

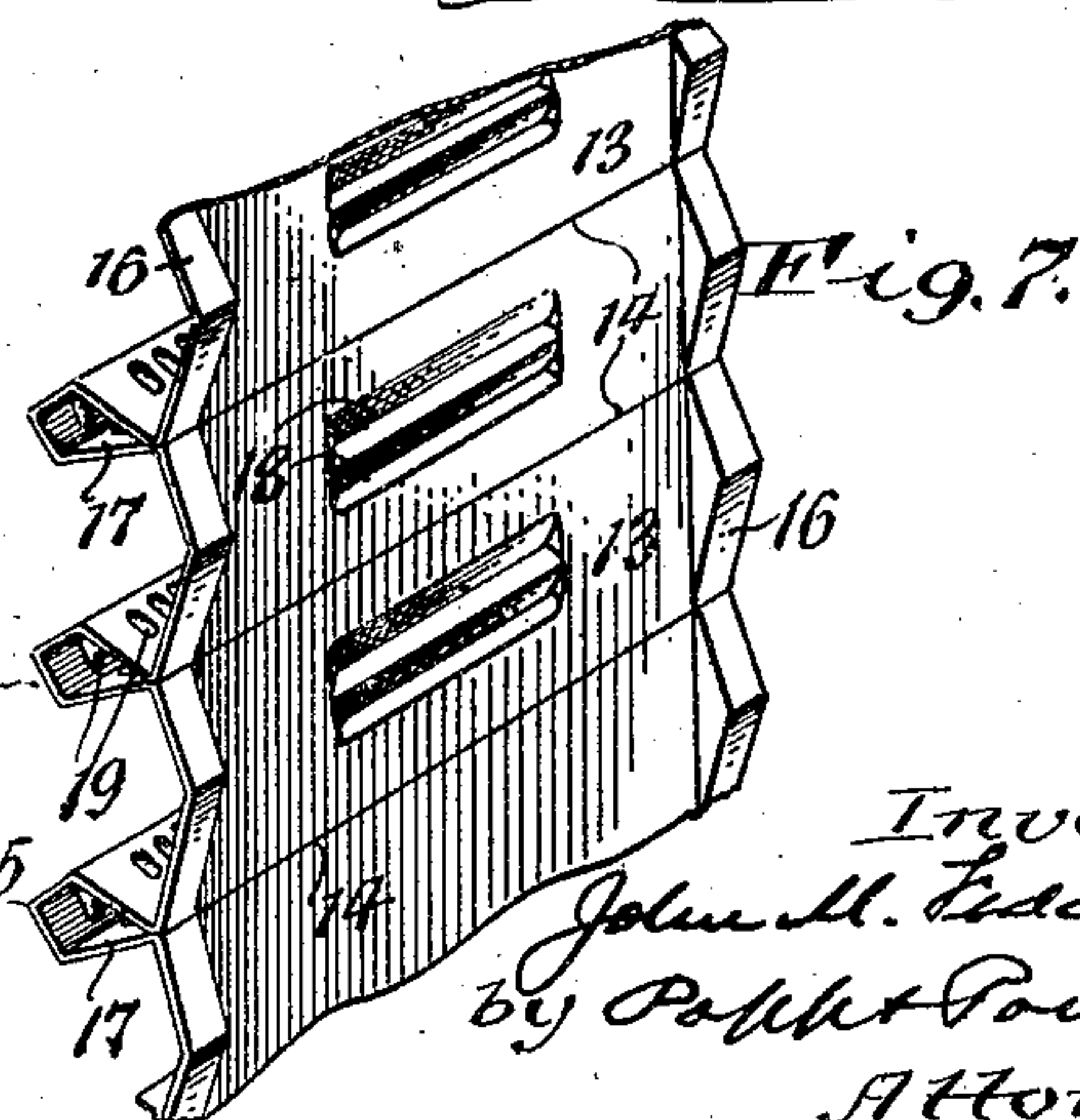
