

(No Model.)

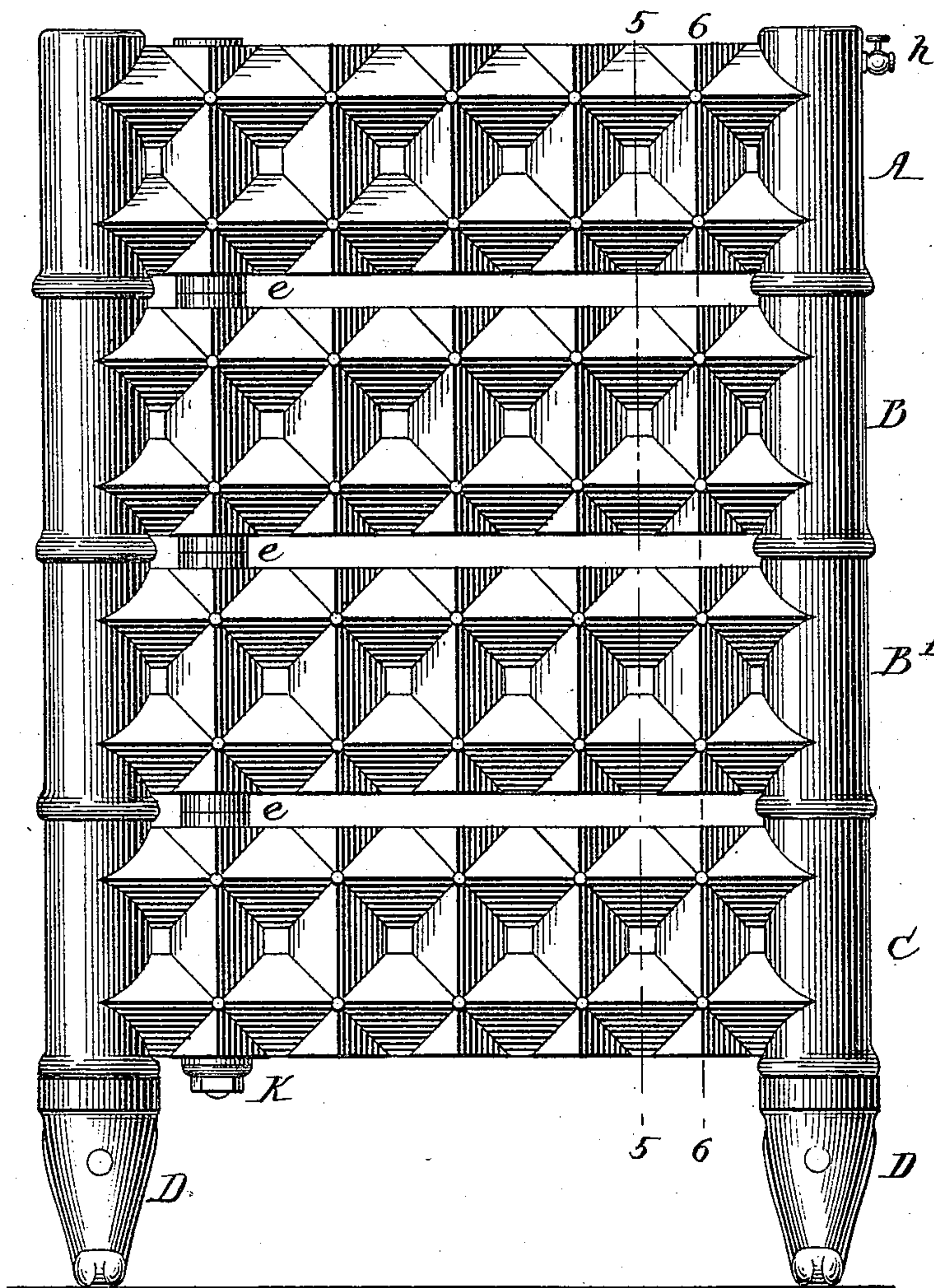
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J. F. PACKER.
RADIATOR.

No. 430,083.

Patented June 10, 1890.

Fig. 1.



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(No Model.)

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Fig. 2.

