

(No Model.)

4 Sheets—Sheet 1.

J. A. WHITNEY.

MEANS FOR MAKING CURVED PIPE.

No. 365,110.

Patented June 21, 1887.

Fig. 2.

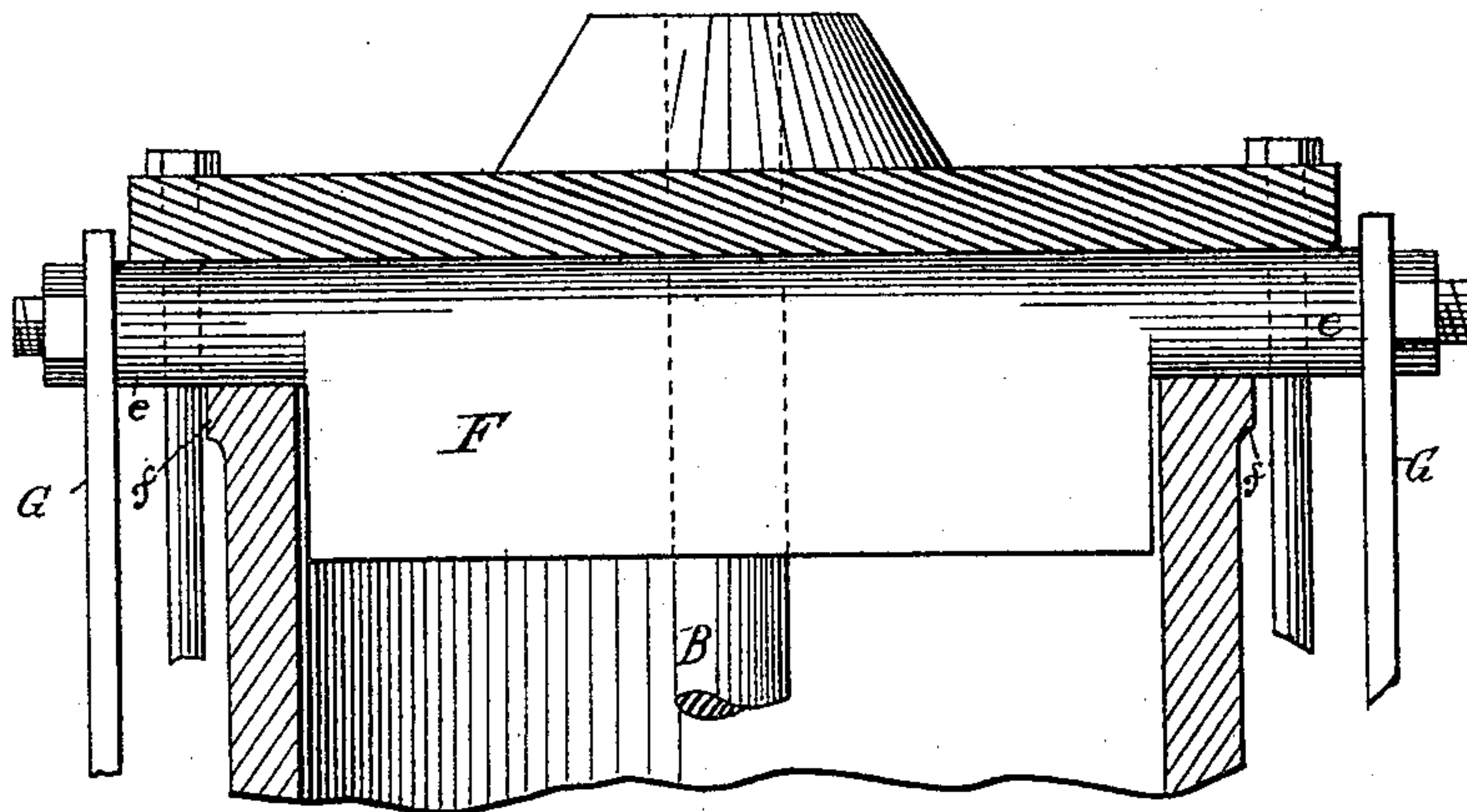
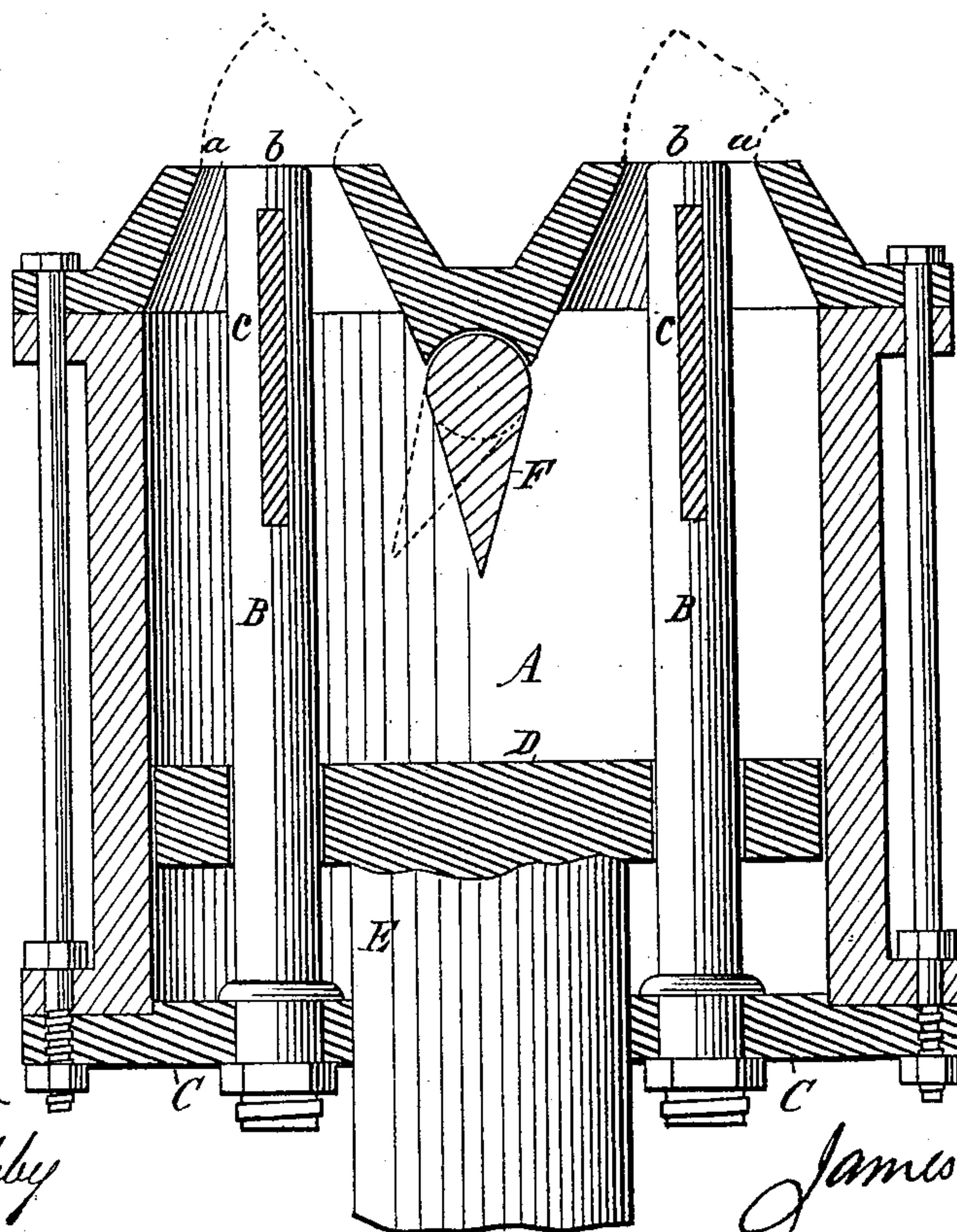


