

(No Model.)

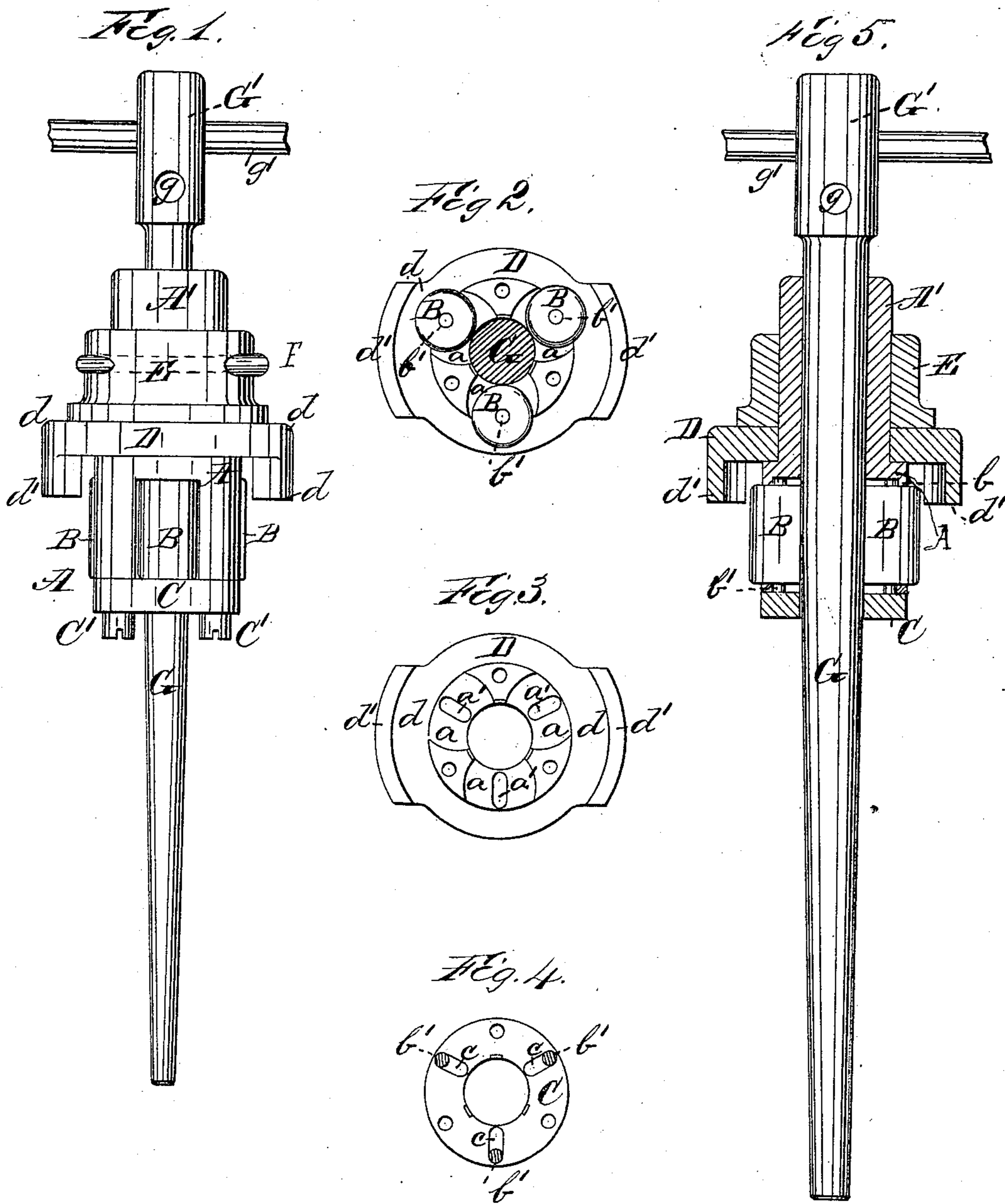
2 Sheets—Sheet 1.

J. F. DETTMAR.

TOOL FOR EXPANDING THE ENDS OF BOILER TUBES.

No. 284,618.

Patented Sept. 11, 1883.



WITNESSES:

Clare M. Richards  
Gwinis

INVENTOR

John F. Dettmar  
BY W. L. Bennett

ATTORNEY

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2 Sheets—Sheet 2.

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Fig. 6.

