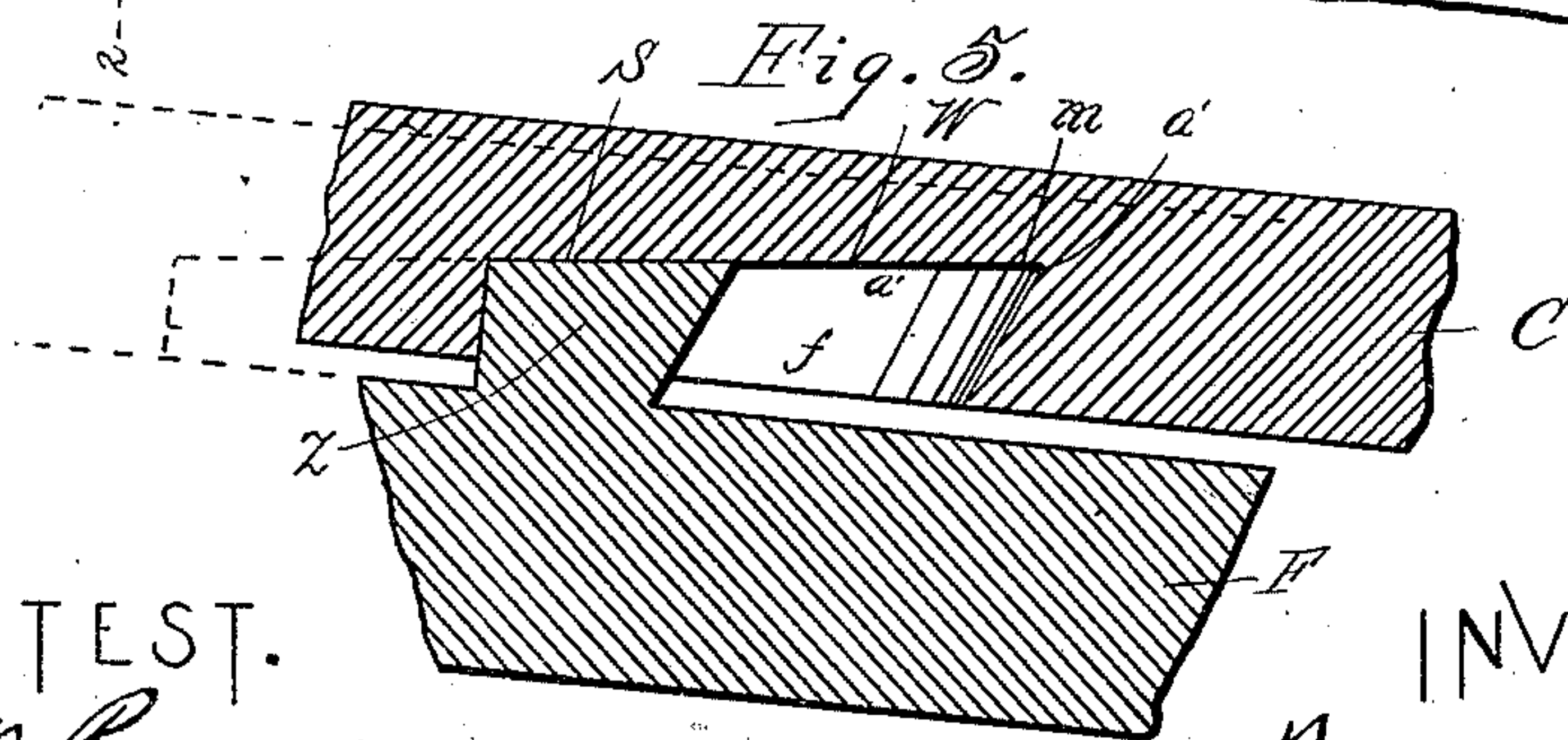
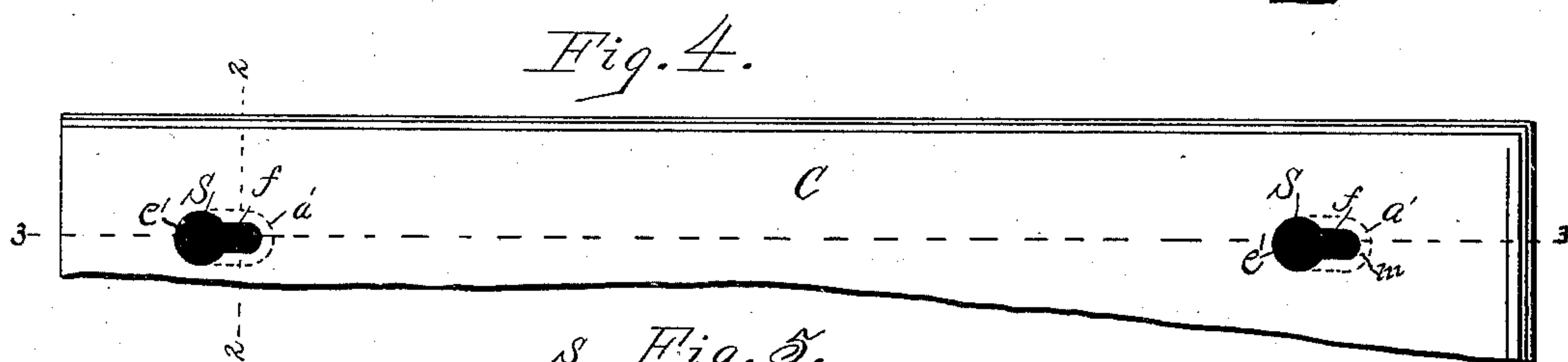
