

(No Model.)

2 Sheets—Sheet 2.

R. L. WALKER.

**FIRE BOX.**

No. 260,810.

Patented July 11, 1882.

Fig. 3.

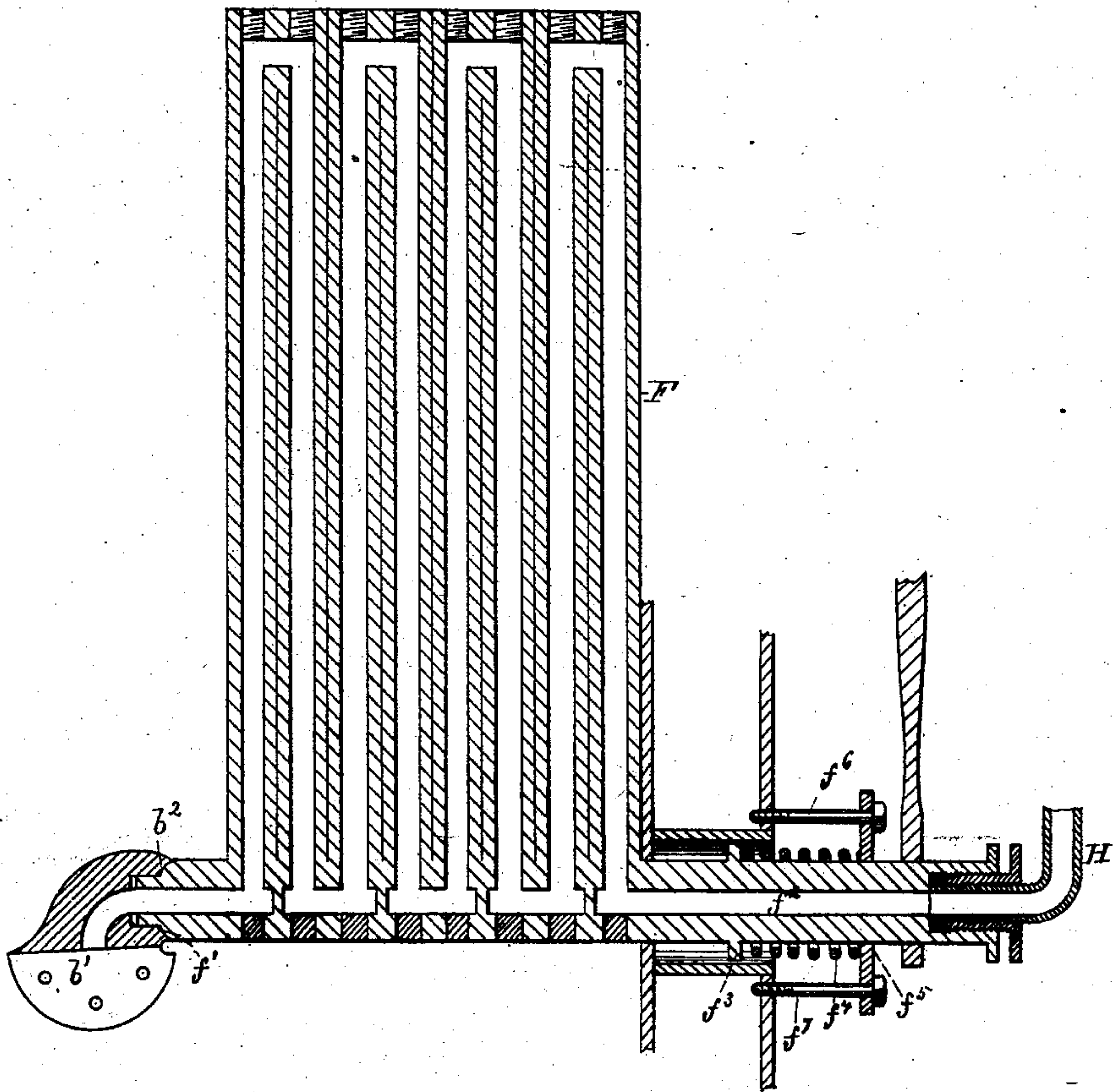


Fig. 4.