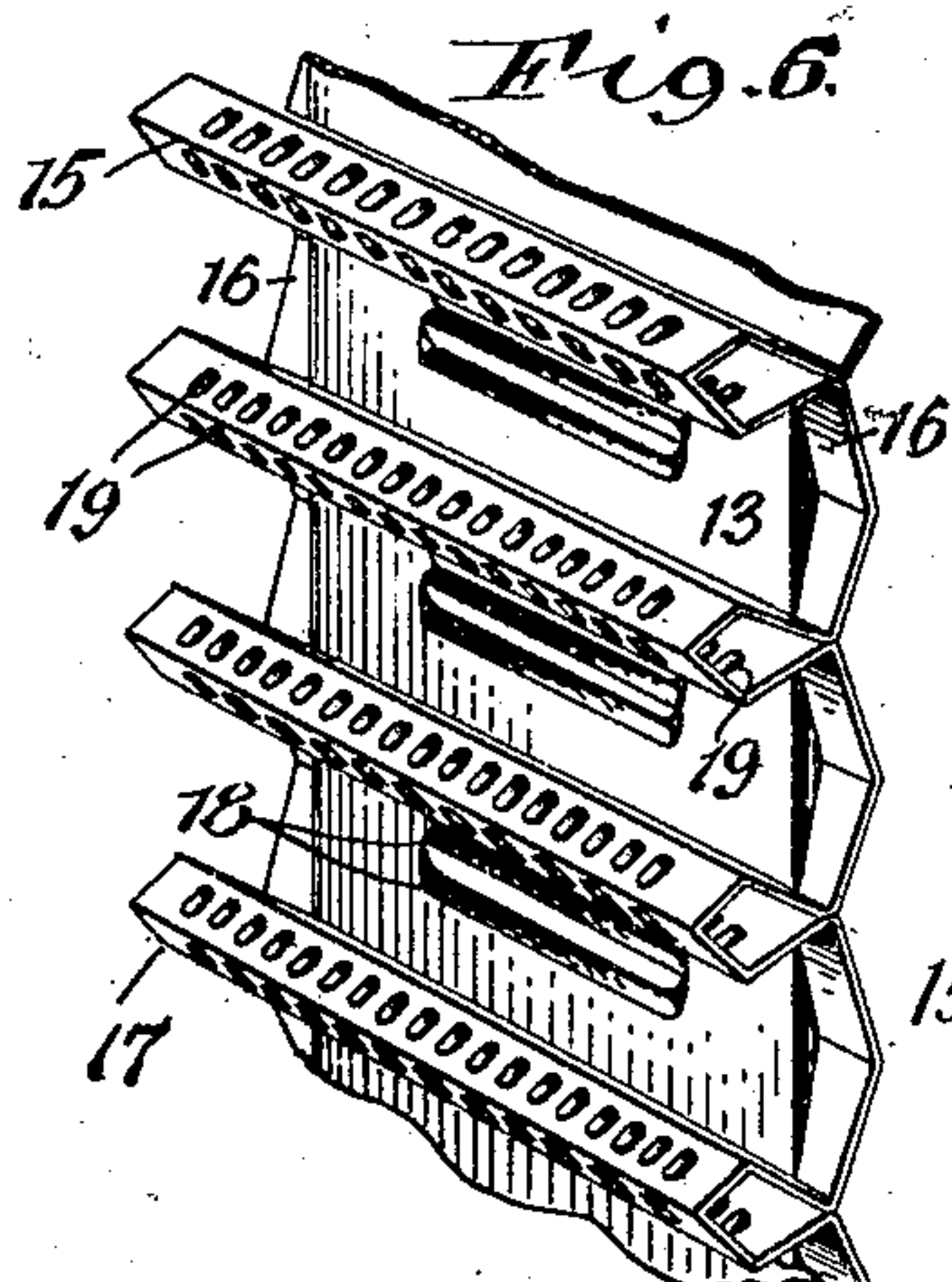
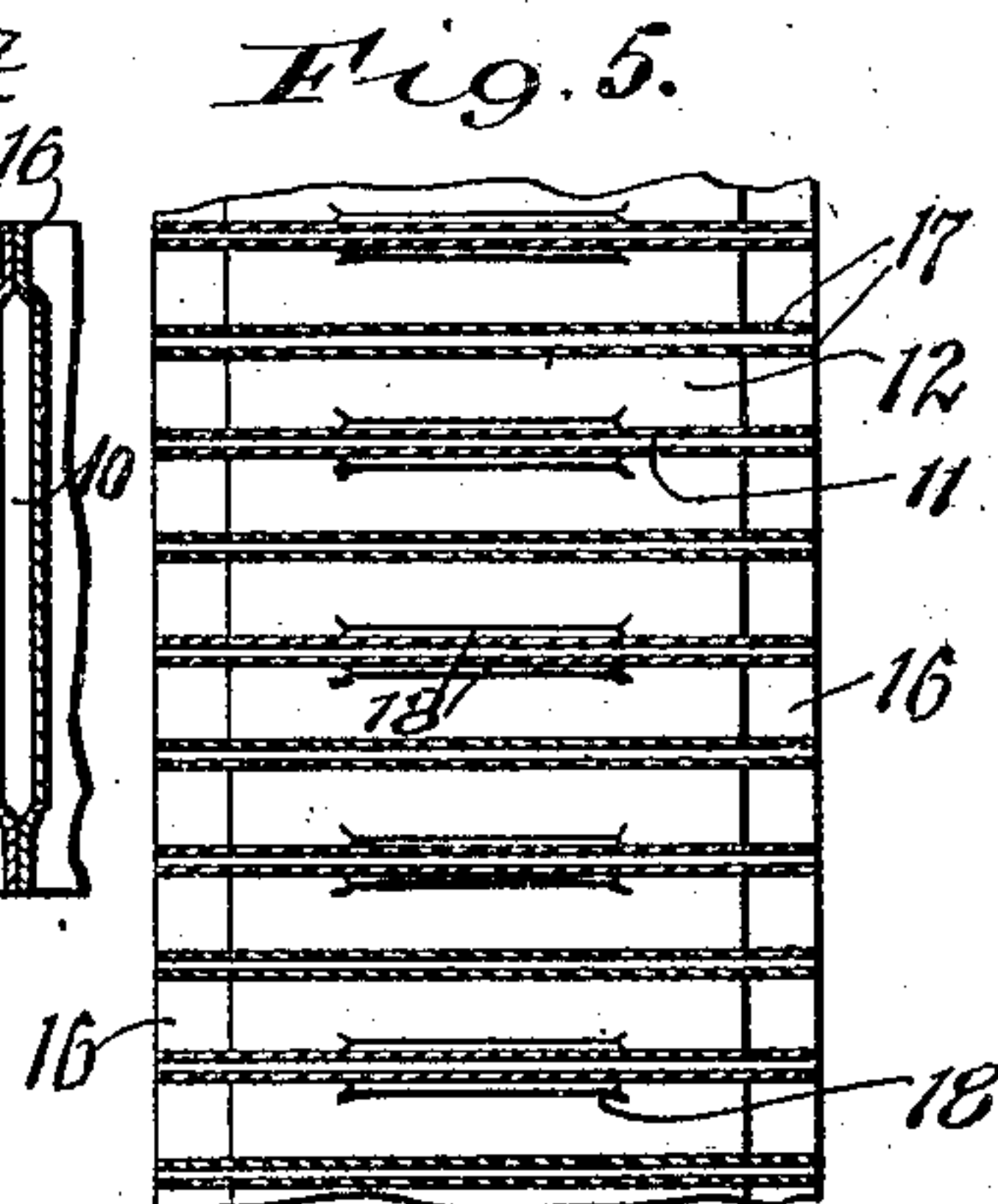
