

No. 894,294.

PATENTED JULY 28, 1908.

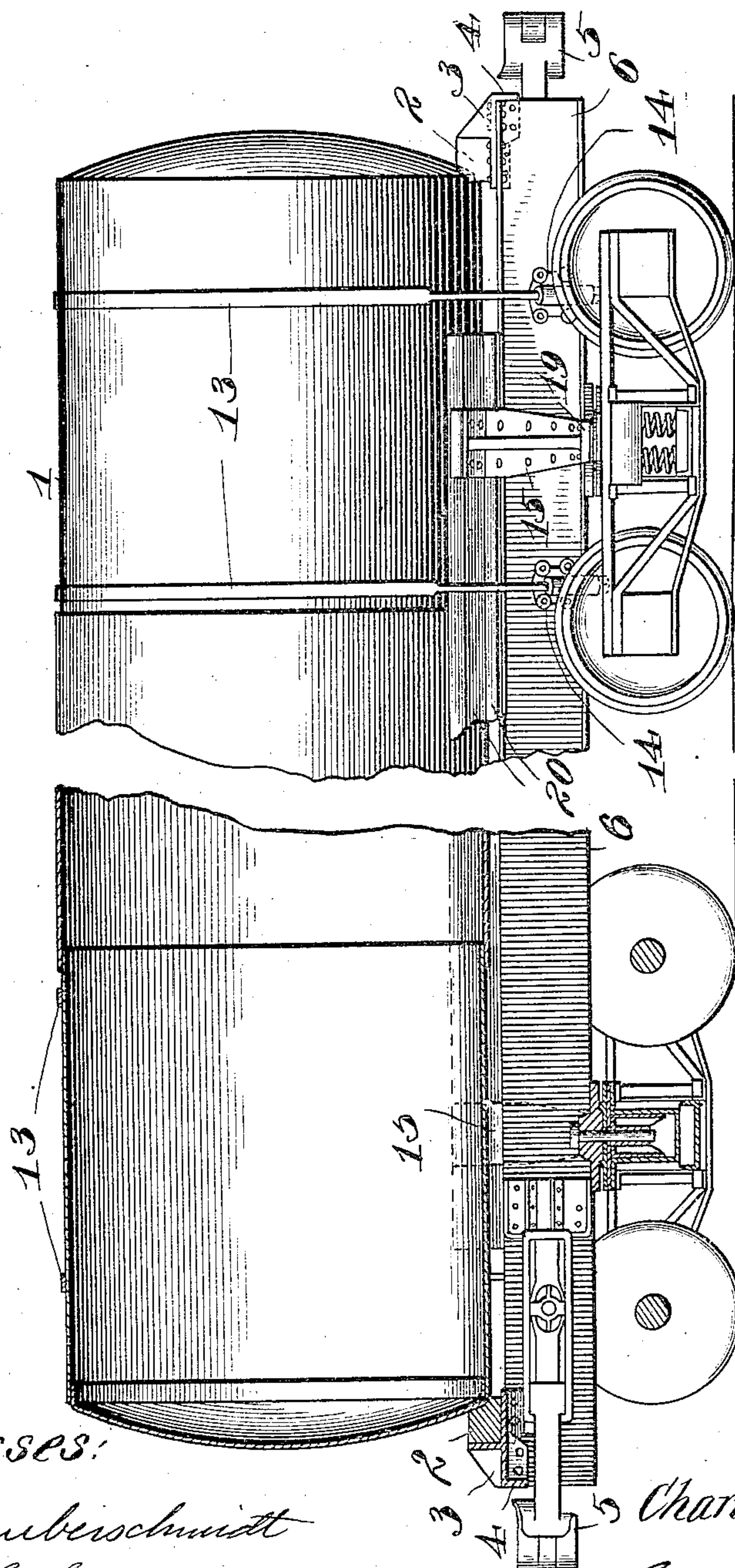
C. A. SHOEMAKER.

TANK CAR.

APPLICATION FILED MAR. 6, 1907.

