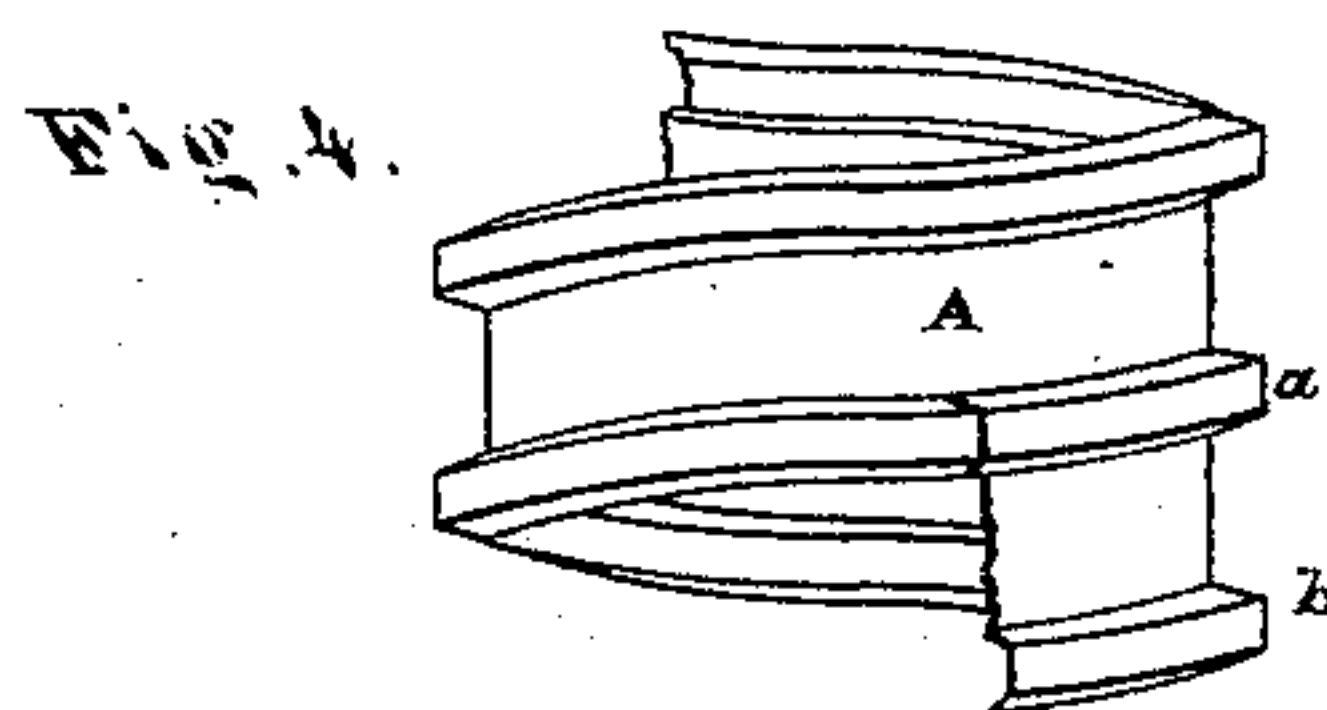
