

(No Model.)

G. C. HICKS.  
HEAT INSULATOR.

No. 570,634.

Patented Nov. 3, 1896.

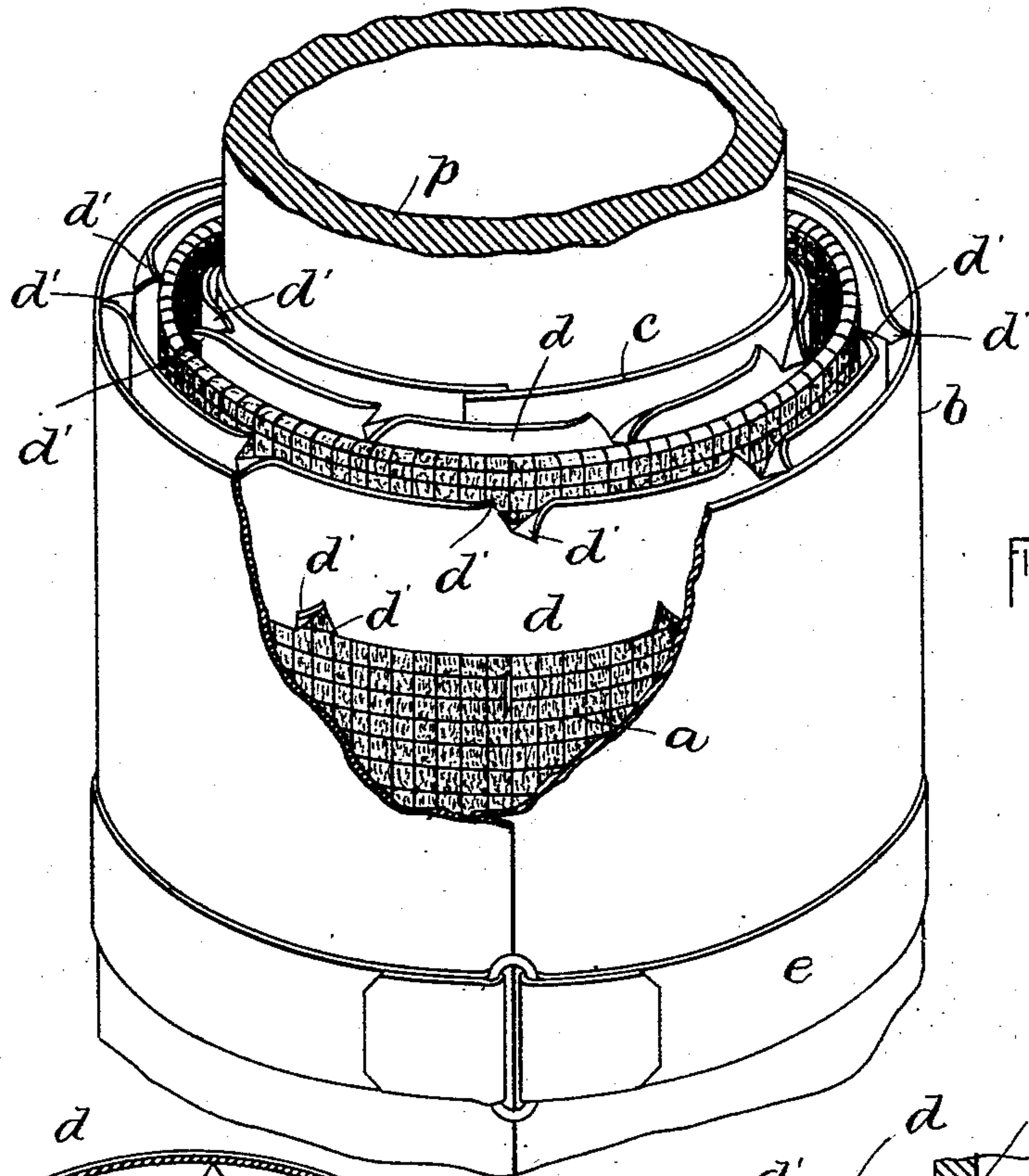


FIG. 1.

