

J. B. ROOT.

Sectional Steam-Boiler Connections.

No. 146,097.

Patented Dec. 30, 1873.

Fig. 1.

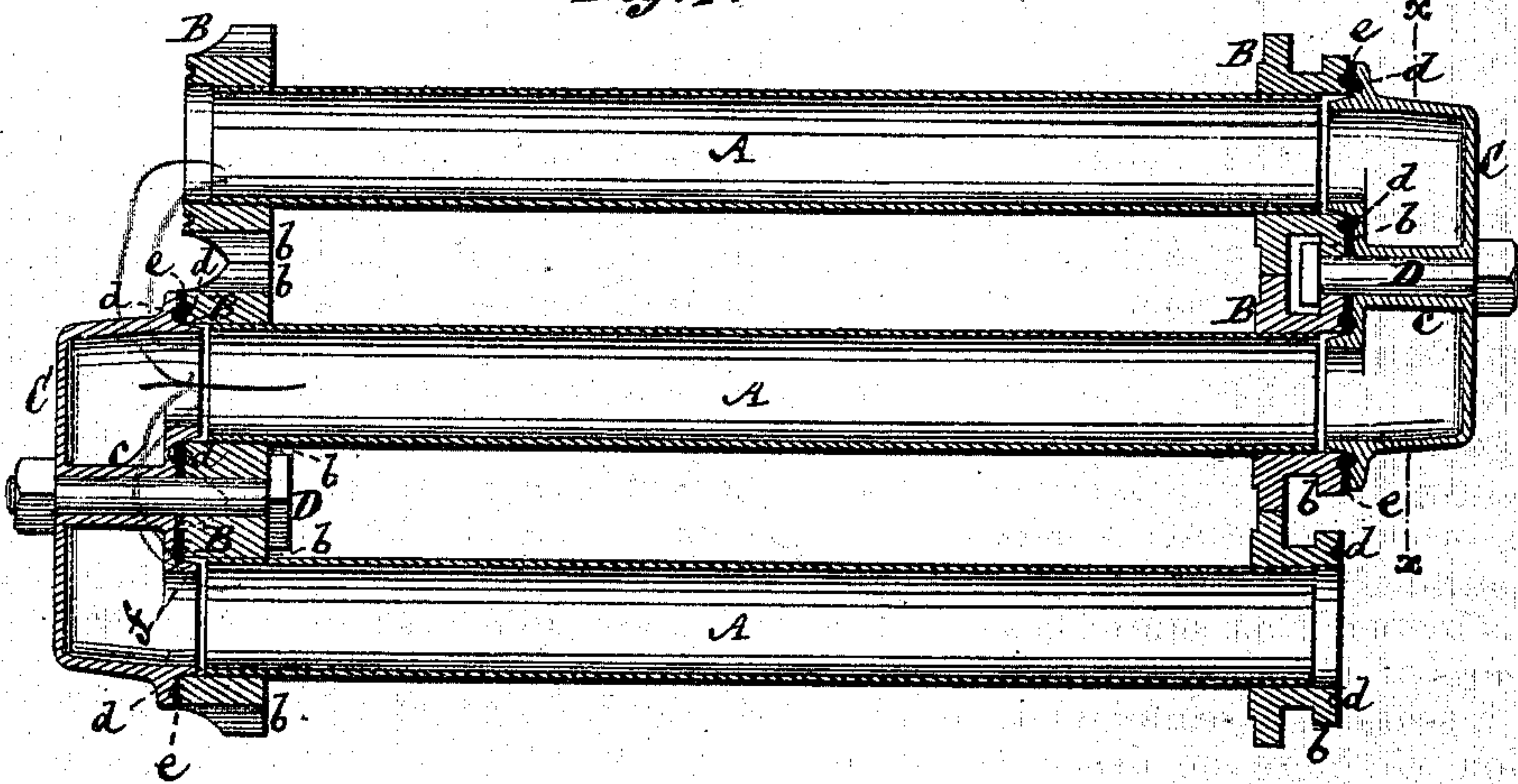


Fig. 4.

