

No. 745,585.

PATENTED DEC. 1, 1903.

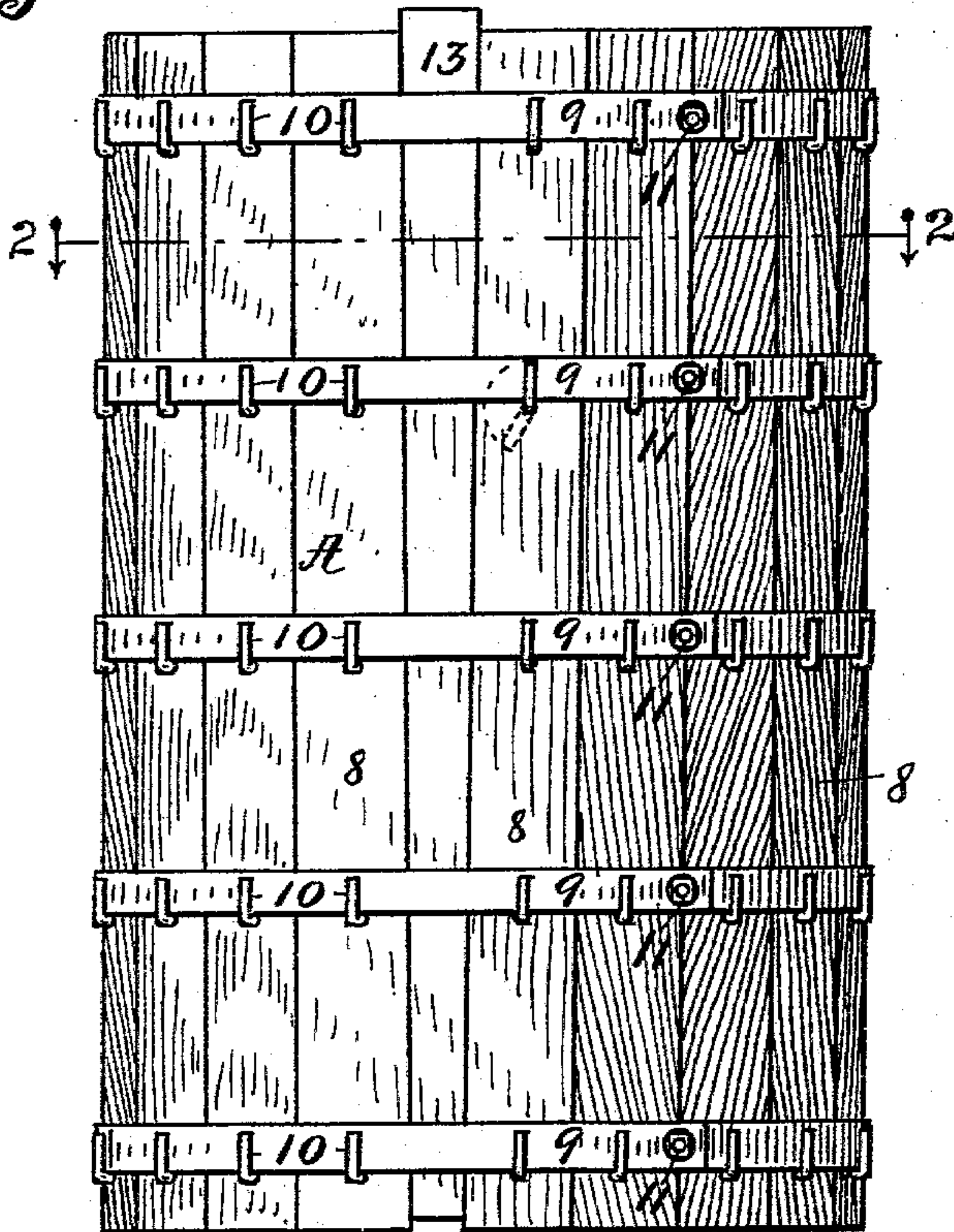
A. FERGUSON.  
CONCRETE MOLD.

APPLICATION FILED MAR. 3, 1903.

