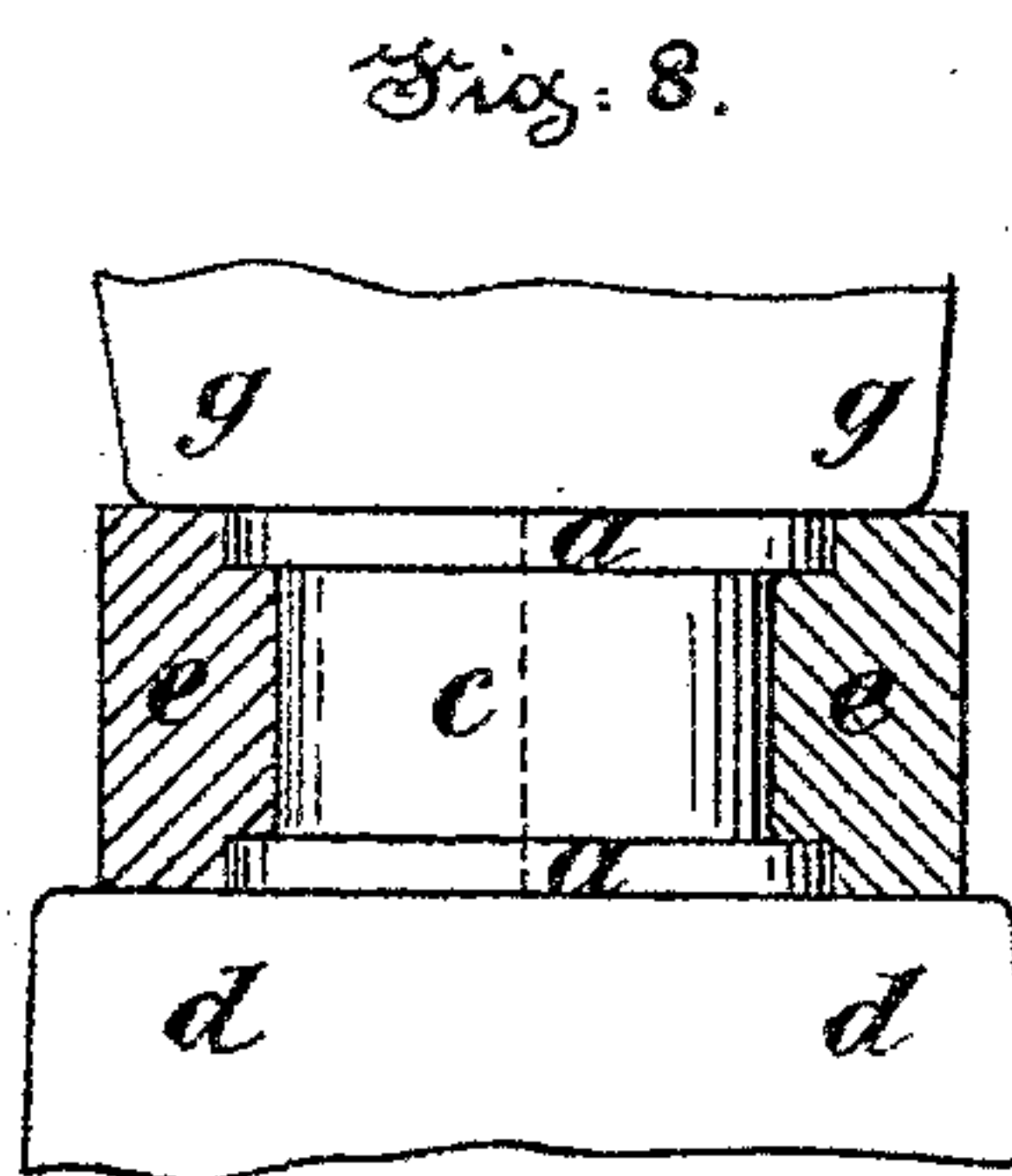