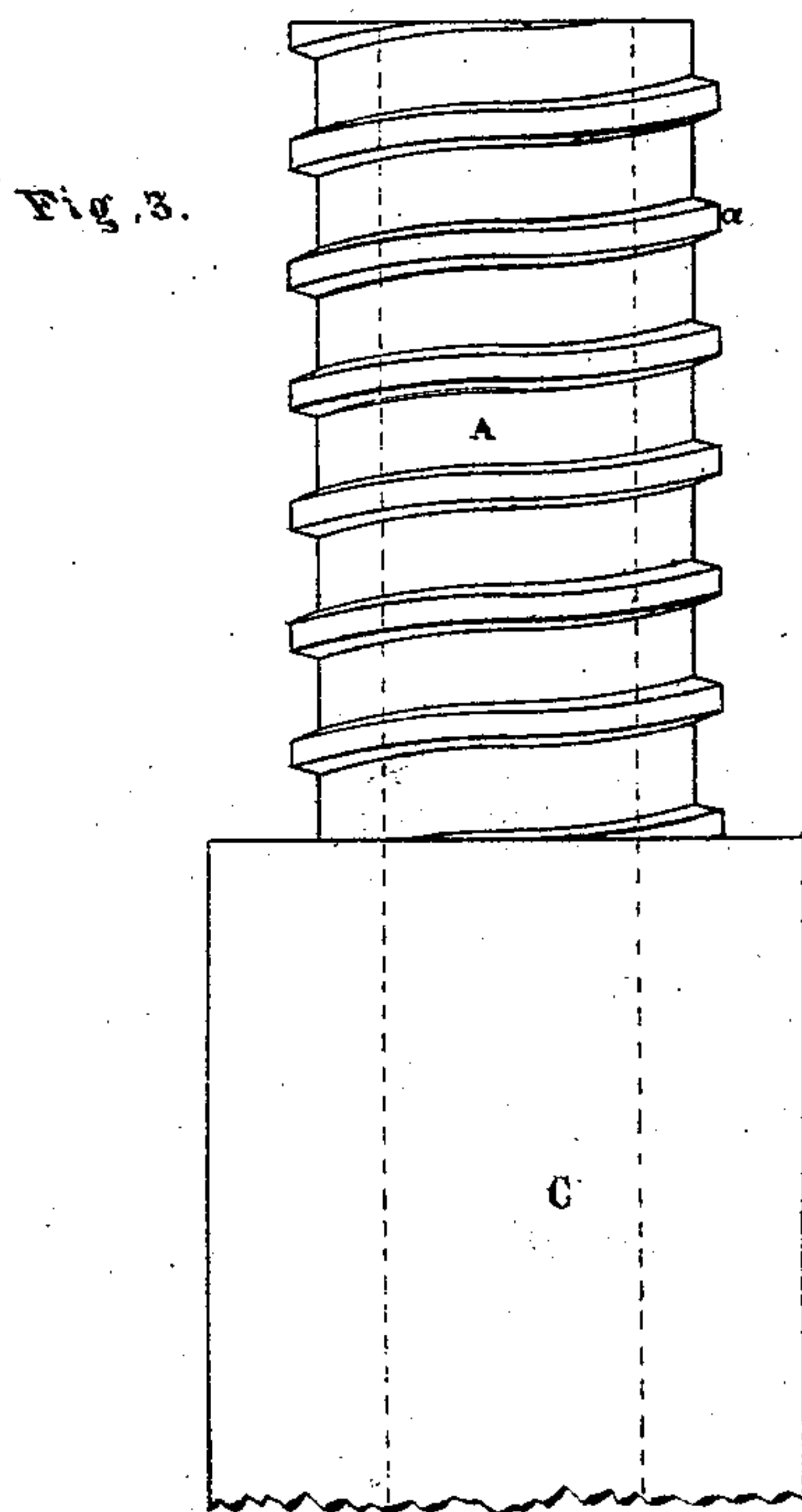