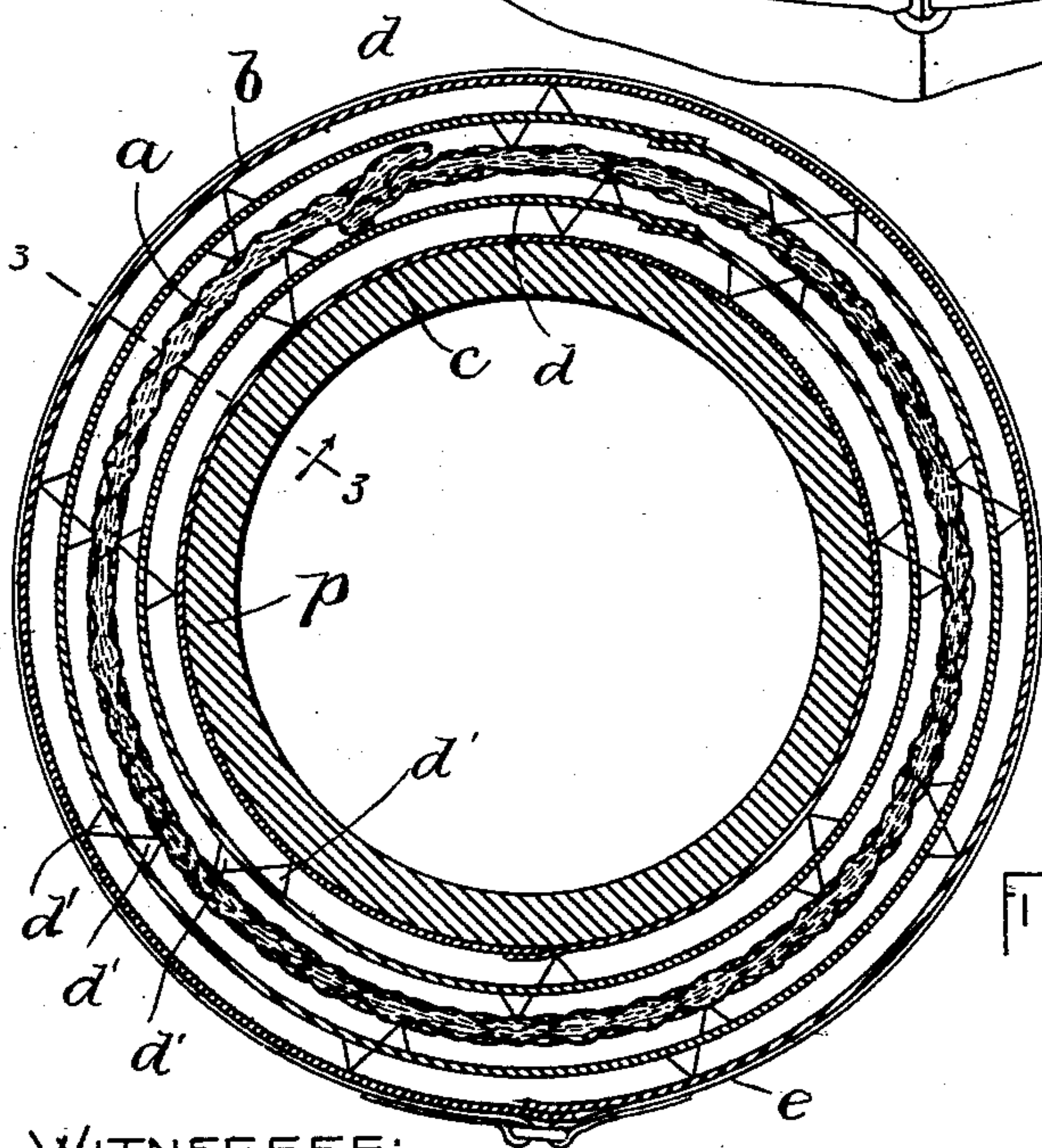


FIG. 2.

