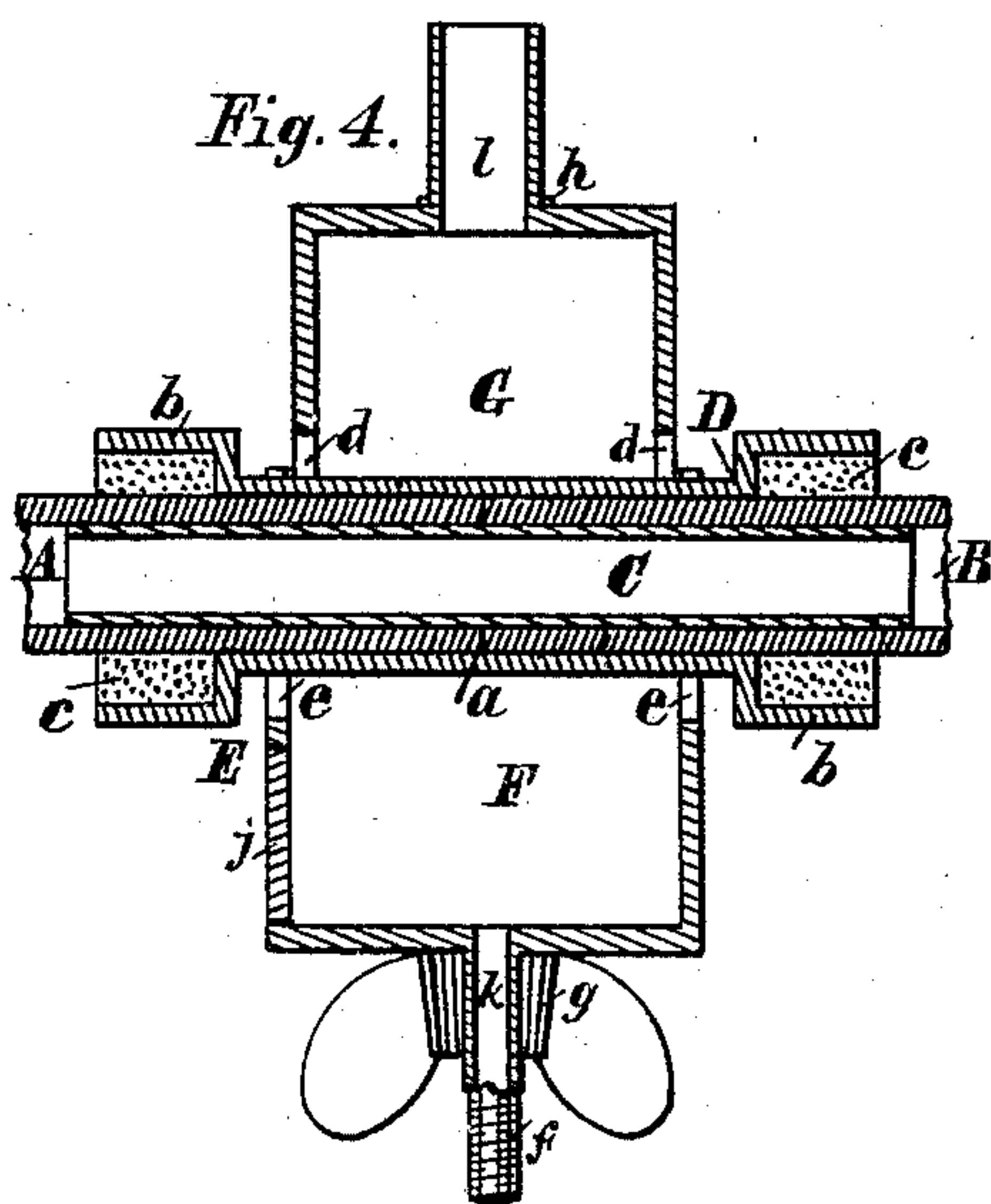