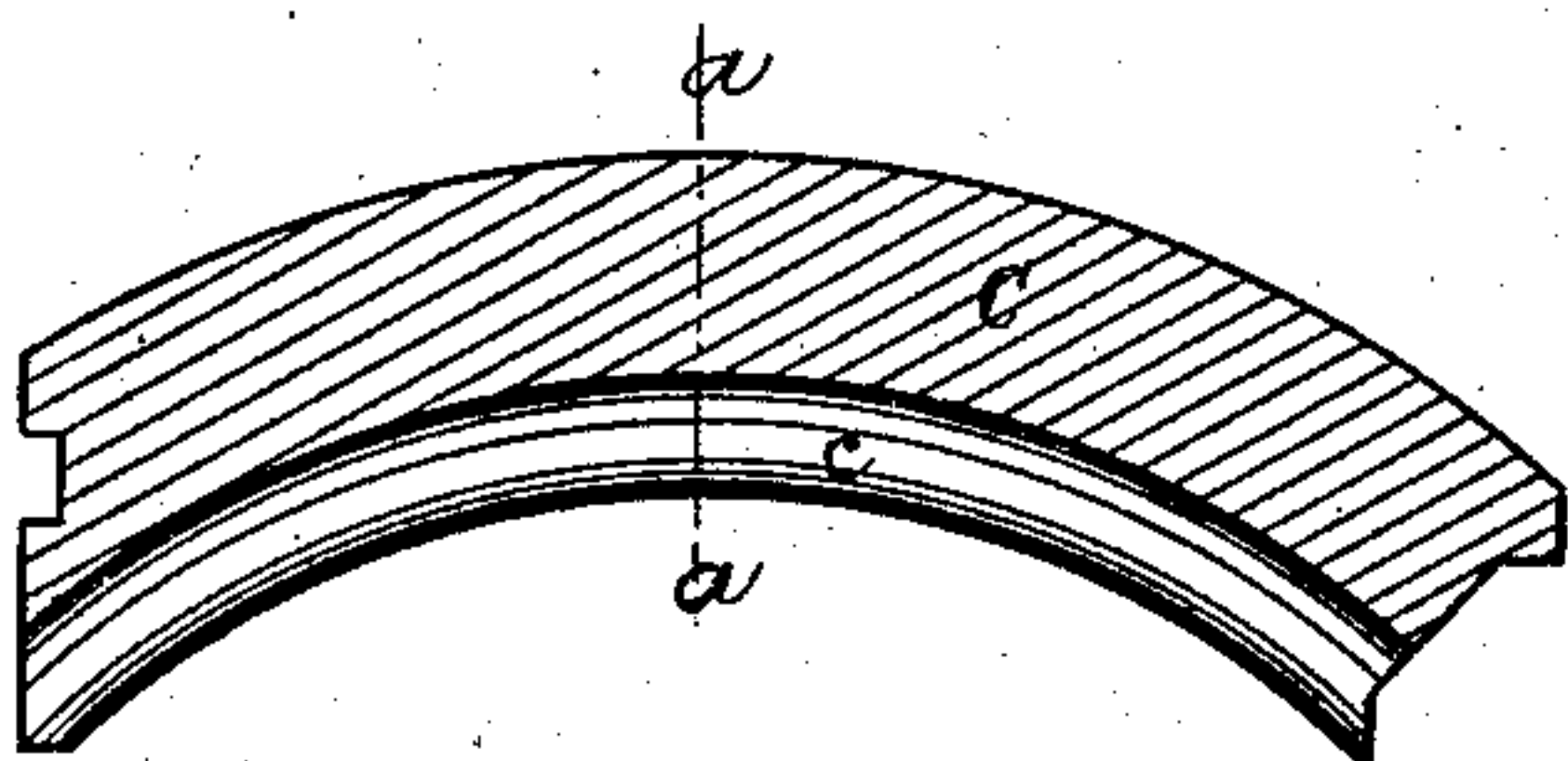
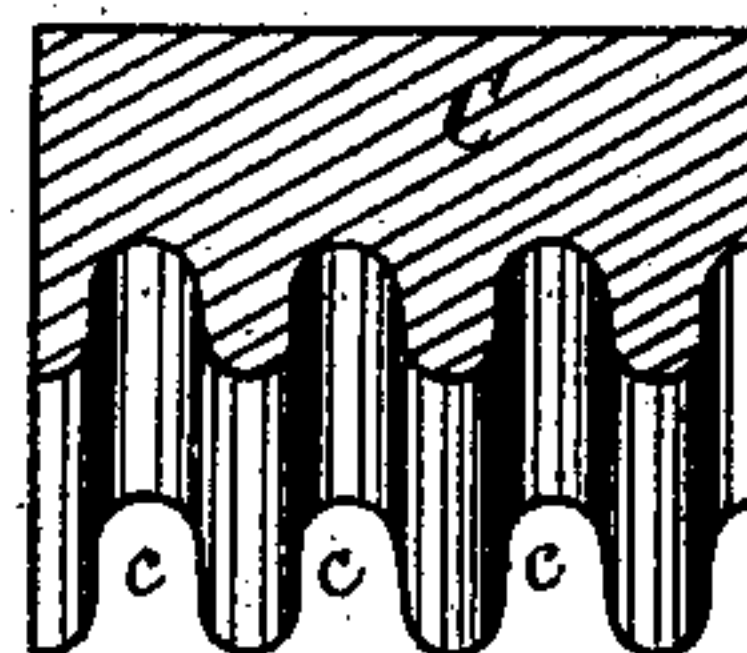


Fig. 5.