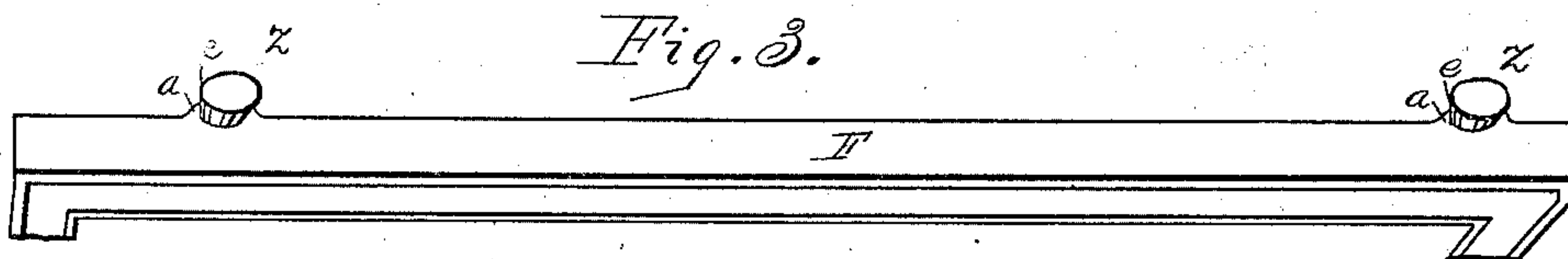
