

C. W. HARVEY.  
HEADER.

APPLICATION FILED JULY 23, 1902.

NO MODEL.

2 SHEETS—SHEET 1.

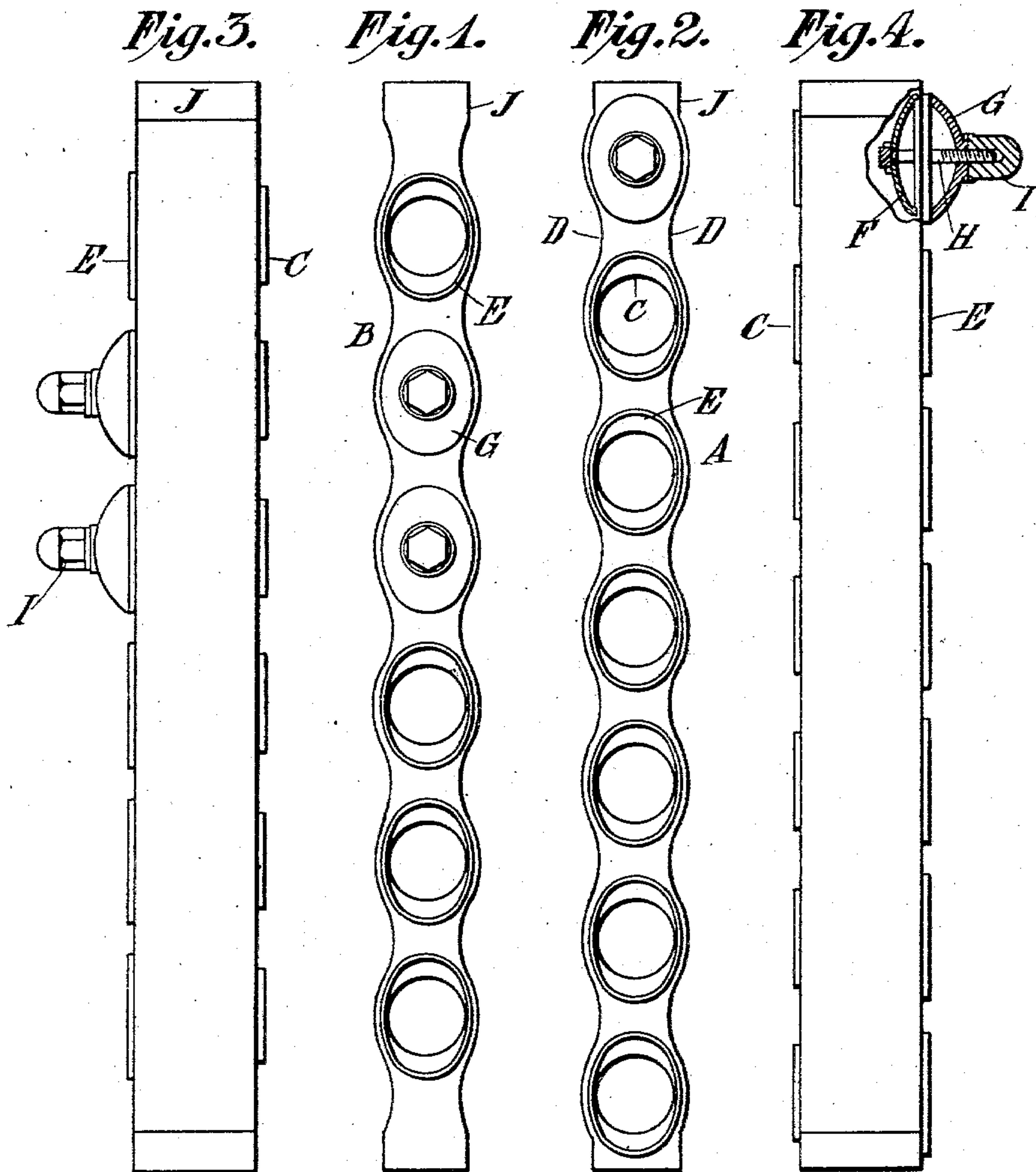


Fig. 5.