Fig. 1.



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Fig. 3.

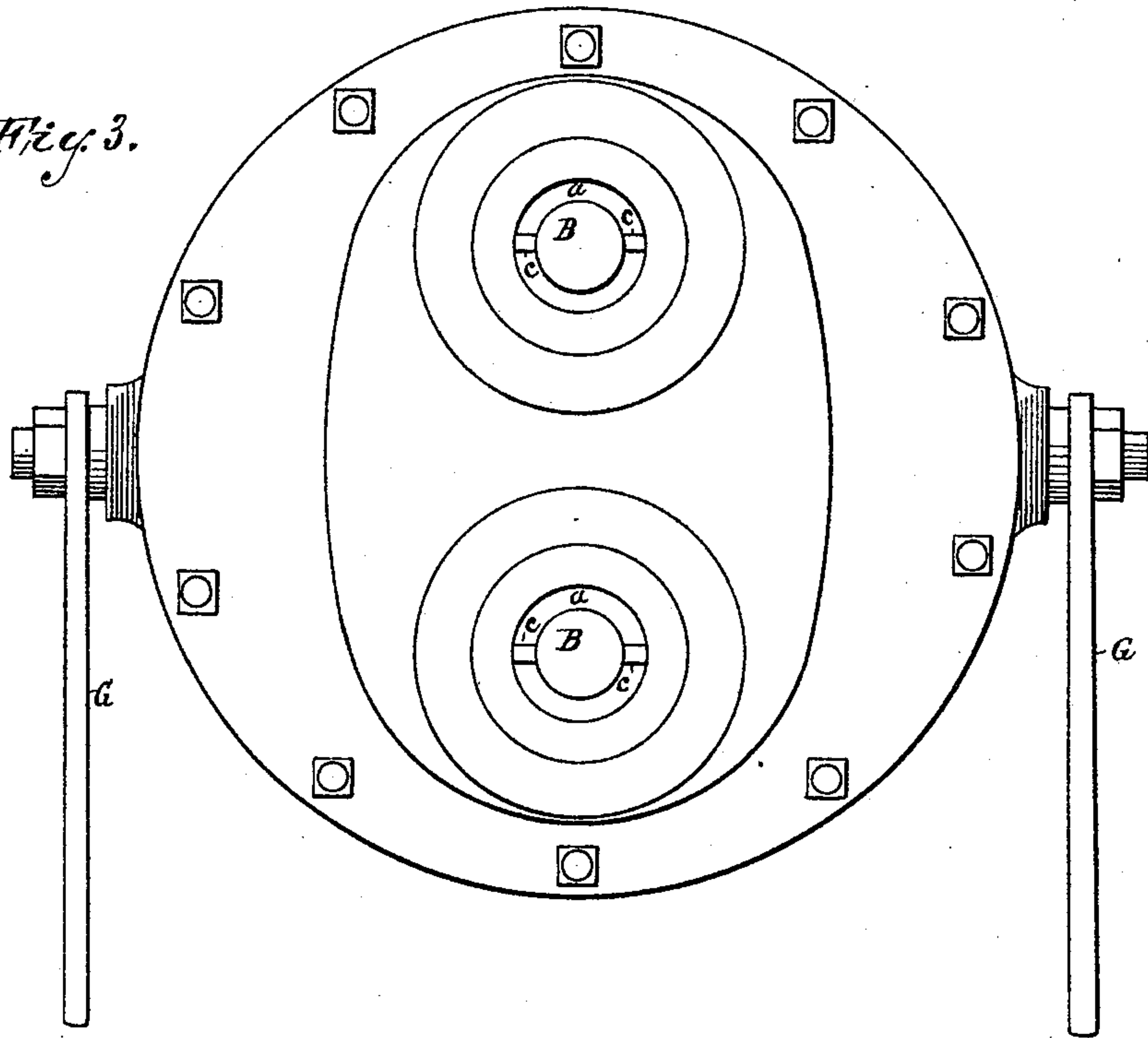
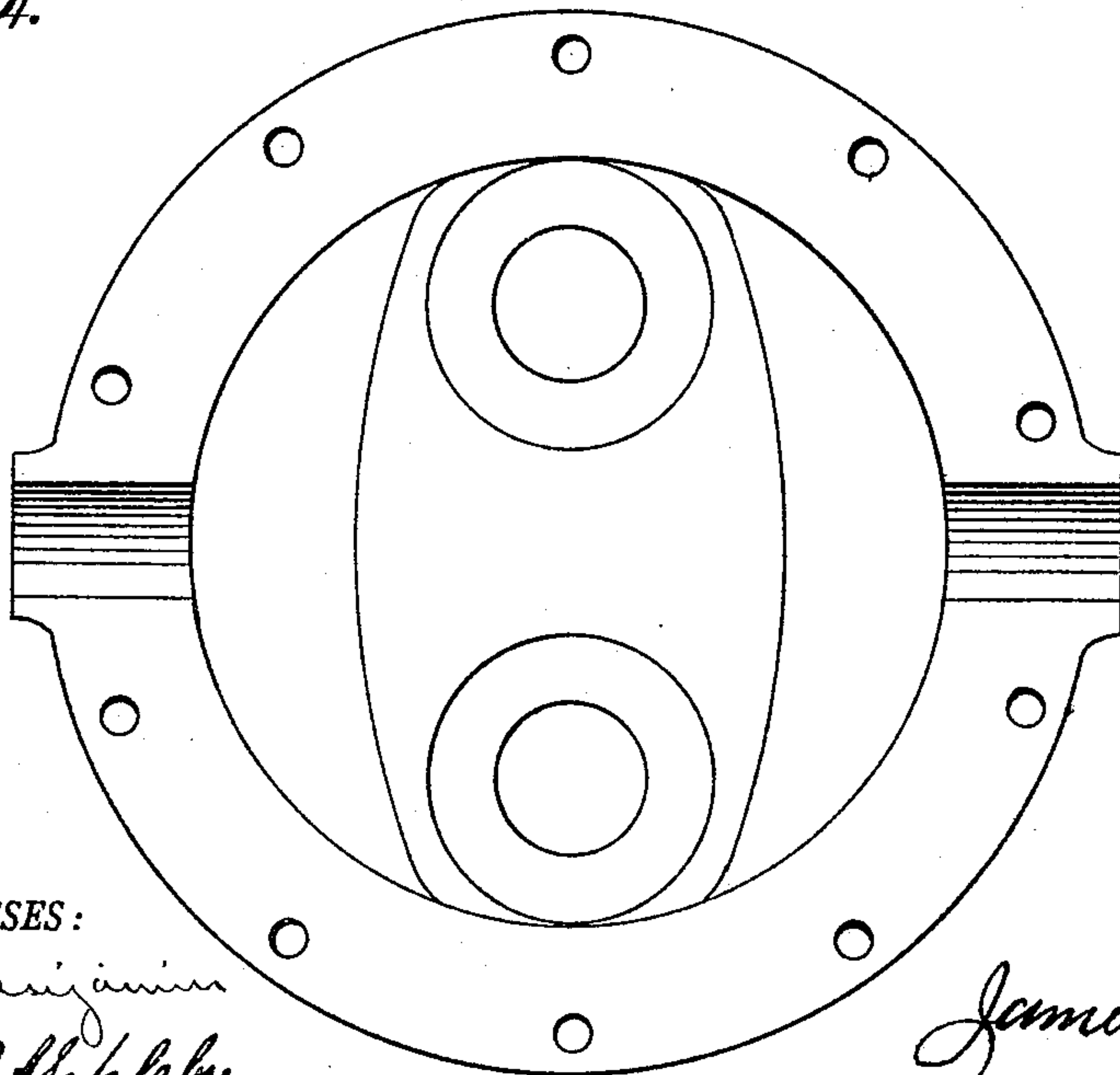


Fig. 4.



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Fig. 6.