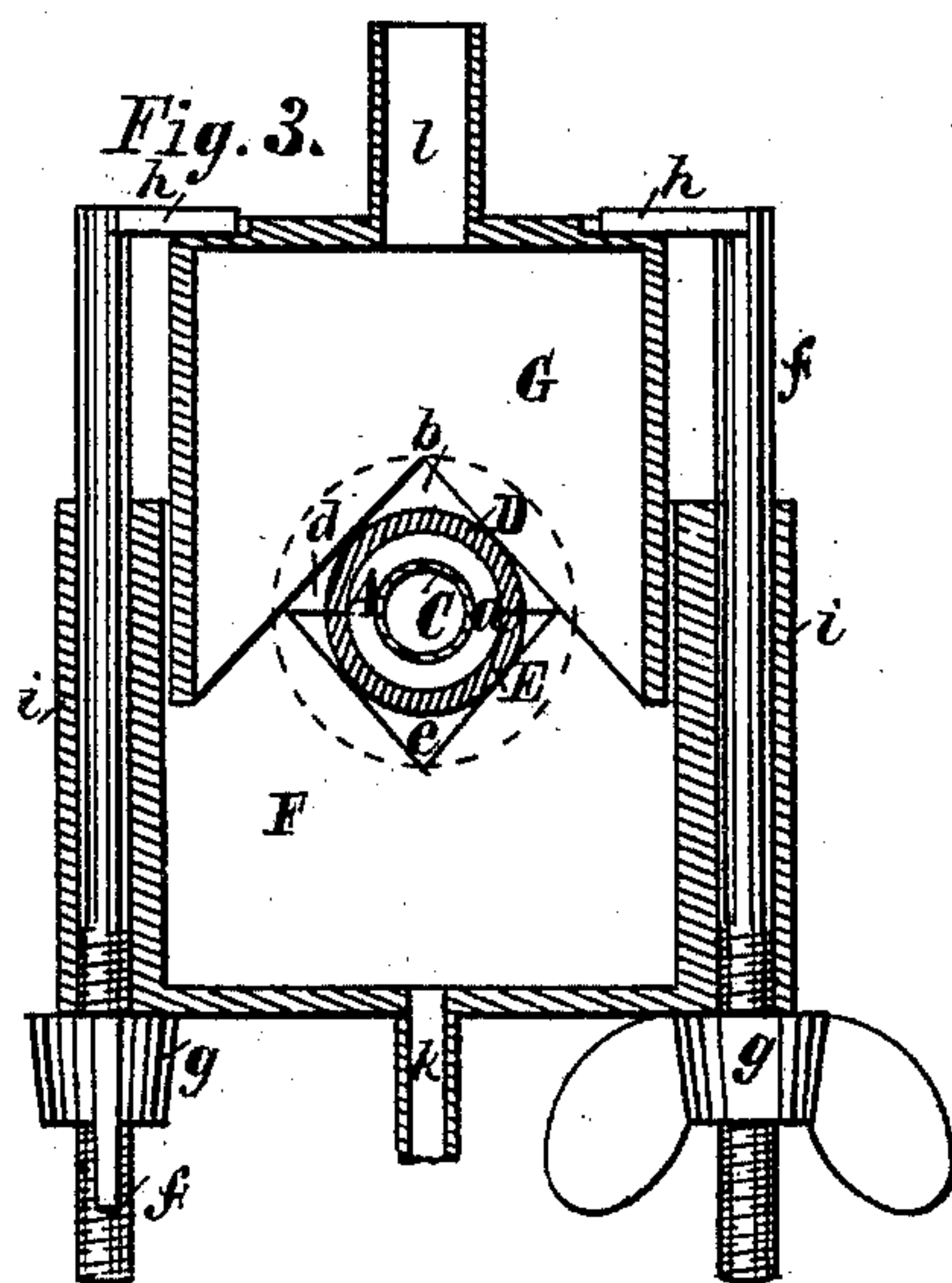