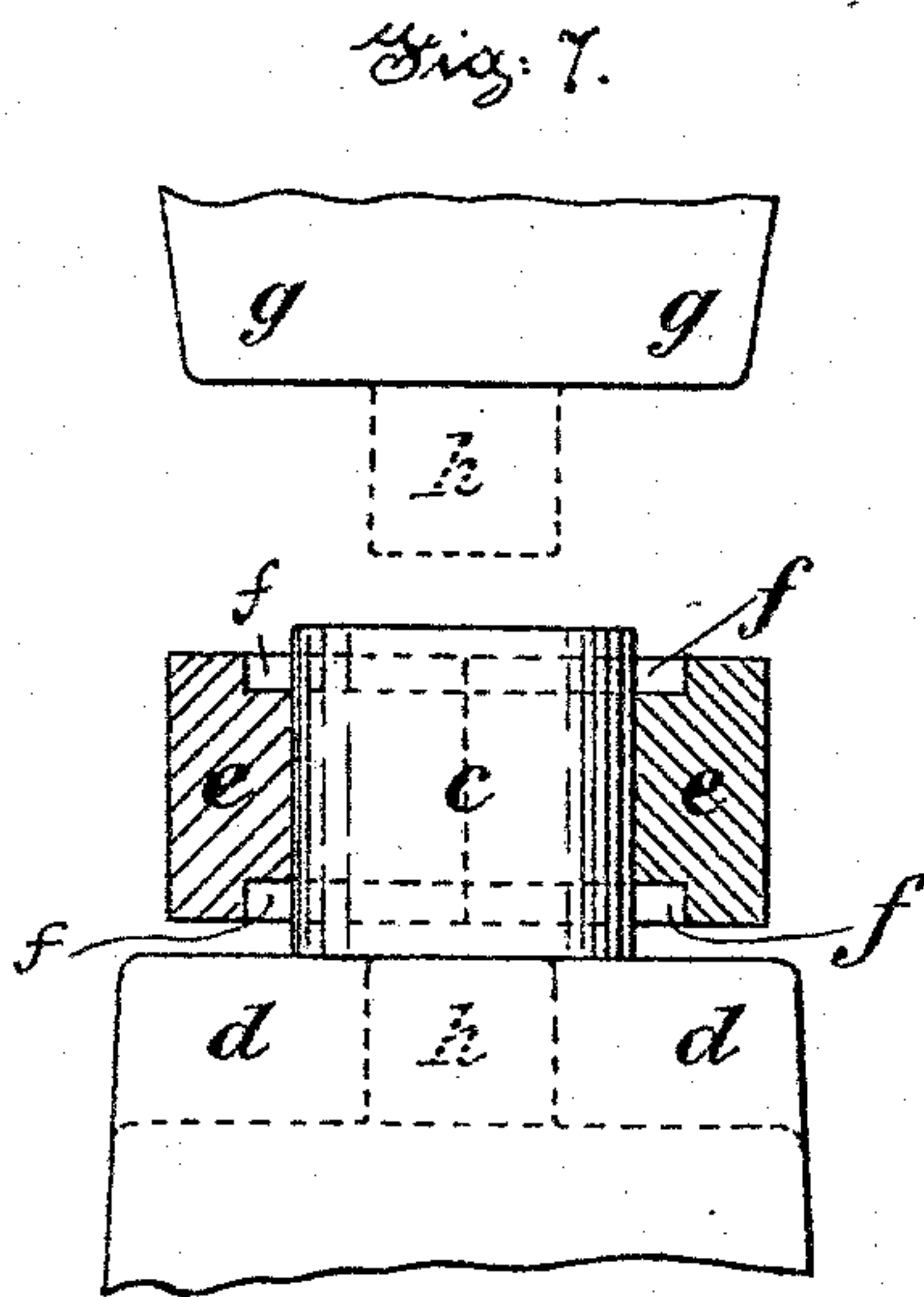
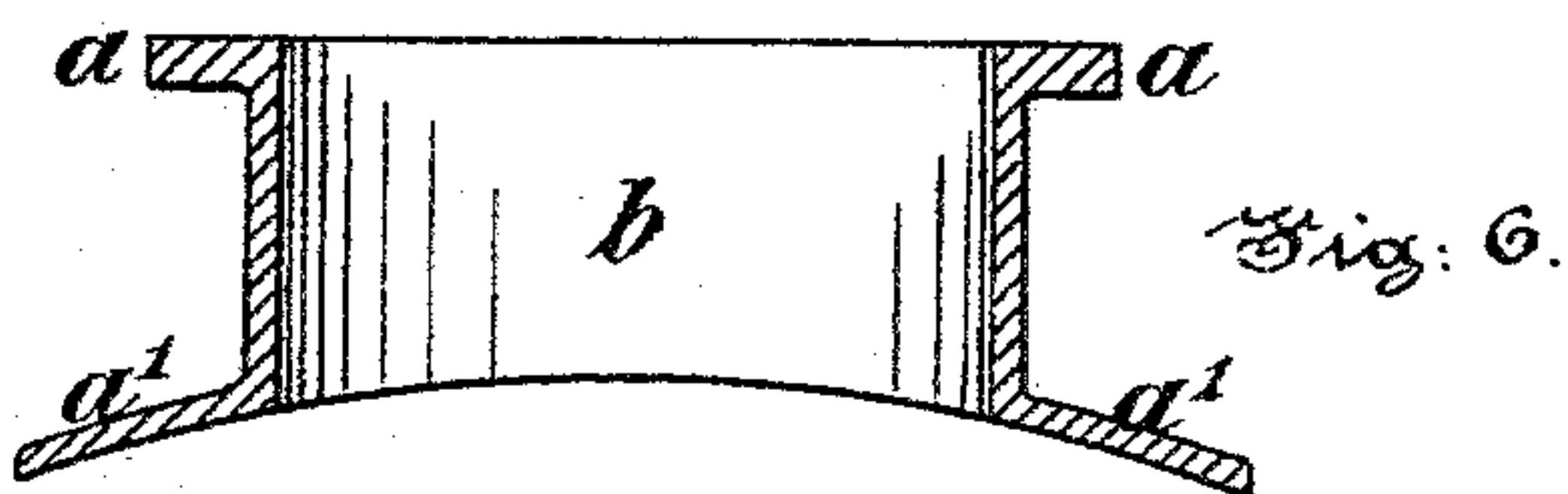