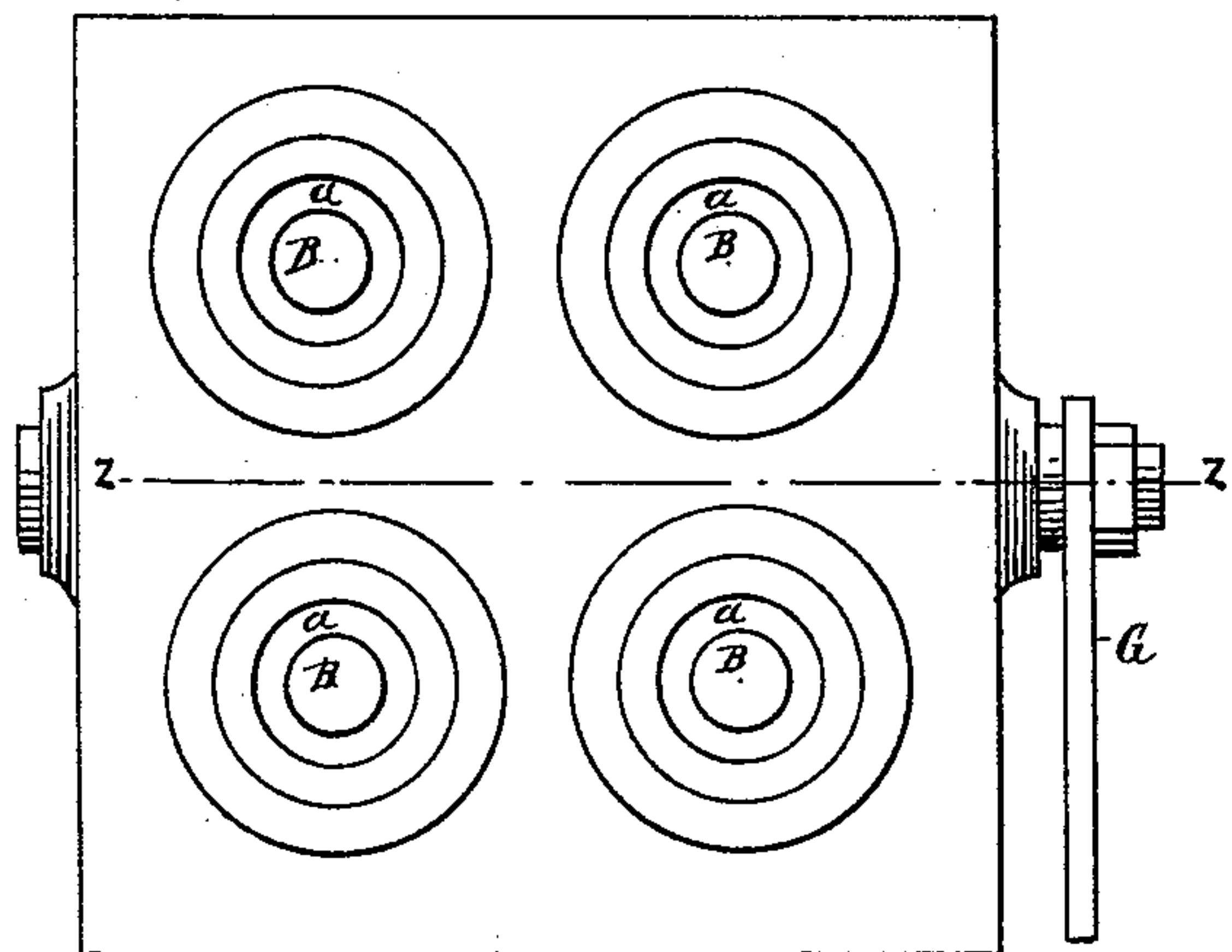


Fig. 7.

