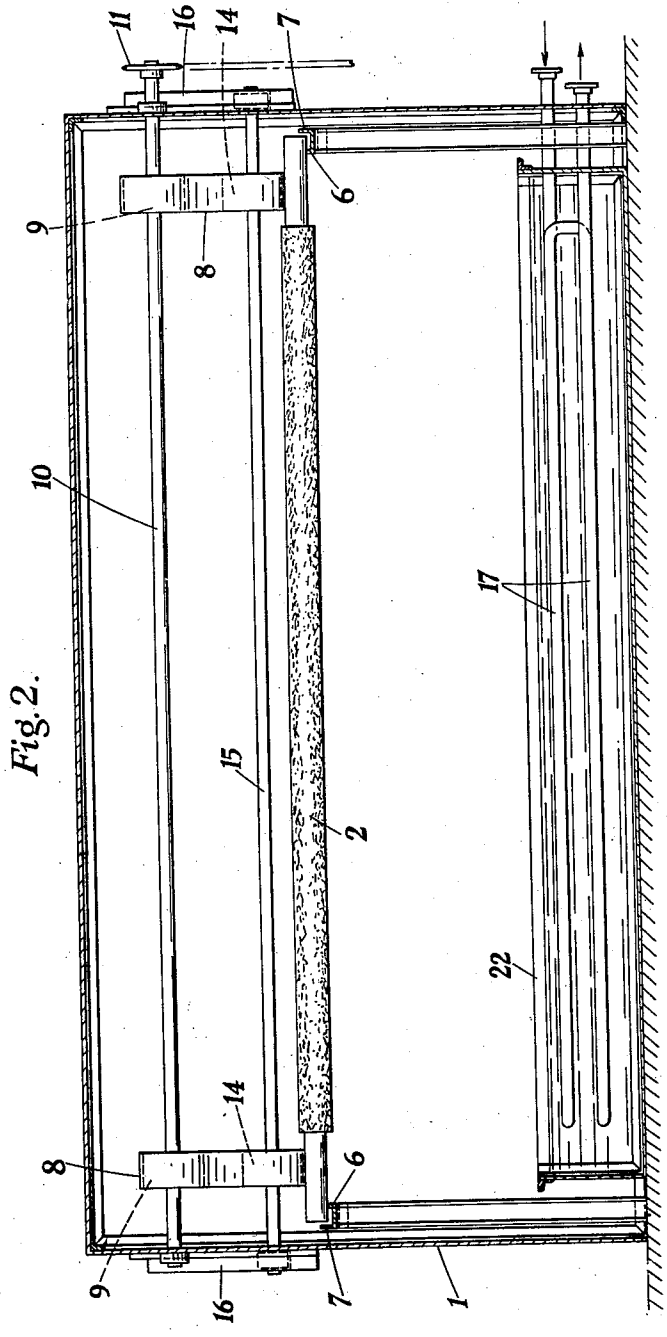


Fig. 2.

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APPARATUS FOR CURING ASBESTOS-CEMENT PIPE

Filed May 23, 1941 4 Sheets-Sheet 3

Fig. 3.