Witnesses.

G. B. Maynard  
John R. Snow.

# Inventor:

Robert L. Walker  
by J. E. Maynard  
his attorney-



# UNITED STATES PATENT OFFICE.

ROBERT L. WALKER, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF  
TO THOMAS NICKERSON, OF SAME PLACE.

## FIRE-BOX.

SPECIFICATION forming part of Letters Patent No. 260,810, dated July 11, 1882.

Application filed April 19, 1882. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT L. WALKER, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Fire-Boxes, of which the following is a specification.

My invention relates to improvements in fire-boxes of steam-boilers of the class in which the fire-box is divided into compartments and the products of combustion from one compartment are made to pass through another compartment on their way to the chimney.

My objects are to prevent smoke by causing the gases from fresh fuel to come in contact with highly-heated surfaces; to insure proper water-circulation in the water-leg that divides the fire-box longitudinally; to prevent the damper and its supports from being injured by the intense heat to which they are exposed; to connect the damper which covers the outlets from the compartments by means of a self-packing water-tight joint to the water-leg that divides the fire-box, and to cause all flakes, cinders, and the like that are carried by the draft, especially in locomotive-boilers, from the fuel in one compartment to be arrested and consumed in the other compartment.

The accompanying drawings illustrate a fire-box of a locomotive with my improvements attached in the best way now known to me.

Figure 1 is a longitudinal section, and Fig. 2 a transverse section on line *x x* of Fig. 1, of a fire-box divided longitudinally by a water-leg into two compartments, which are partly covered by arched fire-brick. Fig. 3 is a sectional view, enlarged, of the damper, showing its connection to the water-leg. Fig. 4 is an elevation, and Fig. 5 a cross-section on line *a a*, Fig. 4, of one of the fire-bricks that form part of the covers to the compartments.

The fire-box A is divided longitudinally by the water-leg B. Arched fire-bricks C C', supported by the water-leg B and the sides of the fire-box, cover these divisions to within a certain distance from their ends and make two compartments or separate fire-boxes, D D', each having an outlet into a combustion-chamber, E, at the end not covered by fire-brick, and communicating with the other at the other end

through one or more openings, *b*, in the water-leg B.

Heretofore in fire-boxes of this class the roof or cover of the compartments has been made of metal plates protected from the heat by being covered with water, in which case, as is well known, the plates cannot be heated above the temperature of the water—a degree of heat altogether insufficient to cause the combustion of the gases from the fresh fuel. Such an arrangement is shown in Patent No. 12,749, April 17, 1855, to O. W. Bailey. I therefore disclaim all that is shown in that patent.

In this my improved fire-box the roof or cover of the compartments is made of fire-brick, or may have a water-leg to form the bottom of the combustion-chamber or upper compartment, E, and a fire-brick lining underneath this water-leg; the essential feature being some refractory material directly over the fuel, and with which the gases from the fresh fuel in one compartment must come in contact on its passage through the other compartment. This material becomes intensely heated and raises the temperature of the gases to the requisite point to cause them to combine with the oxygen drawn in through the incandescent fuel in the compartment through which the gases are made to pass, and thereby insures the perfect combustion of these gases and effectually prevents smoke. This combination of fire-brick or other suitable refractory substance directly over the fuel and forming the cover of the compartments with the water-leg that divides the furnace longitudinally and a damper for alternately closing the outlets of the compartments and causing the gases from the fresh fuel in one compartment to pass over the incandescent fuel and come in contact with the highly-heated roof of the other compartment, so that the temperature of the gases is raised to the degree requisite for their perfect combustion, instead of being kept below that degree of heat by contact with a metal water-leg cover, distinguishes my fire-box from those heretofore constructed on this principle, makes it, in fact, a sure preventer of smoke, and constitutes an important feature of my invention.