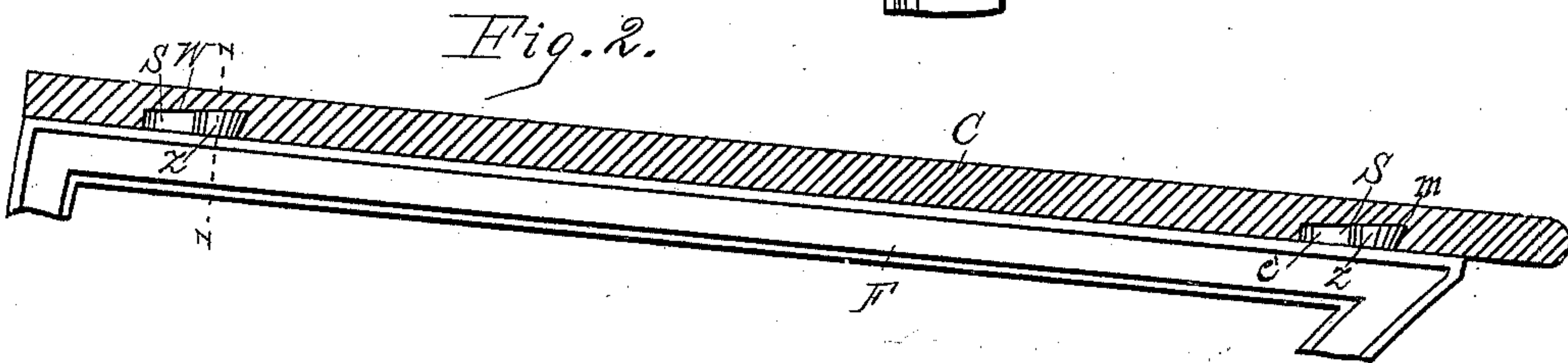
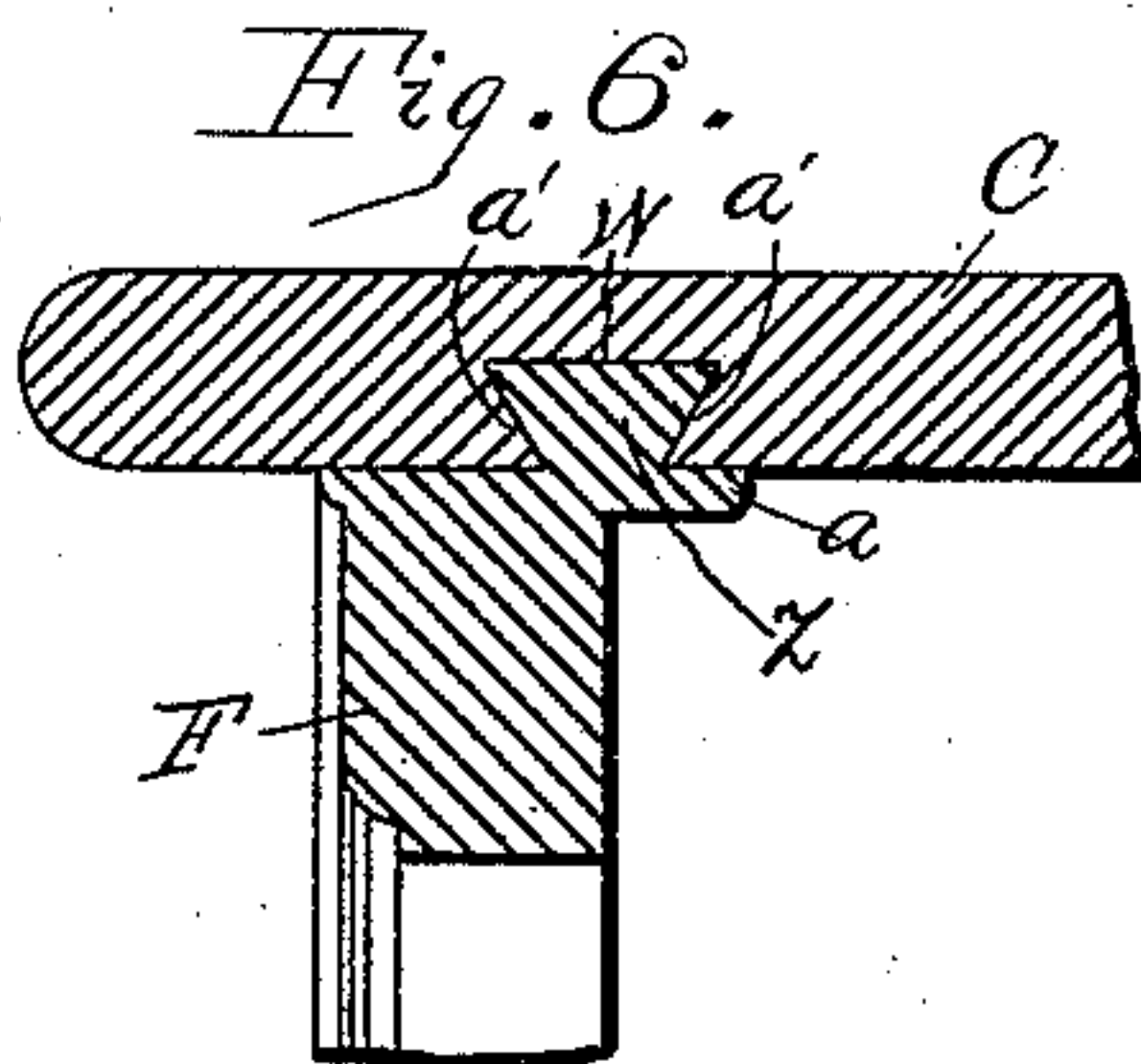