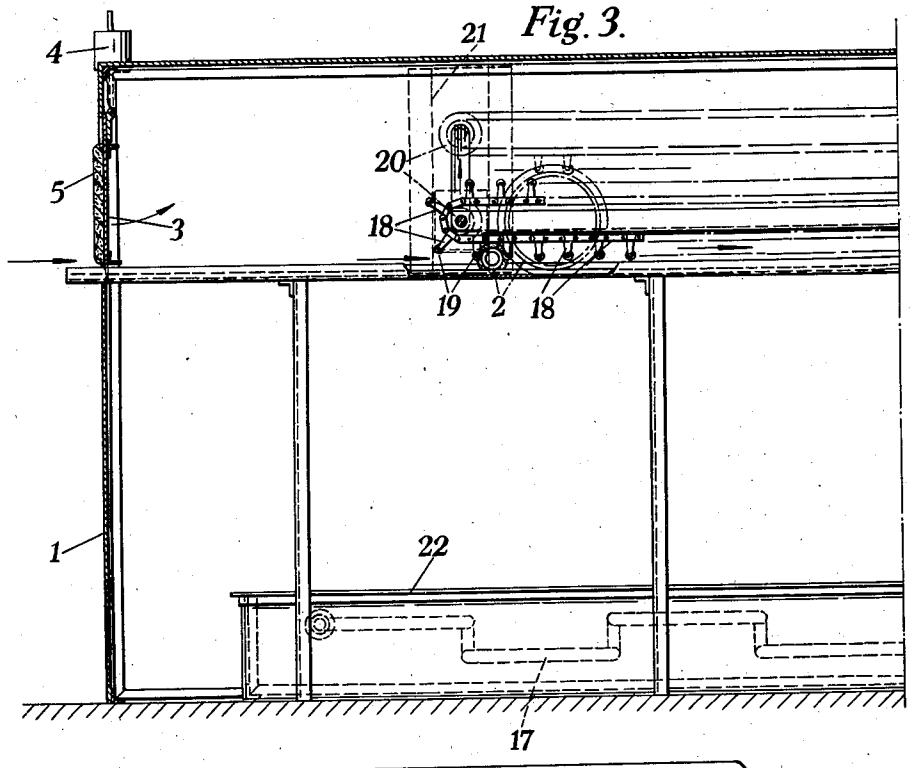
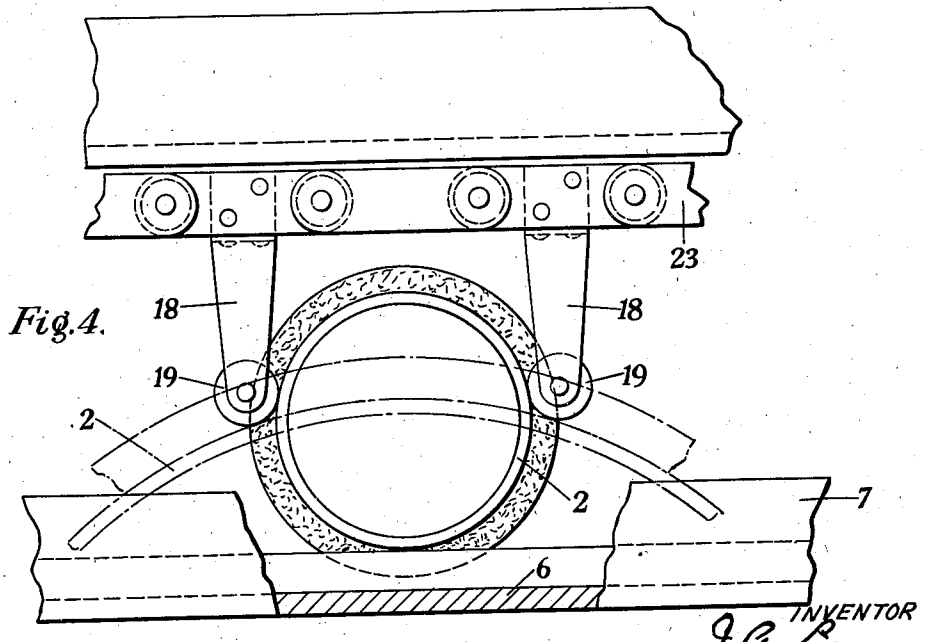


Fig. 4.



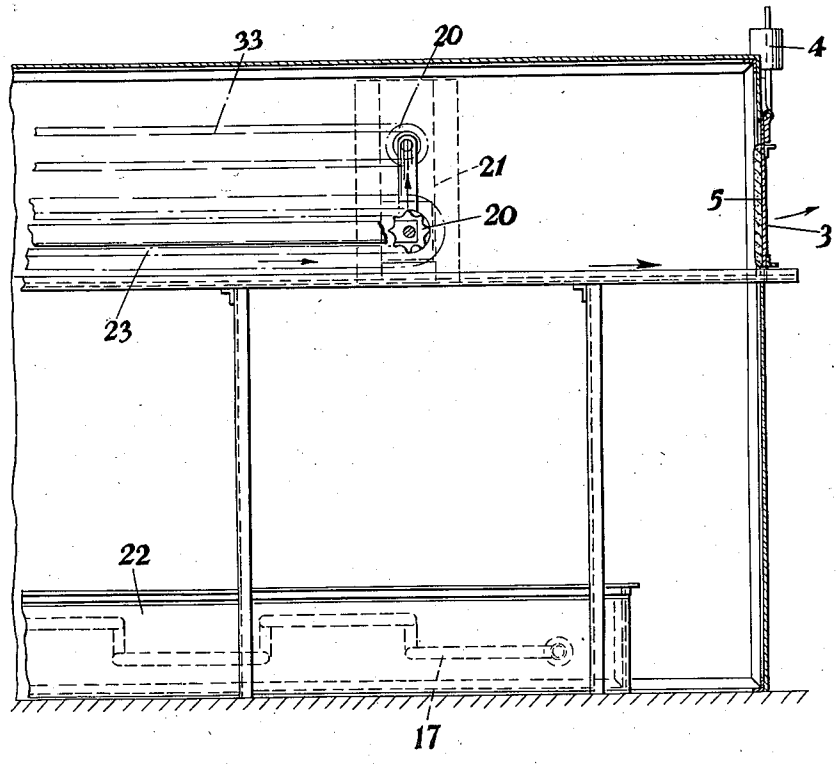
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APPARATUS FOR CURING ASBESTOS-CEMENT PIPE