The water-leg B is braced by the inclined

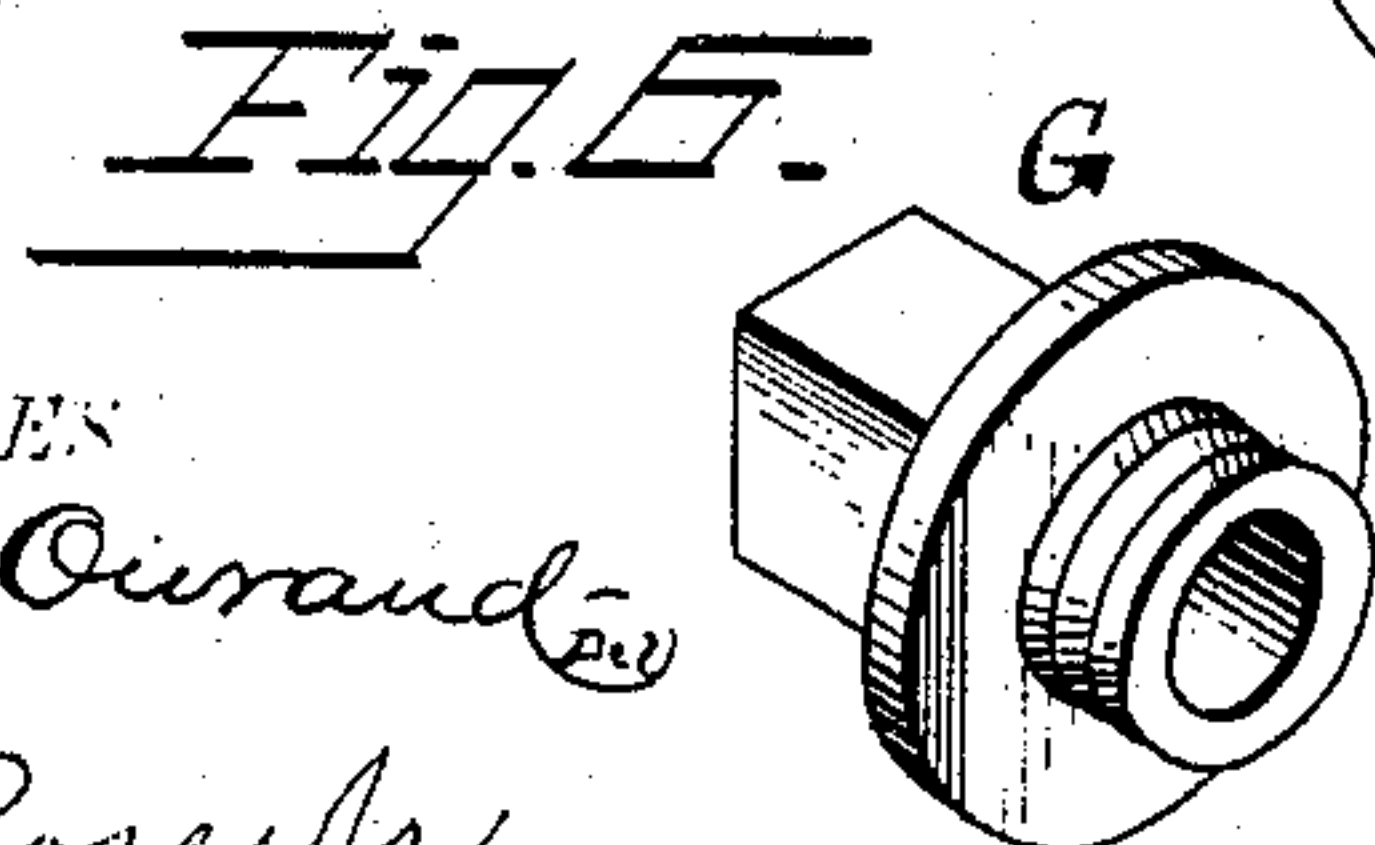