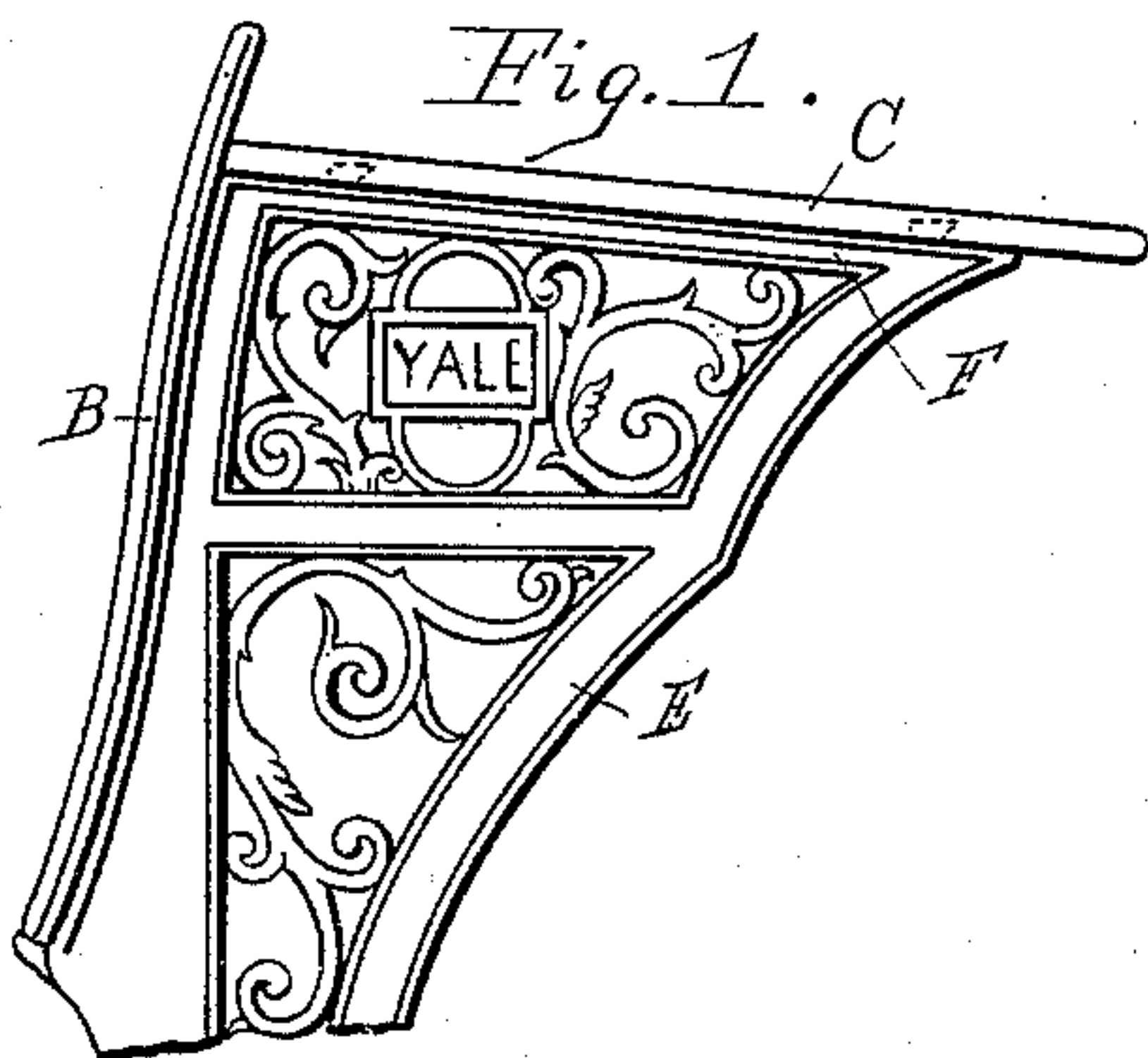


