F. TODD.

RADIATOR FOR AUTOMOBILES.

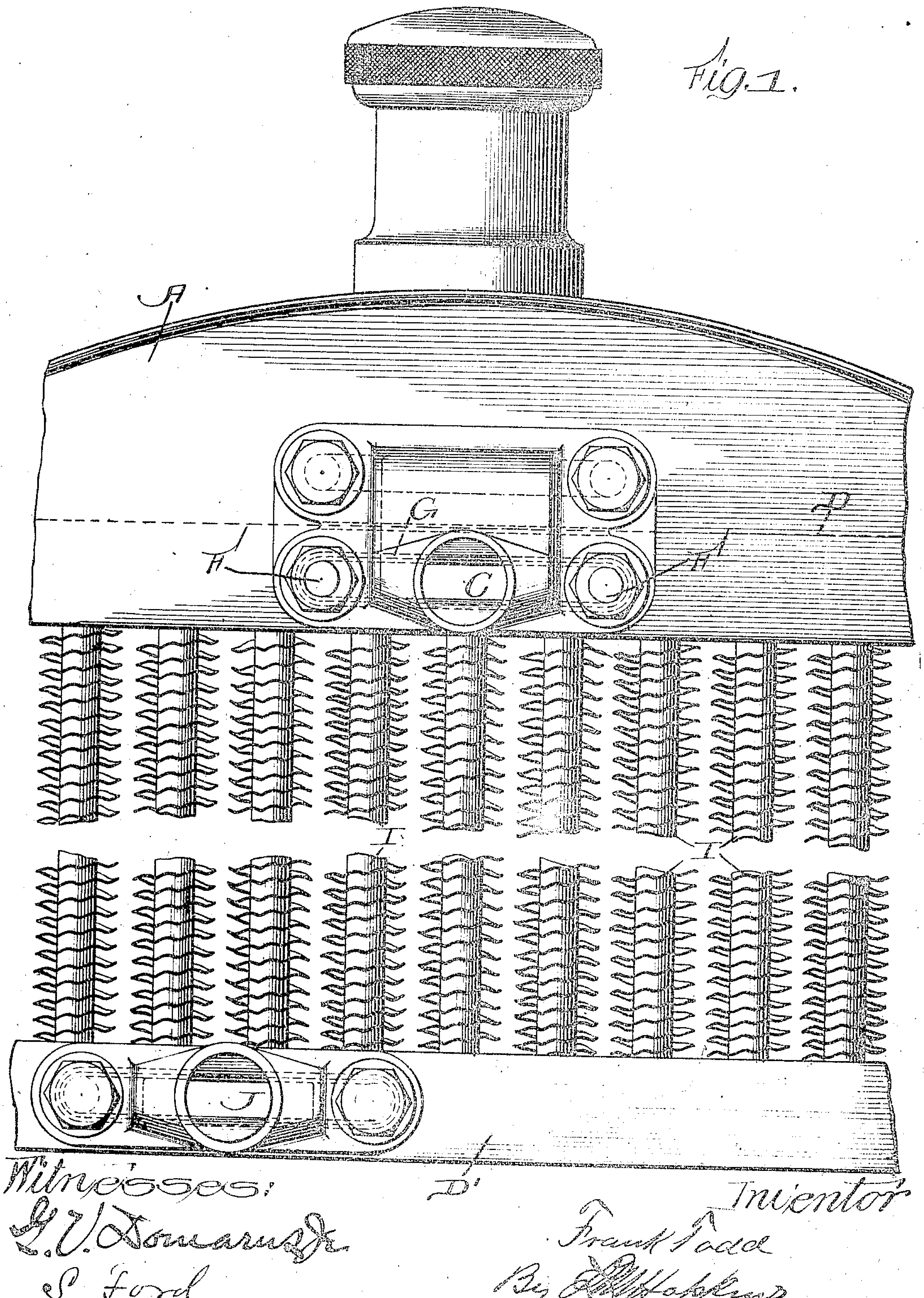
APPLICATION FILED AUG. 30, 1907.

934,584.

Patented Sept. 21, 1909.

4 SHEETS—SHEET 1.

Fig. 1.



