

STEPHEN W. WOOD.

Improvement in Method of Reinforcing Metallic Cartridge-Shells.  
No. 126,613.

Patented May 7, 1872.

Fig. 3.

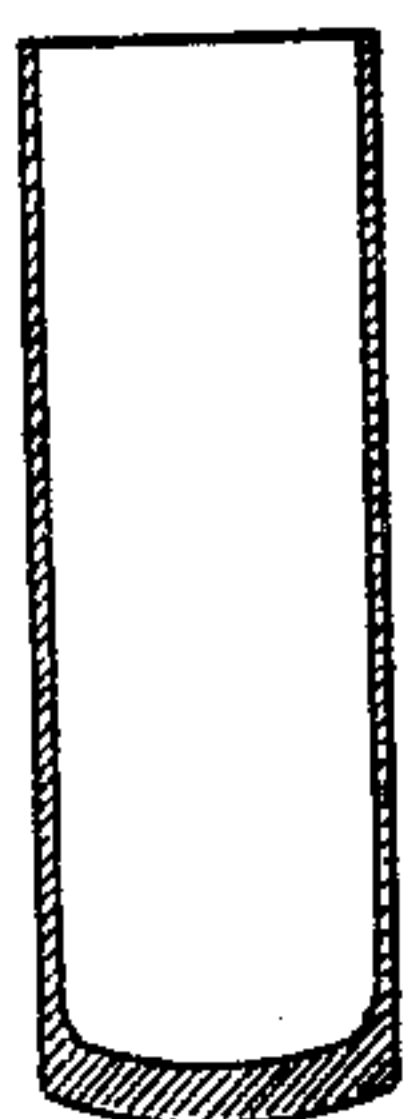


Fig. 2.