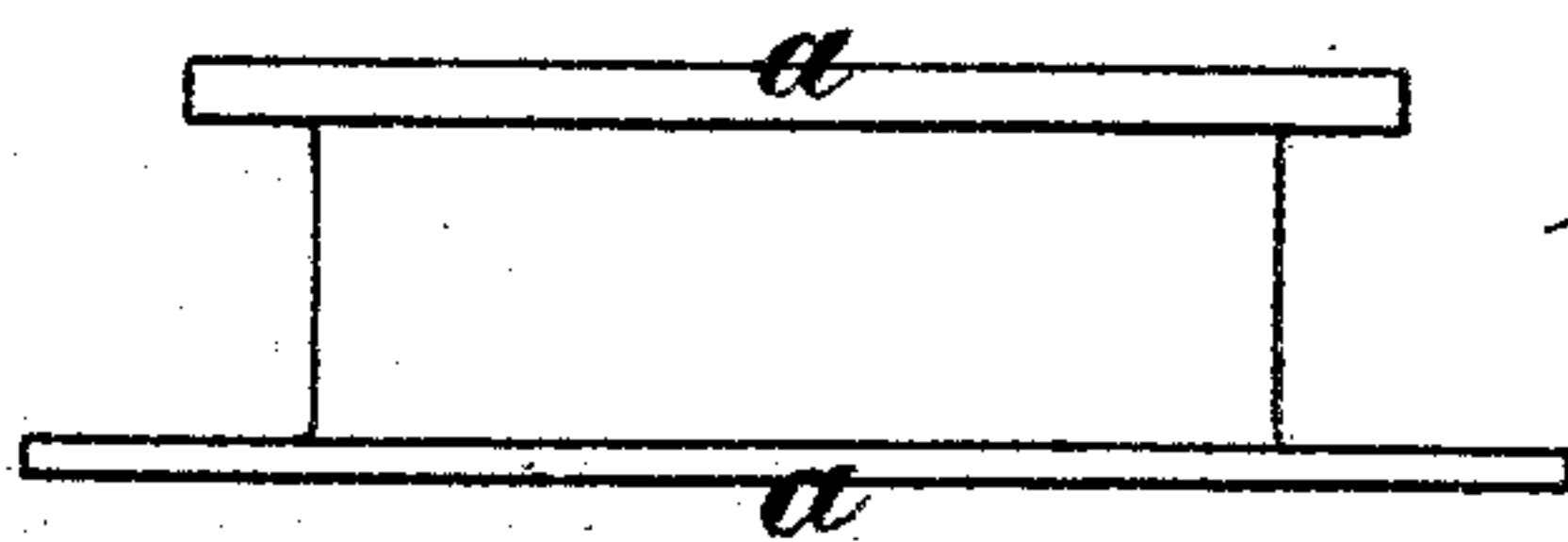