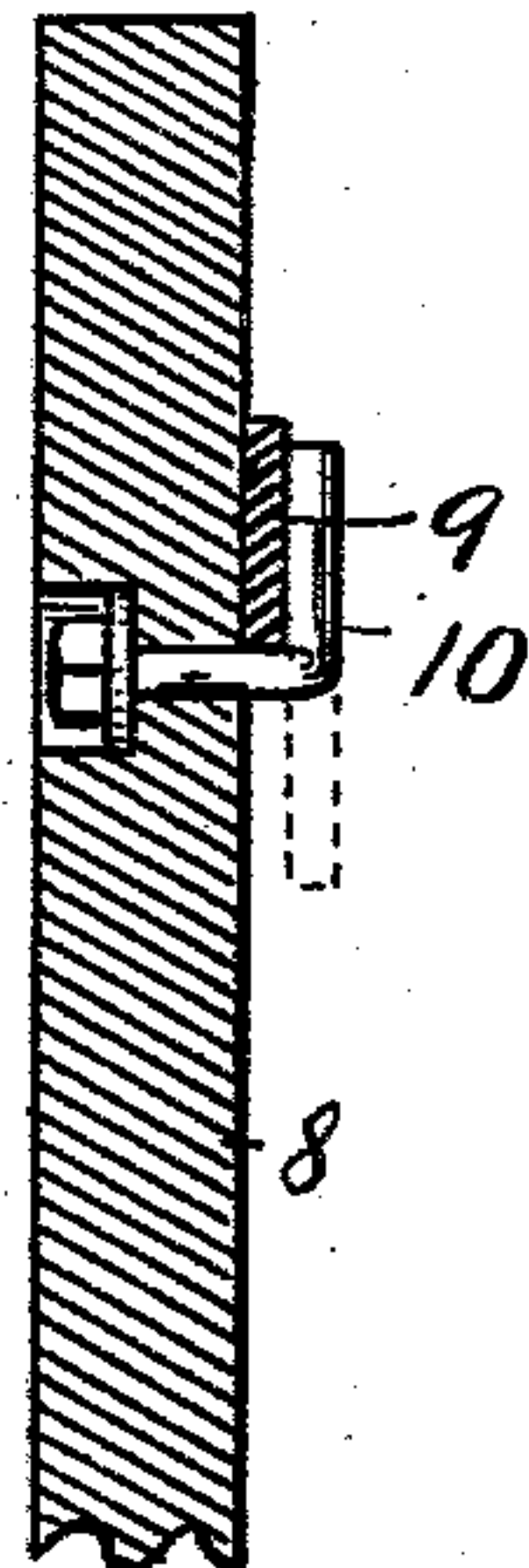
2 SHEETS—SHEET 1.

NO MODEL.