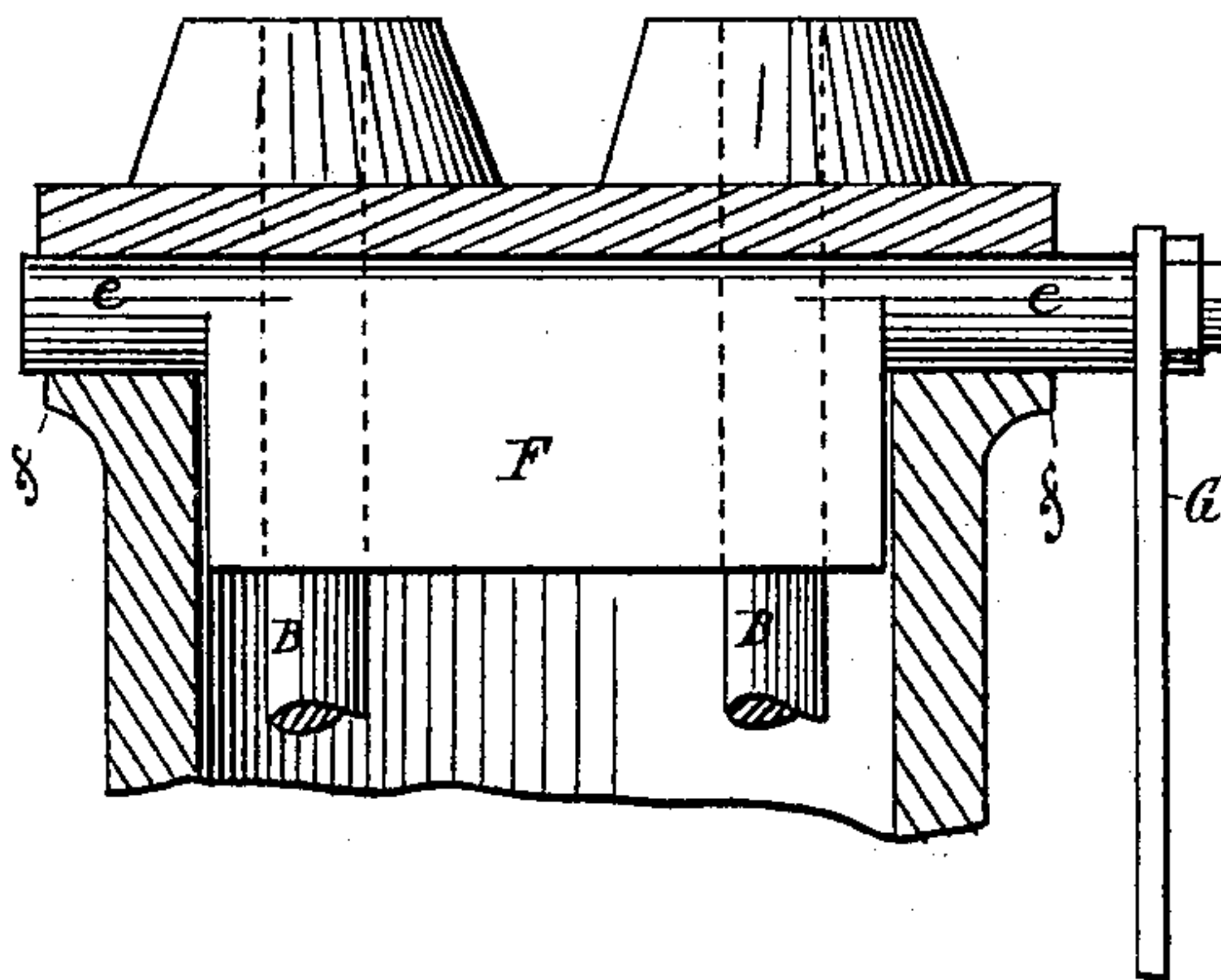
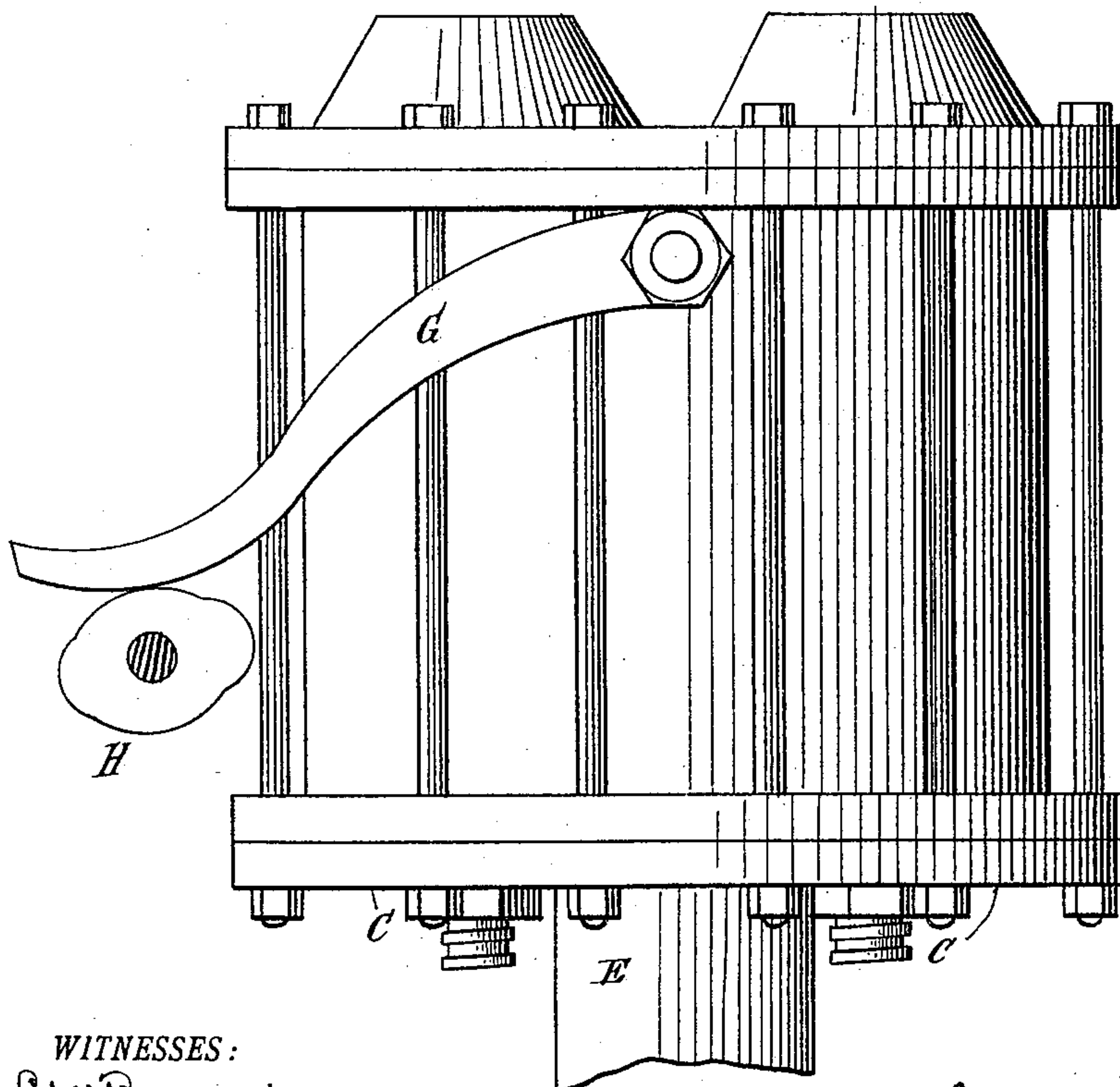


Fig. 5.