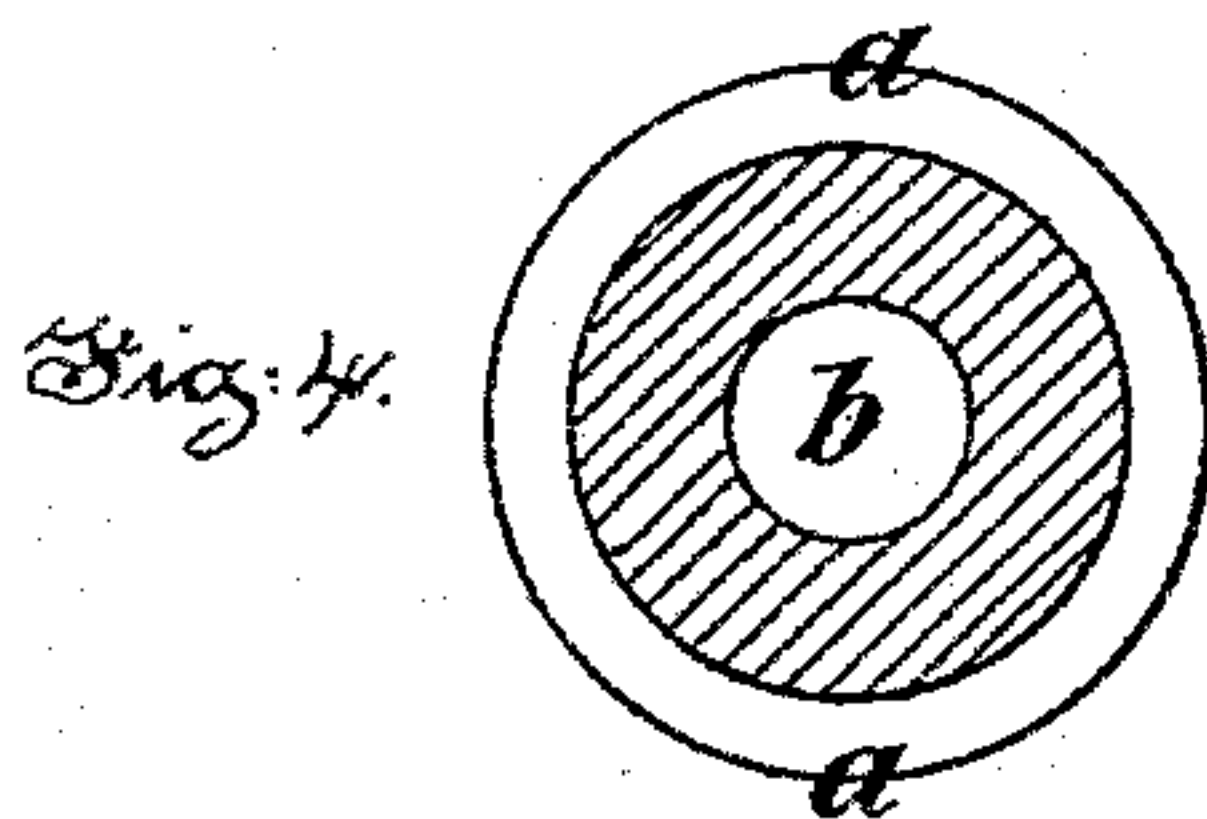