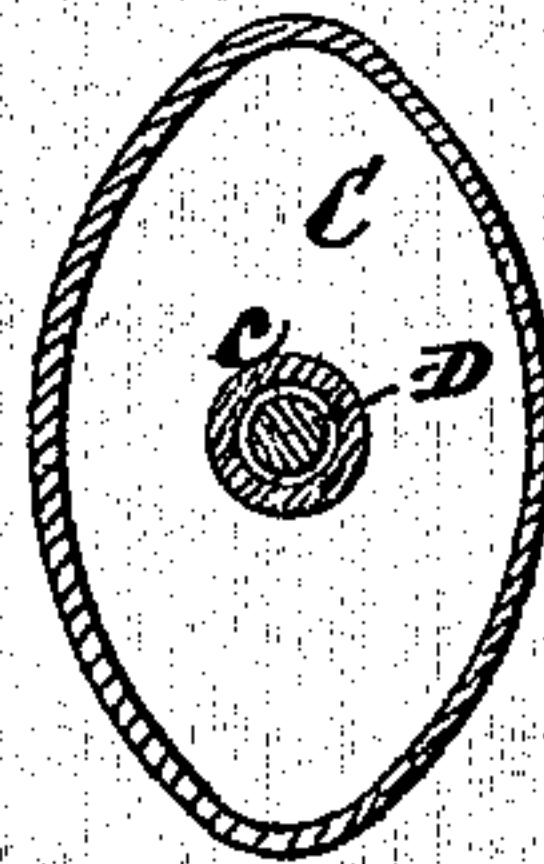


Fig. 3.