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Fig. 3A.



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UNITED STATES PATENT OFFICE

2,329,184

APPARATUS FOR CURING ASBESTOS-CEMENT PIPES

John Arthur Cann, Bickley, England, assignor to Turner & Newall Limited, Spotland, Rochdale, England, a British company

Application May 23, 1941, Serial No. 394,909
In Great Britain May 27, 1940

7 Claims. (Cl. 25—30)

This invention relates to the production of pipes from asbestos-cement or like material, that is to say, fibrous material and a binding agent that sets rigid from a plastic state. These pipes are commonly formed on mandrels, and at present it is the usual practice to loosen the pipes on the mandrels by a process known as calendering while the asbestos-cement is still moist, transfer the moist pipes to split wooden mandrels, and allow them to set and dry on these wooden mandrels. There is a risk of the pipes becoming slightly warped during this setting and drying. Moreover, it is necessary to maintain two sets of mandrels in use, and of course the transfer from the one mandrel to the other is an undesirable operation, although it is necessary under the present practice as the pipes take a long time to set.

Another object is to provide an apparatus in which the pipes may be set while still on the mandrels on which they were made.

A further object of my invention is to provide means for setting the pipes quickly at substantially atmospheric pressure.

Yet another object of my invention is to provide means for handling the pipes before and during the setting without damaging them.

In proceeding in accordance with my invention, the coatings are loosened on the mandrels and then, while still on the mandrels on which they were formed, are placed at substantially atmospheric pressure in hot humid air. The setting is accelerated by the heat, and when the pipes have set they are removed from the mandrels. It is necessary that the air should be humid, because, if it is not, water required for completely setting the cement or other binder will be extracted from the pipes by the atmosphere, and the pipes will be weakened. The temperature of the atmosphere should not exceed 150° F., since above this temperature the asbestos-cement tends to swell. On the other hand, if the temperature is low the setting time is prolonged. It is preferred to maintain the temperature at or above 125° F., as by this means setting takes place in under an hour.

The mandrels may advantageously be slowly rotated while they are in a hot humid atmosphere, as then any risk of the pipes sticking to the mandrels is eliminated.

In order to carry out the process of the invention, I have devised a novel form of apparatus comprising a chamber containing a runway or track along which the mandrels roll in passing through the chamber, means for engaging the mandrels and causing them to roll along the runway or track, and means for maintaining humid the atmosphere in the chamber.

My invention will best be understood from the following description of the preferred embodiments of it, taken in conjunction with the annexed drawings, in which—

Figure 1 is an elevation of one treating chamber with the side wall removed to show the internal parts;

Figure 2 is a section on the line II—II in Figure 1;

Figure 3 is an elevation, similar to Figure 1, of another chamber;

Figure 3*a* is an elevation of the right-hand end of the chamber illustrated in Figure 3; and

Figure 4 shows part of this second chamber to a larger scale.

Referring first to Figures 1 and 2, the chamber is a rectangular structure 1 which is wholly closed except for an opening at each end. Each opening is closed by a hinged door 3 having balance weights 4 fixed to arms which lie outside the chamber and clear it as they rock. Each door also has a buffer 5 fixed to it.

The chamber contains an inclined runway in the form of two tracks 6 which extend through the end openings, the doors being shaped to accommodate these tracks. Coated mandrels 2, with their coatings previously loosened by calendering, roll down the runway, the uncoated ends of the mandrels running on the tracks 6. The tracks each have upstanding outer flanges 7 which act as guides for the mandrels. When a mandrel arrives at a door 3 it hits the buffer 5 and opens the door, so that it passes through automatically, the door closing behind it.