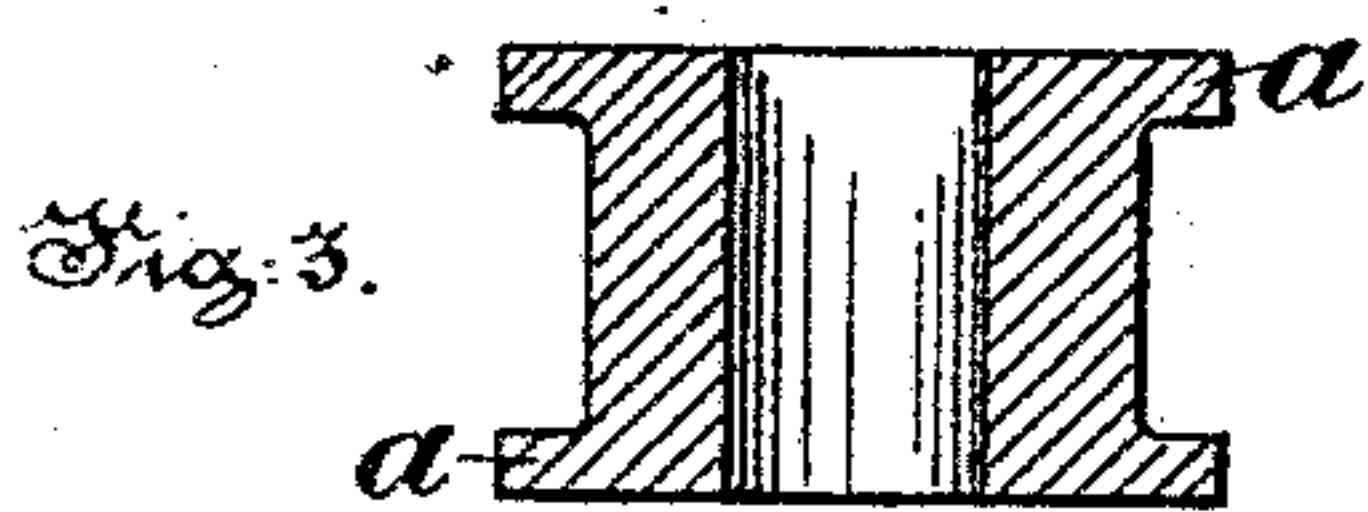
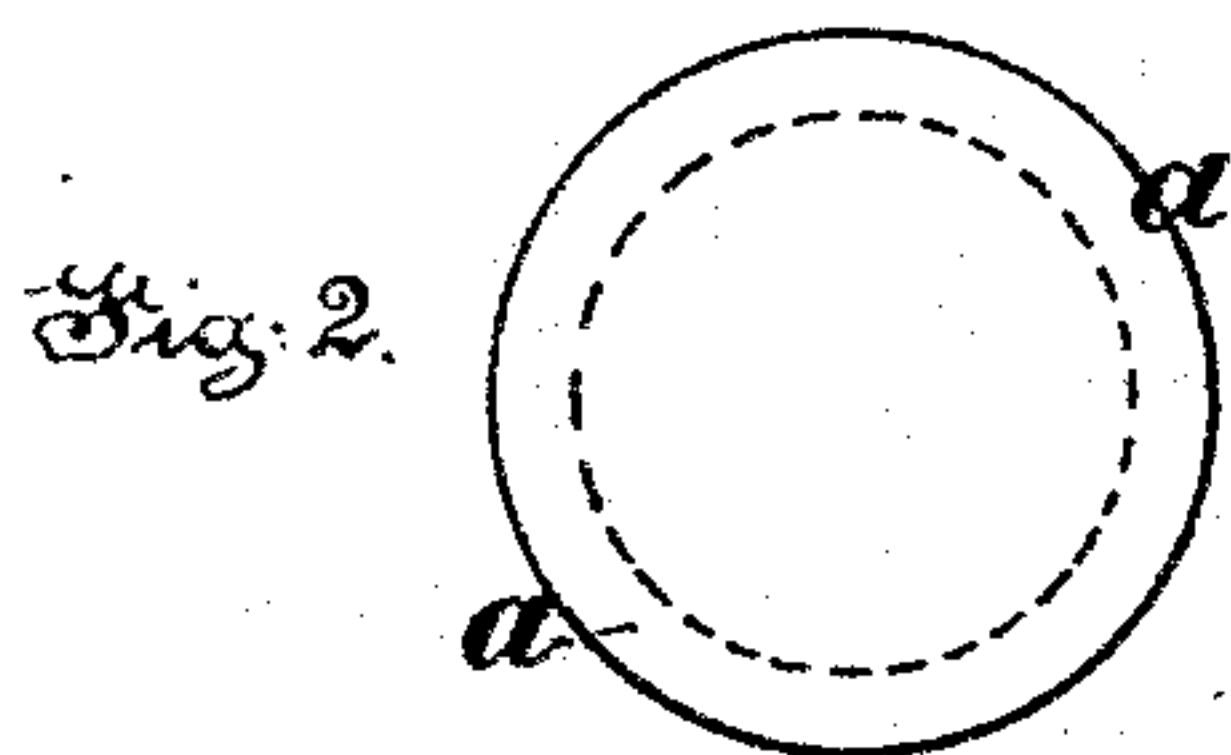