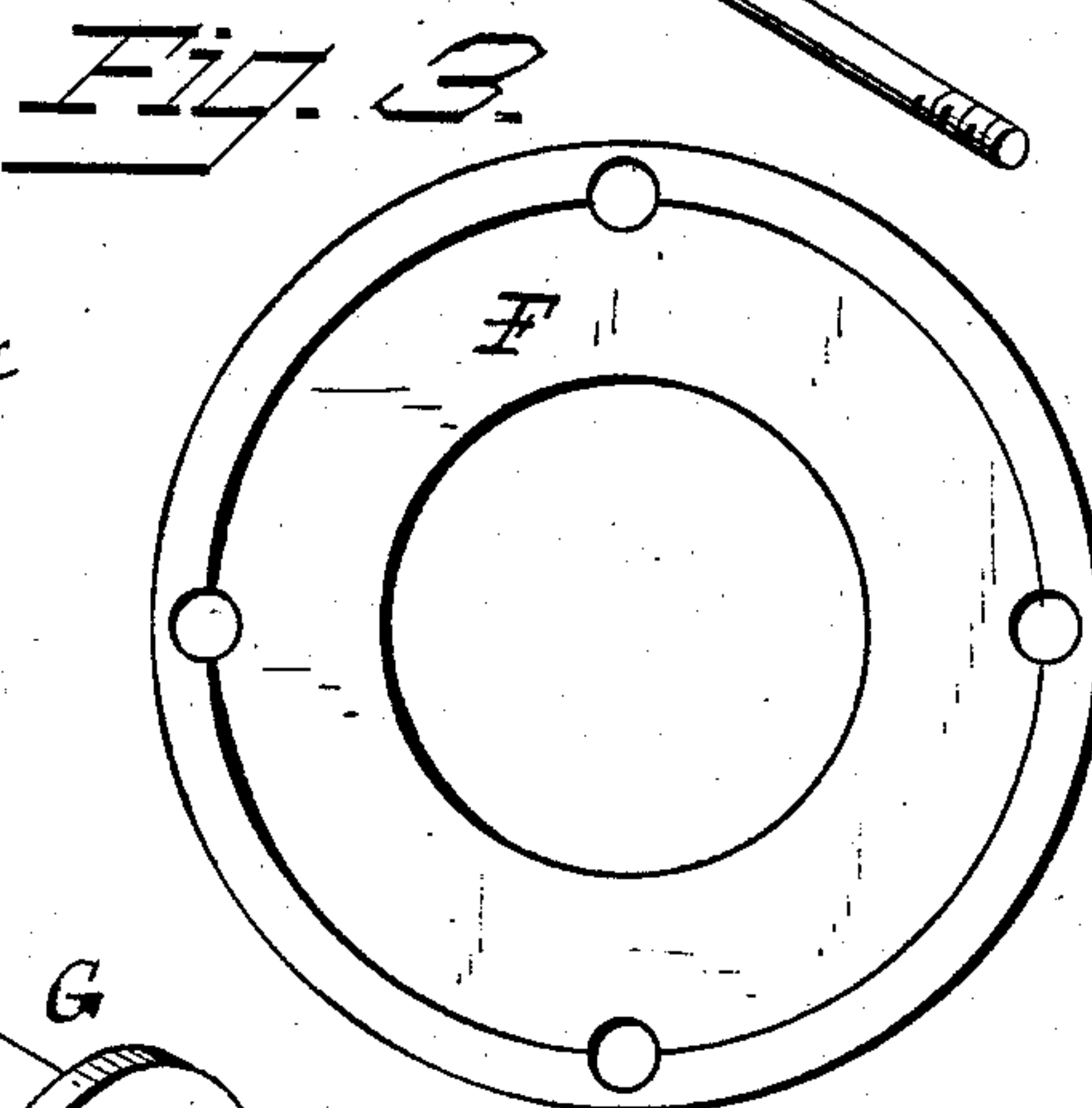
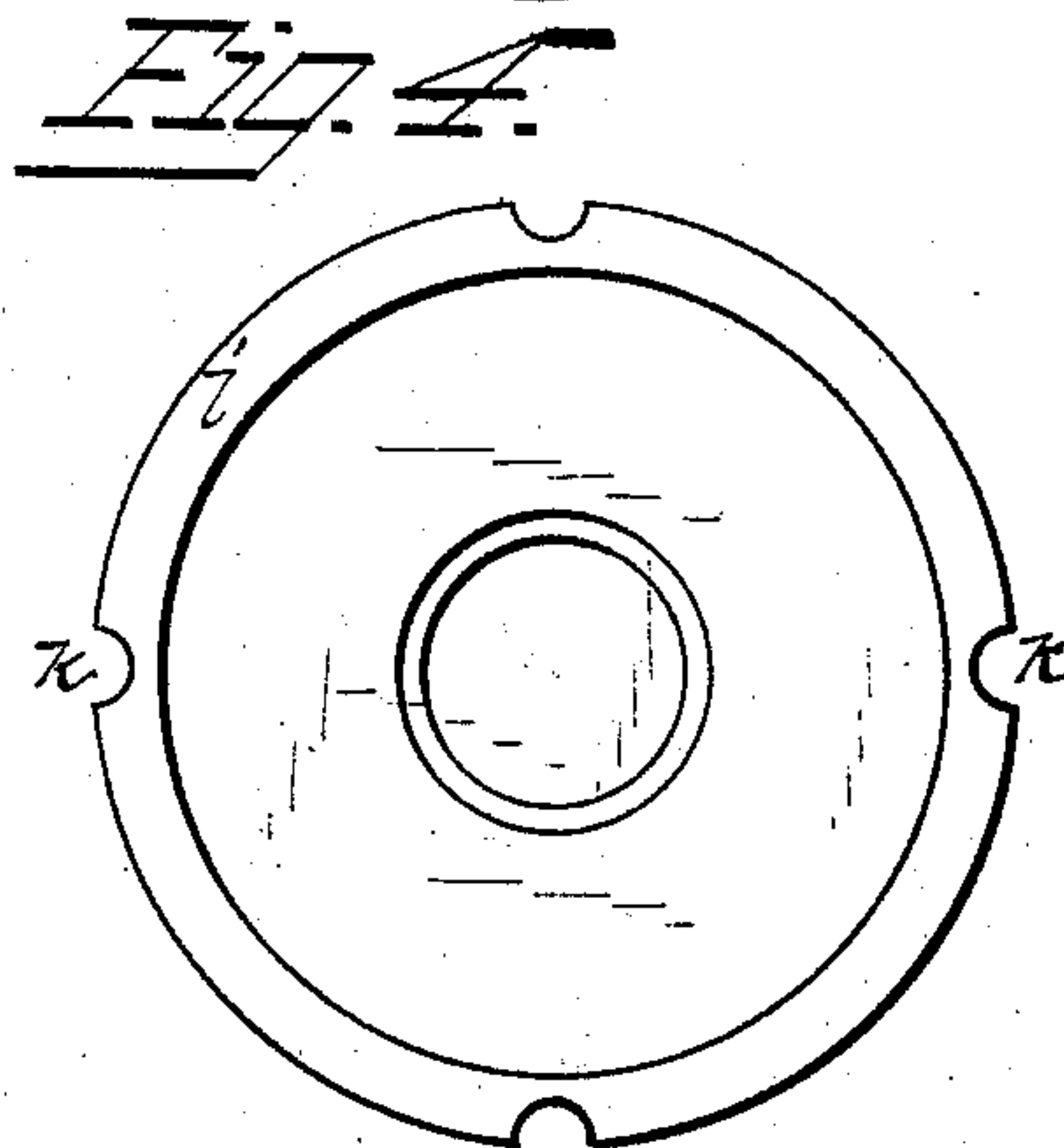