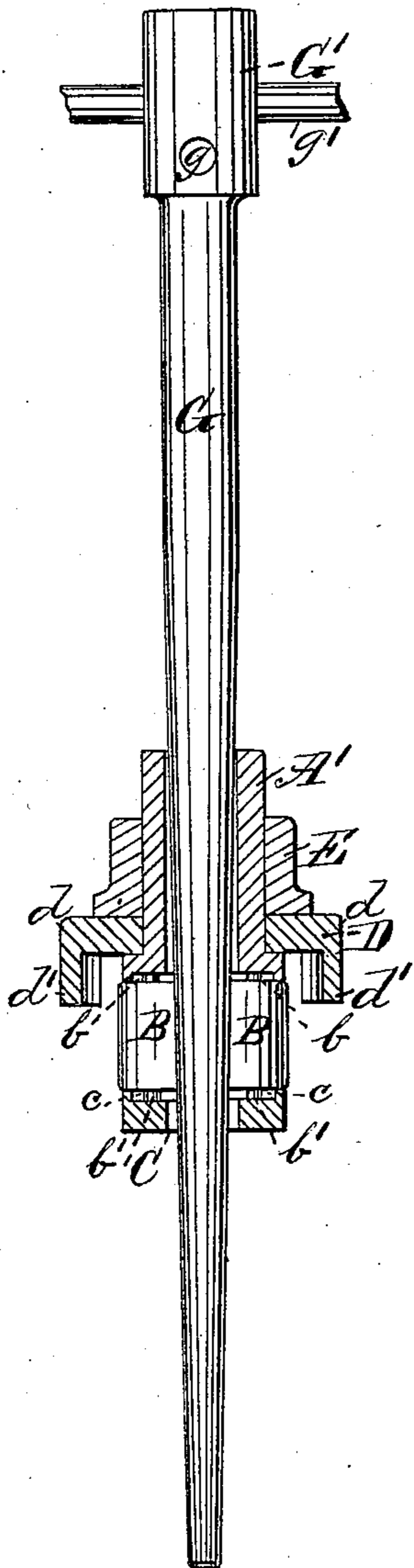


Fig. 8.