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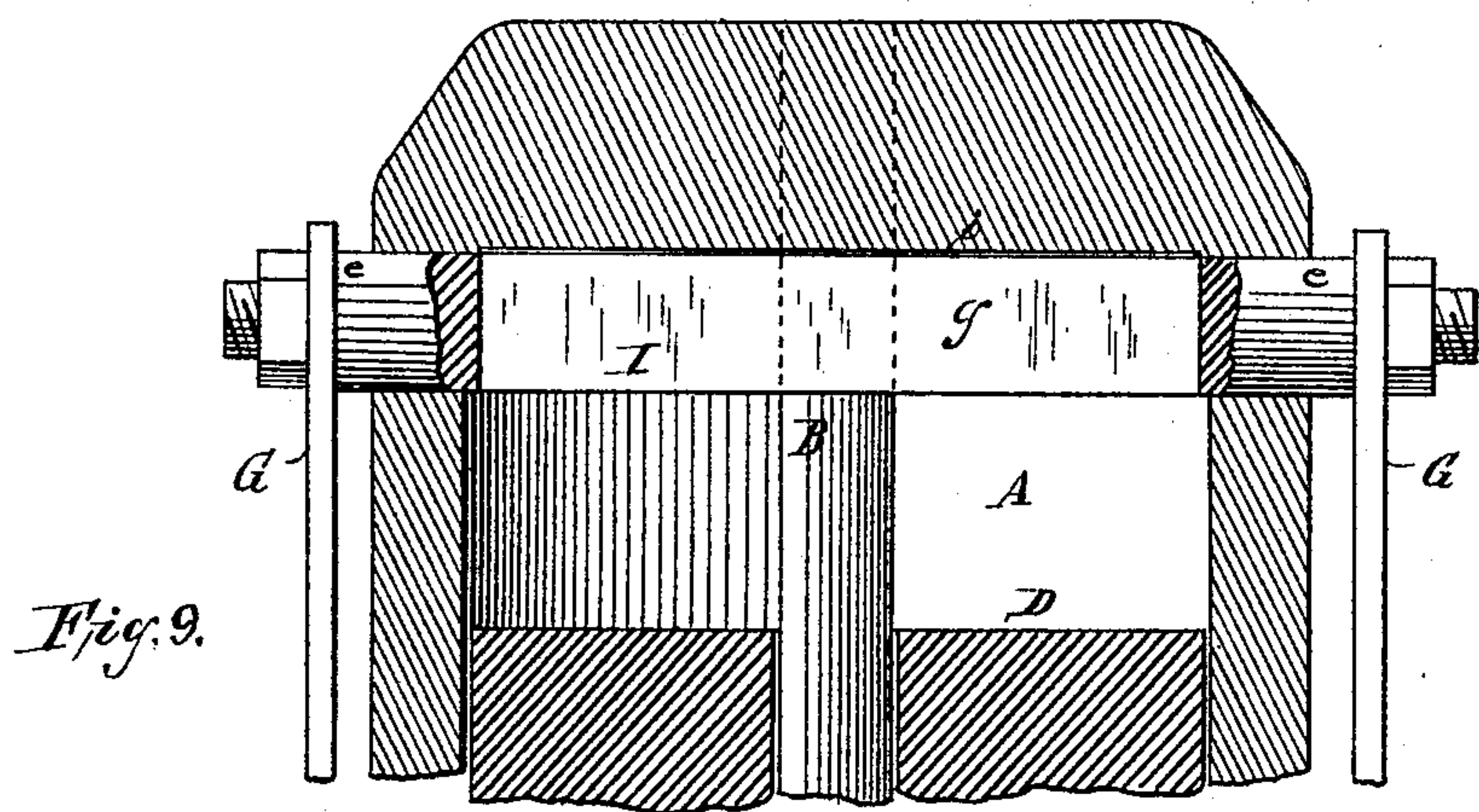
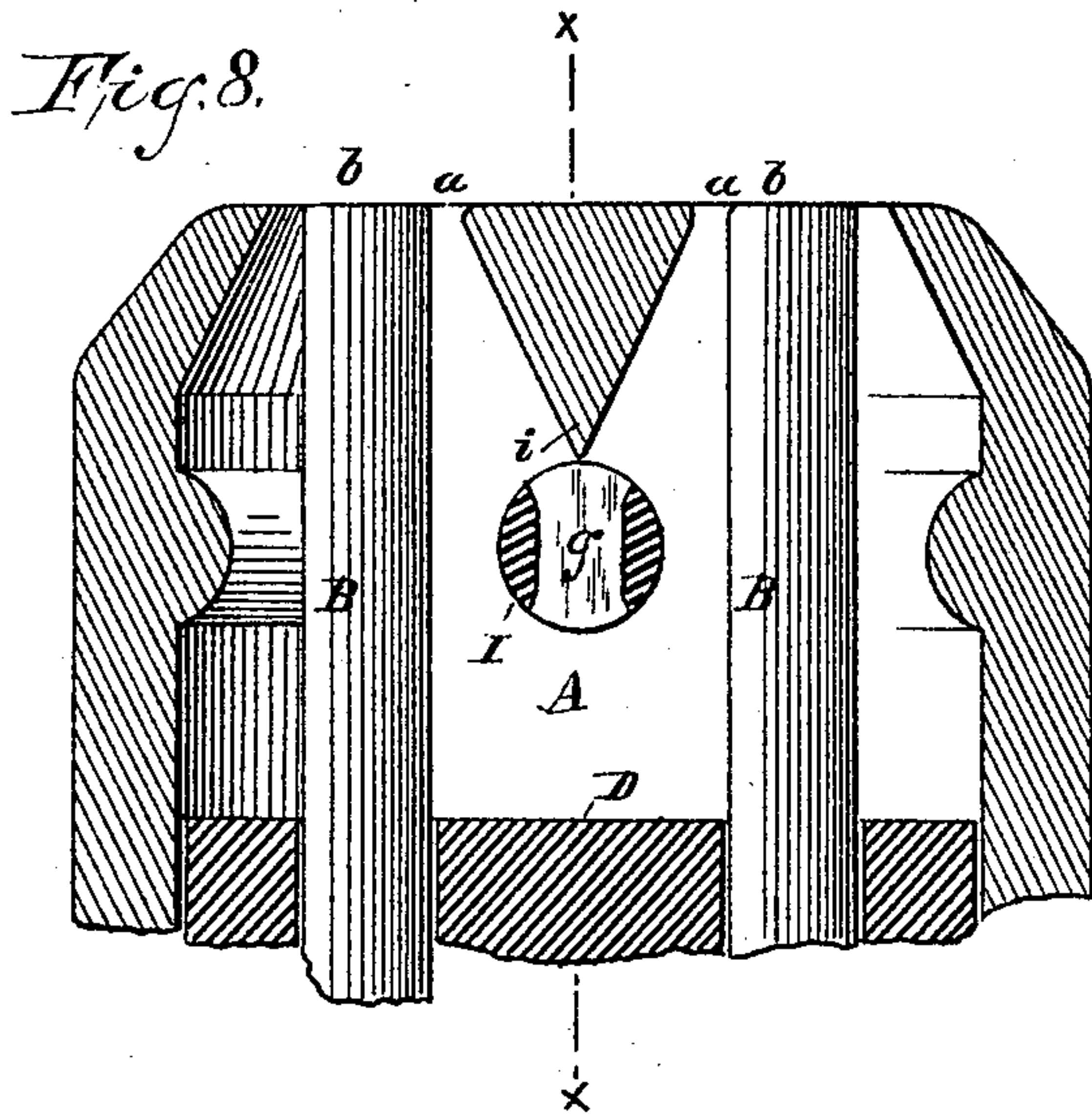
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UNITED STATES PATENT OFFICE.