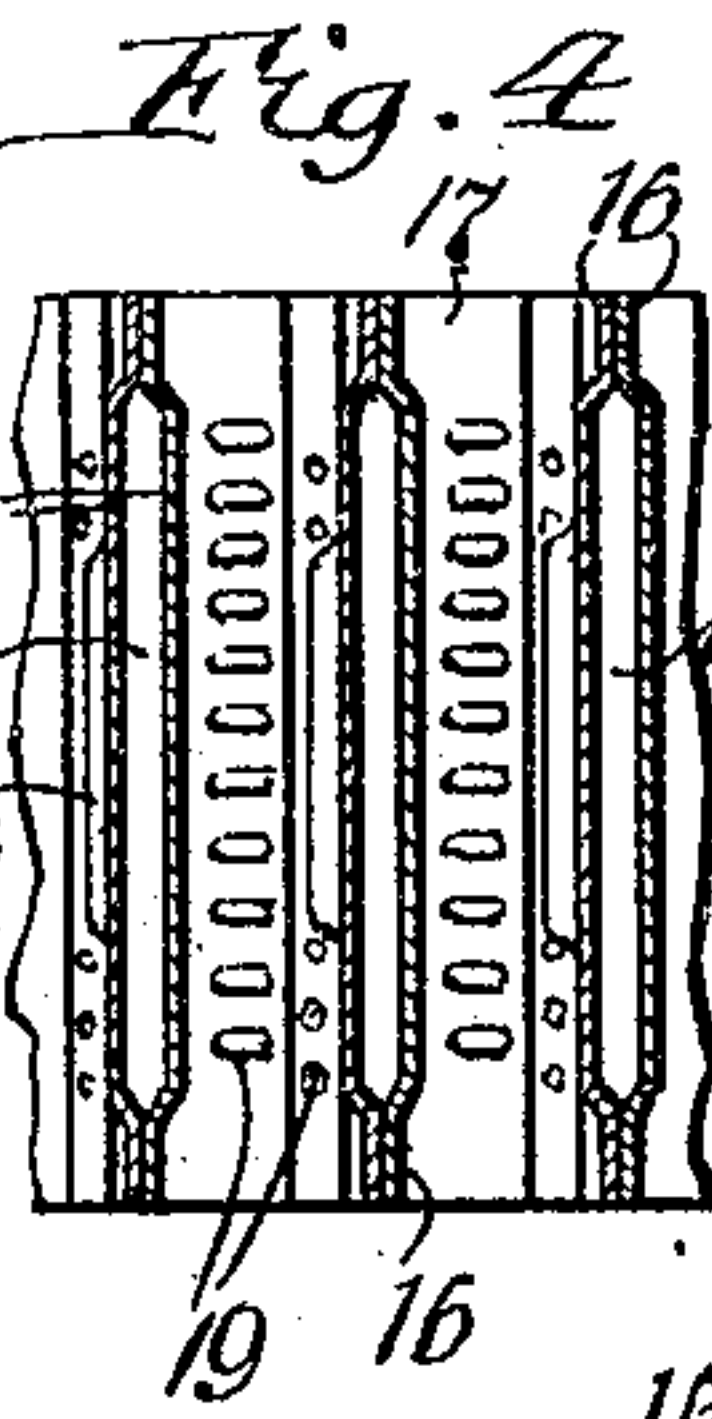