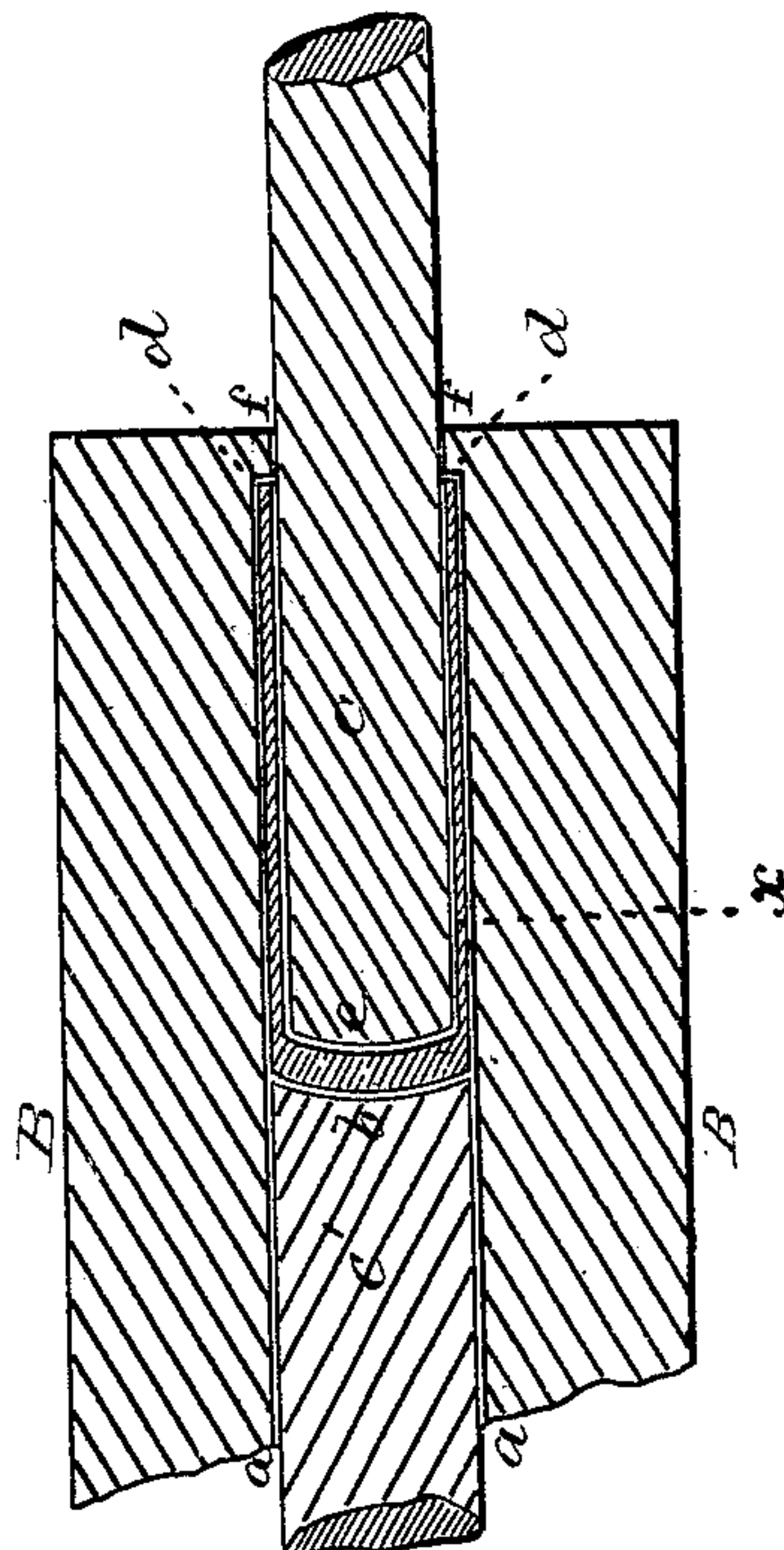