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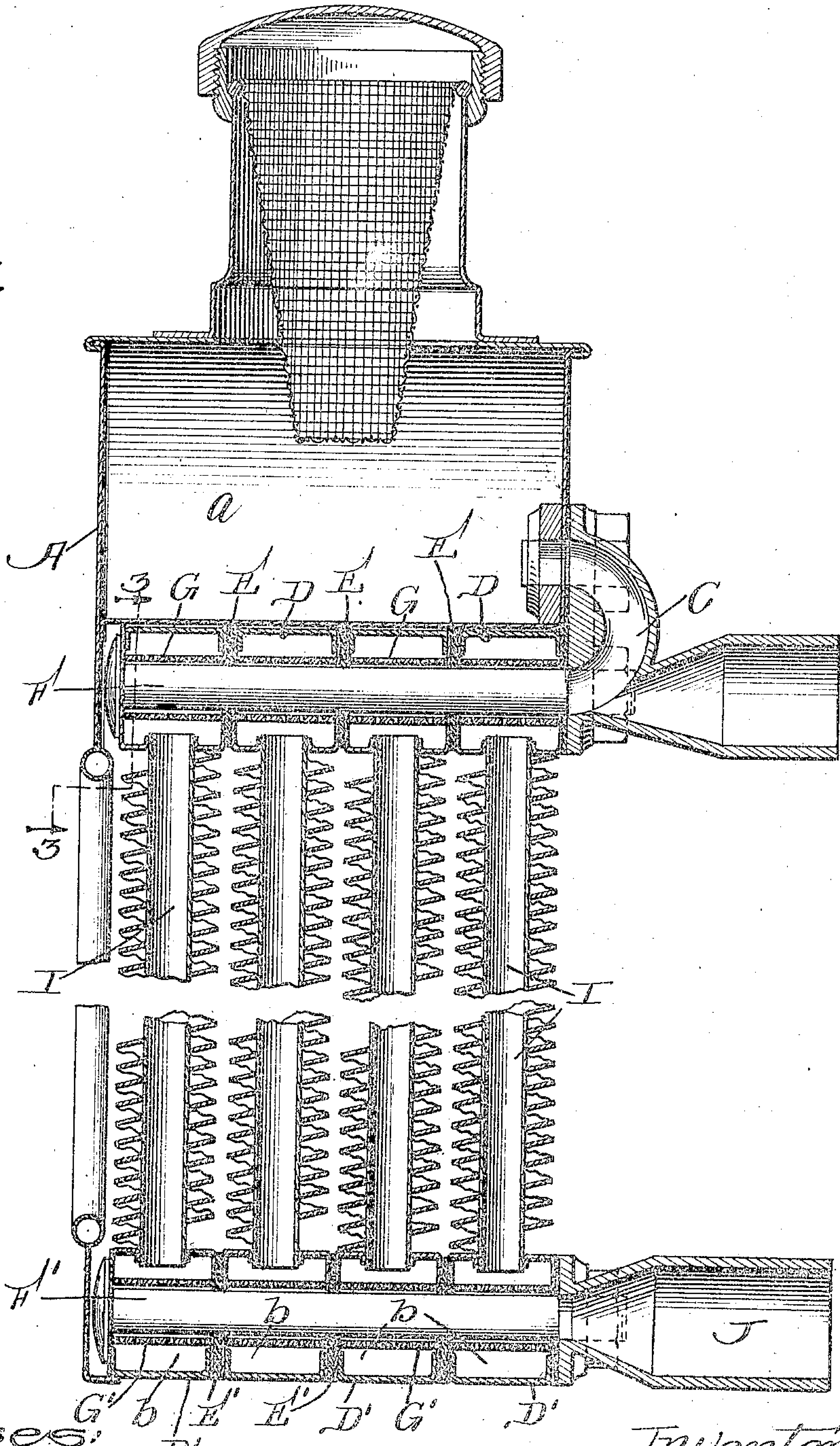
4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 3.