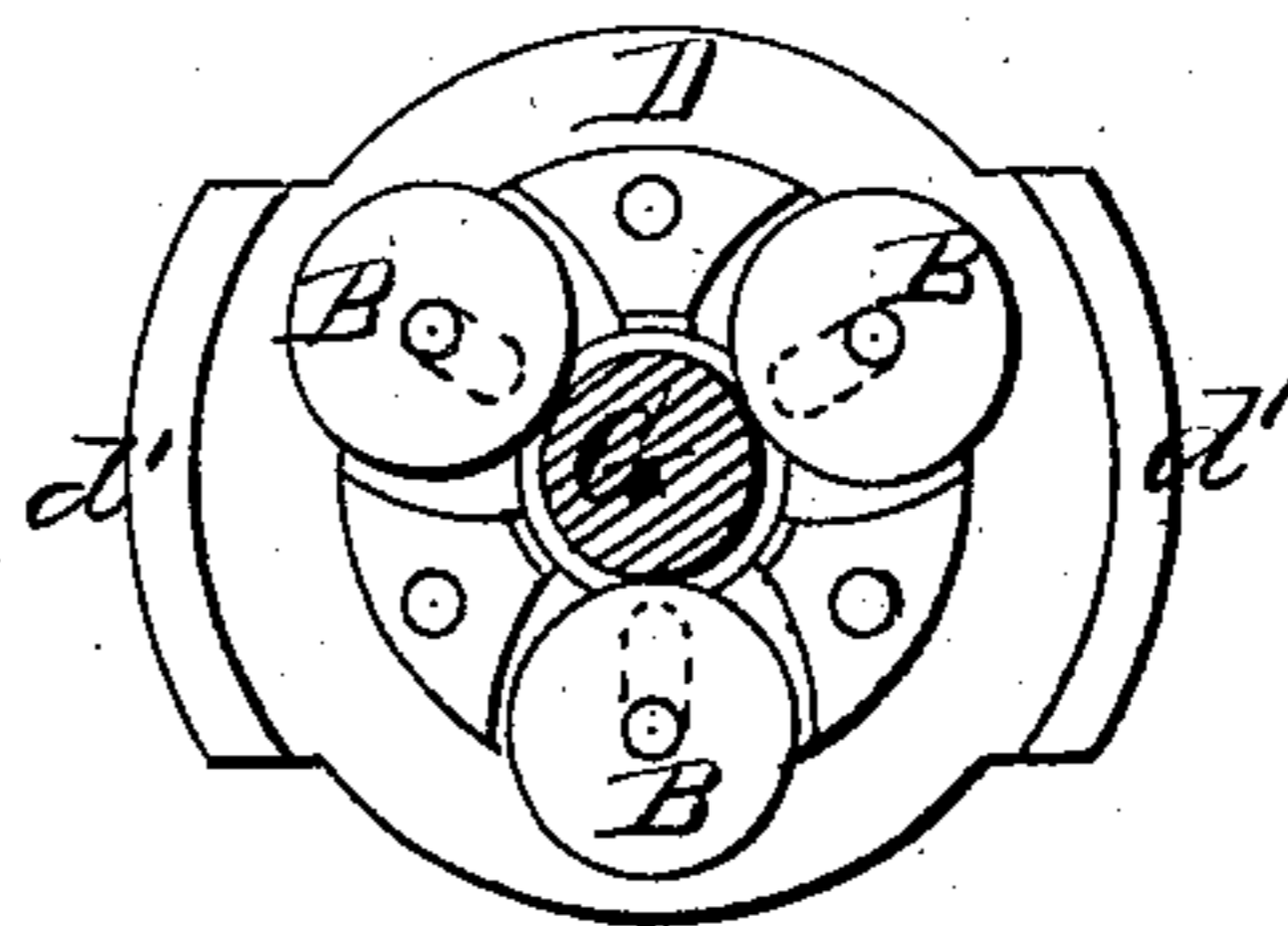
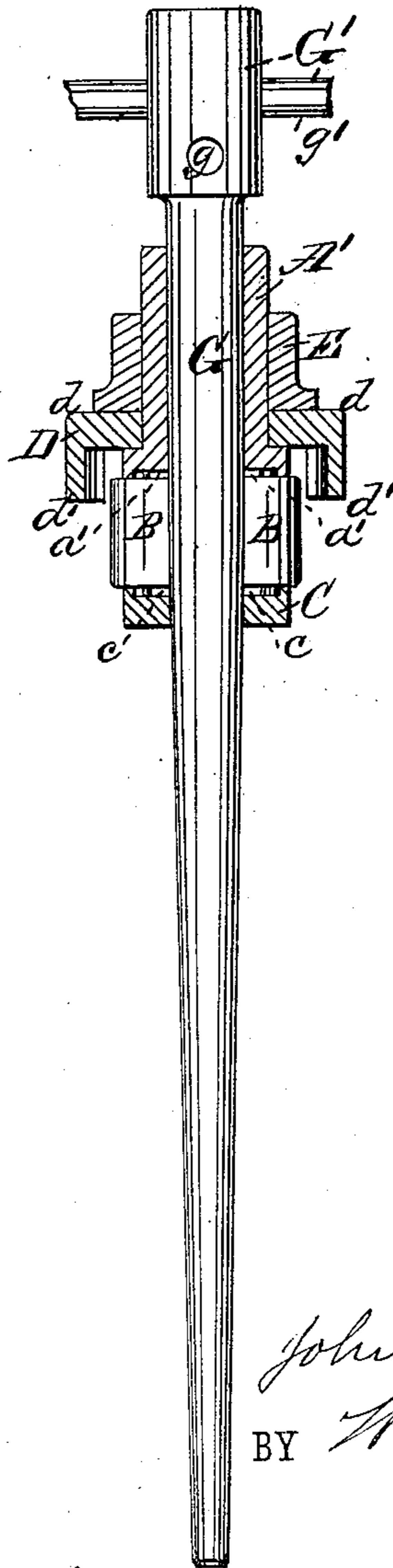


Fig. 7.



WITNESSES:

Paul M. Richards.  
E. Willis

INVENTOR

John F. Dettmar  
BY W. L. Benson

ATTORNEY

# UNITED STATES PATENT OFFICE.

JOHN F. DETTMAR, OF BROOKLYN, ASSIGNOR TO RICHARD DUDGEON, OF  
NEW YORK, N. Y.

## TOOL FOR EXPANDING THE ENDS OF BOILER-TUBES.

SPECIFICATION forming part of Letters Patent No. 284,618, dated September 11, 1883.

Application filed May 17, 1883. (No model.)

*To all whom it may concern:*

Be it known that I, JOHN F. DETTMAR, a citizen of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Tools for Expanding the Ends of Boiler or other Similar Tubes, of which the following is a specification.

My invention relates to improvements in tools for expanding the ends of boiler and other similar tubes; and the object is to enable the same tool to be employed in expanding the ends of tubes of different diameters within a considerable limit, either by the employment of a single mandrel, or a pair or series of mandrels, or by a single mandrel and changeable pressure rollers or swages of varying diameter.

The accompanying drawings form part of this specification and illustrate what I consider the best means of carrying out my invention.