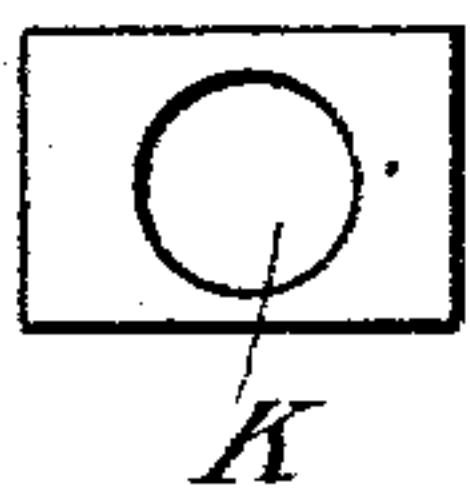
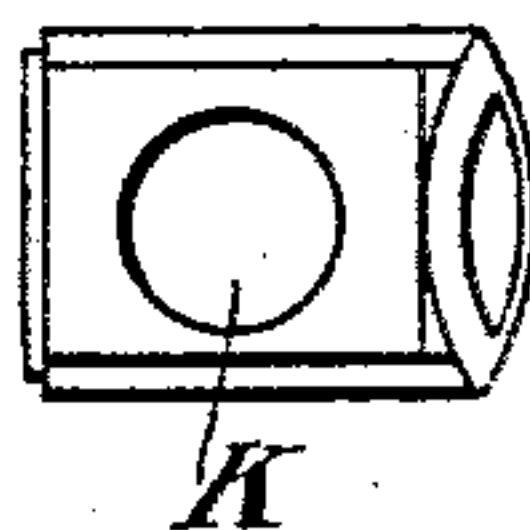


Fig. 11.



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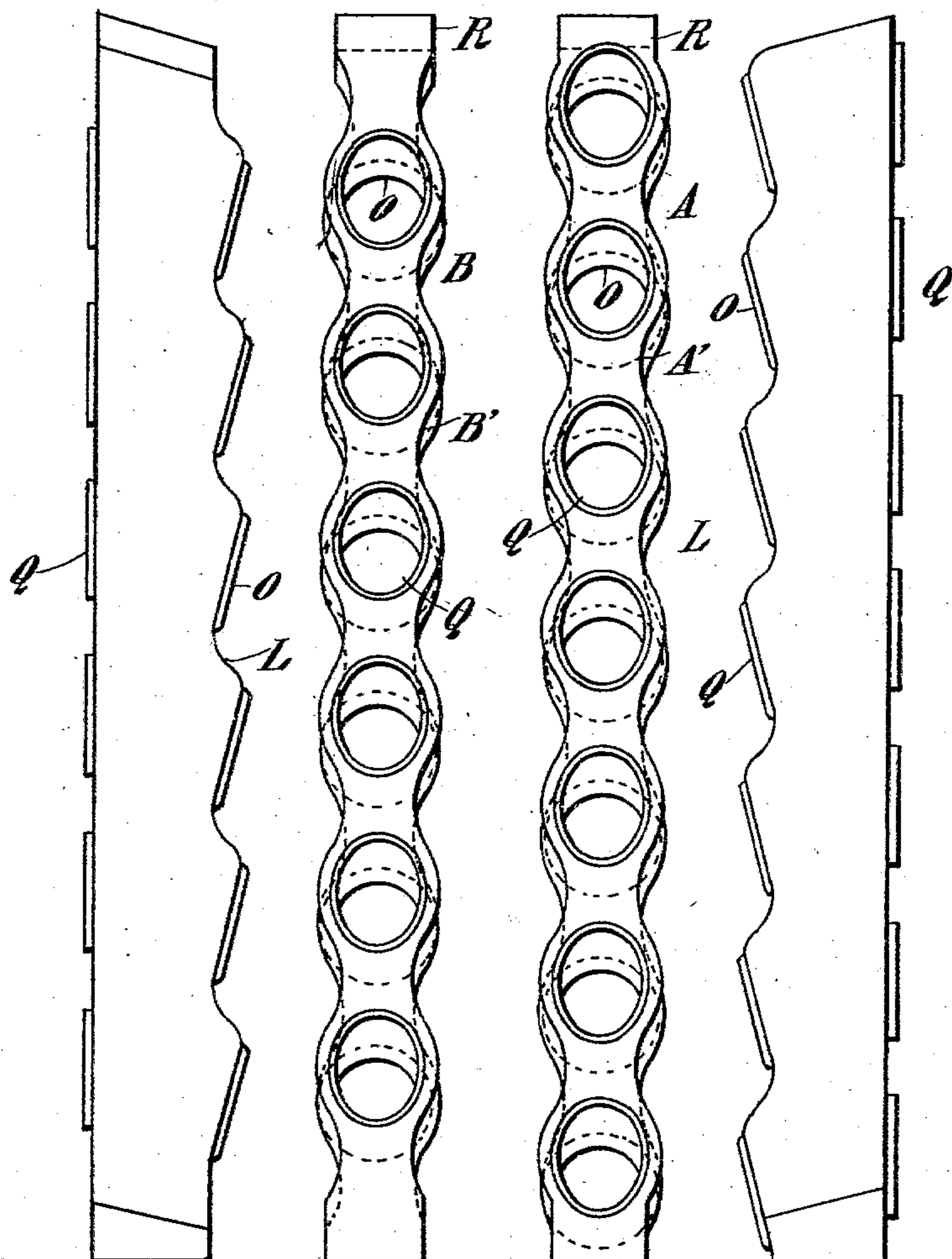
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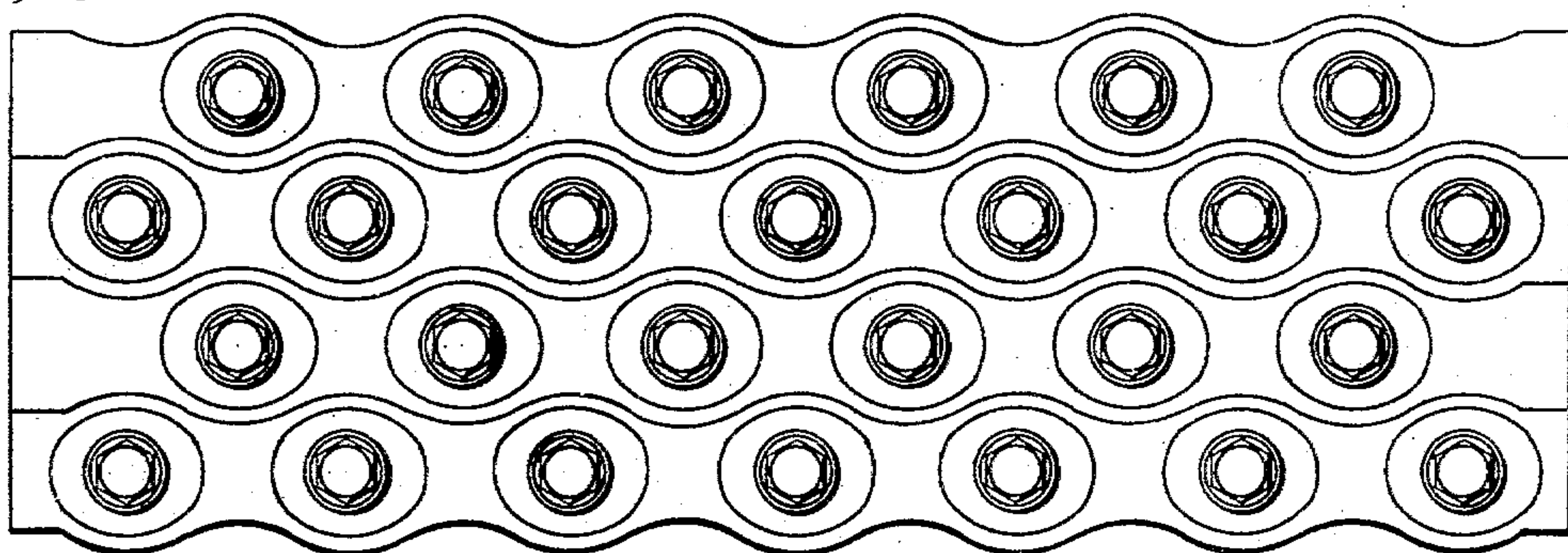
NO MODEL.