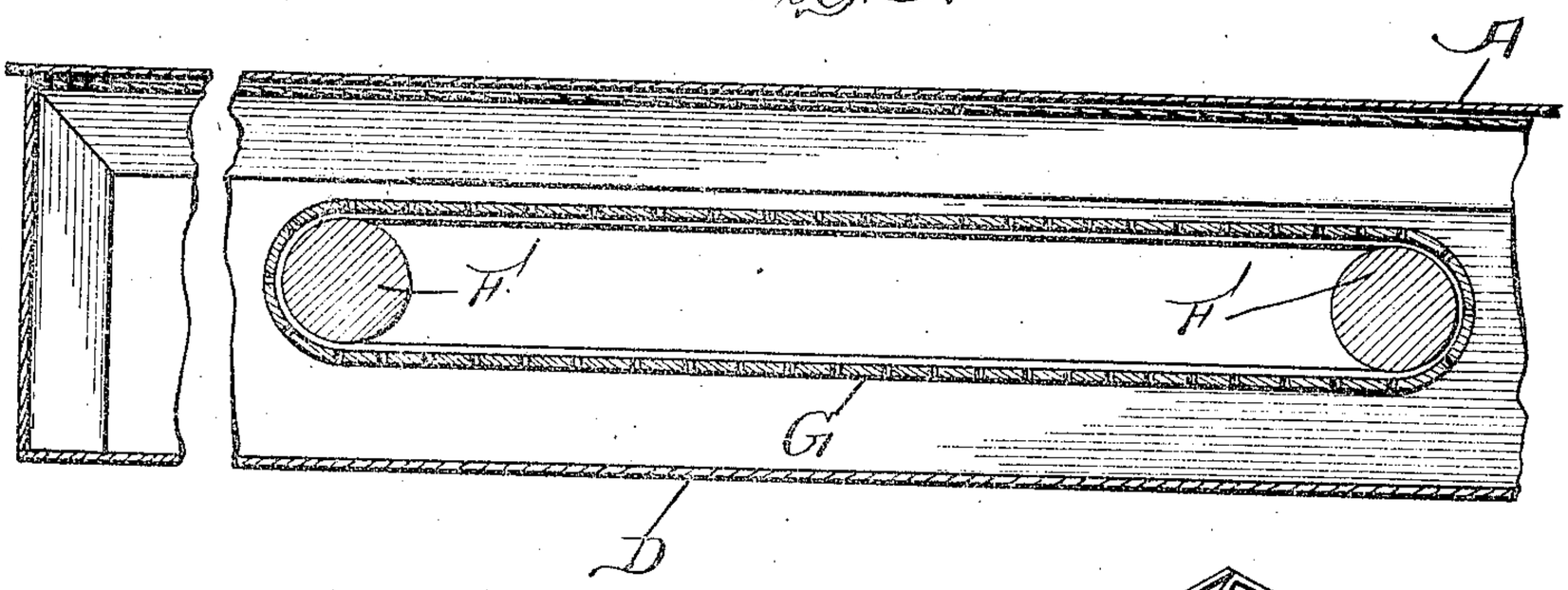


Fig. 4.