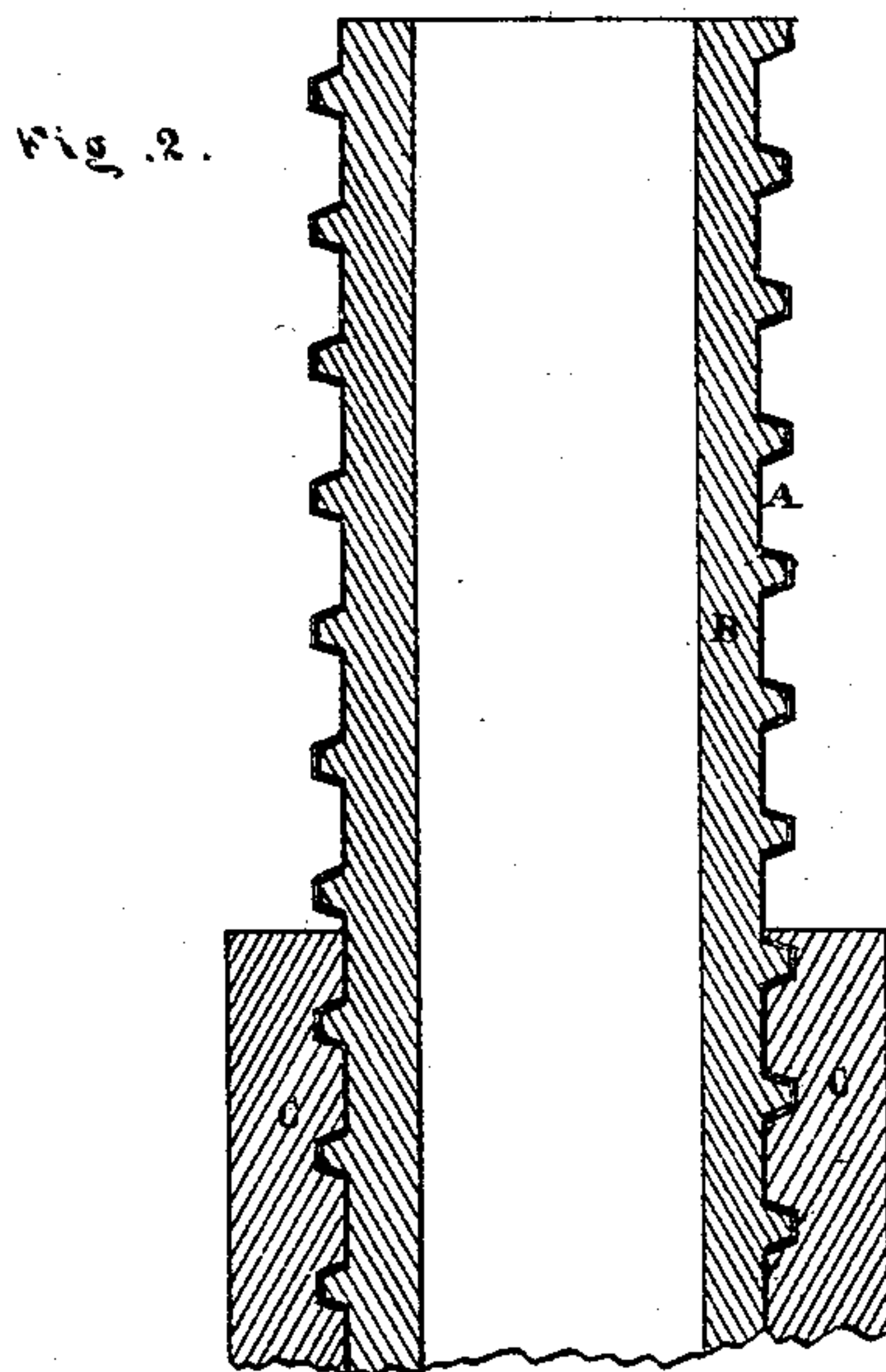