2 SHEETS—SHEET 1.

Fig. 1



Witnesses:

G. A. Pauberschmidt
Leon E. Stroh

Inventor:

Charles H. Shoemaker

By

H. L. Cragg
Atty

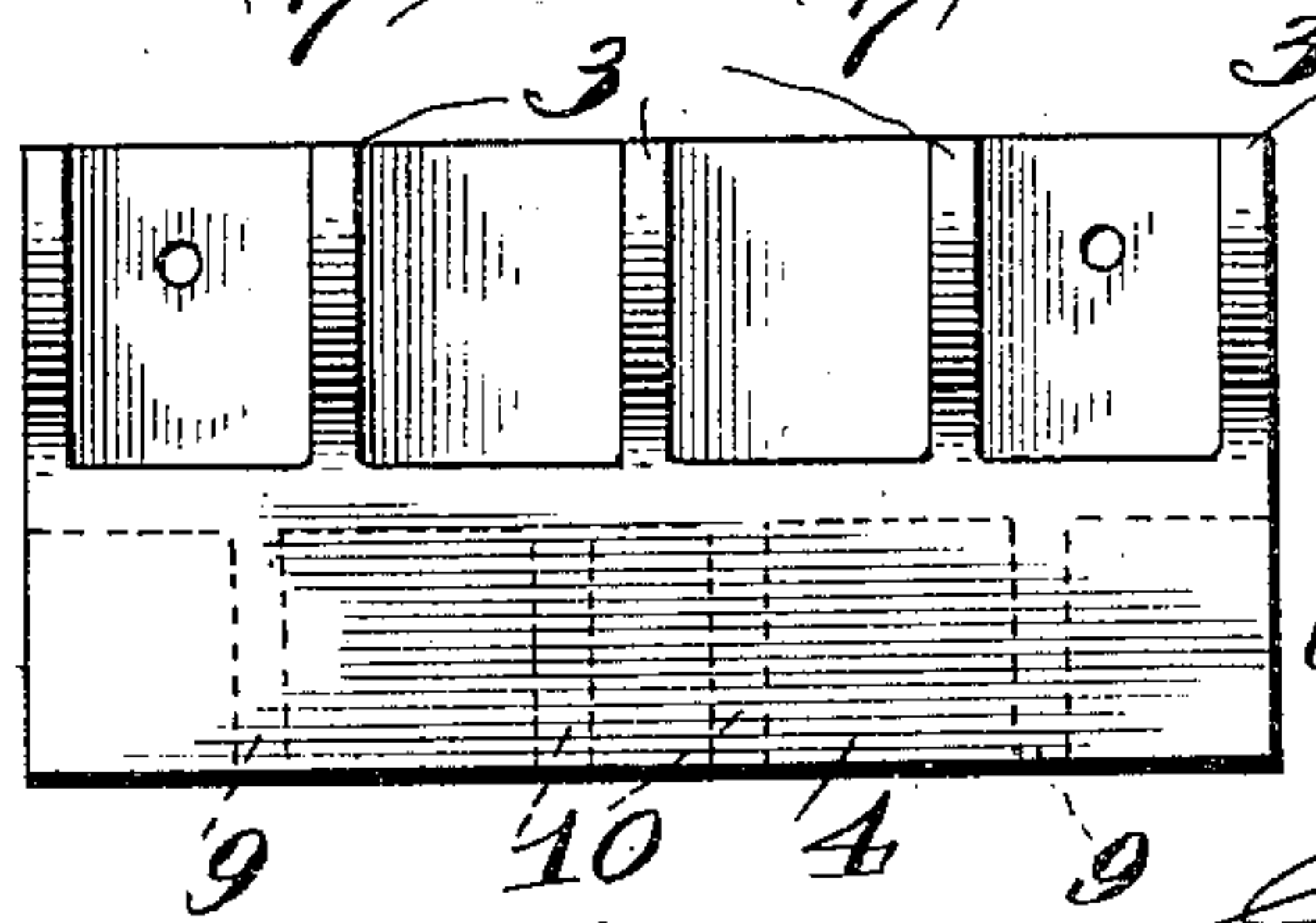
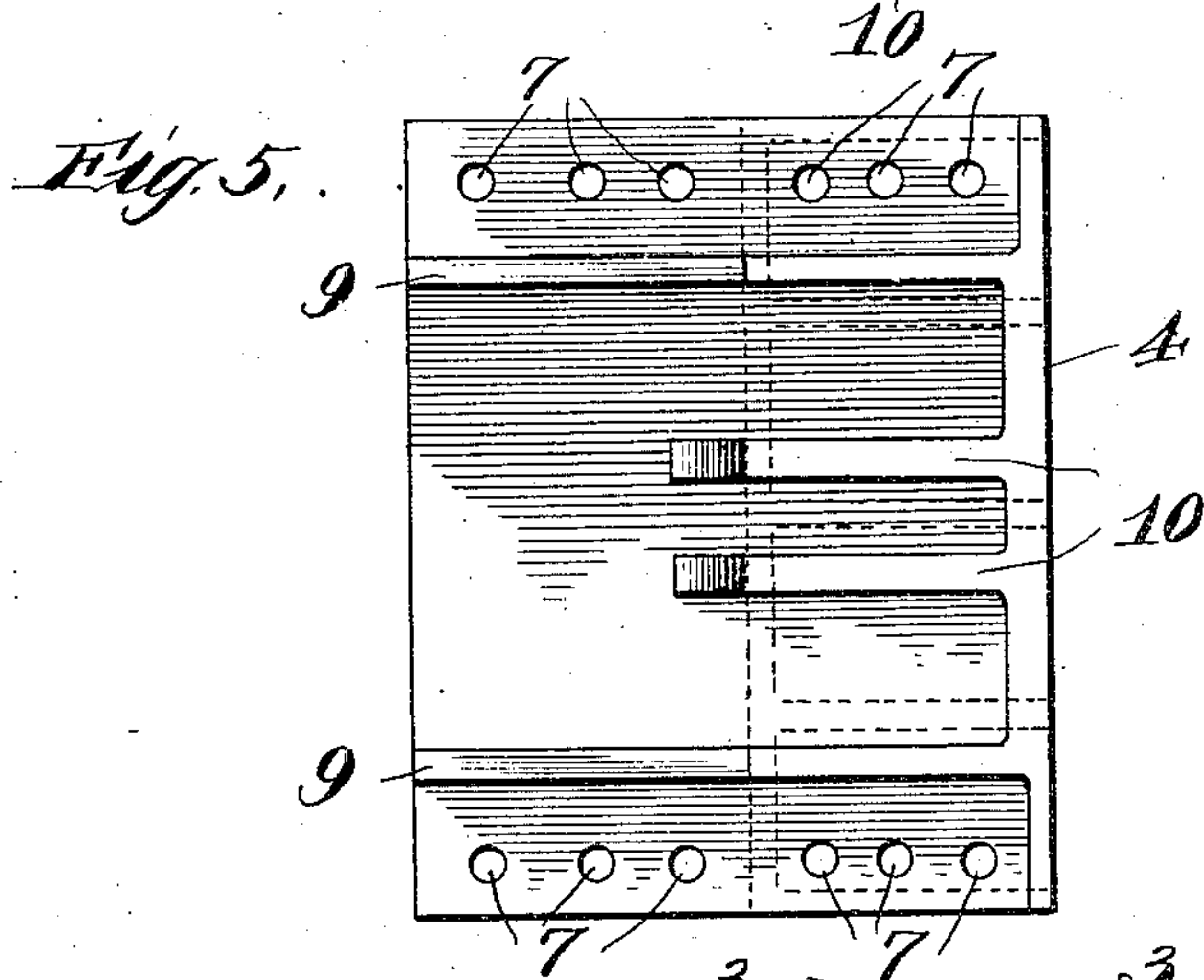