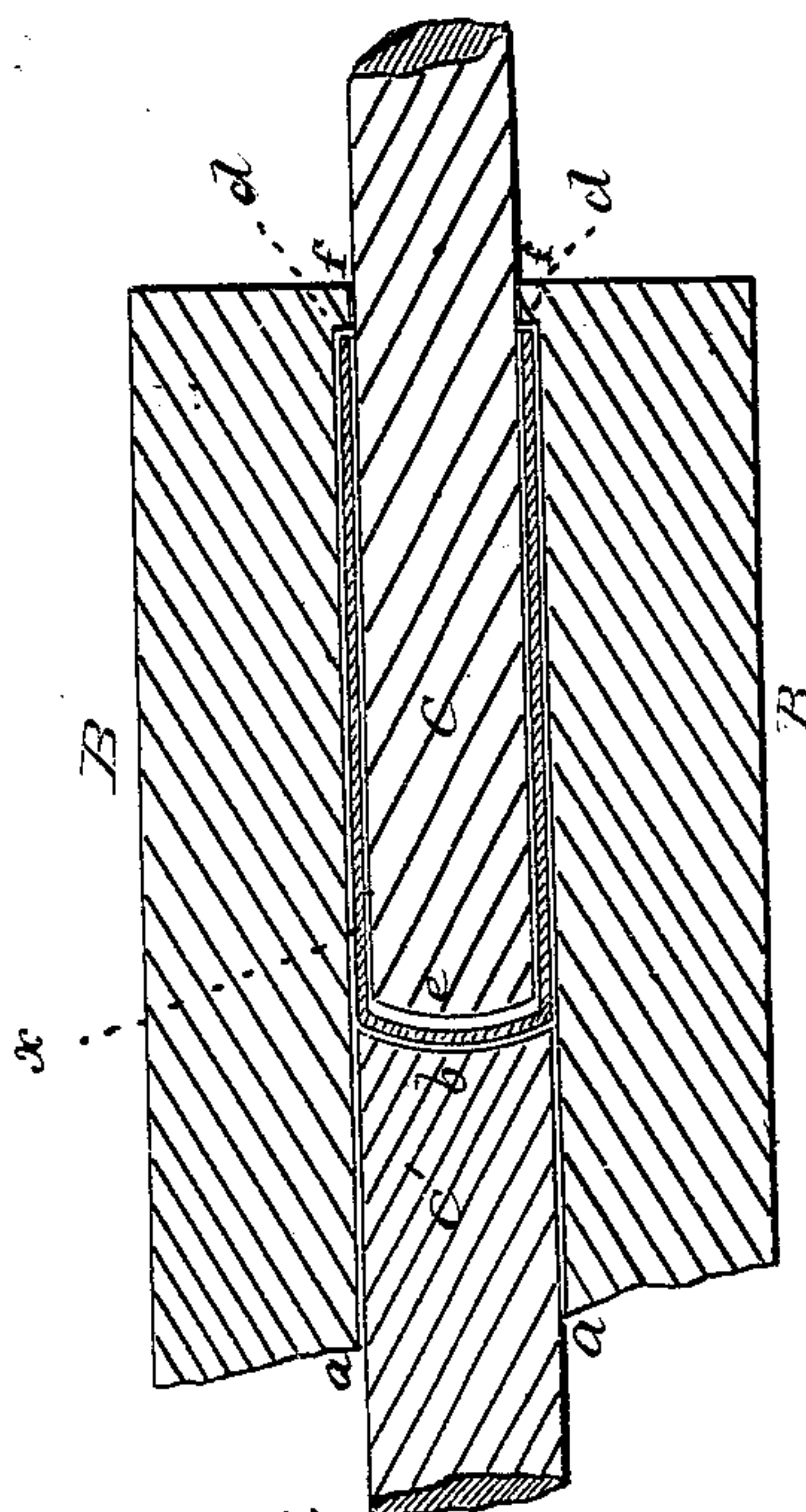