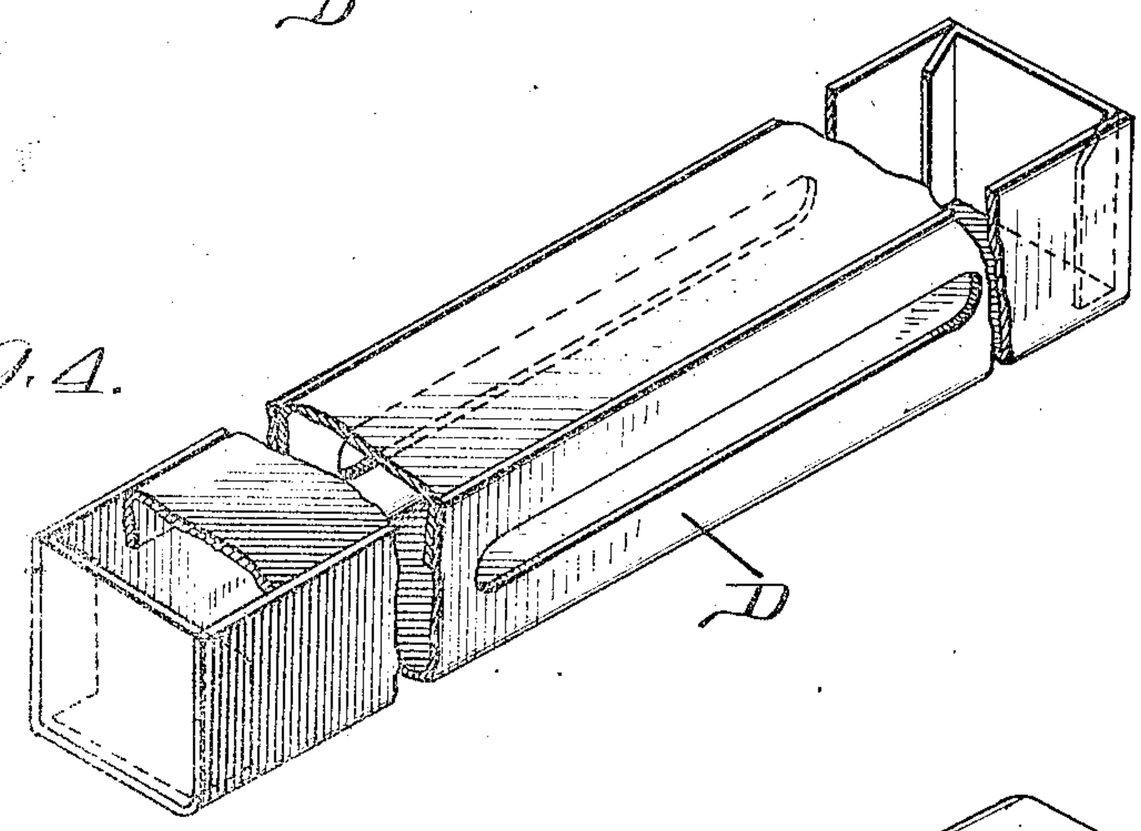
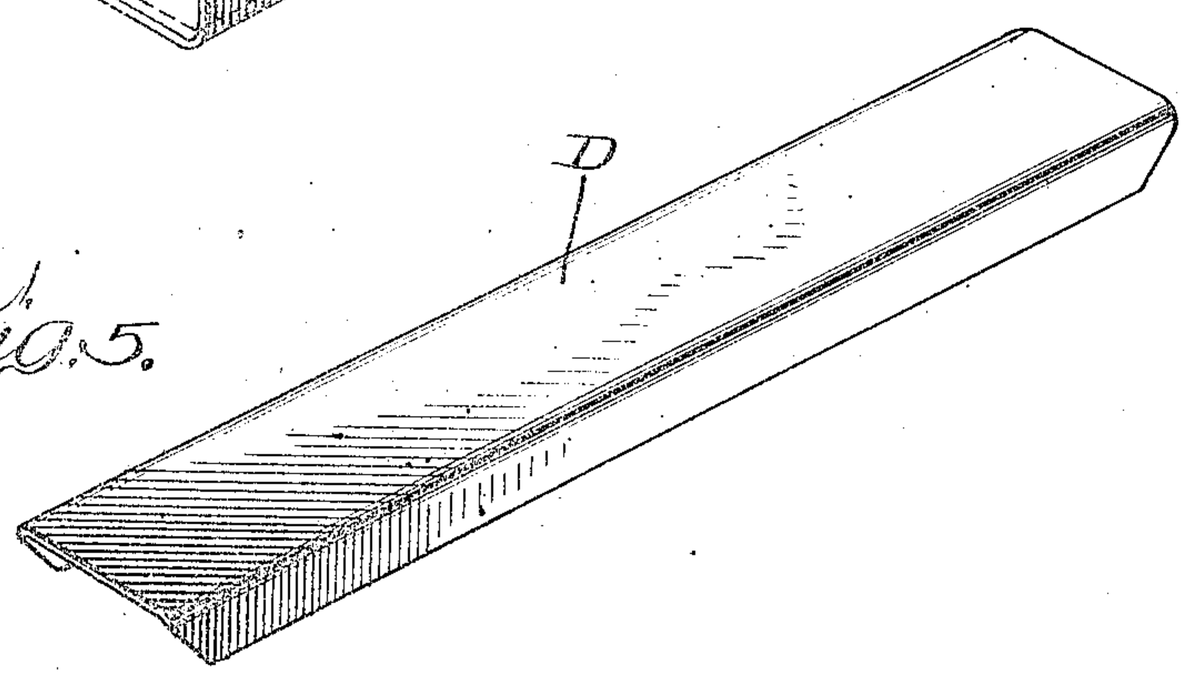