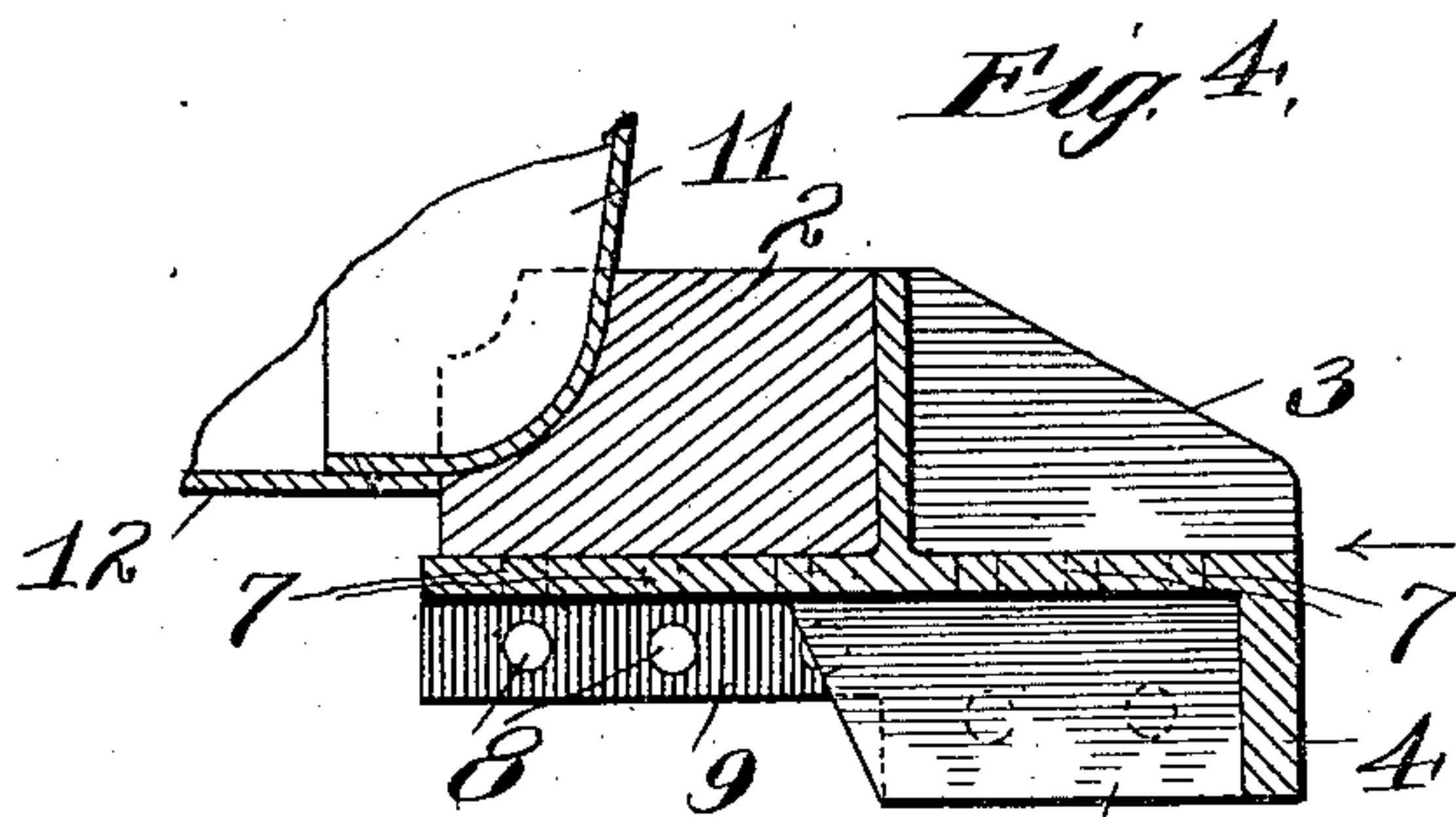
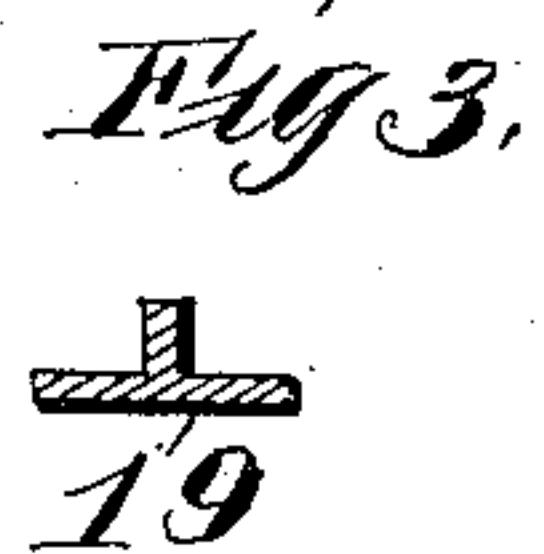