2 SHEETS—SHEET 2.

*Fig. 9.* *Fig. 7.* *Fig. 8.* *Fig. 10.*



*Fig. 6.*



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# UNITED STATES PATENT OFFICE.

CHARLES W. HARVEY, OF NEW BRUNSWICK, NEW JERSEY, ASSIGNOR TO  
NATIONAL WATER TUBE BOILER COMPANY, OF NEW BRUNSWICK,  
NEW JERSEY, A CORPORATION OF NEW JERSEY.

## HEADER.

SPECIFICATION forming part of Letters Patent No. 740,427, dated October 6, 1903.

Application filed July 23, 1902. Serial No. 116,680. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES W. HARVEY, a citizen of the United States, residing at New Brunswick, in the State of New Jersey, have  
5 invented certain new and useful Improvements in Headers, of which the following is a specification, accompanied by drawings.

My invention relates to headers for steam-boilers; and the objects of my invention are  
10 to enable more tubes to be placed in less space than heretofore, thereby increasing the heating-surface of the boiler, and to obtain freer and more unobstructed circulation.

To these ends my invention consists in a  
15 header designed to carry out the above objects and having the general construction substantially as hereinafter fully described and shown in this specification and accompanying drawings, in which—

20 Figures 1 and 2 are rear elevations of two cooperating sections of my improved header. Figs. 3 and 4 are side elevations of the same. Fig. 5 is an end view of one of the sections. Fig. 6 is a front view of a number of header-  
25 sections made according to my invention assembled to form a complete header. Figs. 7 and 8 are rear elevations of header-sections, showing a modification. Figs. 9 and 10 are side elevations of the sections shown in Figs.  
30 7 and 8, and Fig. 11 is an end view of the modification.