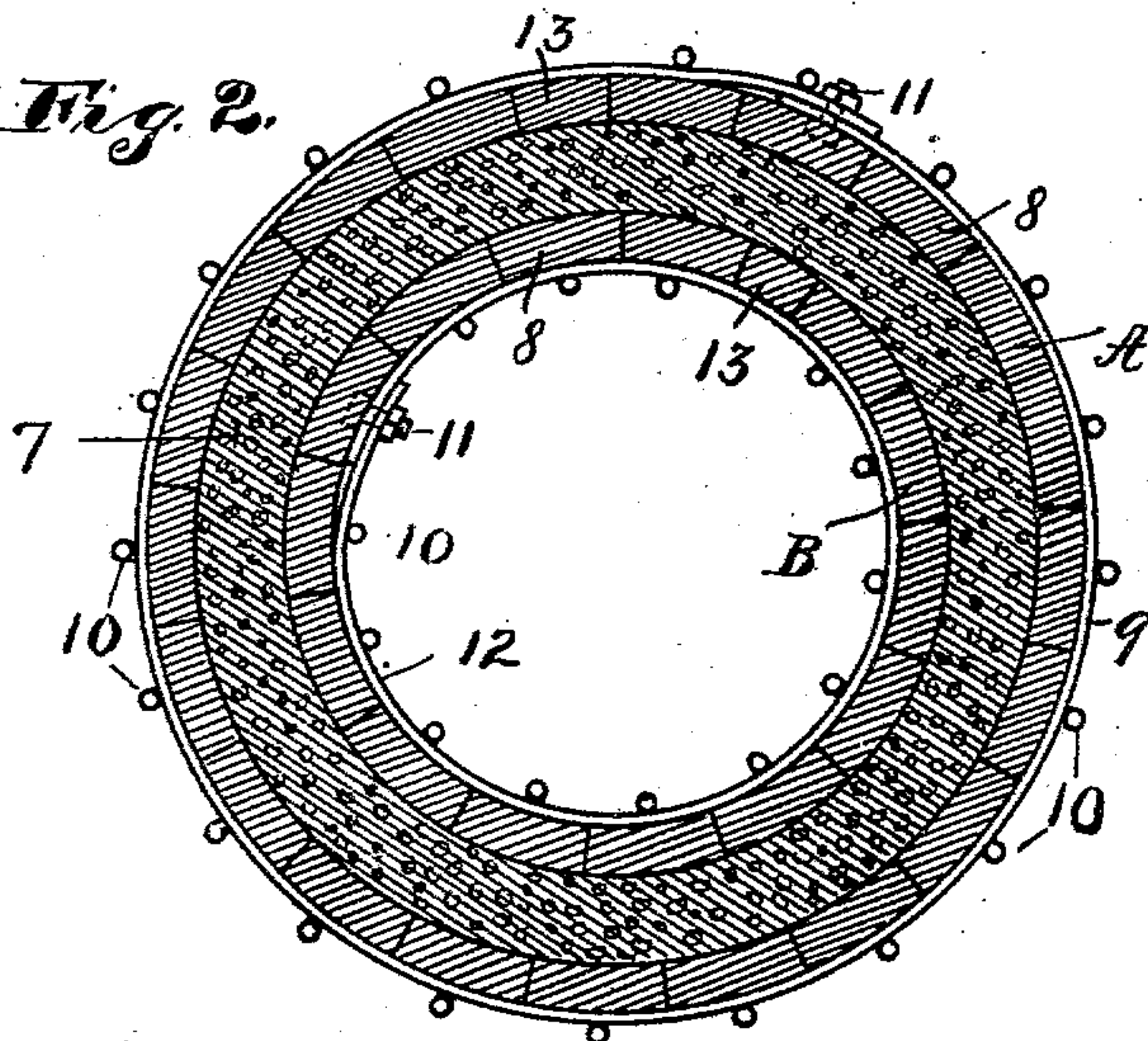
*Fig. 1.*



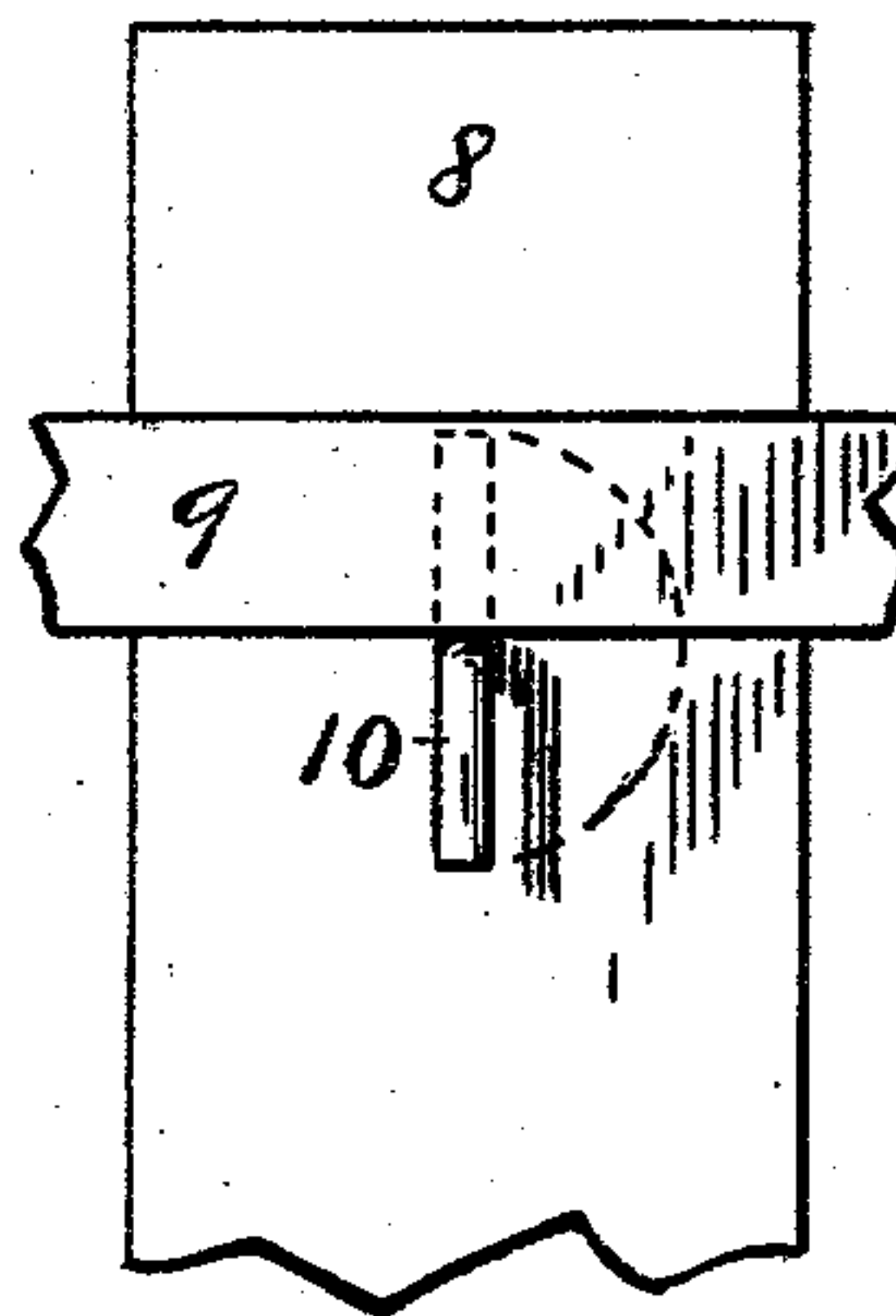
*Fig. 3.*



*Fig. 2.*



*Fig. 4.*



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By *Joseph A. Minturn*  
Attorney.