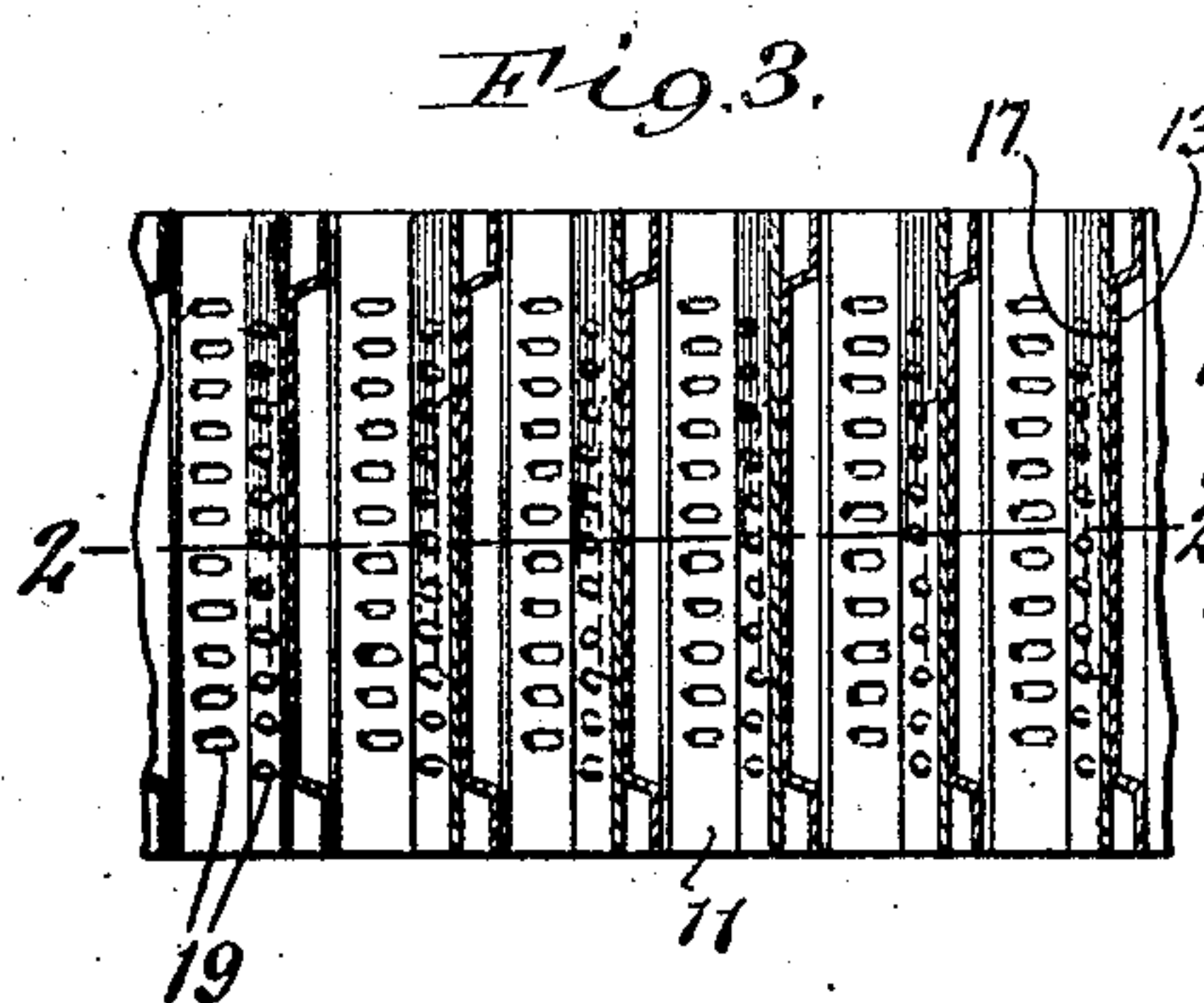
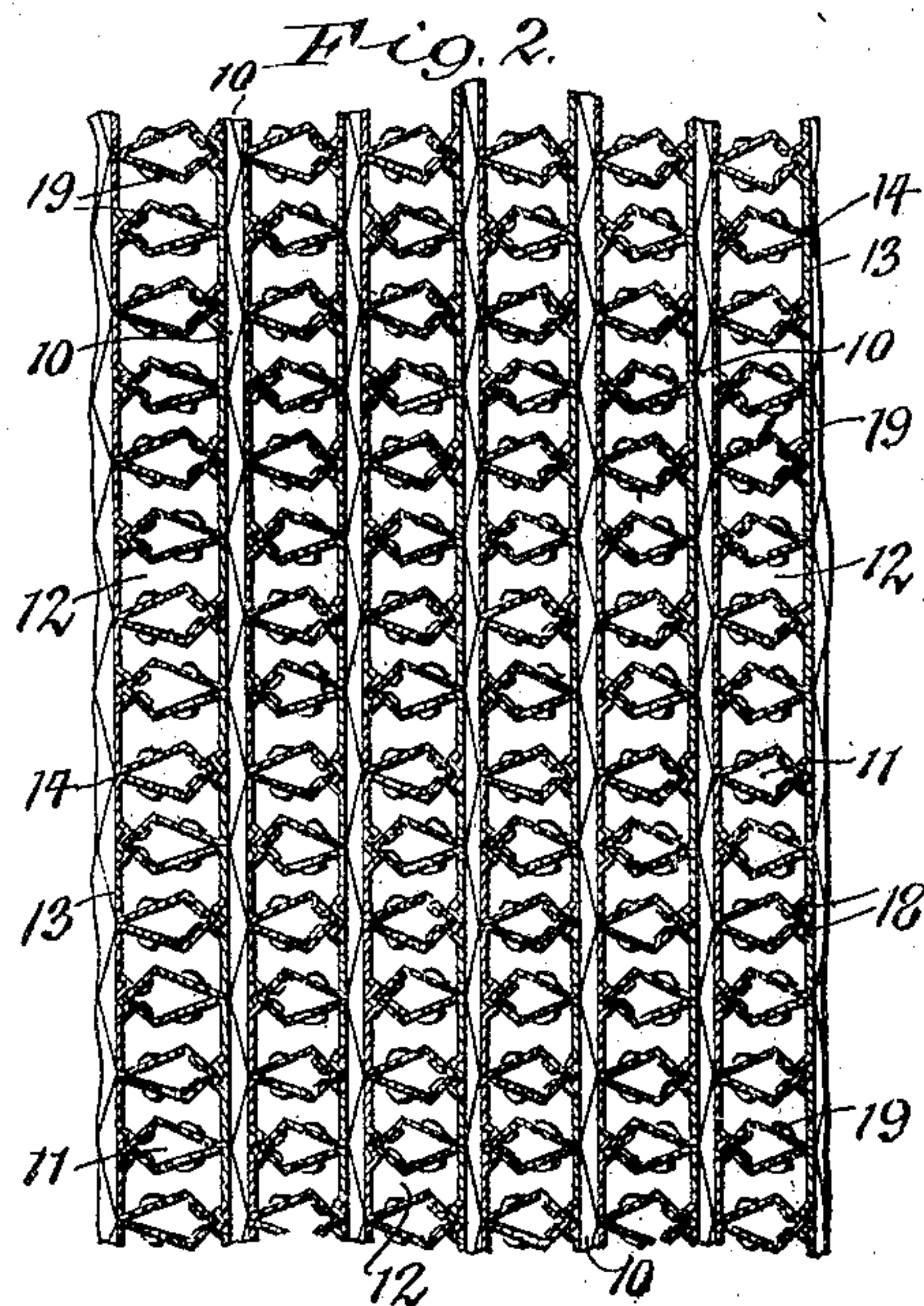