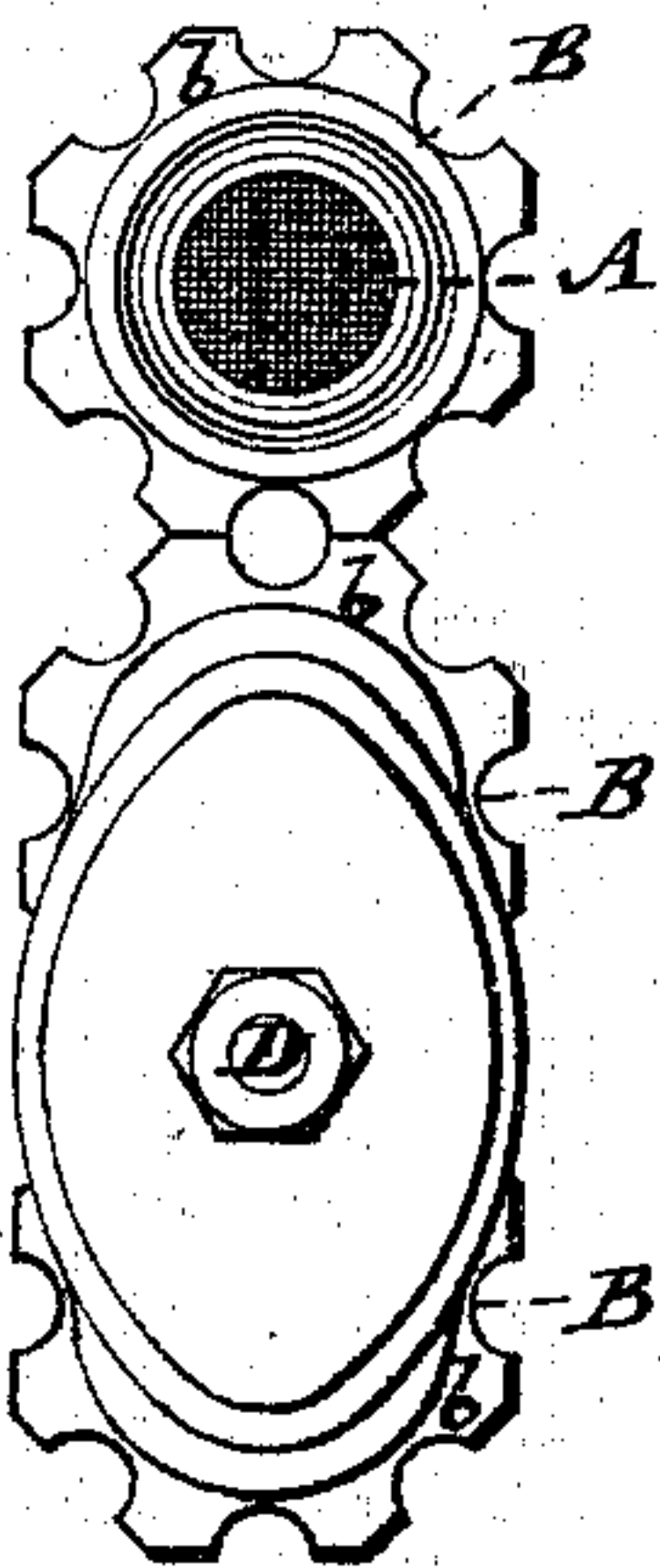
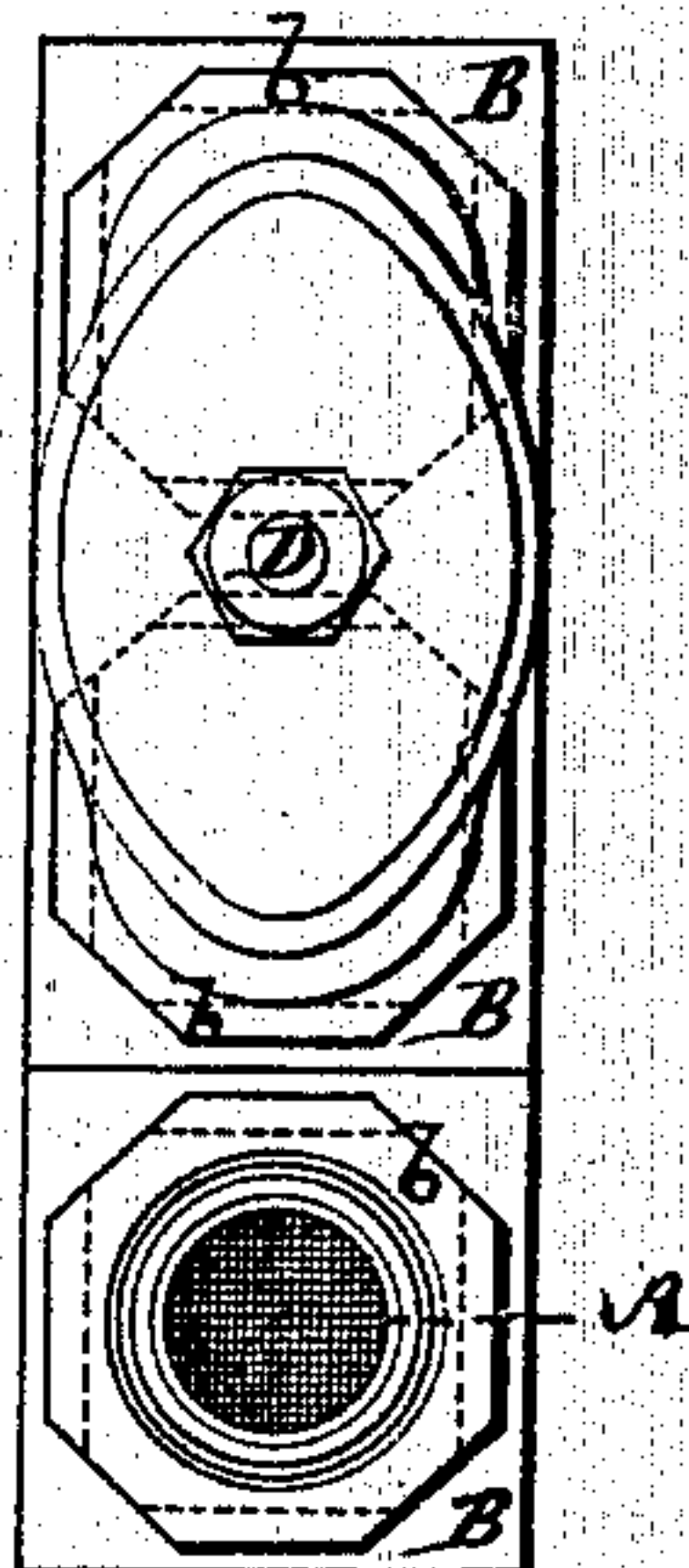


Fig. 2.