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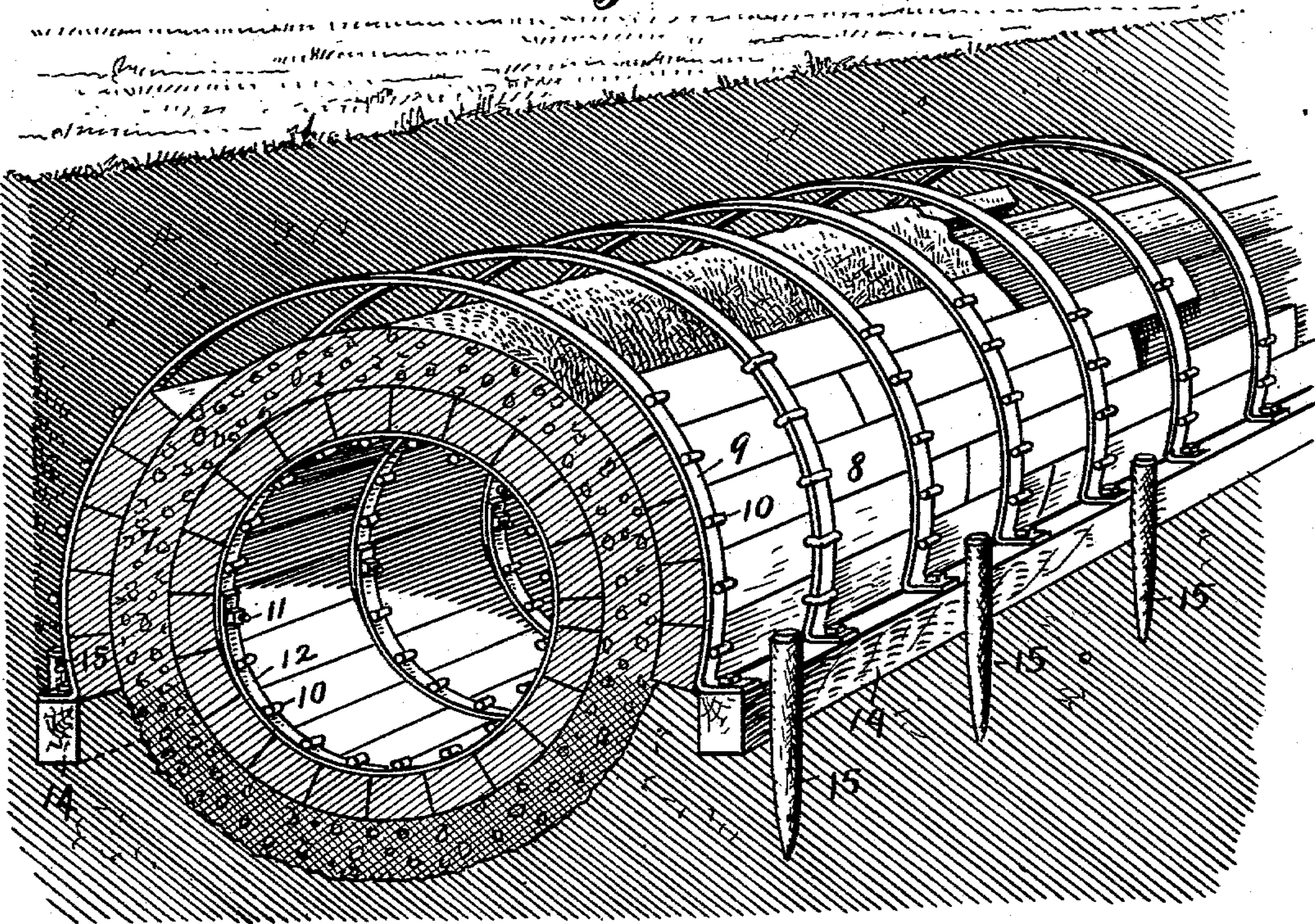
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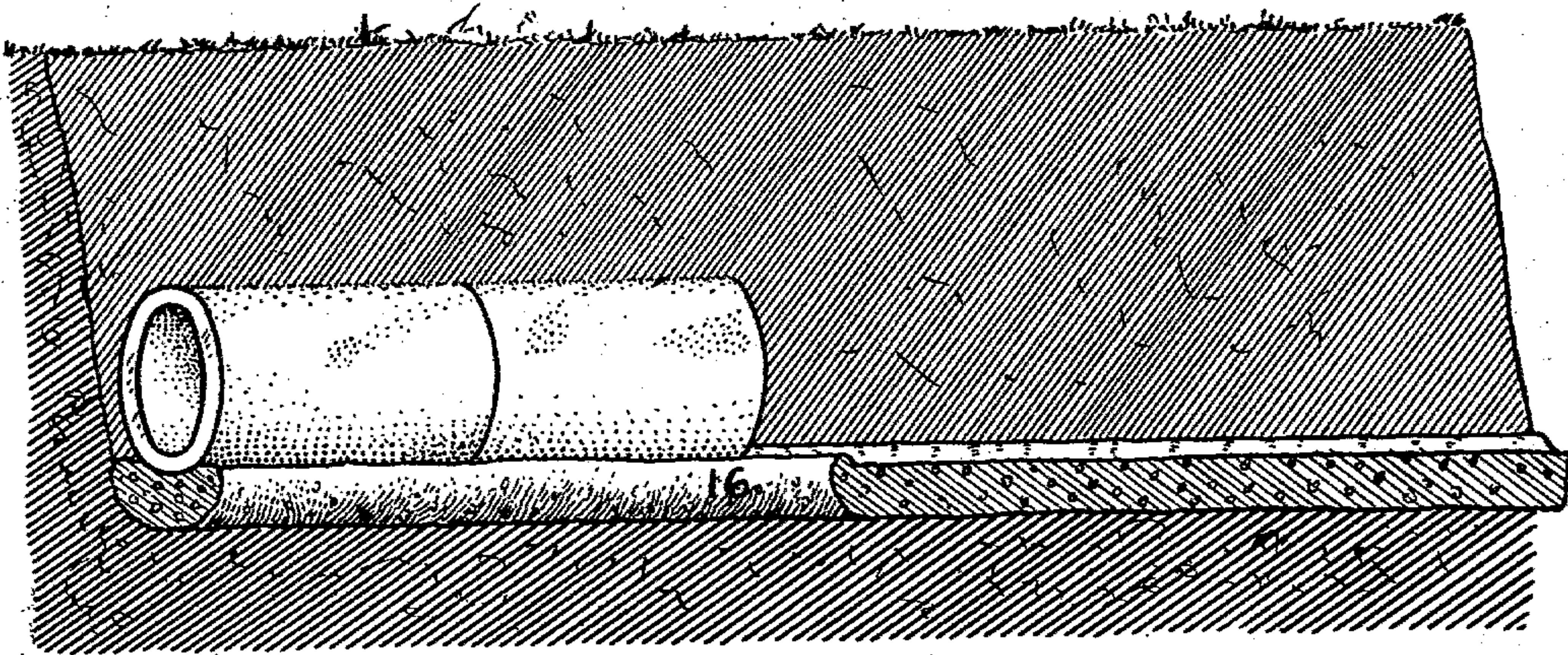
NO MODEL.