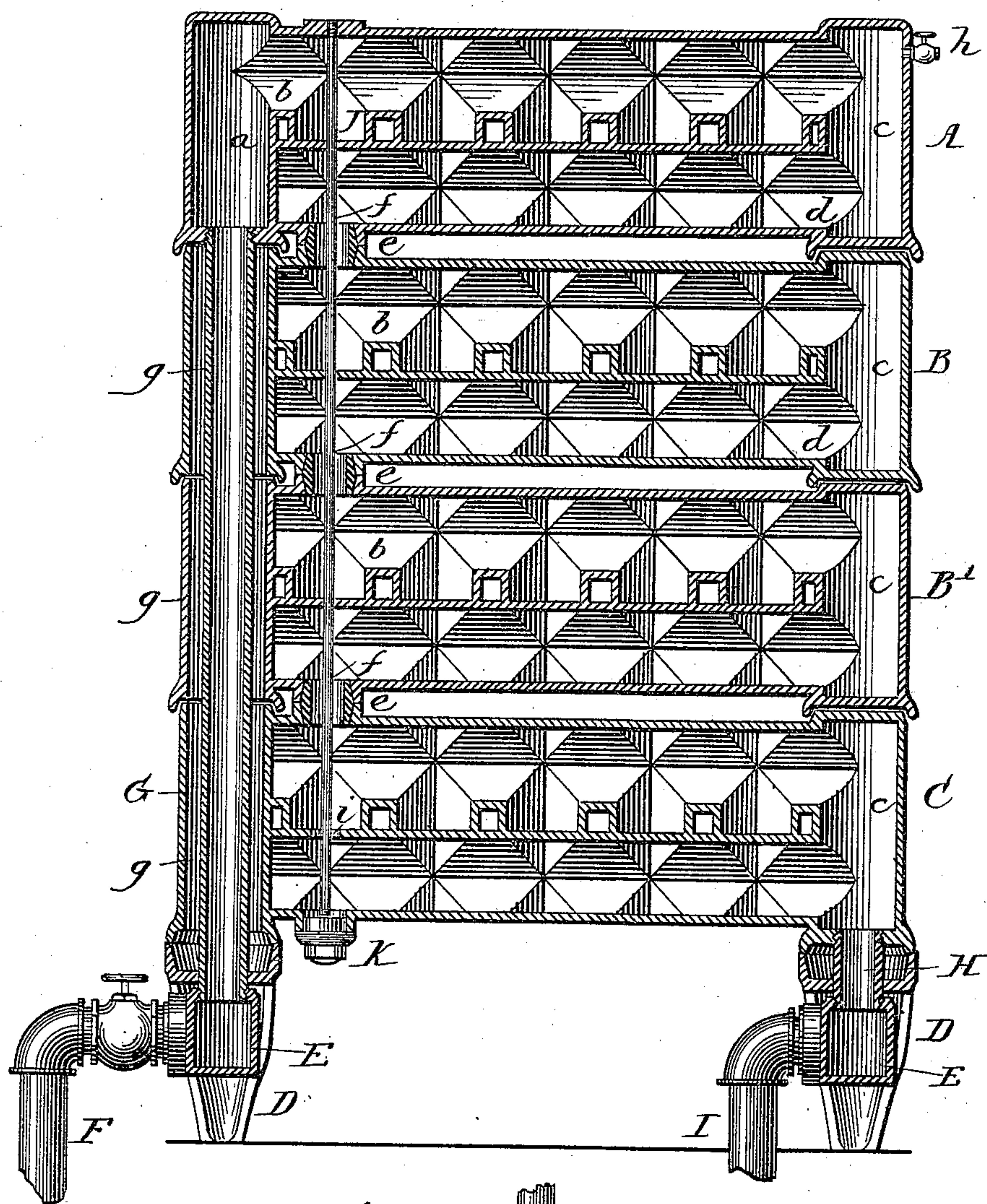