Fig. 1.



Witnesses  
E. M. Gallaher.  
J. S. Brown.

S. W. Wood  
Inventor

STEPHEN W. WOOD.

Improvement in Method of Reinforcing Metallic Cartridge-Shells.

No. 126,613.

Patented May 7, 1872.

Fig. 4.

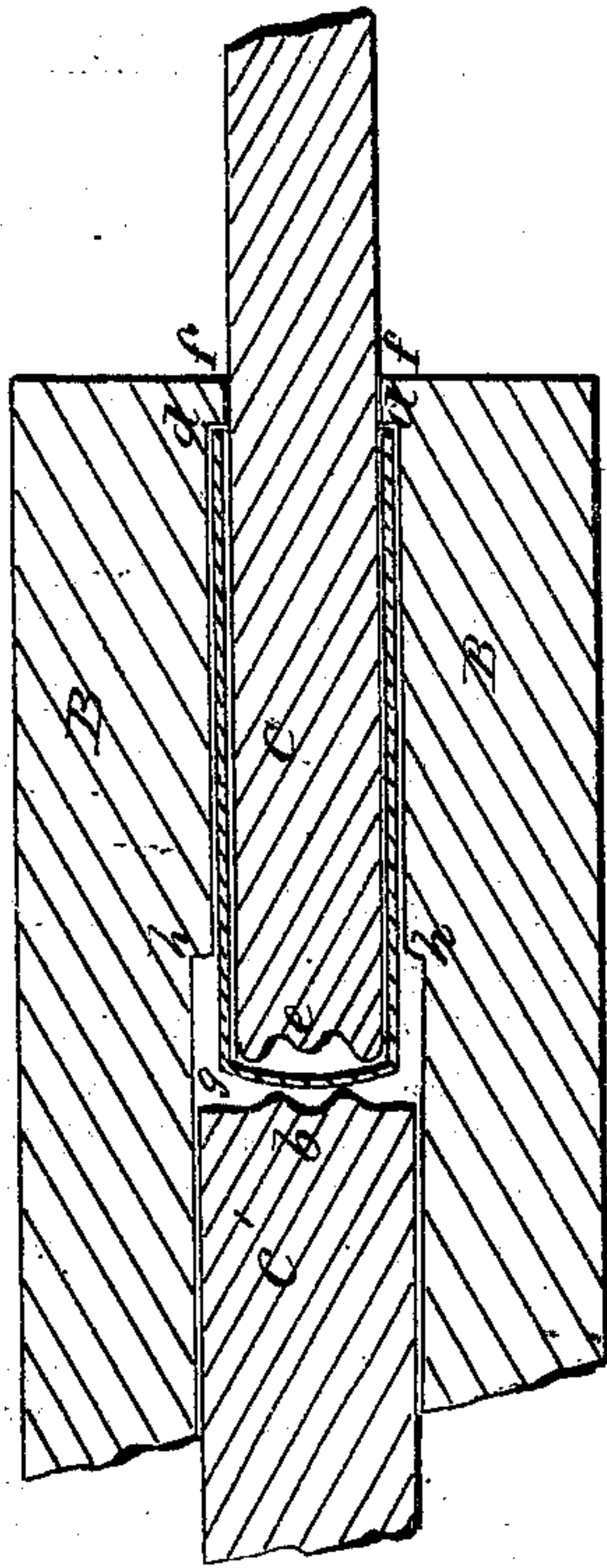


Fig. 8.

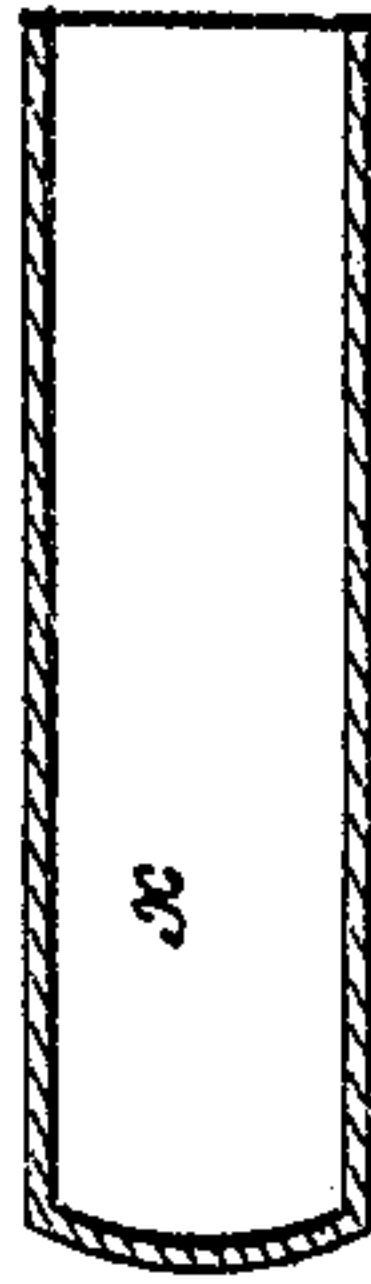


Fig. 7.

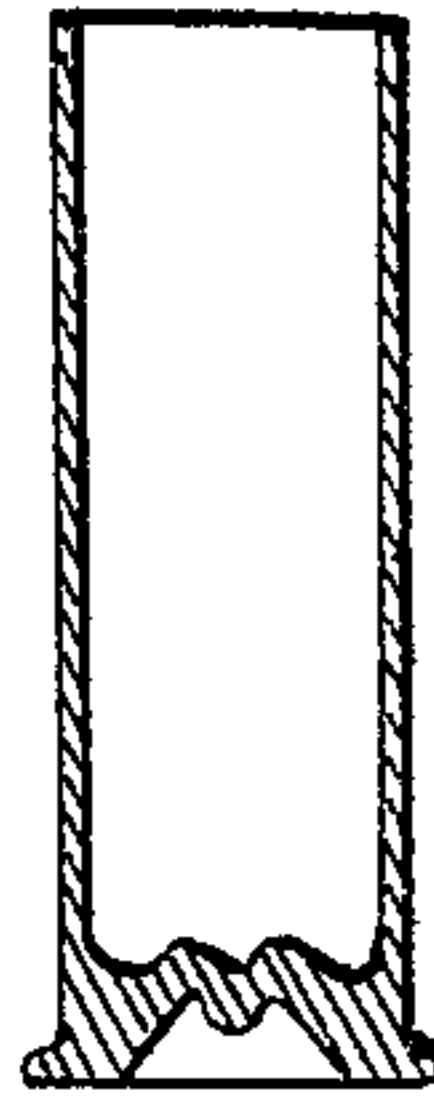


Fig. 5.