(No Model.)

F. R. BEAL.  
FURNITURE JOINT.

No. 415,601.

Patented Nov. 19, 1889.



ATTEST.  
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Ramon B. Wheeler  
att'y



# UNITED STATES PATENT OFFICE.

FRANCIS R. BEAL, OF NORTHVILLE, MICHIGAN.

## FURNITURE-JOINT.

SPECIFICATION forming part of Letters Patent No. 415,601, dated November 19, 1889.

Application filed December 16, 1886. Serial No. 221,792. (No model.)

*To all whom it may concern:*

Be it known that I, FRANCIS R. BEAL, a citizen of the United States, residing at Northville, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Furniture-Joints; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

This invention relates to the attaching of wood-work to metal frames or supports, and is intended especially to attach the tops and backs of school-desks to the metal standards, the parts being self-locking, cheap, and durable, as will be fully explained; and my invention consists in the general construction of parts, as hereinafter specified, and pointed out particularly in the claims.

In the drawings forming a part of this specification, Figure 1 is an end elevation of a school-desk containing my invention. Fig. 2 is an enlarged section through the desk-top at the point of attachment to the metal frame, also on dotted line 3 3 of Fig. 4. Fig. 3 is an enlarged isometrical view of the metal frame, showing the engaging-lugs. Fig. 4 is an enlarged view showing the locking-chambers in the under face of the desk-top. Fig. 5 is an enlarged section through locking parts of desk-top and standard, the parts being in position to lock. Fig. 6 is an enlarged cross-section of the desk-top and standard through the locking parts, the parts being locked as in Fig. 2. The section is also taken on dotted line 1 1 of Fig. 2 and dotted line 2 2 of Fig. 4.

In the drawings, C is the desk-top; B, the back; E, the upright or standard, and F the top rail of the standard, all of which are of the ordinary form. To attach the wood-work B C to the metal standard, I provide the face of the standard meeting the wood-work with projecting lugs Z. (See Fig. 3.) Said lugs are of the form of an inverted cone. The free or top end *e* is of a greater diameter than the base or point of attachment to the metal frame.

*a* is a ledge projecting horizontally from the base of the lugs on one side only. The up-

per face of the ledge stands flush with the upper face of the rail F. (See Figs. 3 and 6.)

In Fig. 4 I show two key-hole-shaped mortises S S, formed in the under face of the desk-top C. The diameter of the circular part *e'* of each mortise is sufficiently large to receive freely the free end of a lug Z, and said circular cuts are arranged to register with the lugs Z upon the frame. Leading into the circular cuts or mortises *e'* is an oblong or neck mortise *f*, giving the mortises S S in the face of the board C a key-hole form, as clearly shown in Fig. 4. I form an under-cut *a'* around the neck portion *f*, as shown in Figs. 5 and 6, also by dotted lines of Fig. 4. The bottom W of each mortise is inclined sloping from the circular openings *e'* to the point *m*, thus making each mortise deeper at *m* around the neck portion *f*, as clearly shown in Figs. 2 and 5. By this manner of cutting the mortises the undercut portion on each side of the neck *f* has a longitudinal incline.

I form the key-hole-shaped mortises by means of a bell-shaped bit, which enters the face of the board C, first cutting the circular chamber *e'* to the desired depth. The board C is then moved horizontally, when the neck of the bit cuts or forms the neck *f* of the mortise. As the board is moved horizontally it is also slightly raised, which causes the bit to cut deeper as the board is advanced, also forming the under-cut *a'*. The depth of the mortise at *m* should be greater than the length of the lugs Z.

The parts are united as follows: The board or desk-top C is placed so as to allow the heads of the lugs Z to enter the circular portions *e'* of the mortises, this portion being clearly shown in Fig. 5. The top C is then moved toward the lugs, causing the reduced or body portion of each lug to enter the neck *f* of the mortises at the same time the heads *e* of the lugs enter the undercut portions *a'*. The incline cut causes the board C to be drawn down or against the face of the frame containing the lugs when the neck of the lugs have fully entered the neck *f* of the mortises, the position being clearly shown in Fig. 2. By this construction when the top C has been driven to its proper position its face will be drawn firmly against the face of the metal standard, the parts being bound firmly to-



gether, thus dispensing with the use of wedges, as is the common practice.

When the parts are in position, as shown in Figs. 1, 2, and 6, the ledge *a* of each lug 5 meets the under face of the top C, as clearly shown in Fig. 6, acting as a brace.

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

10 1. In a device for the purposes set forth, the combination of the wooden part C, having a series of key-hole-shaped mortises, with an inclined under-cut *a'* along the necks of said mortises and being cut gradually deeper 15 from the point *e'* to the point *m*, the series of conical lugs Z formed integral with the metal frame having ledges *a*, said lugs adapted to register and to interlock with the mortises, as and for the purposes specified.

2. The combination, with the flange supporting the seat or back, of a series of buttons formed in one piece with the said flange and projecting into recesses in the seat or back, the said recesses being undercut at the sides and forward end to engage the sides of the buttons, the undercut recesses gradually increasing in depth from one end to the other, and the lateral edges of the recesses thereby converging toward one end, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

FRANCIS R. BEAL.

Witnesses:

WM. H. AMBLER,  
FRANK N. CLARK.