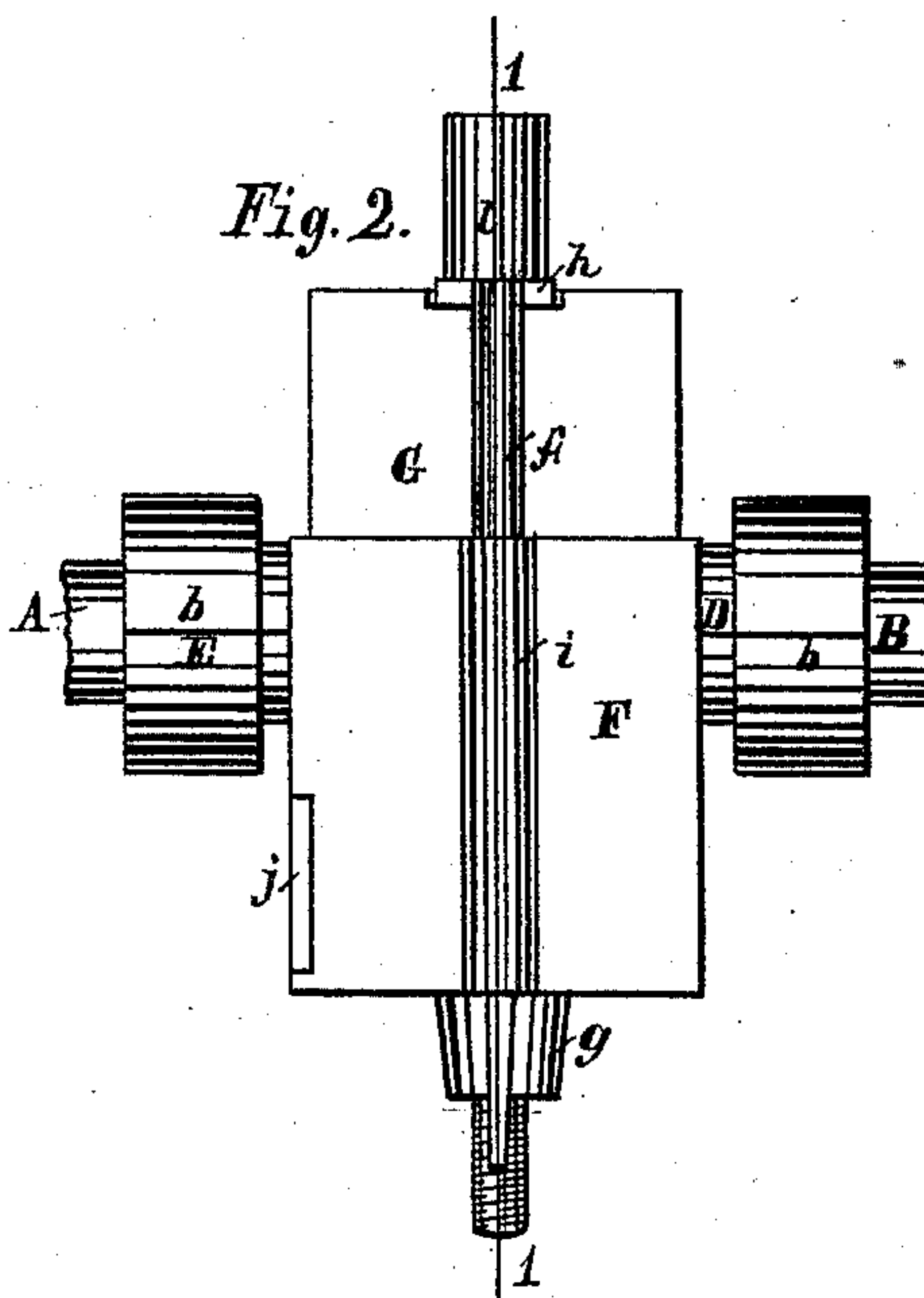