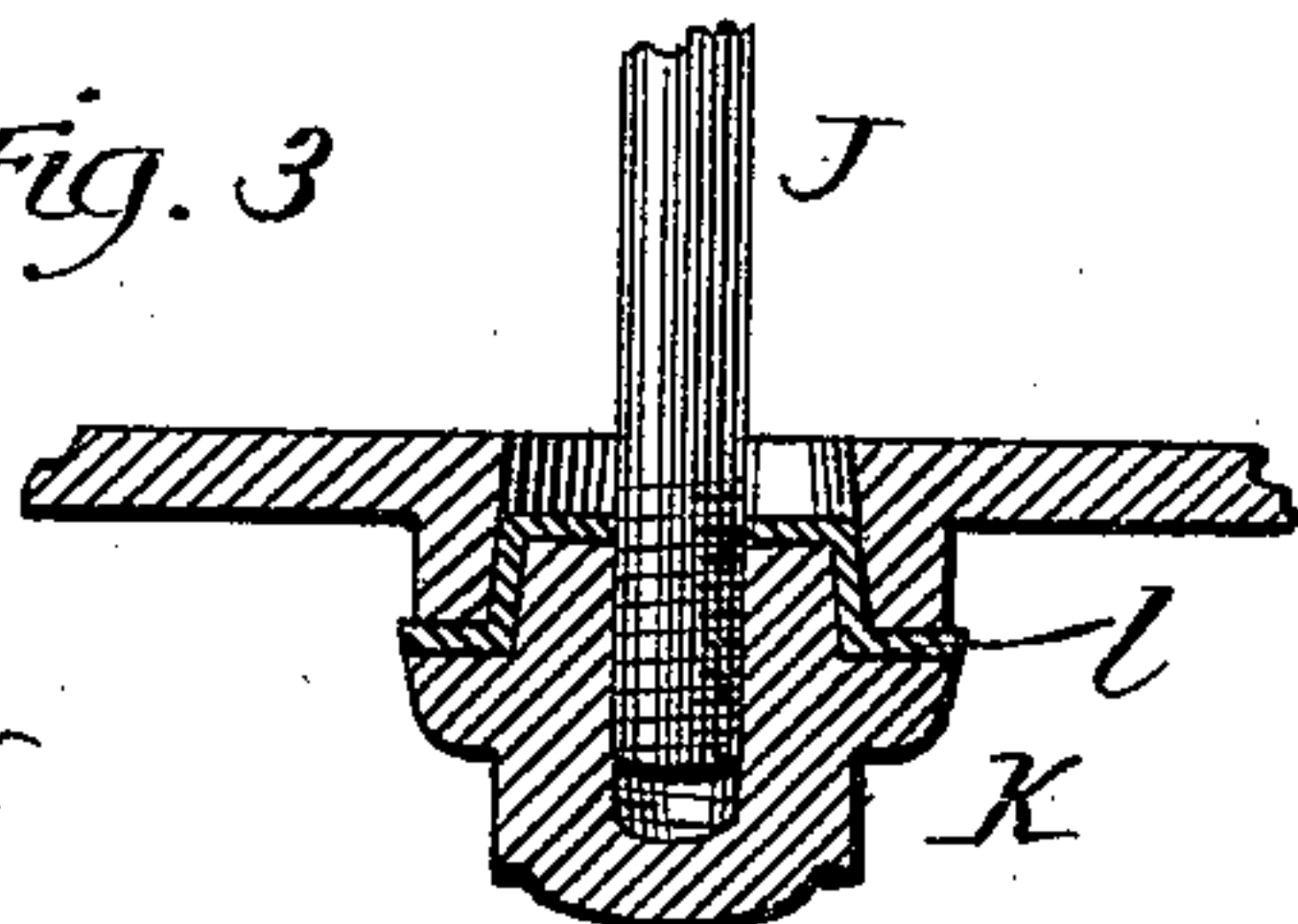