Fig. 5.



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RADIATOR FOR AUTOMOBILES.
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934,584

Patented Sept. 21, 1909.
4 SHEETS—SHEET 4.

Fig. 8.

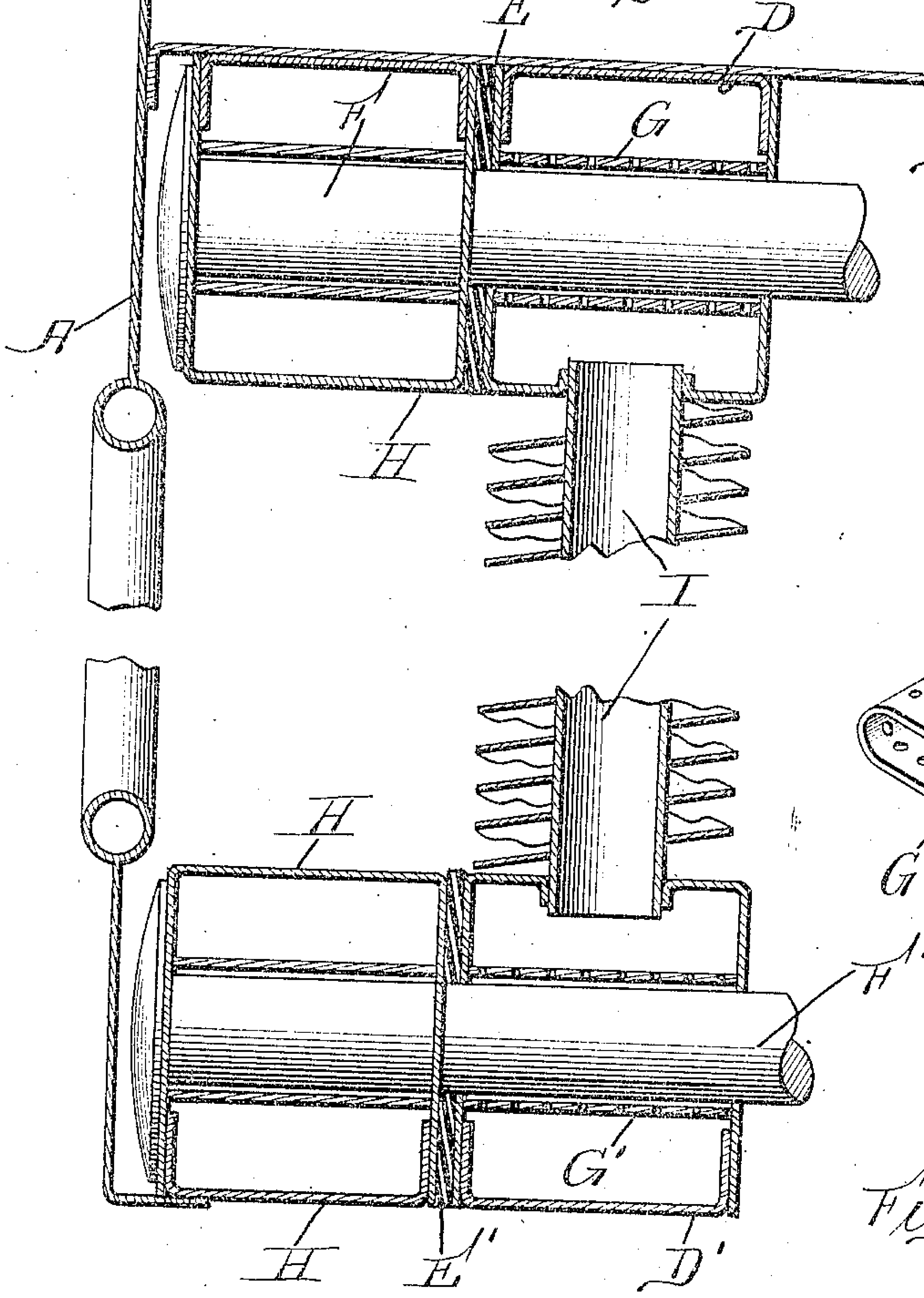


Fig. 6.