Referring to the drawings, Figure 1 is an external view of my improved device. Fig. 2 is a sectional face view of the same with the retaining-ring removed. Fig. 3 is a similar face view with the retaining-ring and pressure-rollers removed. Fig. 4 is a face view of the retaining-plate separately. Fig. 5 is a sectional view of a device, the parts of which are exactly similar to those represented by Fig. 1, with the exception that a plug of greater diameter is shown operating the parts. Figs. 6 and 7 represent vertical sections of a similar device adapted by the graduated insertion of the same plug to expand tubes of different diameters. Fig. 6 represents the device and plug in position to expand a small tube. Fig. 7 represents the same device and plug in position to expand a larger tube. Fig. 8 represents a sectional under-side view of the device represented by Figs. 1 and 2, with the exception that pressure-rollers of larger diameter are inserted.

In each of the views similar letters of reference are employed to indicate corresponding parts wherever they occur.

A represents the hollow stock or holder, in which is formed a series of longitudinal slots or recesses, *a*, adapted for the reception of a se-

ries of pressure rollers or swages, B, of which I prefer there should be three, as shown in the drawings. The pressure rollers or swages B at their opposite ends are provided with short axles *b* and *b'*, respectively. The short axles *b*, at one end of the pressure rollers or swages B, are arranged to be received and work in radial slots *a'*, formed in the ends of the recesses *a*, while the axles *b'*, at the opposite ends of the pressure rollers or swages B, are received and held in corresponding radial slots, *c*, formed in a retaining-ring, C, bolted by means of screws *C'* to the stock A, or otherwise suitably secured thereto, so as to allow of the free action of the pressure rollers or swages B.

D is a bearing-piece, fitted so as to turn freely on the hub or extension A', projecting from and forming part of the stock or holder A. The bearing-piece D is formed with extensions *d* *d*, provided with semicircular rectangular projections or braces *d'* *d'*, adapted to rest against the face of the tube-sheet. (Not shown.) The bearing-piece D is retained in position by means of a cap or elongated washer, E, which is secured to the hub or extension A' of the stock A by means of a key, F, or by other suitable device.

G is the plug, which is formed tapering, and is provided, as shown in the drawings, with a head, G', provided with holes *g*, adapted for the reception of a turning-pin, *g'*, or a handle or handles, by means of which the device may be operated.

In Figs. 1 and 5, I have shown the same device expanded by two different plugs, the plug in Fig. 1 being supposed to be adapted for a two (2) inch tube, while that in Fig. 5 is supposed to be adapted for a two and one-quarter (2 $\frac{1}{4}$ ) inch tube. The proportions may, however, be varied for any desired diameter of tube.

In Figs. 6 and 7 I have shown my improved device in position for operating on tubes of two similar diameters to those before referred to; but in these views I have shown the plug G elongated and of a more gradual taper. In Fig. 6 the plug G is supposed to represent the position it will assume when operating on a

two (2) inch tube, while in Fig. 7 it is represented as operating on a two and one-quarter (2 $\frac{1}{4}$ ) inch tube.

In Fig. 8 I have shown a similar view to Fig. 2, but with the pressure rollers or swages B, as represented by Fig. 2, removed and replaced by pressure rollers or swages B of greater diameter. By thus enlarging the pressure rollers or swages B, I am enabled to operate upon tubes of greater diameter with the same device and with the same plug or expanding means.

By the employment of tube-expanding devices constructed according to my invention great economy is obtained, not only on account of less tools being required to fit the various diameters of tubes in use, but also greater nicety of adjustment is obtained, combined with simplicity of construction and operation.

The pressure rollers or swages B are adapted to be removed and replaced at will by simply taking out the screws C' and removing the plate or ring C. They can then be substituted by other rollers or swages B of larger or smaller diameter.

By employing rollers or swages B of larger diameter, or by employing rollers or swages

of smaller diameter, and employing the same plug G, I can expand larger or smaller tube ends, as desired; or, by employing plugs or expanders G of greater diameter, a still greater variation may be obtained.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, in a device for expanding the ends of boiler or other similar tubes, is—

1. The combination, substantially as before set forth, of the longitudinally-slotted hollow stock, the removable ring at one end of said stock, the pressure rollers or swages whose axles turn in radial slots in the head of the stock and removable ring, respectively, and the tapering distending-plug.

2. The combination, substantially as before set forth, of the stock supporting the pressure rollers or swages and the bearing-piece loosely mounted on the stock and adapted to bear on the tube-sheet.

Witness my hand this 15th day of May, A. D. 1883.

JOHN F. DETTMAR.

Witnesses:

W. L. BENNEM,  
W. H. HICKS.