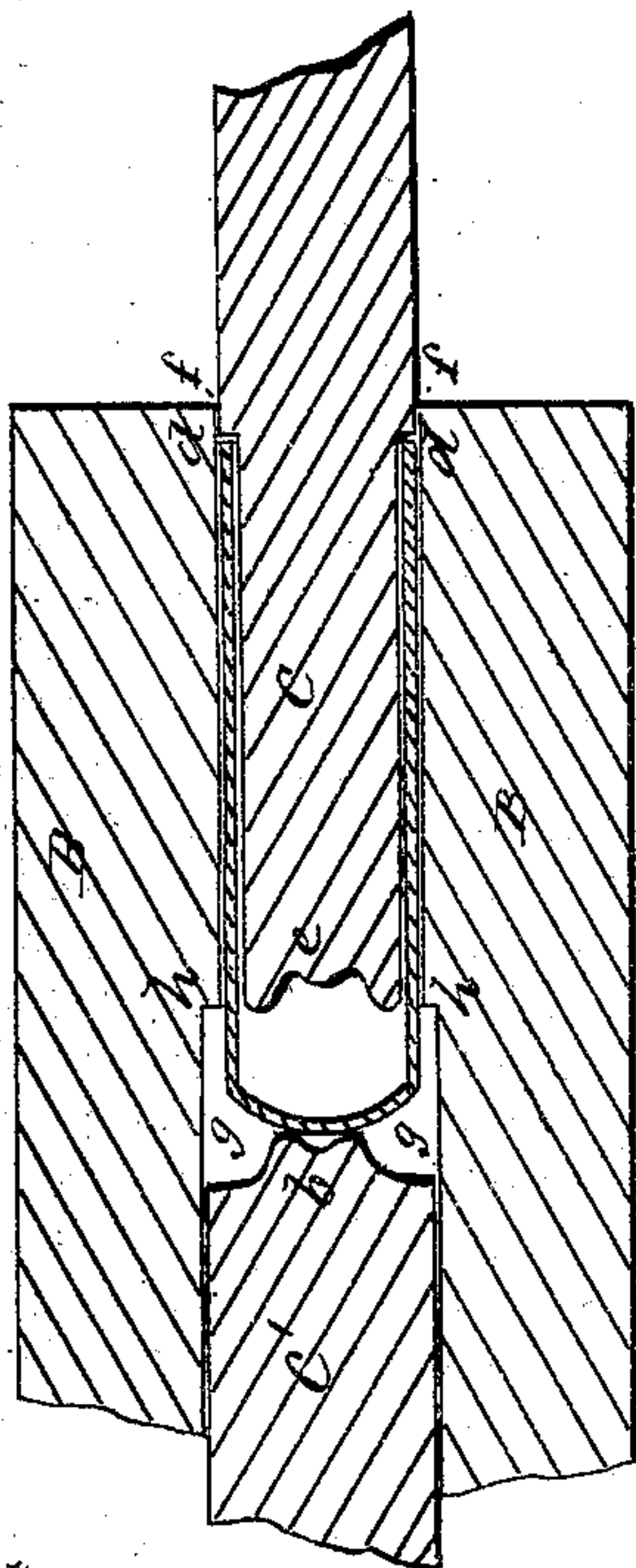
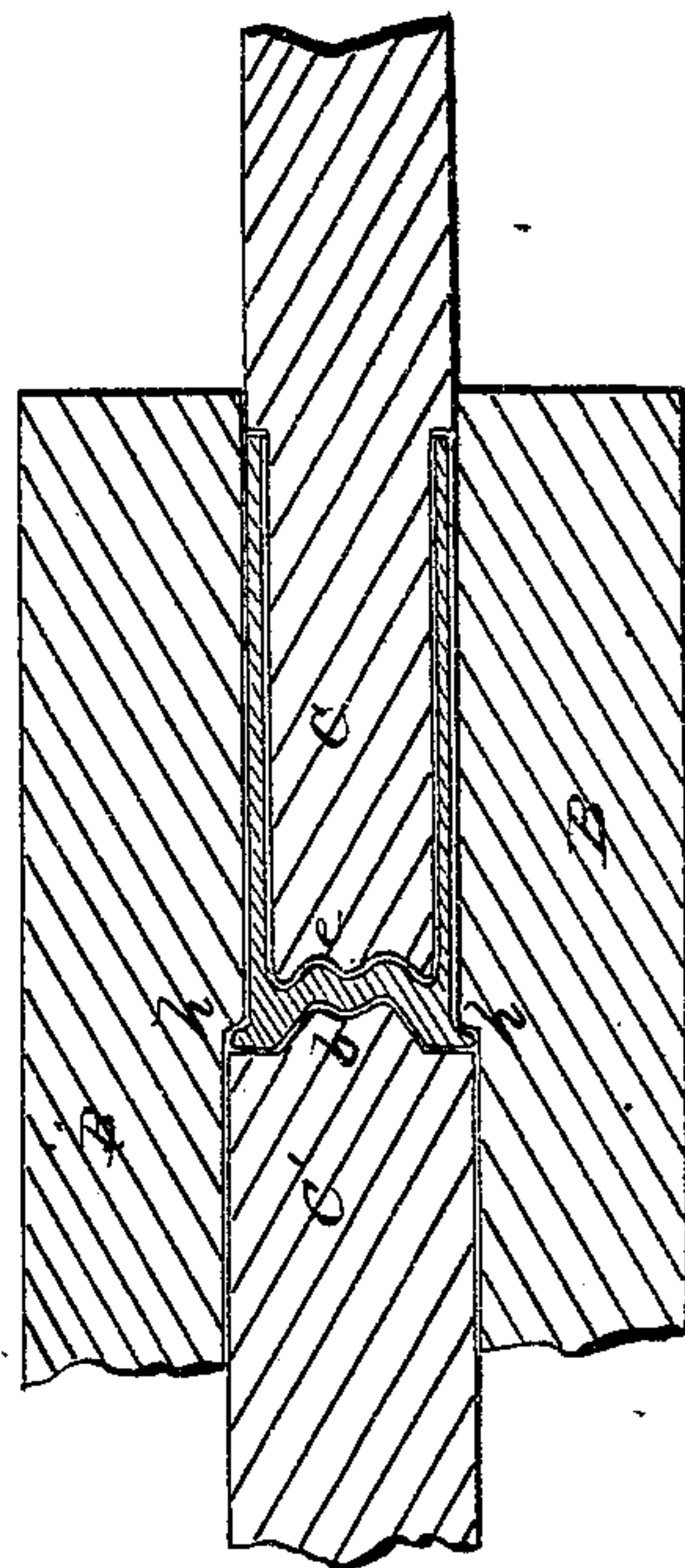