Fig. 3



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Fig. 4.

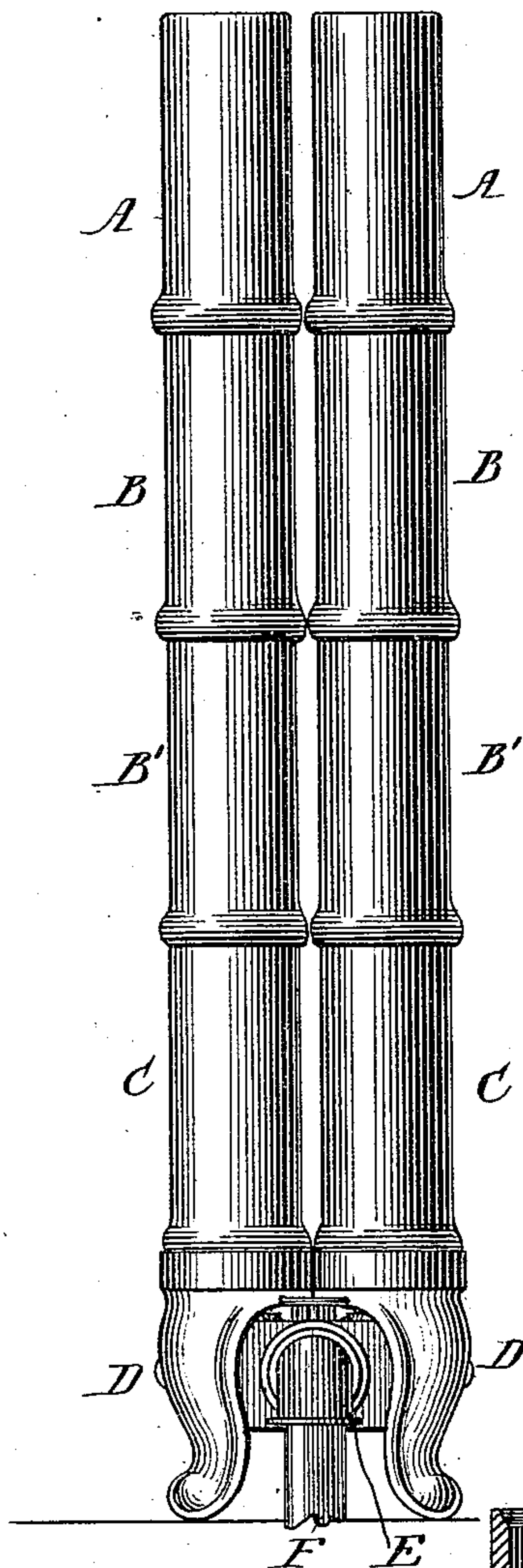


Fig. 5.

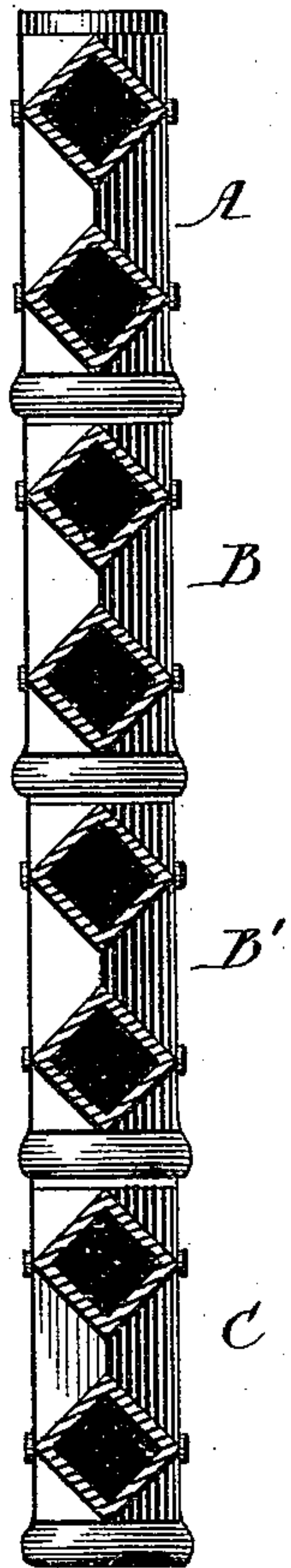


Fig. 6.