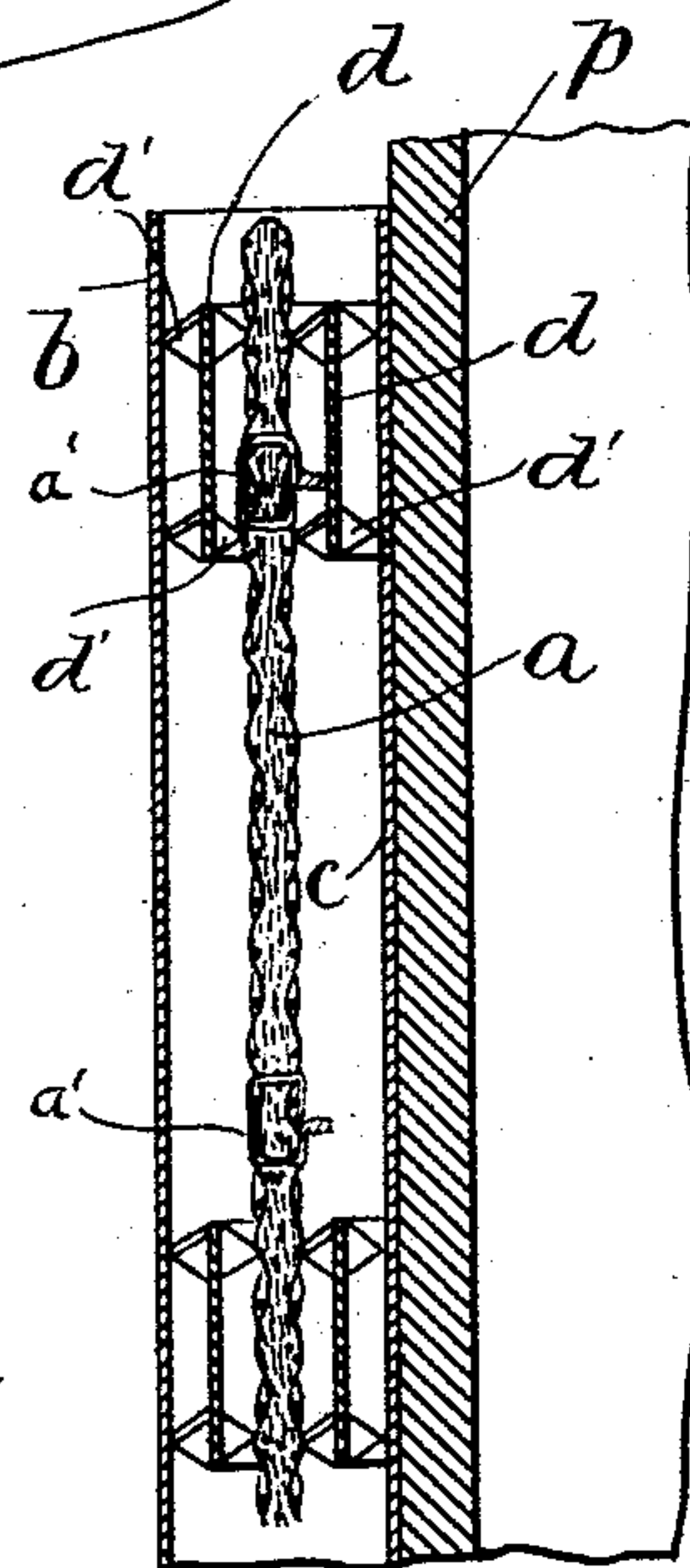


FIG. 3.

WITNESSES:

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# UNITED STATES PATENT OFFICE.

GEORGE CLEVELAND HICKS, OF BOSTON, MASSACHUSETTS.

## HEAT-INSULATOR.

SPECIFICATION forming part of Letters Patent No. 570,634, dated November 3, 1896.

Application filed April 6, 1895. Serial No. 544,708. (No model.)

*To all whom it may concern:*

Be it known that I, GEORGE CLEVELAND HICKS, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Heat-Insulators, of which the following is a specification.