Inside the chamber the mandrels are engaged by two rubber belts 8 which pass around rollers. Each belt is engaged by two end rollers, one of which, 9, is fixed to a shaft 10 driven through a chain wheel 11, and the other of which, 12, is fixed to a shaft 13. Each belt is also engaged by intermediate rollers 14 carried by shafts 15. All these rollers serve to press the lower runs of the belts downwards into contact with the uncoated ends of the mandrels, so that the mandrels are caused to roll slowly through the chamber along the runway.

Asbestos-cement pipes naturally vary in diameter, some being made on mandrels only 4 inches in diameter and others made on mandrels that may be as large as 18 inches in diameter. In order to allow mandrels of different sizes to be treated, the end rollers 12 and intermediate rollers 14 are made adjustable in position. Figure

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1 shows in full lines their position and those of the belts for treating small mandrels, and in dotted lines the positions for treating large mandrels. The necessary adjustment is effected by making the shafts 13 and 15 slidable in guides 16 in the side walls of the chamber.

The atmosphere in the chamber is maintained hot, e. g. at 125° F., and humid by means of a water bath 22 containing steam coils 17. Thus the coatings that form the pipes are set as the mandrels pass through the chamber.

In the chamber shown in Figures 3 and 4, the rubber belts are replaced by chain conveyors 23 having projecting arms 18 which carry rollers 19. As each mandrel arrives it is engaged by a pair of arms 18, as shown in Figure 4, and thus caused to travel through the chamber. The end chain wheels 20 over which the conveyors pass are made adjustable vertically by being mounted in guides 21, so as to accommodate mandrels of different sizes. As an example, there may be five inches between successive arms and then the rollers will engage a 4" diameter mandrel as shown in full lines in Figure 4 and an 18" diameter mandrel as shown in dotted lines in the same figure. In the latter case the frictional engagement of the rollers 19 with the top of the mandrel is enough to cause the mandrel to roll along the runway.

In either of the chambers illustrated, the escape of humid air when the doors are opened may be reduced, if necessary, by the provision of trap chambers, each with two doors, at each end.

I claim:

1. In an apparatus for use in treating asbestos-cement or like pipes in the form of coatings on mandrels, in combination, a chamber, means in said chamber forming a track along which mandrels can roll, conveyor means arranged to engage mandrels and cause them to roll along said track means in said chamber, and means for maintaining humid the atmosphere in the chamber.

2. In an apparatus for use in treating asbestos-cement or like pipes in the form of coatings on mandrels, in combination, a chamber, means in said chamber forming a track along which mandrels can roll, a pair of endless belts mounted to engage the ends of mandrels on said track means, a plurality of rollers for urging said belts into contact with the mandrel ends, and means for driving said belts, whereby to cause mandrels to roll along said track means.

3. In an apparatus for use in treating asbestos-cement or like pipes in the form of coatings on mandrels, in combination, a chamber, means in said chamber forming a track along which mandrels can roll, conveyor means in said chamber for moving mandrels on said track means, a plurality of projecting arms carried by said conveyor means and spaced to engage the ends of mandrels, mandrel-engaging rollers carried by said arms, and means for driving said conveyor means, whereby to cause mandrels to roll along said track means.

4. In an apparatus for use in treating asbestos-cement or like pipes in the form of coatings on mandrels, in combination, a chamber, means in said chamber forming a track along which mandrels can roll, conveyor means arranged to engage mandrels and cause them to roll along said track means in said chamber, and means for adjusting the position of said conveyor means relatively to said track means, whereby to accommodate mandrels of different sizes.

5. In an apparatus for use in treating asbestos-cement or like pipes in the form of coatings on mandrels, in combination, a chamber, means in said chamber forming a track along which mandrels can roll, conveyor means arranged to engage mandrels and cause them to roll along said track means in said chamber, a water bath in said chamber, and means for heating said water bath to maintain a hot humid atmosphere in said chamber.

6. In an apparatus for use in treating asbestos-cement or like pipes in the form of coatings on mandrels, in combination, a chamber formed with an opening at each end for the entry and discharge respectively of mandrels, means for closing each of said openings against the escape of the atmosphere within said chamber, means in said chamber in alignment with said openings and forming a track along which mandrels can roll, conveyor means arranged to engage mandrels and cause them to roll along said track means in said chamber, and means for maintaining humid the atmosphere in the chamber.

7. In an apparatus for use in treating asbestos-cement or like pipes in the form of coatings on mandrels, in combination, a chamber, a pair of spaced tracks in said chamber providing a runway along which the uncoated ends of mandrels can roll, and an endless conveyor associated with each track and arranged to engage the mandrels and cause them to roll along said runway through said chamber.

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