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IMPROVEMENT IN SECTIONAL STEAM-BOILER CONNECTIONS.

Specification forming part of Letters Patent No. **146,097**, dated December 30, 1873; application filed March 15, 1873.

To all whom it may concern:

Be it known that I, JOHN B. ROOT, of the city, county and State of New York, have invented certain Improvements in Sectional Steam-Boiler Connections and Pipes, and for other purposes, of which the following is a specification:

This invention relates to sectional steam-boilers and other structures composed of a cluster of parallel tubes or pipes connected at their ends by bends outside of heads, within which the ends of the tubes fit, said tubes, in the case of a sectional steam-boiler, to which the invention will here be described as applied, serving to circulate the water and steam, while the fire or heated products of combustion pass freely between them.

The invention consists in a certain combination of interior nozzles on the bends, with grooves in the faces of the latter and heads of the tubes, and soft or compressible packings forming tongues within the grooves, the rubber, lead, or other soft material within the grooves in the bends and in the heads of the tubes forming compressible tongue-packings that will keep the joint tight in case of any tipping of the bends.

In the accompanying drawing, which forms part of this specification, Figure 1 represents a vertical longitudinal section of certain of the tubes of a sectional boiler with heads and bends attached and having my invention applied; Figs. 2 and 3, opposite end views of the same; and Fig 4 is a section through one of the return or outside connecting-bends on the line *x x*.

Similar letters of reference indicate corresponding parts.

A A A represent three of the water or steam and water tubes of a sectional boiler, arranged parallel with each other, or successively one above the other, and fitting at their ends within heads B B, the contiguous edges of which meet, and which are respectively formed with outside flanges *b b*, that may either be arranged beyond or outside of the meeting-edges of the heads, as shown to the right hand of Fig. 1 and in Fig. 2, or may be

the meeting portions of the contiguous heads, and be suitably perforated or recessed on their edges for a bolt to pass between them after adjustment of said heads, as represented to the left hand at Fig. 1 and Fig. 3, the heads, in the first instance, being parallelogrammic, and of an irregular shape in the other. It is desirable in both cases, however, that the flanges *b* should be many-sided, or otherwise equivalently constructed, to facilitate fitting together, and detachment or adjustment of the parts, and passage or removal, when required, of the bolts which unite the return or outside bends C with the heads. These bends C connect parallel pipes or tubes A, or rather the heads B thereof, and are provided on their inner faces with nozzles *f* arranged to enter said heads, to which they are secured—that is, each bend to two parallel tubes or heads thereof—and said heads, tubes, and bends held in their proper relative positions by means of a single bolt, D, arranged to pass through a sleeve, *c*, each bend from the outside and between the flanges *b* of the contiguous heads of two parallel or adjacent tubes, and so that the head or nut of each of said bolts takes its bearing on the two flanges of such adjacent heads.

The joints between each bend C and the heads B B, connected by the latter, are made by forming annular or continuous grooves *d d* in the faces of said heads, and in the nozzles *f* on the faces of the bends, and introducing between such parts or surfaces packings *e e* of rubber, lead, or other soft material, so that on tightening up the bends said packings will not only be compressed between the faces of the heads and bends, but be also forced into the grooves *d d*, and thus make a tongue-and-groove joint, which will remain tight in case of any tipping of the bends consequent upon unequal expansion of the tubes.

The nozzles *f* are not required to closely fit the heads B B, but merely serve to assist in placing the bends C, and, by the elastic packings *e* forming a tongue-and-groove joint, there is no necessity to finish off the contigu-

ous surfaces of the bends and heads, or even to turn the grooves in which the elastic packings fit.

What is here claimed, and desired to be secured by Letters Patent, is—

The combination of the nozzles *f* of the bends *C*, the grooves *d d* in the faces of the bends and heads *B B*, and the soft or com-

pressible packings *e e* forming tongues within the said grooves, for the purpose of connecting parallel pipes in clusters, substantially as shown and described.

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