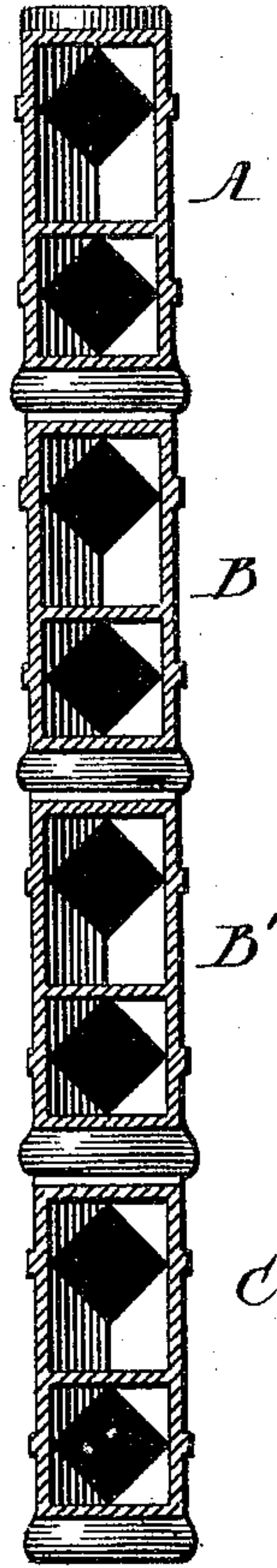
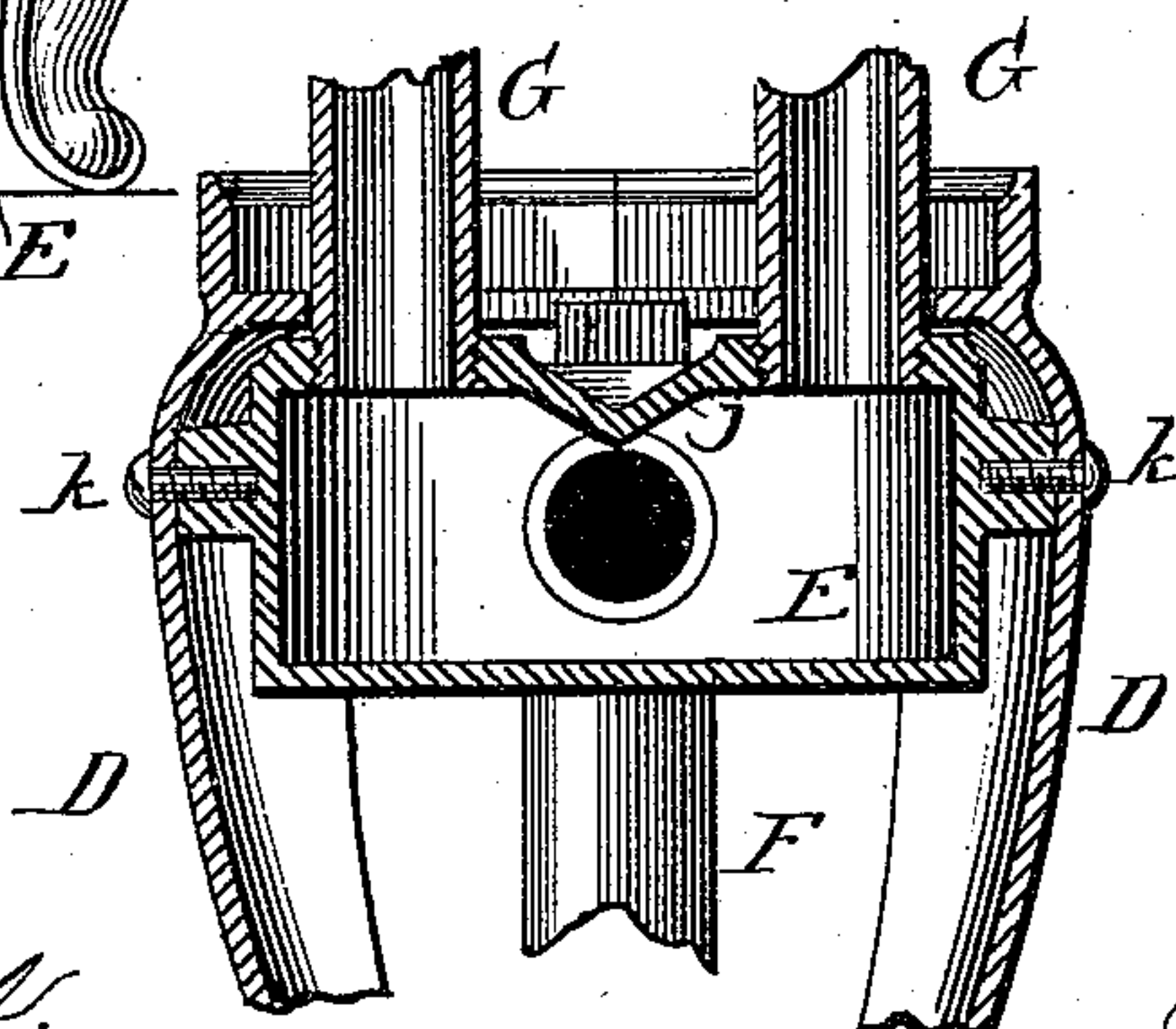


Fig. 7.



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UNITED STATES PATENT OFFICE.

JOHN F. PACKER, OF CHICAGO, ILLINOIS.

RADIATOR.

SPECIFICATION forming part of Letters Patent No. 430,083, dated June 10, 1890.