2 SHEETS—SHEET 2.

*Fig. 5.*



*Fig. 6.*



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# UNITED STATES PATENT OFFICE.

ALONZO FERGUSON, OF INDIANAPOLIS, INDIANA.

## CONCRETE-MOLD.

SPECIFICATION forming part of Letters Patent No. 745,585, dated December 1, 1903.

Application filed March 3, 1903. Serial No. 145,985. (No model.)

*To all whom it may concern:*

Be it known that I, ALONZO FERGUSON, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Concrete-Molds, of which the following is a specification.

This invention relates to improvements in drains, culverts, cisterns, and other like tubular walls; and the object of the invention is to provide a mold of separable parts in which said walls may be formed and then removed after they have become set and rigid enough to be self-supporting.

The object, it should be further stated, is to provide for the use of concrete which will withstand the changes of temperature better than clay pipes and by being formed on the ground where it is to be used will effect a great saving in freight and with large pipes in the labor and machinery for handling and setting them.

The object also is to form a continuous line of pipe or a continuous foundation where a line is made up of several sections in order to prevent undermining at the joints and dis-alinement of the line of pipe.

I accomplish the objects of the invention by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my invention; Fig. 2, a transverse section on the line 2 2 of Fig. 1; Fig. 3, a detail in longitudinal section of the end of a stave, showing a hoop secured by a bolt-hook; Fig. 4, a front or outside view of the end of a stave, showing the bolt-hook turned back from the hoop; Fig. 5, a perspective view of my invention applied to the formation of large continuous sewers, and Fig. 6 a perspective view of concrete pipe-sections made in my molds and laid on a continuous base to support the ends of the joined sections.

Like characters of reference indicate like parts throughout the several views of the drawings.

7 represents the product of my invention, which is a pipe or tubular body formed from concrete of usual and well-known composition, tamped solidly into a mold; and my invention consists, primarily, in the construc-

tion of a mold the parts of which can be used in forming a mold of any desired size and a mold which can be readily taken apart and removed from the finished product.