Referring to the drawings, my improved header is made up of sections adapted to co-  
operate with each other and form a complete  
35 structure, any desired number of the sections being used and of any desired length per section. In Fig. 6 a front view of a header is shown, comprising in this instance five (5) sections, each section having corrugated sides  
40 which are adapted to cooperate with the corrugations of the adjacent sections.

In the form of sections shown in Figs. 1, 2, 3, 4, and 5 the header-section A has corrugated sides B, as shown, with holes C pro-  
45 vided in the back for boiler-tubes, the back and front in this form being preferably straight and substantially parallel to each other. The holes C, as shown, are arranged between the convex portions of the corruga-  
50 tions, leaving spaces between the concave

portions thereof. The section B, as shown in Fig. 1, also has corrugated sides D, with holes C, as before, for boiler-tubes, arranged between the convex portions of the corrugations. The corrugations of the sides of the sections A  
55 and B are so arranged that they will cooperate with each other and permit the sections to be assembled side by side with the convexities of the sides of one section entering and closely filling the concave portions of the  
60 sides of the adjacent section without crevices between corrugations. Therefore when the sections are assembled side by side the tube-holes C of one section will lie opposite the  
65 spaces between the holes of the next adjacent sections, thereby bringing the tube-holes as close together as possible and enabling the largest number of tubes to be assembled in a given space. The front of each section in this  
70 instance is provided with openings E of larger area than the tube-holes and, as shown, of oval shape, each oval opening E being arranged opposite a tube-hole C and so designed in shape and size as to allow of cut-  
75 ting out the old tube and passing it out through the opening, replacing it with a new one in the same manner. Each hand-hole or opening E in front of the headers is provided with an internal plate F and an external  
80 plate G, held in place with a suitable bolt H and a covered nut I, as shown.

In order that the header-sections may be assembled and provided with an even base or top and bottom, the sides of each section are continued straight for a short distance from  
85 each end, as at the portions J on each end, and then the corrugations of the sides are begun from the straight portions J, the section A, for instance, being provided with a convexity adjacent each straight portion J, while  
90 the section B is provided with a concavity adjacent each straight portion J. The header-sections shown in Figs. 1 and 2 are adapted to be set at an angle to the horizontal to allow the tubes to be inclined to the horizontal.  
95 The ends of the sections A and B are provided with holes K, as shown, in order that they may be suitably connected to the steam-drum and mud-drum.

In the modification shown in Figs. 7, 8, 9, 100



10, and 11 the header-sections A' B' are adapted to stand vertically, while provision is made for arranging the boiler-tubes at an inclination to the horizontal. In this instance the sides B' of section A' are corrugated, as before, and the sides D' of section B' are also corrugated and adapted to cooperate with the corrugations of section A'. In this construction the rear portions or back L of the header-sections are also corrugated, as shown, and provided with openings O for tubes, as before, in the longer portions P of the corrugations in such manner that the tubes may be placed in the tube-holes and conveniently inclined to the horizontal. In this instance openings or hand-holes Q, preferably of oval shape, are also arranged in the front portions of the header-sections opposite the tube-holes O and in line with the general direction or inclination of the boiler-tubes when arranged in the headers. The sides of the header-sections are shown to be straight, as at R, for a short portion of each side, from which straight portions the corrugations of the sides are commenced in such manner that as many as desired of the header-sections may be conveniently assembled side by side to form the structure shown in Fig. 6.

30 The headers or header-sections may be made of either wrought-iron, forged steel, or cast-iron, and they may be made of any height, according to the number of tubes desired, and when conjoined or assembled side

by side one after the other the whole structure may be made in width according to the horse-power required. 35

Obviously my invention may be embodied in widely-varying forms, and therefore without limiting myself to the construction shown and described and without enumerating equivalents I claim, and desire to obtain by Letters Patent, the following: 40

A header section or element for a sectional boiler, said element having corrugated sides, the convex portions of the corrugations on one side being opposite to those on the other side, and the said corrugated sides being adapted to closely fit the corrugations of any similar corrugated cooperating header section or element without crevices between the corrugations of the meeting sides, the back of said header-section being provided with holes for tubes arranged between the convex portions of the sides, and the front of said section having oval openings also between the convex portions of the sides and of greater area than the tube-holes in the back of the section, for substantially the purposes set forth. 55 60

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

CHARLES W. HARVEY.

Witnesses:

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