This invention has for its object to provide effective and desirable means for reducing to the minimum the loss of heat by radiation, conduction, or convection from the surfaces of steam and hot-water pipes and from other surfaces requiring such protection; and it consists in the improvements which I will now proceed to describe and claim.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a perspective view of a portion of a length of pipe provided with a heat-insulator embodying my invention. Fig. 2 represents a transverse section of the same. Fig. 3 represents a longitudinal section on line 3 3 of Fig. 2.

The same letters of reference indicate the same parts in all the figures.

In the drawings, *a* represents what I term a "non-conducting and heat-reflecting wrapper," the same being composed of a filling of mica flakes or layers of any suitable size assembled in sufficient quantity to make a body of suitable thickness and area, and a foraminous envelop or binder of wire-netting inclosing said filling and exposing considerable portions of the surfaces thereof.

The wrapper *a* may be constructed by spreading flat a sheet of wire-netting, depositing the mica flakes upon it, the flakes being laid flat upon the netting and parallel with each other, so that the sides of the flakes will form the surfaces of the filling, and then placing another sheet of netting upon the upper side of the filling, the two sheets being suitably united along their edges. The sheets are connected at intervals through the body of the sheet by suitable means, such as tie-pieces *a'*, passed through the wire-cloth and the mica filling, as shown in Fig. 3, said tie-pieces preventing the mica flakes from gravitating to the lower portion of the wire-cloth envelop. A single sheet of netting may be employed, of greater area than the accumulation of mica, the netting being folded over the mica and suitably fastened. The wrap-

per thus constructed constitutes one member of my improved heat-insulator, and in connection therewith I employ two sheet-metal members *b* and *c*, one inclosing and the other inclosed by the wrapper. The inner member *c* is preferably a thin pliable sheet of some bright metal, such as aluminium, adapted to closely fit the surface of the steam-pipe *p* or other article to be protected, while the outer member *b* is preferably a heavier sheet, adapted to constitute the casing of the insulator and preferably provided with polished surfaces. Said member *b* may be made of zinc or tin.

Between the members *a*, *b*, and *c* I interpose two sets of separating-bands *d d'*, which are made of sheet metal and are provided with oppositely-projecting teeth *d'*, formed by slitting and bending portions of the bands. These teeth are pointed at their outer ends, so that they present limited bearing-surfaces on the members *a b c* and do not therefore conduct heat to any material extent. The bands are held out of contact with the members by the teeth and the members are effectually separated from each other by the bands and teeth, so that annular air-spaces are formed between the members, as shown in Fig. 2.

It will be seen that the serrated bands constitute simple and inexpensive as well as strong and reliable separating devices, the pointed teeth engaging the members *a, b*, and *c*, so that the bands are not liable to slip out of place.

The external member or casing *b* is preferably held in place by external bands *e*.

It will be seen that each member of the insulator reflects back a considerable portion of the heat transmitted to it, so that comparatively little heat reaches the outer member and still less is radiated by it.

The intermediate member or wrapper *a* is particularly effective and desirable, owing to its non-conducting material and the reflecting quality of its surfaces, as already explained. Said wrapper may be used with good results independently of the other members, or in connection with only the outer member, or with any other suitable external casing.

The serrated separating-bands are impor-



tant features of my improvement, their sharply-pointed teeth enabling them to securely engage the members with which they come in contact and prevent slipping of the  
5 separators between said members. The meshes of the wire-cloth sheets of the wrapper *a* receive the points of the teeth that engage the wrapper, so that said teeth penetrate the wrapper deeply enough to insure a firm  
10 engagement.

I claim—

A heat-insulator comprising in its construction a flexible innersheet or member of bright metal tightly inclosing the pipe, a flexible  
15 wrapper composed of a filling of mica flakes and sheets of wire-netting inclosing and secured to said filling and exposing the bright

reflecting-surfaces thereof, two sets of separating-bands, one engaged with the outer and the other with the inner surface of the wrapper, each band having oppositely-projecting pointed teeth, and a flexible metal inclosing sheet supported by the outer set of separating-bands, the said wrapper being supported and separated from the inner sheet by the  
25 inner set of bands.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 1st day of April, A. D. 1895.

GEORGE CLEVELAND HICKS.

Witnesses:

C. F. BROWN,

A. D. HARRISON.