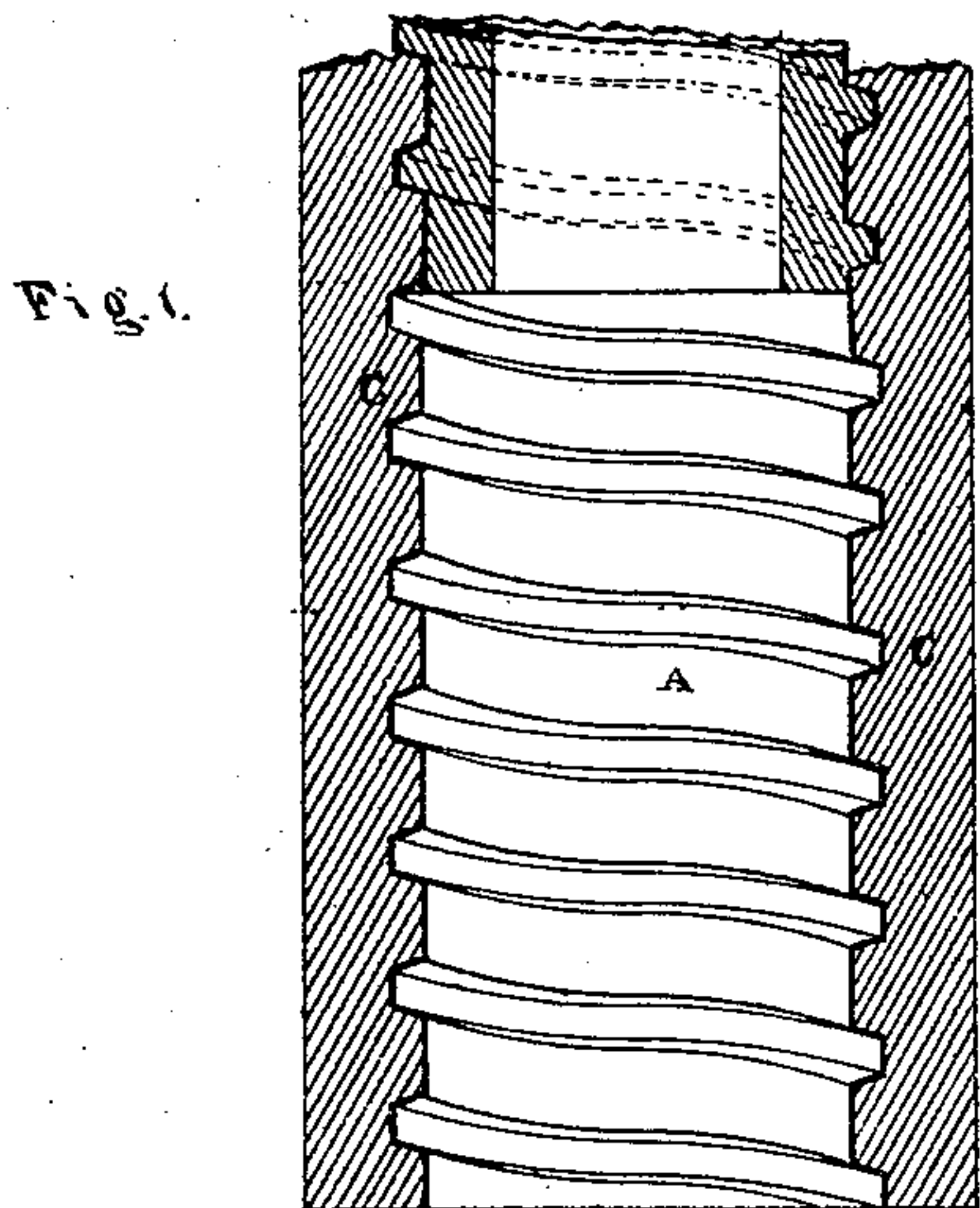