Fig. 6.



Witnesses  
E. M. Gallaher  
J. S. Brown

Stephen W. Wood  
Inventor



# UNITED STATES PATENT OFFICE.

STEPHEN W. WOOD, OF CORNWALL, NEW YORK.

## IMPROVEMENT IN METHODS OF RE-ENFORCING METALLIC CARTRIDGE-HEADS.

Specification forming part of Letters Patent No. 126,613, dated May 7, 1872.

*To all whom it may concern:*

Be it known that I, STEPHEN W. WOOD, of Cornwall, in the county of Orange and State of New York, have invented an Improvement in Re-enforcing Metallic Cartridges; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawing making part of this specification—

Figure 1 being a section representing an arrangement of die and punches for re-enforcing cartridges by my improved method as the beginning of the movement or process; Fig. 2, the arrangement of the die and punches at the close of the movement, the cartridge being shown re-enforced; Fig. 3, a separate view of the cartridge, in section, re-enforced; Fig. 4, a section, showing a modified form and arrangement of the die and punches as at the beginning of the movement of re-enforcing; Fig. 5, a section, showing a similar form of die and punches, but indicating a somewhat different mode of operating them to perform the work; Fig. 6, a section, showing the die and punches according to the method of operation as in Fig. 5, but indicating the position thereof after the completion of the operation of re-enforcing the cartridge; Fig. 7, a separate view, in section, of the cartridge re-enforced by the last method; Fig. 8, a view, in section, of a cartridge before being subjected to the process of re-enforcing invented by me.