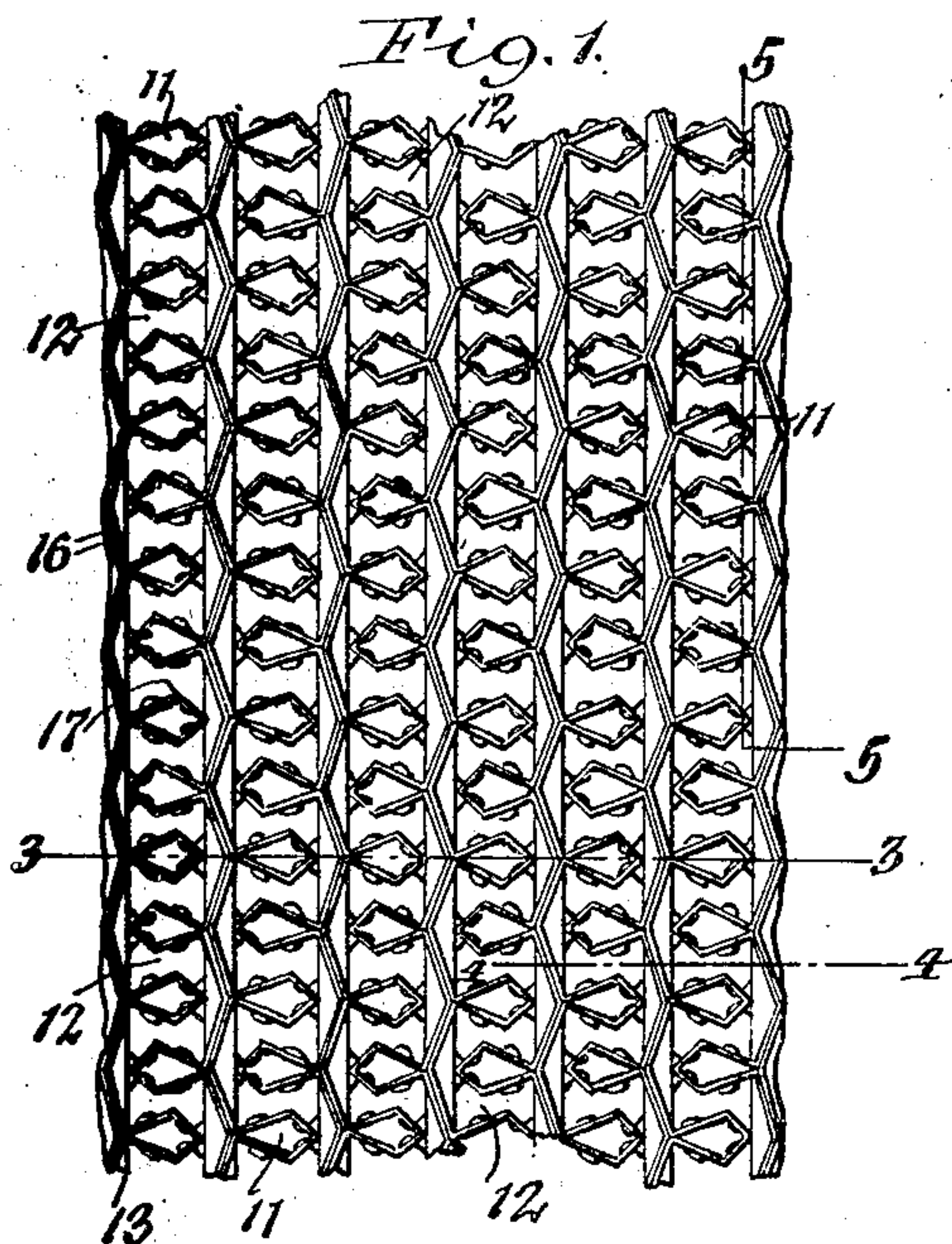
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J. M. FEDDERS