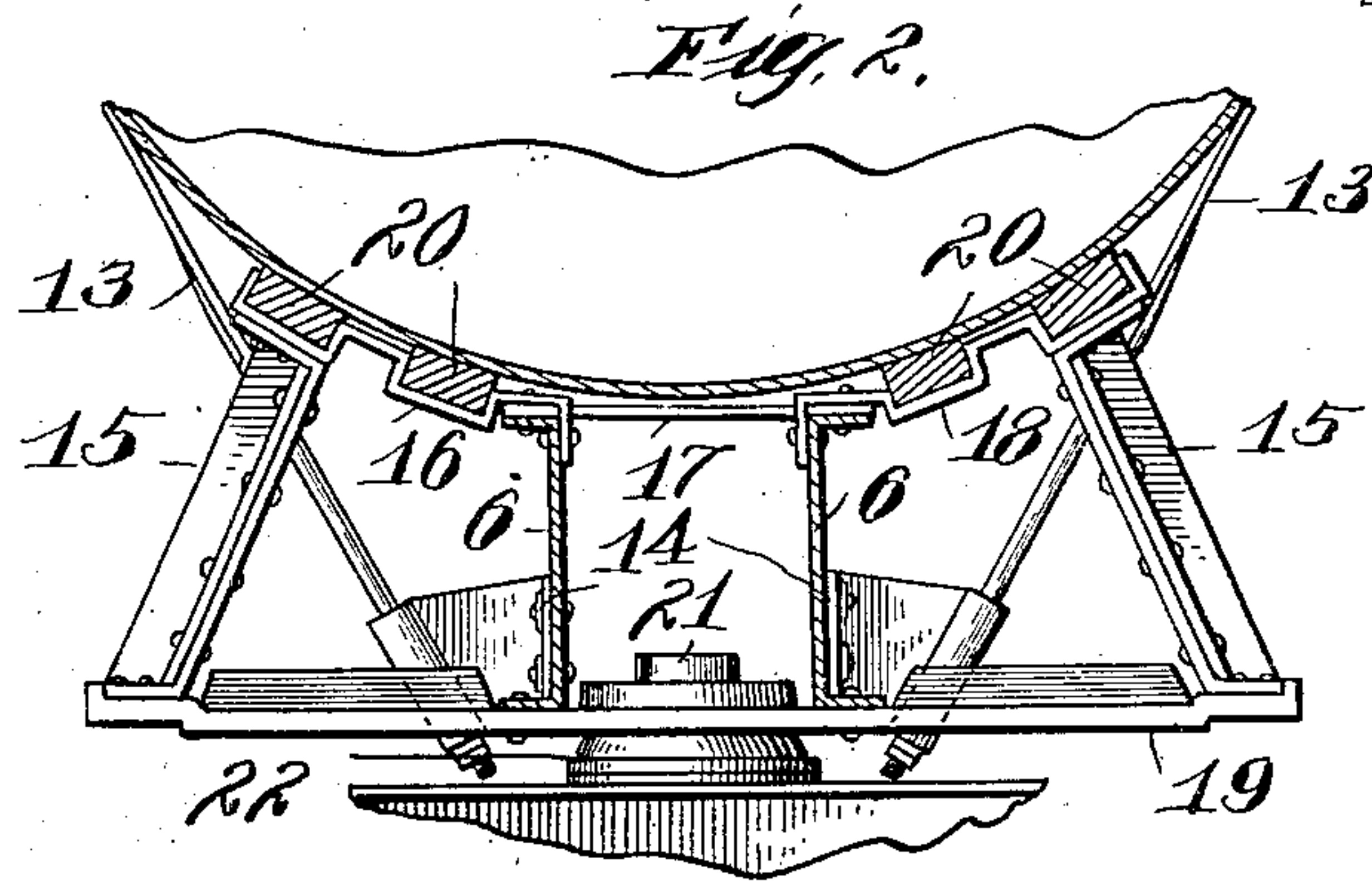
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C. A. SHOEMAKER.
TANK CAR.