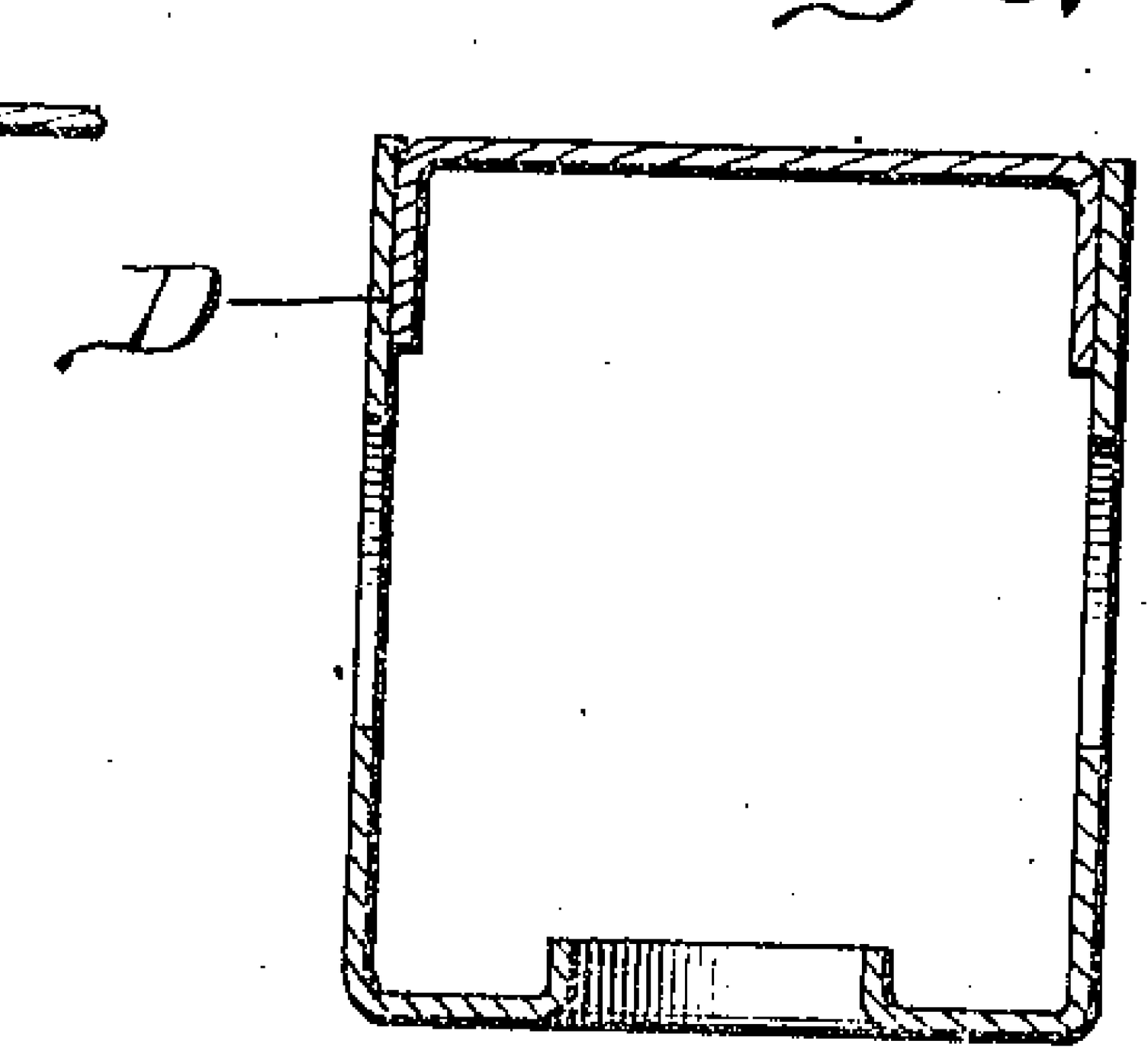


Fig. 7.