A. P. STEPHENS.

Improvement in Manufacture of Cement-Pipe.

No. 127,438.

Patented June 4, 1872.



WITNESSES:

*J. S. Wightman*  
*Anna M. Northrop.*

INVENTOR:

*Anson P. Stephens*  
*By Tho. P. How*  
*Atty*

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Fig. 5.

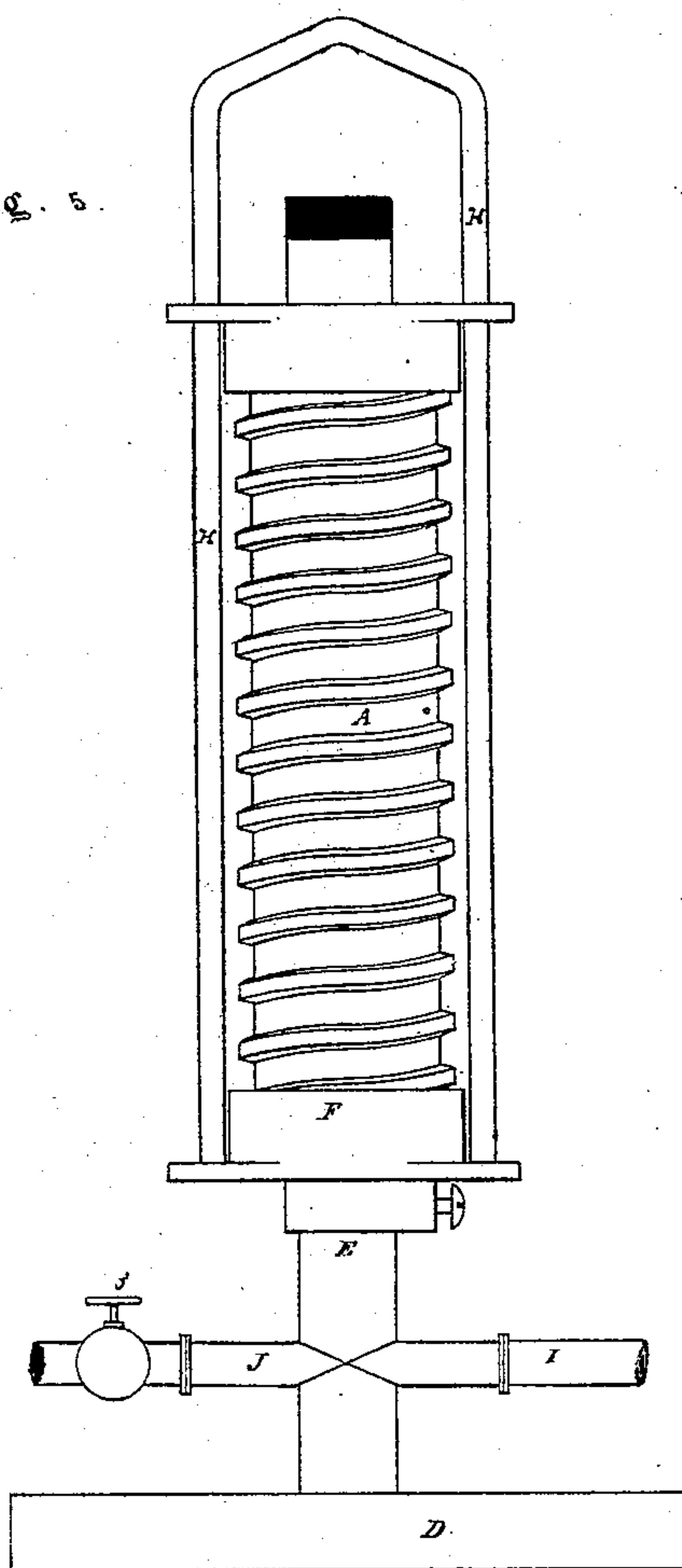


Fig. 6.