Application filed August 22, 1889. Serial No. 321,680. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. PACKER, residing at Chicago, in the county of Cook and State of Illinois, and a citizen of the United States, have invented a new and useful Improvement in Radiators, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation. Fig. 2 is a longitudinal vertical section. Fig. 3 is a detail. Fig. 4 is an end elevation of a double radiator. Fig. 5 is a transverse section on line 5 5 of Fig. 1. Fig. 6 is a similar section on line 6 6 of Fig. 1, and Fig. 7 is a cross-section showing the inlet and its connections.

The object of this invention is to provide a radiator which can be used with either hot water or steam, and to construct it in sections, so that radiators of different capacities may be formed from the different sections, and also to construct a radiator which will be steam or water tight, and which can expand or contract without opening any seams or joints by having practically a single joint or connection around or away from which the sections may separately expand without affecting the connection.

The nature of my invention will be hereinafter described, and pointed out in the claims.

In the drawings, A indicates the upper section, B B' the intermediate sections, C the lower section, and D the legs, of the radiator.

E are receiving heads or boxes; F G, induction-pipes; H I, discharge-pipes; J, a connecting-rod; K, a nut at the lower end of the rod J; *a*, a tubular space at the receiving end of the upper section; *b d*, cross-passages; *c*, vertical connections for the cross-passages; *f*, tubes for water-passages from the upper to the lower section; *g*, air-spaces around the pipe G; *h*, vent-cock; *i*, passage through the dividing-plate of the lower section; *j*, a dividing-plate in the receiving-head E; *k*, screws for attaching the head E to the legs D, and *l* a soft-metal packing.

The sections A, B, B', and C are cast entire, and I prefer the form shown in Fig. 1, as that form gives a free circulation of air through the spaces between the sections, and also through the sections by means of holes through the middle of the squares; but it is evident that the openings or holes between

the upper and lower passages *b d* may be run together, so as to form an opening the full width, if desired, in which case no division-plate will be required. In the form shown the passages *b d* are separated by division-plates in the squares, so as to separate each passage, and a right and left passage is provided for each section. The ends of the sections are by preference made cylindrical, and are provided with flanges at their lower ends to fit over under sections, so as to give the radiator a finished appearance, and as the ends are closed no special fitting is required and no leakage can be occasioned by any unequal expansion between the sections. The upper section A is provided with the end passage *a*, while the end passages *c* of all the sections are alike. The lower cross-plate of the upper section forming the passage *a* is closed and the tube G is screwed therein, while the under sections form a continuous passage or dead-air space *g* around the pipe G, and at this end of the radiator the outer tubular sections are not closed at their ends. The sections B B' are made alike. The under-section C is provided with a hole *i* in the partition where the tie-rod goes through, so as to form a water-passage at this point, which in this case prevents the under passage from being a return-passage, as the water or steam passes from both passages into the discharge. The radiator is thus built up of three different kinds of sections, and it will be understood that as many intermediate sections B B' as are necessary to attain the desired height may be used—that is, one, two, or more—and also that all of the intermediate sections may be omitted and an operative radiator may be formed by simply uniting the sections A and C, so that radiators of the desired capacity for the room can be constructed without having special patterns for different sizes and without requiring special construction for the place in which they are to be used, the only changes required being a shortening or lengthening of the tube G and the rod J to adapt them to any height. As there is no water or steam around the pipe G, this end of the radiator does not require any special fitting, even with the end plates omitted, and unequal expansion or contraction at this end between the sections does not have