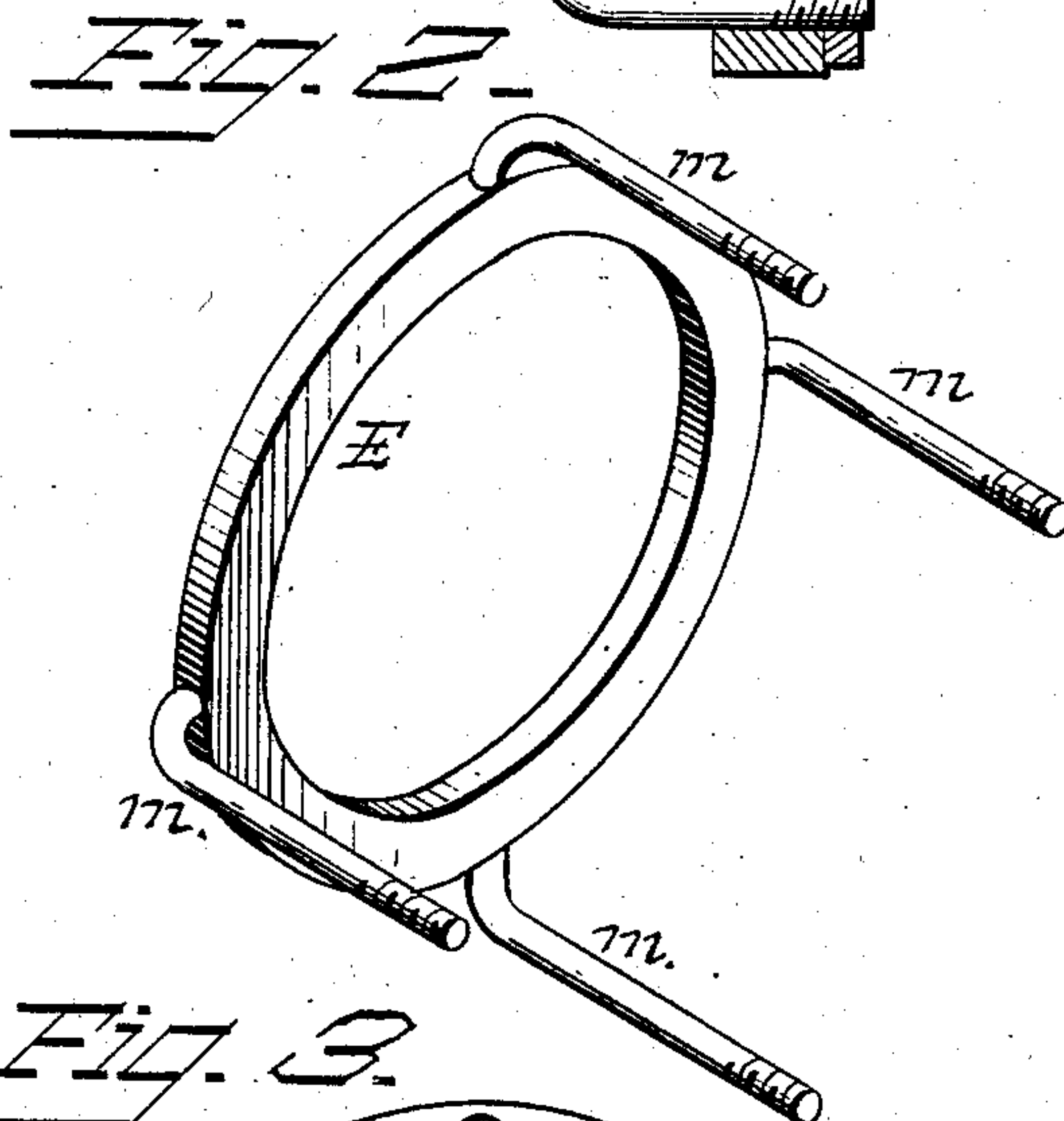
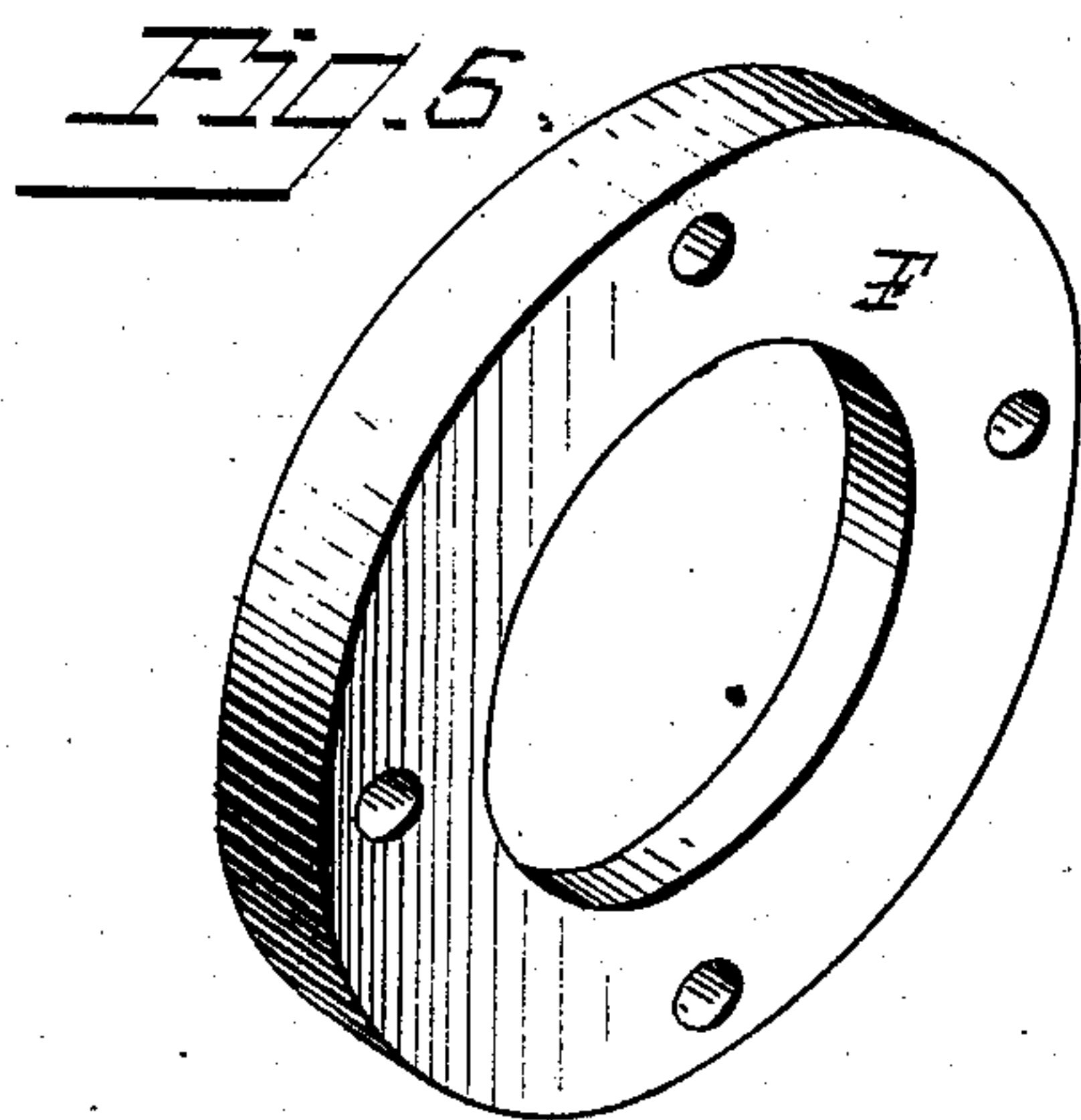