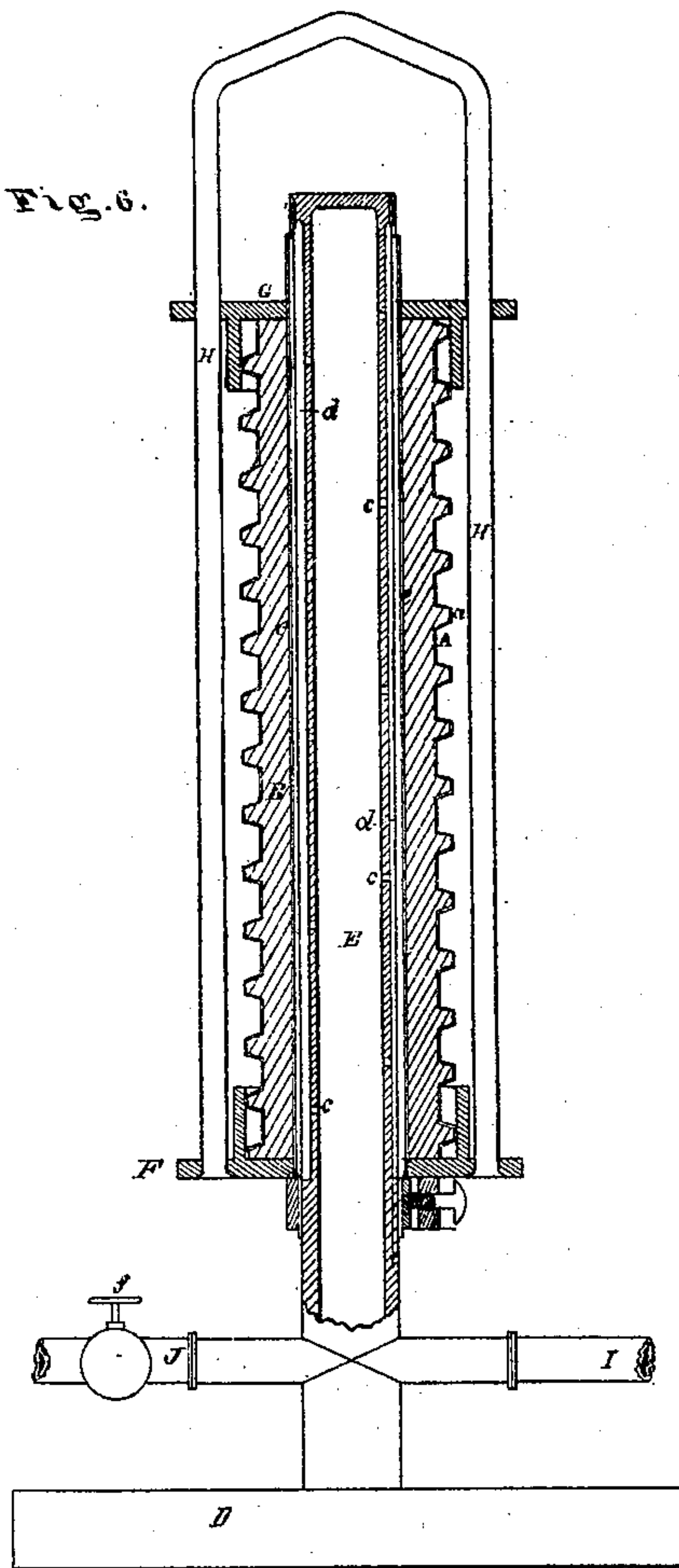


Fig. 7.



Witnesses:

*E. S. Lightman*  
*Anna M. Northrop.*

Inventor:

*Anson P. Stephens*  
*By Thos P. How*  
*Atty*



# UNITED STATES PATENT OFFICE.

ANSON P. STEPHENS, OF BROOKLYN, NEW YORK.

## IMPROVEMENT IN THE MANUFACTURE OF CEMENT PIPES.

Specification forming part of Letters Patent No. 127,438, dated June 4, 1872.

Specification of certain Improvements in Cement Pipes and apparatus for making the same, invented by ANSON P. STEPHENS, of Brooklyn, in the county of Kings and State of New York.

### *Nature and Objects of the Invention.*

This invention relates to a cement-pipe having a metallic support, and to apparatus for forming the inside or cement lining in a better and more economical manner than has heretofore been practiced. The first part of said invention consists in a pipe, composed in part of cement and in part of a strip of sheet-metal, wound spirally into the form of a screw, as hereinafter more fully set forth. The second part of my said invention consists in the apparatus hereinafter described for forming the inside or cement lining of pipes of the aforesaid and similar constructions.

### *Description of the Accompanying Drawing.*

Figure 1 is an axial horizontal section of a piece of a joint of pipe constructed according to my invention, said figure showing that end of the pipe which is intended to be screwed upon the outside of the piece or joint of pipe to which it is to be united. Fig. 2 is a similar section, showing the end of the pipe to be screwed into an end, such as shown in Fig. 2. Fig. 3 is a side view of a piece, such as shown in section in Fig. 2. Fig. 4 is a detail side view, showing a piece of coiled sheet metal, above referred to, and is designed to illustrate the mode of forming the metallic portion of the said pipe. Fig. 5 is a side elevation of an apparatus designed to be used in the formation of the inside cement portion of the said pipe, with the metallic portion of the said pipe placed therein. Fig. 6 is an axial longitudinal section of the same, showing also the inside cement portion or lining of the pipe. Fig. 7 is a transverse section of the inside tube, which forms a part of this apparatus.