any injurious effect. These sections are coupled at *e* by means of short projecting flanges, which are preferably made flaring, and in which is inserted a double-incline soft-metal short tube *f*, which makes a water or steam tight connection between the sections, and as this is the only point at which they are connected with water or steam tight joints expansion or contraction operates from this point, so that there is no liability of the expanding or contracting action of the metal opening or straining these joints. The rod J passes through these short tubes *f* and through the opening *i* and is screwed into the top plate, as shown at Fig. 2, while its lower end is provided with a strain-nut K, which may be packed, as shown at Fig. 3, so as to make the radiator water or steam tight. This packing *l* is made of soft metal to fit inside of the retaining-flange, which is slightly tapered, so as to make a packing inside and compensate for any possible difference in expansion between the rod J and the cast sections, and thus prevent the liability of leakage, which might occur if the abutting against the end of the flange were relied on. As the rod J is inside, its expansion or contraction will usually equalize itself with the expansion or contraction of the cast sections, and thus prevent any leakage and any undue strain of the sections; and it will also be understood that the rod J is mainly a safety-rod for preventing the sections from coming apart in handling, or in case of any accidental side-thrusts, otherwise the radiator would be complete without it. The pipe G is screwed into the lower end plate of the end tube *a*, and passes down to a receiving-head E, which is supported by or upon the legs D by means of the screws *k*, as shown at Fig. 7. The supply-tube F is connected with this head E, and is provided with a suitable stop or valve to control the supply to the radiator. At the opposite end of the radiator is a similar head E, into which the water or steam is discharged, and is conducted therefrom by the pipe I to any place desired. The upper ends of the legs D are fitted to receive the lower section C and support it, as shown in Figs. 1 and 4, and they are made, as shown in the drawings at Fig. 7, with a vertical upper sectional rim provided with an interior groove at the upper end, in which the lower rim of section C is placed, and with a horizontal inwardly-projecting flange, which partly surrounds the inlet or escape pipes. The legs are attached to the heads E by the screws *k*, so that the heads with the legs may be placed in position and connected with their supply and discharge pipes before the radiator-sections are mounted thereon. Two or more of these radiators may be built up side by side, as shown in Fig. 4, in which case the receiving-head E will be provided with a dividing-plate *j*, as shown, which will direct equal portions of the ascending water or steam to the two pipes G, which are both connected with the same head.

The discharge-head may be made in the same manner; but a dividing-plate would not be necessary at that point. The discharge-head is connected with the lower section C by a short tube H, as shown in Fig. 2. The receiving and discharge heads E are more easily applied than bent tubes; but it will be understood that where single radiators are used these heads may be dispensed with, and the pipes G F and H I may be connected directly together or be made as single pipes.

In operation for water the water will ascend through the tube G to the tube or passage *a*, from thence through the passage *b* to the tubular passage *c*, from which it will return through the passage *d* to the connecting-pipe *f*, where it will descend to the passage *b* of the next lower section and to the second tube *c*, and return to a second tube *f*, and so on through as many intermediate cast sections as are used, and in passing into the lower section C the water passes through the lower connecting-tube *f* and through the enlarged passage *i* into both passages of the lower section, so that the flow of water in both is toward the discharge-pipes H I, where it passes out of the radiator. When steam is used, it will traverse the same passages in the same manner.

The legs D are so made that they are removable when the screws *k* are taken out, and by having a bearing against the heads E they are strongly held in position and give the radiator a firm support; but the pipes F I will support the radiator, so that the legs can be safely removed for the purpose of taking up or putting down carpets or for obtaining access to the heads E.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. The combination of the section A, having the end passages *a c* and the lateral passages *b d* and tube *f*, with the section B, also having passages *b d* and end passage *c*, and the lower section C, having the passages *i* and *c*, substantially as specified.

2. The combination of the section A, having the end passages *a c* and cross-passages *b d*, with the section C, having the opening *i* and passage *c*, and the supply-pipe G and discharge H, substantially as specified.

3. The combination, with upper, lower, and intermediate sections having vertical end passages *c* and cross-passages *b d*, of a supply-tube G, extended from the base of the radiator to the upper section at one end, a discharge-tube H, leading from the lower section, the connecting-tubes *f*, located between the sections adjacent to the supply-tube, and the connecting-rod J, passed through the tubes *f*, substantially as described.

4. The combination, with upper, lower, and intermediate sections having vertical end passages *c* and cross-passages *b d*, and the heads E E below both ends of the lower sections, of the pipe F, leading into one of said heads, the pipes G, extended from said head to the up-

per sections, the pipes H, leading from the lower sections into the other head, and the pipe I, leading from said head, substantially as described.

5 5. The combination, with the radiator-sections having vertical end passages and horizontal cross-passages, of the heads E, having legs D, the pipe F, leading into one of said heads, the pipe I, leading from the other head, the supply-pipes G G, extended from one of said heads to the upper sections of the radiator, and the pipes H H, leading from the lower sec-

tions into the other head, substantially as described.

6. The combination of the section C, having the interiorly-tapered annular flange and rod J, with the nut K, partly entering the tapered flange, and the packing l, substantially as and for the purpose described.

JOHN F. PACKER.

Witnesses:

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