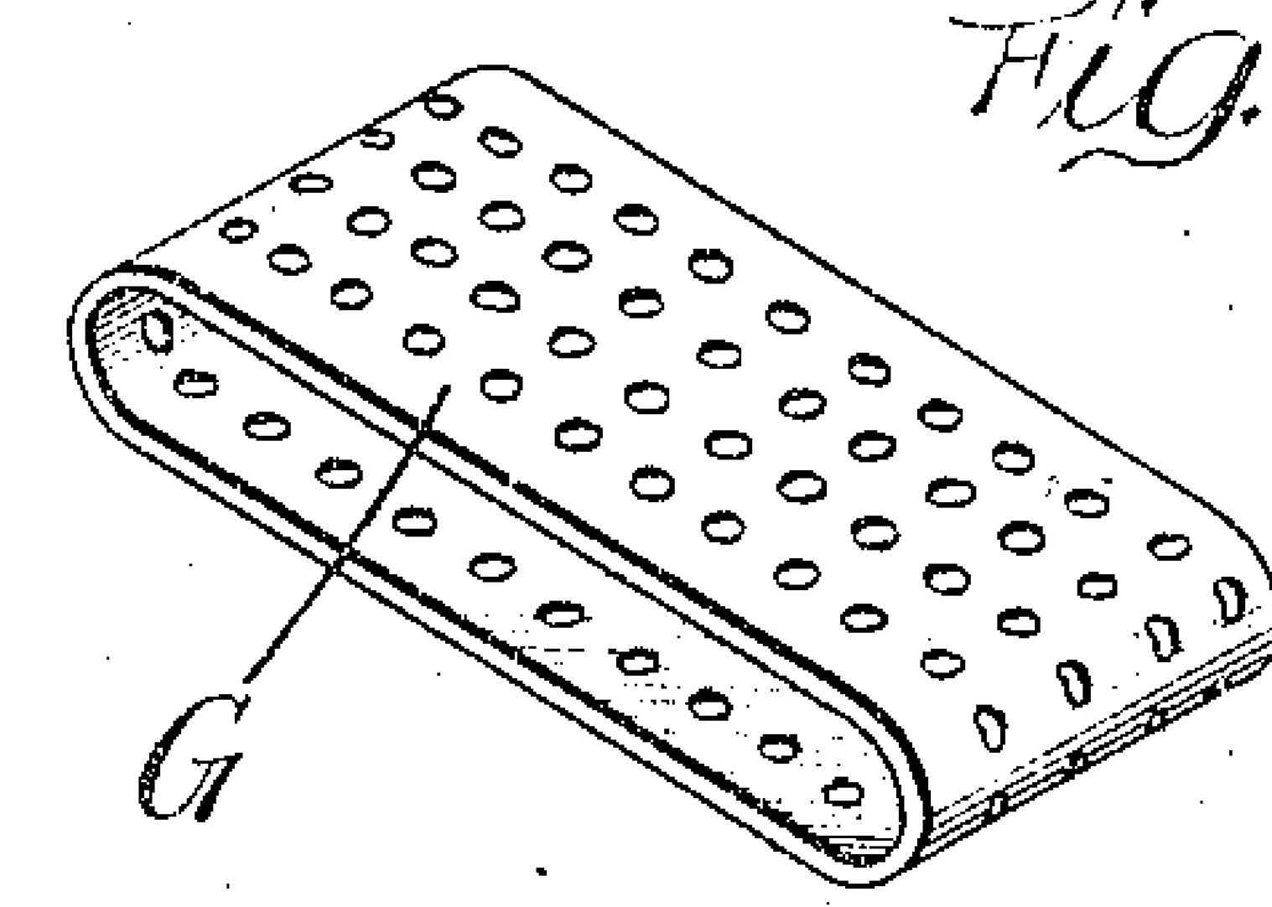
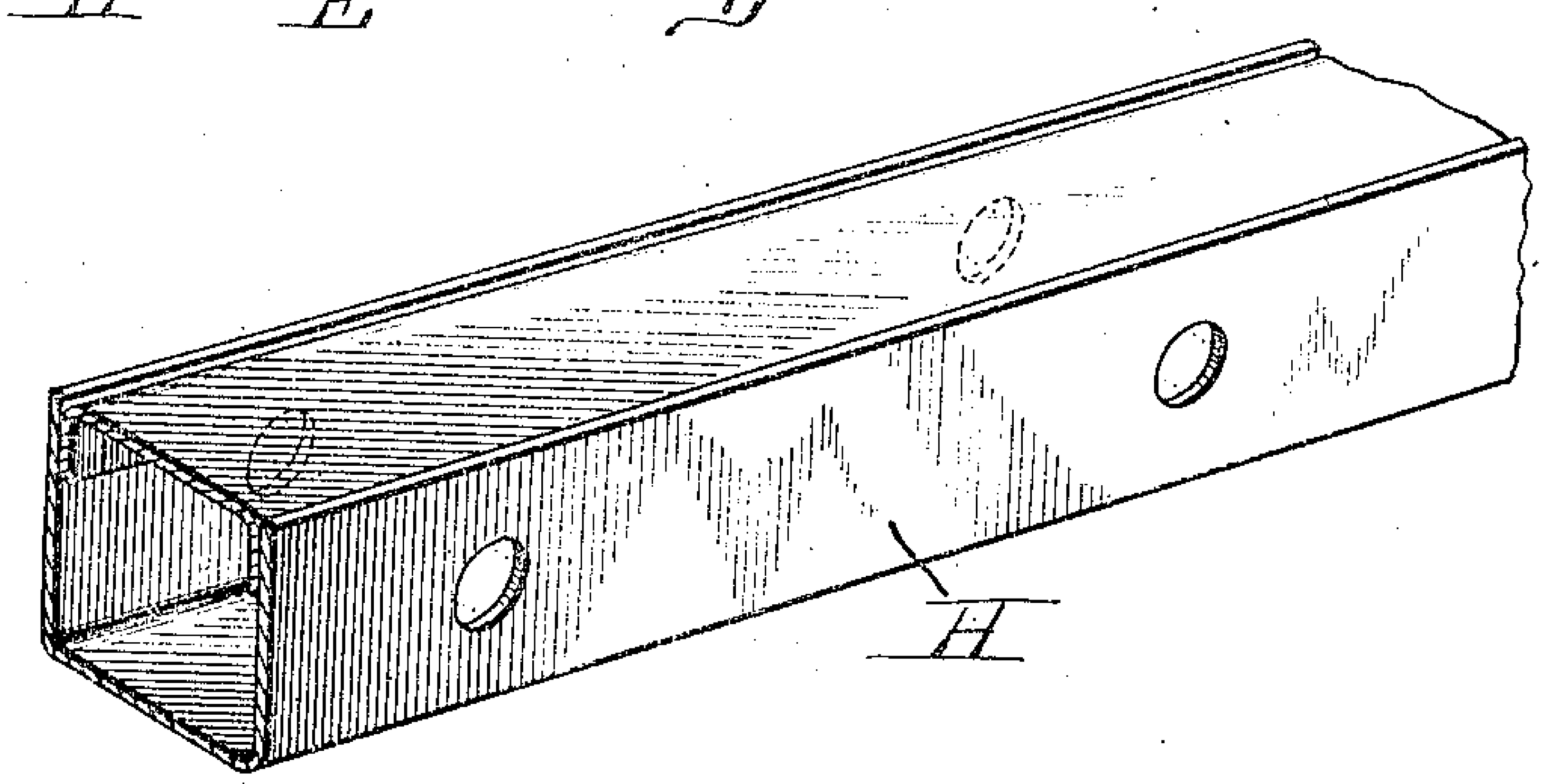