Like letters designate corresponding parts in all the figures.

The nature of my invention consists in re-enforcing metallic cartridges by forcing metal from the sides thereof, and compressing or upsetting it into the head or base, thereby thickening the same to the extent required.

There may be various ways of effecting this mode of re-enforcing cartridges.

In the accompanying drawing are represented several arrangements of die and punches for the purpose, which I will proceed to describe in succession.

In Figs. 1 and 2 an arrangement of a die, B, and punches C C' for simply re-enforcing a cartridge, is shown, which will properly illustrate the general principle. The die B has, in one end, an aperture, *a*, which just admits a cartridge, *x*, of ordinary form, without a flange, indicated in Fig. 8, but made somewhat longer

than the re-enforced cartridge is required to be. At the bottom of this aperture is a shoulder, *d*, having a width about equal to the thickness of the shell of the cartridge; and thence an aperture, *f*, having the diameter of the interior of the cartridge is continued through the die. The punch C' fits the larger aperture *a* of the die, and its inner end *b* is of the proper shape to determine the form of the head required for the re-enforced cartridge. The punch C fits the smaller aperture *f* and the interior of the cartridge *x*, and its inner end *e* has a form corresponding with the inner end *b* of the punch C'.

The cartridge *x* to be re-enforced is first placed in the aperture *a* of the die, its open end abutting against the shoulder *d*, as indicated in Fig. 1. The punches are then brought into position, as shown in the same figure, the punch C' in contact with the head of the cartridge, and the punch C not quite in contact with or reaching the head thereof on the inside, so that there may be room to receive the metal between the punches as it is forced from the contiguous part of the sides of the cartridge by the first movement of the punch C' inward. Then, as the punch C' is driven further into the die, the punch C recedes therefrom somewhat faster than the punch C' enters, so that the space between the two gradually enlarges to afford room for the continual augmentation of metal from the sides of the cartridge compressed into the head till, at the completion of the operation, the head is re-enforced to the extent required, as indicated in Fig. 2, the cartridge by itself being shown as in Fig. 3. The punch C' is then withdrawn from the die, and the re-enforced cartridge driven out by a forward movement of the punch C, or otherwise, as most convenient; another cartridge is inserted and the punches returned to the position shown in Fig. 1. All the movements of the punches are produced by cams or other mechanism, well understood by those skilled in the art.

In Fig. 4 the die B, in addition to the aperture *a* for the reception of the cartridge, and the aperture *f* for the punch C, has an aperture, *g*, still larger than the aperture *a*, equal to the diameter of the rim or flange, which is generally formed on the heads of cartridges, and the punch C' fits this enlarged aperture.



After the punches are brought into position, as shown, the punch C' is first forced inward, while the punch C remains stationary till the head of the cartridge is shaped, as indicated by the inner end *b e* of the punches. Then, as the punch C' continues further inward, the punch C recedes somewhat faster than the other punch advances, as in the former case, but not proportionally so much faster, so that a part of the metal from the sides of the cartridge may be forced outward to form the flange or rim of the cartridge, till at last the flange or rim is compressed and shaped between the punch C' and shoulder *h* at the bottom of the aperture *g*.

In Fig. 5 a flanged cartridge is also made, as in Fig. 4, and the operation differs only in

the relative movements of the punches, the punch C remaining in one position, as shown, while the punch C' is forced inward to form the flange, and wholly or partially re-enforce the cartridge. But in the completion of the re-enforcement the punch C may recede somewhat to the position shown in Fig. 6. The complete cartridge is represented in Fig. 7.

What I claim as my invention, and desire to secure by Letters Patent, is—

The method herein described and shown of re-enforcing the heads of cartridge-shells made of metal of uniform thickness.

STEPHEN W. WOOD.

Witnesses:

J. S. BROWN,

E. M. GALLAHER.