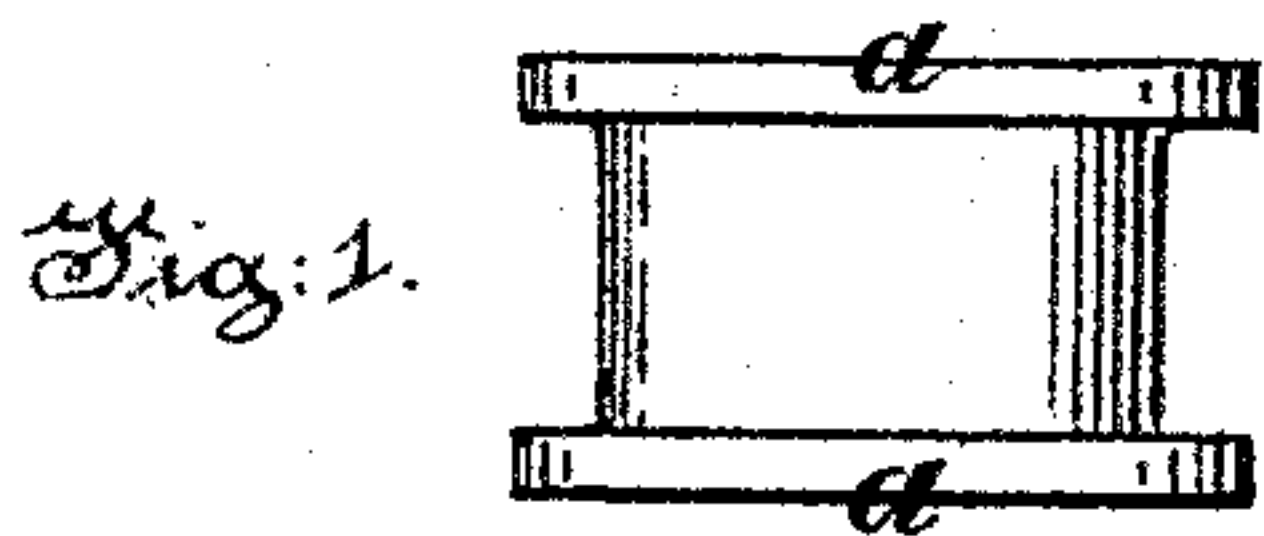