### *General Description.*

In making my improved pipe I first take a strip of sheet metal, A, which has been grooved at its edges as shown in Fig. 4, and coil it into the form of a screw by winding it upon an appropriate mandrel for that purpose, the edges or thread portions *a* and *b* being lapped upon

each other, so as to give these edges a hold upon each other, and form a continuous screw of the length of the joint of pipe required; or, I take a flat strip of metal and coil it into the same form upon a mandrel, at the same time swaging up the metal, as shown at *a* and *b*, to form the threads of the screw, by means of swaging rollers or tools adapted to this purpose, the mandrel being placed in a lathe and made to revolve for the accomplishment of this work. For pipes intended to be screwed together at their ends, one end of the mandrel upon which it is formed should be a trifle larger than the other, so one end of the screw thus formed shall be sufficiently larger than the other to allow the smaller end to be screwed into the larger. The coil A having been thus formed into a screw of the proper length for a joint of pipe, and the ends trimmed squarely, and properly secured by soldering or riveting, it should then be covered on the inside with a coating of cement, B, and on the outside with a coating of cement, C, as shown throughout the entire length of the pipe, with the exception that, when the joints of pipe are to be screwed together, the cement lining B should be omitted at the larger end a sufficient distance to allow the smaller end of the next joint of pipe to be screwed into it the required distance, and the outer cement portion C should be omitted for a similar distance at the smaller end, as shown. The inner cement portion B may be applied and formed by various methods; but, as it is very desirable that this portion should be made as perfect as possible, and the material densely packed, I have devised an apparatus for the purpose, which is represented in Figs. 5, 6, and 7, Sheet 2 of the drawing. In these figures, D is the base or stand upon which the other parts are supported. E is a tube extending upward from the said base or stand, closed at the bottom and top, having apertures *c c* opening into grooves *d d* made in the outer side of said tube. With the exception of these grooves the outer surface of the said tube is cylindrical. *e* is a piece of thin India-rubber tube drawn over the outside of the tube E, and secured at the top and bottom to the said tube E by winding with twine or otherwise, so as to be hermetically closed at this point. F is a base or cup to receive the end of the spirally-wound sheet



of metal A, and support it while the lining B is being put into it. G is a cap, to support the top of the screw A, and this cap is supported by the bale H, which extends upward from the cap F. The top plate of this cap G may be made open, at intervals, around the India-rubber core for the introduction of the cement, or it may be raised up to allow the cement to be introduced under it, and replaced when the proper amount of cement has been introduced and before the core is expanded. I is a pipe, which should be connected with a hydrostatic press or force-pump. J is a waste-pipe, which is provided with a stop-cock, *f*.

The further operation of this apparatus is as follows: The sheet-metal piece or screw A having been placed in position, as shown, the cement filled in, the cap or cup G being brought down into its place, so as to hold the tube A in its position, so as to bring the tube E in the center, and the stop-cock *f* being closed, water is pumped through the pipe I into the tube F with sufficient force to expand the India-rubber tube *e* and compress the cement into all parts of the tube A, the water being allowed to pass freely through the apertures *c c* for that purpose. When this operation has been carried far enough the pumping is discontinued, and the pipe is allowed to stand for a short time till the cement has partially set, when the stop-cock *f* is opened and the water allowed to escape from the inside of the rubber tube, which allows the latter to contract to its original dimensions, when it can be easily removed; and when the cement has become hard enough for removal, the pipe, so far as completed, may be taken from the apparatus.

The cement used in the construction of these pipes may be any hydraulic or other cement which is suitable for the purpose for which the pipe is intended.

This construction, and this mode of forming the inside of the pipe, produce a very serviceable pipe for conveying water when the pressure is not very great, and may, perhaps, in some cases, be serviceably used for gas. The outer cement portion C may be formed around the part A in a core-box, or it may be applied when the pipe is laid into place.

#### *Claims.*

1. The combination of the spirally-formed sheet-metal tube A, and the core or inside cement lining B, substantially as and for the purpose described.

2. The combination of the spirally-formed sheet-metal tube A, and the outer cement portion C, substantially as and for the purpose described.

3. The combination of the spirally-formed sheet-metal tube A, and the outer and inner cement portions B and C, substantially as and for the purpose described.

4. The combination of the perforated tube E, and the elastic tube *e*, substantially as and for the purpose hereinbefore set forth.

5. The combination of the tube E, elastic tube *e*, and the cups or supports F and G, substantially as and for the purpose hereinbefore set forth.

ANSON P. STEPHENS.

Witnesses:

THOS. P. HOW,  
ANNA M. NORTROP.