APPLICATION FILED MAR. 6, 1907.

2 SHEETS—SHEET 2.



Witnesses:
D. A. Pauberschmitt
Leon C. Stroh

Inventor:
Charles A. Shoemaker.

By *G. L. Cragg*
Atty.

UNITED STATES PATENT OFFICE.

CHARLES A. SHOEMAKER, OF CHICAGO, ILLINOIS.

TANK-CAR.

No. 894,294.

Specification of Letters Patent.

Patented July 28, 1908.

Application filed March 6, 1907. Serial No. 360,926.

To all whom it may concern:

Be it known that I, CHARLES A. SHOEMAKER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Tank-Cars, of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to tank cars, and has for its object the improvement in the construction thereof.

As is well known to those skilled in this art, various ways have been adopted for holding the tanks of tank cars against longitudinal displacement with respect to the under frames of car bodies supporting the same. It has been common practice to pass rivets through the sheets of the tanks for the purpose of holding the tanks in place. It is very apparent that this construction is faulty, for the rivets are subject to shearing strains and the holes in the tank sheets containing the shanks of the rivets are likely to be enlarged and the tank sheets are likely to be warped and buckled where the rivets pass there-through, whereby the life of the tanks is materially reduced. Moreover, the tanks are liable to severe injury and breakage, due to the bumping the cars receive when contained in a train, also in switching, etc., for the main agency that prevents longitudinal movement between the tanks and the car bodies carrying the same are the anchoring rivets.

One feature of my invention resides in providing means whereby the tanks are held from longitudinal displacement with respect to the car bodies or under frames independently of any rivets. In practicing this feature of my invention, I substantially fill the space intervening between the lower parts of the ends of the tank and the bumping or buffer surfaces, the material thus filled in being subject to compression strains that arise when there is any tendency to movement of the tank longitudinally of its under frame, which tendency might be present, for example, when the brakes are suddenly applied, or in switching. The material that is thus filled in between portions of the ends of the tanks and the contiguous buffing surfaces, desirably includes wood, which affords cushioning action, so that the tendency to relative

movement between the tank and the car body will not be too violently resisted. This feature of my invention will be more fully explained hereinafter.

Another feature of my invention resides in providing an improved supporting means to be located between the ends of the tank. Each supporting means preferably includes a body bolster and braces extending upwardly therefrom, said body bolster and braces being suitably united to constitute the support of my invention. The supports also desirably include the center sills, which thus serve not only in uniting the braces and body bolsters of each support, but which also join all of these supports that are provided for the tank, thereby making very firm, strong and suitable supports, by the use of which shearing strains upon rivets may be eliminated to the greatest extent.