(No Model.)

W. MALAM & W. SCHOFIELD.
MANUFACTURE OF MANHOLES AND STAND PIPES FOR STEAM BOILERS.
No. 615,598.

Patented Feb. 27, 1894.



Witnesses.
George Baumann
James Gracie

Inventors.
William Malam
William Schofield
By their Attorneys.
Howard and Howard

UNITED STATES PATENT OFFICE.

WILLIAM MALAM, OF FAIRFIELD, AND WILLIAM SCHOFIELD, OF OPENSHAW,
ENGLAND.

MANUFACTURE OF MANHOLES AND STAND-PIPES FOR STEAM-BOILERS.

SPECIFICATION forming part of Letters Patent No. 515,598, dated February 27, 1894.

Application filed February 8, 1893. Serial No. 461,446. (No specimens.) Patented in England December 12, 1891, No. 21,750.

To all whom it may concern:

Be it known that we, WILLIAM MALAM, residing at Fairfield, and WILLIAM SCHOFIELD, residing at Openshaw, near Manchester, in the county of Lancaster, England, subjects of the Queen of Great Britain and Ireland, have invented certain Improvements in the Manufacture of Manholes and Stand-Pipes for Steam-Boilers, (for which we have obtained a patent in Great Britain, No. 21,750, dated December 12, 1891,) of which the following is a specification.

The object of this invention is to manufacture manholes and stand-pipes for steam boilers without any welding or joint from a solid cast or wrought ingot or bloom.

The nature of our said invention and the manner in which the same is to be performed or carried into practical effect will be readily understood on reference to the illustrative drawings hereunto annexed and the following explanation thereof.

According to our invention we manufacture man-holes and stand-pipes for steam boilers and other similar purposes, in two ways, first from a solid cast steel ingot and secondly from a solid wrought iron bloom. In the first case we cast a solid ingot in a cylindrical form the depth of the required man-hole, and with a flange *a* at top and bottom as shown on Figures 1 and 2 of the drawings (elevation and plan view) and we bore or punch a hole *b* through the center of this cylinder thus producing a hollow flanged cylinder of smaller diameter but greater thickness than the desired manhole (see sectional views Figs. 3 and 4). We then make this ingot red hot and place it in a rolling machine similar to that employed for rolling weldless tires for railway and other wheels, and we roll the ingot out to the required diameter and thickness as shown at Fig. 5 after which we form the lower flange *a'* to fit the curve of the boiler as shown at Fig. 6.

To obtain the same result in forged or wrought metal, we take a heated bloom *c* in the form of a cylinder (see Fig. 7) deeper than the required man-hole, and we form the flange at the top and bottom by placing the same on end on the anvil *d* of a steam ham-

mer, and surrounding the central portion with a die *e* formed in two pieces and having a circular recess *f* above and below, the two parts being secured together round the bloom *c* as shown. We then set the hammer in action and the descent of the hammer block *g* (see Fig. 8) "upsets" both ends of the cylindrical bloom forming a flange at top and bottom like *a* Fig. 1 the "upset" portion filling the recesses *f* made in the top and bottom of the die *e* for that purpose. Or a hydraulic press may be used in place of the steam hammer. Or, we take a cylindrical bar or bloom of the diameter of the flanges *a* and by means of swages or otherwise we reduce the center part so as to leave a projecting flange or collar at each end. In either case we then punch or bore a hole *b* through the solid bloom or cylinder (see Figs. 3 and 4) and (for large diameters) we roll this hollow flanged cylinder out to the diameter and thickness of the manhole required as described with regard to Figs. 5 and 6, but for smaller diameters we make the article solid in the first instance of the form and size required and simply bore or punch the hole through the center. Or, instead of making a solid bloom or cylinder and punching or boring the hole as above we may form the hole at the same time as the flanges by providing the anvil *d* and the hammer block *g* with a stud or pap *h* as shown by dotted lines at Fig. 7; or a drawn tube of the required depth and thickness may be used instead of a solid cylinder.

We make the double flanged stand-pipes in the same manner excepting that the proportions of the ingot or bloom and the grooves in the rolls will be varied to suit the difference in diameter and height of the finished article required.

We claim as our invention—

1. The process of manufacturing man holes or stand pipes for steam boilers, consisting in first forming a hollow flanged cylinder of smaller diameter but greater thickness than the required man-hole or stand pipe, then rolling it out to the required diameter and thickness, and then forming the lower flange to fit the curve of the boiler, substantially as described.

2. The process of manufacturing man-holes or stand pipes for steam boilers, consisting in first casting a solid ingot, boring or punching a hole through the center, then rolling it
5 out to the required diameter and thickness and then forming the lower flange to fit the curve of the boiler.

3. The process of manufacturing man-holes or stand pipes for steam boilers consisting
10 in first casting or forging a solid ingot or bloom, boring or punching a hole through the center and upsetting the flanges, then rolling

it out to the desired diameter and thickness and forming the lower flange to fit the curve of the boiler, substantially as described. 15

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

WILLIAM MALAM.
WILLIAM SCHOFIELD.

Witnesses:

CHARLES A. DAVIES,
JNO. HUGHES.