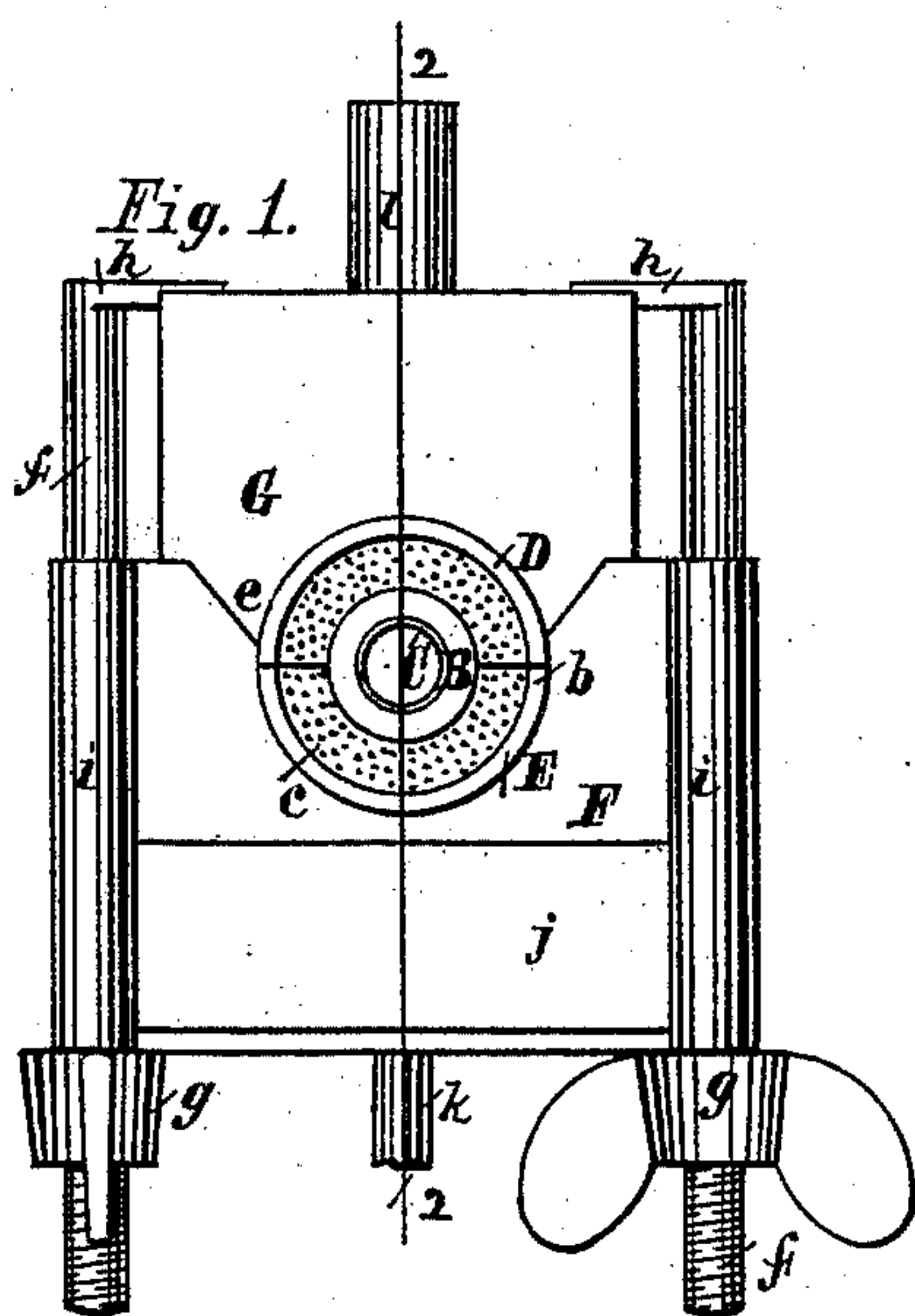