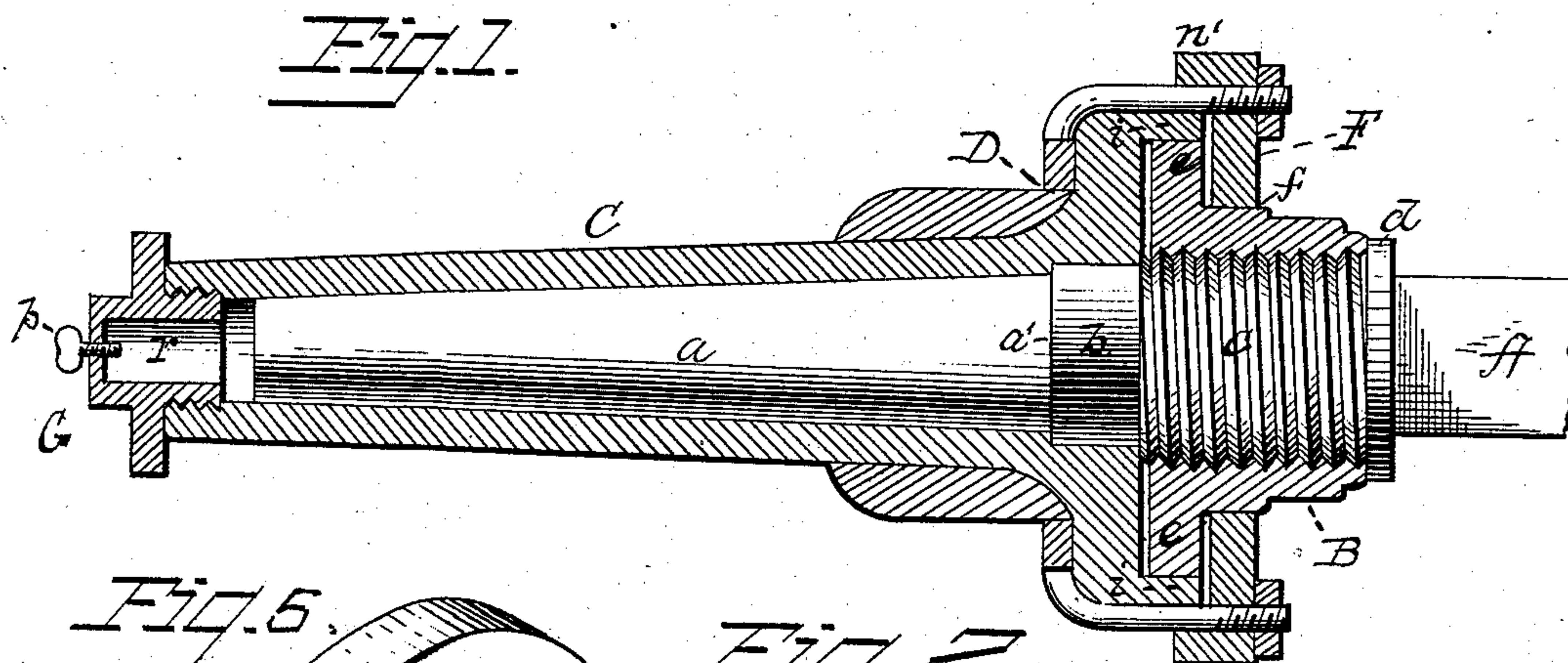


(No Model.)

A. WARTH.  
HUB ATTACHING DEVICE.

No. 260,811.

Patented July 11, 1882.



WITNESSES  
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