JAMES A. WHITNEY, OF BROOKLYN, NEW YORK.

MEANS FOR MAKING CURVED PIPE.

SPECIFICATION forming part of Letters Patent No. 365,110, dated June 21, 1887.

Application filed September 25, 1886. Serial No. 214,491. (No model.)

To all whom it may concern:

Be it known that I, JAMES A. WHITNEY, of Brooklyn, in the county of Kings and State of New York, have invented certain Improvements in Means for Making Curved Pipes, Plumbers' Traps, &c., of which the following is a specification.

This invention comprises certain novel means for manufacturing curved pipes, plumbers' traps, &c., of soft metal or other suitable plastic material, whereby such manufacture is very greatly facilitated, and whereby such articles may be produced at a moderate expense.

Figure 1 is a vertical longitudinal sectional view illustrating an apparatus constructed according to my said invention. Fig. 2 is a vertical transverse sectional view taken in a plane at right angles to that of Fig. 1. Fig. 3 is a plan view of the apparatus represented in Figs. 1 and 2. Fig. 4 is an inverted plan view of the upper part of the apparatus represented in Figs. 1, 2, 3, and 5. Fig. 5 is a side view of the apparatus represented in Figs. 1 to 4, inclusive. Fig. 6 is a plan view on a smaller scale, further illustrating my said invention; and Fig. 7 is a vertical transverse sectional view taken in the line $z z$ of Fig. 6. Fig. 8 is a vertical transverse sectional view illustrating a modification included in my invention, and Fig. 9 is a vertical transverse sectional view of said modification and taken in the line $x x$ of Fig. 8.

A is the cylinder or receiver, in which is placed the lead or other soft metal or plastic material from which the curved pipes or plumbers' traps are to be made. This cylinder A is constructed with or provided with a suitable top, in which are circular outlets or nozzles a . In the apparatus as represented in Figs. 1 to 5, inclusive, these outlets or nozzles are two in number.

B B are cores, the upper or outer ends, b , of which extend axially into or through the outlets or nozzles a , said cores, at least at their outer ends, being of cylindrical shape, corresponding to that of the outlets or nozzles a , so that the space between the outer ends of the cores and the concentric inner surfaces of the outlets or nozzles a constitute annular dies, through which the soft metal or material from the cylinder A is forced in tubular form in the operation of the apparatus.

The cores B B may be of any suitable character and secured in any suitable manner. As represented in the drawings, their lower or inner ends are firmly secured to the bottom C or inner end of the cylinder A, and the upper or outer ends are steadied by radial or lateral partitions c , which extend from the cores to the adjacent inner side of the cylinder A; but the said cores may be otherwise constructed and arranged or held in place, so long as suitable annular dies are provided for operation, substantially as herein explained.

D is a piston or plunger, which works within the cylinder A, to force the soft metal or plastic material from said cylinder to and through the annular dies. As represented in the drawings, the piston or plunger D has its piston-rod E extended through the bottom or inner end of the cylinder A, and is intended to be operated by hydraulic power, or in any other suitable manner. When the cores B are attached to the bottom or inner end of the cylinder A, as hereinbefore indicated, the piston or plunger D is so constructed that the said cores pass through the said plunger or piston without interference to the operation of either. Any suitable construction and operation of the piston or plunger may be used, so long as it is capable of serving the purpose of forcing the soft metal or plastic material from the cylinder A to and through the annular dies.

F is a device for regulating and controlling the supply of soft metal or plastic material to the annular dies. As represented in Figs. 1 and 2, and also in Fig. 7, this device consists of a blade or wing provided at each end with journals e , which are supported in suitable bearings, f , provided to the cylinder A. This blade or wing F extends across said cylinder from side to side thereof, and, as near as may be, midway between the axial lines of the cores B B. One or both ends, preferably the latter, of the journals e of the blade or wing F extend outward from their bearings, to permit the attachment of levers G, or their equivalents, in such manner as to enable the blade or wing F to be moved in opposite directions upon its axis. The requisite movement to the levers G may be given thereto by a cam, H, suitably shaped to give such varying or variable motion to the lever or levers G as is required to actuate the blade or wing F. When the blade

or wing F is in substantially the same relation with each of the two annular dies, the soft metal or plastic material ejected from the cylinder A will pass through the said dies in the form of substantially straight tubes or pipes, it being understood that the shape and proportions of the cylinder A and the parts leading and included in said annular dies are such that when the blade or wing F is in the position just described the soft metal or plastic material will pass through each of the dies in substantially uniform quantity at all parts of the die.