(No Model.)

W. A. HENDERSON.
JOINT FOR SOFT METAL PIPES.

No. 396,654.

Patented Jan. 22, 1889.



Attest;

*Edw. Sumner,
Willard Sears.*

Inventor;

William A. Henderson.

UNITED STATES PATENT OFFICE.

WILLIAM A. HENDERSON, OF MALDEN, MASSACHUSETTS.

JOINT FOR SOFT-METAL PIPES.

SPECIFICATION forming part of Letters Patent No. 396,654, dated January 22, 1889.

Application filed January 26, 1885. Serial No. 154,079. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. HENDERSON, a citizen of the United States, residing at Malden, in the county of Middlesex and State of Massachusetts, have invented a new and useful Joint for Soft-Metal Pipes, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to an improved joint for the ends of pipes of lead or other fusible metal; and it consists in a joint formed by fusing the pipes at their ends while the ends are in juxtaposition, the molten metal being prevented from flowing within the pipes, substantially as hereinafter set forth.

In the drawings, Figure 1 is a front view of an apparatus for carrying out my invention. Fig. 2 is a side view of the same. Fig. 3 is a central vertical section taken on line 1 1 in Fig. 2. Fig. 4 is a central vertical section taken on line 2 2 in Fig. 1.

Let A and B be two pipes, of lead or other fusible metal, the ends of which are to be united at *a*. These ends are faced off so that they may be brought against each other in close juxtaposition. Before putting the ends together a short shell or tube, C, is placed within the pipes, fitting the same and so as to come under the joint at *a*. The object of this shell or tube is to prevent the molten metal from flowing within the pipes.

The shell or tube C may be of hard metal; or it may be formed of material—as paper—which may be afterward reduced to pulp by water or other liquid flowing through the pipe.

On the pipes A and B, I fit a casing, which may be divided longitudinally and of two parts, D and E, so as to be readily placed around the pipes preparatory to uniting the pipes and removed therefrom after the work has been completed. The casing D E has flaring ends *b b*, so as to leave at each end a space, *c*, between the casing and the pipe. The spaces *c c*, I prefer to fill with asbestos or other material which is a non-conductor of heat. Owing to the flaring ends of the casing and the asbestos therein the pipes will be prevented from being heated to the fusing-point opposite these ends and outside of the casing.

Heat being applied to the outside of the casing through the middle thereof, opposite the joint *a*, the pipes may be fused at their ends, the metal flowing together, so that when it is cooled a perfect union of the ends will be effected and one homogeneous pipe formed of the two pipes A and B.

The heat may be applied by means of a flame from gas; but in many cases I find the device useful which is shown in the drawings, and by which I may use coal. Said device is in the form of a box having a lower part, F, and an upper part, G, to slide therein. Each of these parts has notches, one, *d*, in each of the opposite sides of the upper part, and one, *e*, in each of the corresponding sides of the lower part. In the notches of the lower part the casing D E rests, while the upper part shuts over the casing, as shown. The notches *d e* being of a tapering form, casings of various sizes may be held in the openings formed in the box thereby. By means of bolts *f f*—one at each side of the box—and nuts *g g* thereon the parts of the box may be drawn together, the heads *h h* of the bolts bearing against the top of the part G and the nuts against the under side of the part F. The bolts are held in place and slide in tubular guides *i i* at the opposite sides of the part E. By means of the bolts and the two parts of the box the parts of the casing D E are clamped closely together and onto the pipes A and B. There is a door, *j*, so that coals may be put in the lower part, E. Air may then be forced through a tube, *k*. Thus the casing D E and the pipes A and B are heated, as required. The gases of combustion may pass out of the box at the tube *l*.

Pipes may be joined at a curve or angle in a similar manner, the box having openings for the pipes in two adjoining sides, instead of in opposite sides, as shown in the drawings, and the casing D E being made curved or angular to correspond to the curve or angle formed by the pipes to be joined.

I claim as my invention—

1. A pipe formed of two soft-metal pipes placed end to end and united simply by fusing the metal of the pipes at the place of juncture, the diameter of the pipe at the

place of juncture being the same as the diameter of said ends, substantially as set forth.

2. A pipe formed of two soft-metal pipes placed end to end and united by fusing the metal of the pipe at the place of juncture, the diameter of the pipe at the place of juncture being the same as the diameter of said ends, and said pipe having within and covering

said place of juncture a tube conforming to the interior of the pipe, substantially as set forth.

WILLIAM A. HENDERSON.

Witnesses:

EDW. DUMMER,
WILLARD SEARS.