Fig. 9.



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UNITED STATES PATENT OFFICE.

FRANK TODD, OF CHICAGO, ILLINOIS, ASSIGNOR TO JOSEPH B. LONG, OF CHICAGO, ILLINOIS.

RADIATOR FOR AUTOMOBILES.

934,584. Specification of Letters Patent. Patented Sept. 21, 1909.

Application filed August 30, 1907. Serial No. 390,769.

To all whom it may concern:

Be it known that I, FRANK TODD, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Radiators for Automobiles, of which the following is a specification.

In practice difficulty has heretofore been experienced in repairing breakages and leaks, especially in an interior and not easily accessible part of the radiator. Those familiar with the art are aware that in some instances the matter of repairing a slight leak in an inaccessible part involves not only a considerable expense but also a disfiguration of the radiator which makes it undesirable for further use.

The object of the present invention is to provide a radiator that involves the construction unit system; or in other words a system enabling the radiator to be constructed or reconstructed of structural units having uniform characteristics.

An important and peculiar feature of the invention is a construction which enables the substitution of a "dummy" element or unit of construction for an active element or unit which may happen to become disabled. So far as I am aware this has never been done in actual practice, and the desirability of it is self-evident.

The present invention involves among other things a construction of such a nature that should one of the elemental units of the radiator become disabled upon the road or in a locality where repairs of the nature required are impracticable a "dummy" can be substituted without impairing the operativeness of the radiator and without any disadvantage thereto with the exception of the diminution of its capacity to the extent of the removed active elemental unit.

These being the objects, the invention consists in the features of novelty that are hereinafter described with reference to the accompanying drawings, which are made a part of this specification, and in which;

Figure 1 is a front elevation of a radiator embodying the invention in its preferred form. Fig. 2 is a transverse section thereof in a vertical plane. Fig. 3 is an enlarged section of a portion of one of the headers on the line 3—3, Fig. 2. Fig. 4 is a perspective view of one of the headers with portions broken away and the bracing sleeve omitted. Fig. 5 is a perspective view of the top or cover of the header. Fig. 6 is a transverse section of a header. Fig. 7 is a perspective view of a bracing sleeve. Fig. 8 is a fragmentary vertical section of a radiator embodying the invention and showing the use of "dummy" headers. Fig. 9 is a perspective view of the middle portion of a "dummy" header.

A represents the customary casing or outside jacket of the radiator of an automobile. In the present instance it has an upper or inlet chamber *a* into which the water is admitted from the jacket of the motor and an outlet chamber *b* from which the water, having been colled, escapes, returning to the jacket of the motor. The characteristic of the present invention resides in the manner of assembling the parts going to make up the radiator. From the chamber *a* the water passes in the first instance through a passage C into the so-called headers D of the radiator, whence the circulation takes place in the customary manner. The passage C opens into one of the headers D and these headers are all coupled up in such manner that when the water enters one it passes freely from that one into the other, and so on in series. These headers have interposed between them elastic packings E, which are for the sole purpose of making water tight joints between them and are tied together by bolts F, which are disposed longitudinally with respect to the direction of the operation of the machine. The passage C is so constructed that it enters into the bolt construction, forming a part of the connection between the several headers. In other words the passage C is formed in a casting, a part of which receives the tie-bolts F. These tie-bolts are surrounded by elongated sleeves G which are perforated in order to permit the flow of water through them but otherwise perform the sole function of bracing the sides of the headers D in opposition to the resistance of the tie-bolts by which they are tied together.

As already intimated the purpose of this invention is to provide a separable and segregable structure, so that in the event of the destruction or disabling of any element of the radiator, the disabled element may be removed and I have therefore provided "dummy" elements H which may be substituted for the headers G. The effect of this

is that should the front section, become disabled and the operator being without a similar section to replace it, he may replace it by the dummy sections H which restores the radiator to the operative condition, but simply reduces its capacity to the extent of the removed section.

Another decided and very material advantage of the construction shown is that when a damaged section of the radiator requires to be removed it can be done with facility, the radiator in its entirety being made up of a number of absolutely similar units, anyone of which can be removed or replaced with facility.

From the headers D the water passes downward through the radiating tubes I and into the lower headers D′ and thence to the outlet J. The lower headers are constructed and arranged precisely like the upper headers, and have similar accessories, which bear the same reference letters as the accessories of the upper headers, plus the prime mark (′).

What I claim as new is:

1. In a radiator the combination of a plurality of circulating tubes, each having at each of its ends, respectively, a header-section, means for forming tight joints between the header sections, upper and lower water chambers; tubes passing through the upper and lower header-sections, and a waterway or passage connecting said tubes with the water chambers, said tubes being provided with lateral perforations.

2. In a radiator the combination of plurality of vertical circulating tubes or conduits, header-sections communicating with the upper and lower ends of said conduits, respectively, said header sections having horizontal openings, horizontal tubes occupying said openings, and having lateral openings, upper and lower chambers, and conduits or passages communicating with the upper and lower chambers and the horizontal perforated tubes aforesaid.

3. In a radiator the combination of a plurality of vertical circulating tubes or conduits, header-sections communicating with said conduits at their upper and lower ends respectively, tie bolts passing through the header-sections and adapted to draw them into close contact with each other, perforated tubes disposed horizontally and passing through said header-sections, and in-let and out-let passages communicating with said horizontal conduits, respectively.

4. In a radiator the combination of a plurality of vertical circulating tubes or conduits, header-sections with which the upper and lower ends of said conduits communicate, respectively, an upper, or in-let chamber, a water jacket, a passage leading from the water jacket, a perforated tube arranged within the headers at the upper ends of the conduits, a tie bolt adapted to draw the header-sections together, and dummy header-sections adapted to be inserted in the place of disabled active header-sections.

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