RADIATOR CORE

Filed Dec. 20, 1926



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UNITED STATES PATENT OFFICE.

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RADIATOR CORE.

Application filed December 20, 1926. Serial No. 155,855.

This invention relates to a core for use in radiators whereby the water for gas engines is cooled.

The objects of this invention are to provide a core of this character which will provide a greater radiating surface for the amount of metal which is employed; also to so construct the several units that the same may be more quickly and reliably assembled without exercising undue care; also to so organize the several parts that practically all the metal is exposed to the atmosphere so as to secure the maximum radiation of heat from the water to the air; and to interlock the several units of the core with each other in a manner which will retain the several elements in their proper position and thereby increase the strength and improve the appearance of the core as a whole.

In the accompanying drawings:—

Figure 1 is a fragmentary front elevation of a radiator core embodying my improvements.

Figure 2 is a vertical transverse section of the same taken on line 2—2 Fig. 3.

Figure 3 is a horizontal section taken on line 3—3 Fig. 1.

Figure 4 is a fragmentary horizontal section taken on line 4—4 Fig. 1.

Figure 5 is a vertical section taken on line 5—5 Fig. 1.

Figures 6 and 7 are perspective views of one section of a radiator unit made in accordance with my invention.

Similar characters of reference indicate like parts in the several figures of the drawings:

The radiator core comprises a plurality of water passages 10 which in the present example are arranged vertically and adapted to communicate at their upper and lower ends with upper and lower water boxes or headers, and a plurality of air tubes 11, 12, which are arranged horizontally between the several water passages and extend fore-and-aft of the core so as to conduct air there-through and carry away the heat which is radiated from the water by the metal surfaces of the core.

These water passages and air tubes are

made from a plurality of sheet metal strips, each of which is bent to form a row of wall sections 13 which are arranged in the same plane and engage each other at their horizontal longitudinal edges 14 so as to produce a continuous wall; and a plurality of fins projecting laterally from this wall and each fin having the form of a loop 17 which has its inner longitudinal edges connected with the opposing longitudinal edges of the two adjacent wall sections 13, while the outer side or summit 15 of this loop is closed. At the opposite vertical end edges of the wall sections 13 the same are provided with laterally offset flanges 16, which in the preferred construction are made of corrugated or zig-zag form, there being preferably one corrugation at each end of one of the wall sections, as shown in the drawings.

Two of such previously prepared strips are assembled by placing the inner sides of the same together in such manner that the convex faces of the corrugated flanges on each of these strips engage with the concave faces of the corrugated flanges of the other strip, while the central parts or wall sections of these strips are spaced apart from one another, thereby forming a radiator unit which has one of the water passages 10 between the two strips.

By inter-engaging the corrugated or serpentine flanges of the strips of a unit, these strips are reliably interfitted within each other and the same are also readily centered relatively to one another, thereby not only facilitating the assembly of the members of the unit and reducing the cost of manufacture, but also maintaining the members of each unit definitely against displacement after the same has been assembled and preparatory to permanently uniting the same by means of solder. This solder is applied to the opposing surfaces of the flanges of two units and also the longitudinal meeting edges of the adjacent wall sections of each strip for the purpose of sealing the joints between the wall sections and rendering the water tube continuous and without openings through which water might leak.