8 represents the stave-like parts of the mold, which are of wood with beveled edges. These staves are arranged in cylindrical form to provide an outer tier A and an inner tier B, which are separated from each other a distance equal to the thickness of the desired pipe and are held in concentric relation by any suitable means. (Not shown.) The outer tier of stave-sections is bound by the metal hoops 9, placed outside thereof, and the staves are fastened to the hoops by means of the hooks 10, which, as shown in Fig. 3, are bolts, the heads of which are sunk in the stave so as to prevent indenting the concrete surface which will be formed against it. The hooks permit the staves to be slid longitudinally upon the hoops or the hoops to be driven into the hooks; but the greatest advantage occurs when the mold is to be dismembered. Then the hooks are turned out of contact with the hoop, as shown in Fig. 4, and the hoops, which are made out of metal straps with ends united by bolts 11, are disconnected at said bolted ends and removed from the staves, leaving the latter free for easy removal.

The inner tier of staves B is held by inside hoops 12, the ends of which, like hoops 9, are bolted together, and bolt-hooks seated in the staves engage the hoops. By this construction the inner staves may be readily removed after the concrete pipe formed between the two tiers has set.

The inner tier of staves may be used with my bolt-hooks and separable hoops in forming the walls of cisterns, the outer tier in that case being dispensed with, as the earth surrounding the cistern-hole takes its place.

In assembling the staves the last one of the tier will be tapering, as shown at 13, to form a wedge by the driving in of which the tier will be made firm and tight.

Pipes of concrete for culverts, sewers, and the like up to thirty-six inches in diameter or thereabout may be made with profit by my improved molds at a neighborhood factory and the pipe-sections hauled to the place of use; but where diameters much in excess of



the above figures are needed it will generally be more convenient to make the pipe in the trench where it is to be used. This necessitates the modification in the use of the outer  
 5 staves, as shown in Fig. 5. In this case the trench is dug and the bottom rounded to the curve of the desired concrete pipe. An offset is made in the trench on each side of the proposed pipe as a bearing or foundation for the  
 10 outer staves, and outside of that the longitudinal wooden stringers 14 are laid to bolt the ends of the hoops to. Stakes 15, driven outside of the stringers, prevent spreading of the stringers by the weight of material  
 15 and tamping in the formation of the pipe. The prepared bottom of the trench is then laid with cement the desired thickness of the pipe and is rounded properly, whereupon the inner tier of staves properly hooped together  
 20 is deposited on the bottom concrete layer. Then the outside metal hoops are placed and their ends bolted to the stringers, and then the outer staves are slipped under the hoops into place as the concrete is introduced and  
 25 tamped. After the building up of the staves has reached the altitude shown at the near end of Fig. 5 the top of the pipe can be constructed without the outer staves, and they need not be used. By breaking joints with  
 30 the staves, as shown in the drawings, an endless pipe may be formed which will be free from jointed ends to drop down and ultimately destroy the drain.

Where the smaller pipe-sections are used,  
 35 I provide a continuous base of concrete 16, as shown in Fig. 6, of sufficient mass and strength to support the sections of pipe, and while the base thus provided is soft and green

I lay the pipe-sections thereon in a slush of cement, and they adhere to said base and  
 40 form practically a continuous line of pipe.

Having thus fully described my invention, what I claim as new, and wish to secure by Letters Patent, is—

1. A mold for the purposes specified, comprising inner and outer staves, hoops having  
 45 separable ends extending transversely of said inner or outer staves, bolts securing the ends of the hoops and bolts having heads countersunk in the staves, and having hooked projecting  
 50 ends adapted to be moved across the hoops to secure the staves thereto.

2. In a mold for the purpose specified, staves in tiers, bolts with heads countersunk in said staves having projecting ends bent at  
 55 right angles to form hooks, and hoops having detachable ends, said hoops being laid between the hooks and the staves.

3. In a mold for the purposes specified, separable sections having parallel sides and  
 60 edges, hoops connecting said sections having separable ends, bolts connecting said ends, bolts having heads countersunk in said sections and having the ends of the bolts projected through the sections and extended be-  
 65 yond the sections and bent at right angles over the hoops to hold the latter, said bent bolt ends having a swinging adjustment, and tapering mold-sections introduced between the parallel sections to act as a wedge to  
 70 tighten the sections to the hoops.

ALONZO FERGUSON. [L. S.]

Witnesses:

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