By turning the blade or wing F in one direction—as, for example, as indicated in the dotted outline in Fig. 1—the passage of the metal toward the inner side of one of the annular dies will be retarded by the narrowing of the passage at such side of said die, and this retardation of the movement of the soft metal or plastic material at said inner side of said die will cause a less quantity to pass through the die at that side, and will cause the issuing soft metal or material to assume a bent or curved form as it passes from the die. Simultaneously with this, there being a larger portion of soft metal or plastic material directed to the inner side of the other die, a larger quantity of soft metal or material is caused to pass through the inner side of the said other die, and the metal or material issues in suitable form from said other die. By reversing the position of the blade or wing F—in other words, by moving it to an opposite position—the greater portion of metal or material is directed to the inner side of the first-mentioned die and a smaller portion to the inner side of the other die, thereby reversing the direction of the curves given to the issuing metal or material, so that by this means two separate curved pipes or plumbers' traps may be formed at one and the same time and substantially at one operation.

It is to be understood that curved pipes or traps are severed or removed, as occasion requires, by the use of a saw or by any other suitable means or appliance. When desired, instead of two annular dies, the apparatus may be constructed with two series of annular dies, the series being placed opposite each other, as represented in Fig. 6. Each series may consist of two or more of such dies, and a controlling or directing device—as, for example, the blade or wing F—is placed between the two series in substantially the same manner as in Figs. 1 to 5, inclusive. It is placed between the two annular dies indicated in said figures.

Any suitable apparatus, device, or mechanism may be used as the equivalent of the blade or wing F, so long as such apparatus, device, or mechanism operates to deflect or direct a portion of soft metal or plastic material from one to the other of the sides of the two annular dies, or from one to the other of the inner sides of the two series of annular dies. Thus, for example, as shown in Figs. 8 and 9, a rock-

ing cylindrical bar may be arranged with its ends in the bearings corresponding to the bearings *f* in the cylinder A, said cylindrical rocking bar being longitudinally slotted from top to bottom or from its outer to its inner sides, as shown at *g*, said slot being arranged below or within the parts *i*, (indicated in Fig. 9,) so that when the said slot is arranged in such relation to the parts *i* that equal portions of the soft metal or plastic material passing through said slot will pass to the two dies or series of dies the pipes or tubes formed will be substantially straight, while by axially turning said cylindrical bar a larger portion of soft metal or plastic material will be conducted to one or the other of the sides of the two dies or series of dies to give the requisite curvatures to the pipes or traps. The said slotted bar I may be actuated in the same manner as the blade or wing F, or in any suitable way.

It is of course to be understood that the number of curved pipes or plumbers' traps which are substantially simultaneously formed will be proportioned to the number of annular dies with which the apparatus is provided.

What I claim as my invention is—

1. In a machine for making curved pipes, plumbers' traps, &c., the combination, with the cylinder A, constructed or provided with two nozzles or dies, of means for varying simultaneously and in unison the flow of material to opposite sides of each of the said nozzles, substantially as and for the purpose herein set forth.

2. In a machine for making curved pipes, plumbers' traps, &c., the combination, with a cylinder, A, constructed or provided with two series of nozzles or dies, of means for varying simultaneously and in unison the flow of material to opposite sides of each one of each of the said series of nozzles, substantially as and for the purpose herein set forth.

3. In a machine for making curved pipes, plumbers' traps, &c., the combination of two annular dies, means for forcing and transmitting soft metal or plastic material simultaneously and in unison to and through the said dies, and means for varying simultaneously and in unison the flow of material to opposite sides of each of said dies, substantially as and for the purpose herein set forth.

4. In a machine for making curved pipes, plumbers' traps, &c., the combination of two series of annular dies, means for forcing and transmitting soft metal or plastic material simultaneously and in unison to and through the dies of each said series of annular dies, and means for varying simultaneously and in unison the flow of material to opposite sides of the dies of the said series of dies, substantially as and for the purpose herein set forth.

5. In a machine for making curved pipes, plumbers' traps, &c., the combination, with two annular dies, of mechanism constructed and arranged to deflect or vary the supply of soft metal or plastic material from one to the other of the inner sides of the said dies, sub-

stantially as and for the purpose herein set forth.

6. In a machine for making curved pipes, plumbers' traps, &c., the combination, with
5 two series of annular dies, of mechanism constructed and arranged to deflect or vary the supply of soft metal or plastic material from one to the other of the inner sides of each die of the said series of annular dies, substantially
10 as and for the purpose herein set forth.

7. In a machine for making curved pipes, plumbers' traps, &c., the combination, with
15 two annular dies, of a blade or wing, F, for varying the supply of soft metal or plastic material from one side to the other of each of the said two dies, substantially as and for the purpose herein set forth.

8. In a machine for making curved pipes, plumbers' traps, &c., the combination, with
20 two series of annular dies, of a blade or wing, F, for varying the supply of soft metal or plastic material from one side to the other of each of the dies of the said two series of annular dies, substantially as and for the purpose
25 herein set forth.

9. In a machine for making curved pipes, plumbers' traps, &c., the combination, with two annular dies, of mechanism for varying the supply of soft metal or plastic material

from one side to the other of each of said two dies, and means for automatically controlling the operation of said mechanism with reference to the said dies, substantially as and for the purpose herein set forth.

10. In a machine for making curved pipes, plumbers' traps, &c., the combination, with
35 two series of annular dies, of mechanism for varying the supply of soft metal or plastic material from one side to the other of each die of the said two series of annular dies, and means
40 for automatically controlling the operation of the said mechanism with reference to the said two series of dies, substantially as and for the purpose herein set forth.

11. In a machine for making curved pipes, plumbers' traps, &c., the combination, with
45 two annular dies, of the blade or wing F, a lever, G, and a cam, H, substantially as and for the purpose herein set forth.

12. In a machine for making curved pipes, plumbers' traps, &c., the combination, with
50 two series of annular dies, of the blade or wing F, a lever, G, and a cam, H, substantially as and for the purpose herein set forth.

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