The unit when thus completed, has the lat-

erally projecting loops 17 on one of its strips arranged opposite the spaces between the laterally projecting loops of the other strip so that the several loops of this unit are staggered. In assembling a plurality of units of this character, the laterally projecting loops on one unit are arranged between the laterally projecting loops on the adjacent wall of another unit, each radiating loop engaging its summit 15 with the central part of a wall section of an adjacent unit. By this means a plurality of air tubes 11 are formed within the several loops of two adjacent units which are arranged in a vertical row between these units. The several radiating tubes in each vertical row are however spaced apart or out of engagement from each other so as to form between the same and the adjacent wall sections 13, a vertical row of air tubes 12 which alternate with the air tubes 11 formed within the radiating loops.

By this means practically all of the metal of the several strips of the core is exposed to the atmosphere which insures the maximum radiating effect of the heat of the water to the strands of air passing through the air tubes, whereby the radiating capacity of the core is increased accordingly.

In the drawings, each of the radiating loops is of substantially diamond shape in cross-section, but this shape may be varied if desired.

In order to facilitate the assembling of the several units and also to retain the radiating loops in a centered position with reference to the opposing wall sections with which they engage, each of the wall sections 13 is provided on its outer side with a pair of centering ribs 18, which ribs form between them a seat which is engaged by the summit 15 of a radiating loop 17 of an adjacent unit, thereby preventing this loop from being displaced at its outer extremity in a direction lengthwise of the strips, thereby preserving a regular and neat appearance of the radiator from the front, and also increasing its strength and rigidity whereby the same is enabled to withstand the strains to which it is subjected in service.

For the purpose of further increasing the radiation of heat from the radiating loops to the air which passes through the several water tubes, each of these radiating loops is provided on its outer sides with longitudinal rows of embossments 19. As the air passes through the air tubes, the same strikes these embossments and is thereby deflected or agitated in its course which operates to retard the flow of the air through these tubes and compels the same to take up a greater amount of the heat which is being radiated from the water, and thereby increase the cooling efficiency of the radiator core accordingly.

After the plurality of radiator units has been assembled in the manner described, the same are dipped in a joint solder which not only connects the strips of each unit for producing water-tight tubes, but also serves to connect the radiating loop of each unit with the wall sections of an adjacent unit, so that the several strips are connected to practically form one integral mass which is strong and durable and capable of sustaining the maximum load which is likely to be imposed on the same.

As a whole, this radiator core is not only very strong and durable, but the same can also be very easily and quickly assembled without requiring great skill, and after assembly, the parts remain in their proper relative position preparatory to being soldered together, thereby enabling a radiator core of increased efficiency to be produced at comparatively low cost.

I claim as my invention:

1. A radiator core having a plurality of water passages and a plurality of air tubes arranged between said water passages each of said water passages having opposing walls formed between two strips of sheet metal the central part of each consisting of a row of wall sections which meet at their longitudinal edges and which have their end edges off-set, forming flanges which engage one another, and said air tubes being formed by a plurality of loops each having its edges connected with the meeting edges of two adjacent wall sections, and the summit of each loop engaging with a wall section of an adjacent strip.

2. A radiator core having a plurality of water passages and a plurality of air tubes arranged between said water passages, each of said water passages having opposing walls formed between two strips of sheet metal, the central part of each consisting of a row of wall sections which meet at their longitudinal edges, and which have their end edges off-set forming flanges which engage one another, and said air tubes being formed by a plurality of loops each having its edges connected with the meeting edges of two adjacent wall sections, each of said wall sections being provided on its outer side with a pair of ribs, and each of said loops seated with its summit between a pair of said ribs.

3. A radiator core having a plurality of water passages and a plurality of air tubes arranged between said water passages, said core formed of a plurality of sheet metal strips each of which is bent to form a row of wall sections which are arranged in the same plane and engage one another at their longitudinal edges, and a row of loops projecting laterally from said wall sections and each loop having its longitudinal edges connected respectively with the longitudinal

edges of two adjacent wall sections, the opposite end edges of each strip being corrugated and the corrugations of two adjacent strips being interfitted, each of said wall sections being provided on its outer side with a pair of longitudinal centering ribs, each loop being spaced from adjacent loops and seated with its summit between the pair of ribs on adjacent wall section, and each loop being provided with a plurality of longitudinal rows of embossments. 10

In testimony whereof I hereby affix my signature.

JOHN M. FEDDERS.