Hitherto braces or brackets have been provided that included the center sills in their construction, but which did not include body bolsters or other members uniting the center sills as well as other brace portions of the supports, the construction being such that fulcra were afforded at the center sills for the supporting brackets which would promote the puncture of the sheets of the tanks. By using the body bolsters as part of the tank supports, the fulcra at the center sills are removed, for the portions of the body bolsters (or other member substituted for the body bolsters) extending between the anchorages of the center sills and the body bolsters, prevent the location of the objectionable fulcra at the center sills. The body bolsters in my improved construction as practically embodied, constitute tension members, while the center sills and the additional members constitute the compression members. A tension member is also provided at the upper part of each support that is substantially parallel with the tank. I prefer to use the center sills and the body bolsters in my improved tank supports, for thereby many very important advantages are secured, but I do not wish to be limited in all embodiments of my invention to the use of these elements in my improved supports.

I will explain my invention more fully by reference to the accompanying drawings, showing the preferred embodiment thereof, in which—

Figure 1 is a side view of a tank car broken

in two and partially shown in section. Fig. 2 is an end view of so much of my improved tank car construction sufficient to illustrate my improved support. Fig. 3 is a detail view showing the cross-section of my body bolster. Fig. 4 is a detail view in section showing an end portion of a tank and the material that is interposed between the same and the contiguous buffing surface of the tank car. Fig. 5 is a bottom view of the structure shown in Fig. 4. Fig. 6 is a view in the direction of arrow 6 of Fig. 4, the tank being omitted.

Like parts are indicated by similar characters of reference throughout the different figures.

The tank 1 is mounted upon the supports of my invention hereinafter to be particularly described, and is confined between the head blocks 2 provided at the ends of the under frame, there being substantially no clearance between the tank and its head blocks, due allowance, however, being made for expansion and contraction of the tank lengthwise, the tank being thus capable of practically no relative movement longitudinally of the car body, owing to the head blocks, such slight movement as might be permitted upon considerable contraction of the tank being negligible. The head blocks 2 are desirably of composite formation, wood and cast steel desirably entering into their construction. The wooden portions are numbered 2 in the drawings and the balance of each composite head block is numbered 3, this portion of each head block being made of cast steel and having structural characteristics that will be understood by reading Figs. 1, 4, 5 and 6 of the drawings. The castings 3 are provided with pockets that face each other and which contain the wooden blocks 2, the front faces of these castings 3 being downwardly deflected at 4 to constitute buffing surfaces to receive the blows of the horns of the couplers 5. The castings 3 are desirably riveted to the top flanges of the center sills 6, for which purpose rivet holes 7 are formed in the castings 3. Said castings are also desirably riveted to the webs of the center sills 6, for which purpose rivet holes 8 are provided in downwardly extending ribs 9 formed as parts of the castings 3. Two other rivets 10 are also desirably provided in the bottom of each casting 3, which are disposed immediately behind the buffing apron 4 so as to thoroughly brace said apron.

Referring more particularly to Fig. 4, the manner in which the head blocks engage the lower portions of the ends of the tank will be better understood. As will be seen by reference to this figure, the cushion block 2 is shaped not only to receive the head 11 of the tank, but also abuts against the bottom sheet 12 of the tank, whereby said bottom sheet, which, of course, is disposed longitu-

dinally of the tank, receives the thrust, thus guarding the head of the tank against buckling action.

It will be seen that whenever the car body has its inertia counter-acted, that the compressive strains are mainly absorbed between the buffing surface of the aprons 4 and the surface of the cushion blocks 2 that engage the bottom sheets 12 and heads 11 of the tank, so that said tanks are not permitted materially to move longitudinally of the car body supporting the same, whereby many disadvantageous effects inherent in prior constructions are overcome. As a further advantage, it will be apparent that the strain upon the rivets uniting the buffer plates 4 with the center sills, is counter-acted by the forces simultaneously applied at both ends of each composite head block structure, these forces being applied by a striking coupler horn and by the tank, substantially simultaneously. The rivets uniting the head block structures with the center sills are sufficient to withstand the ordinary thrusts, but when the thrusts are sufficiently strong to shear the rivets, the rivets receive counter-acting thrusts from the tank and the coupler horn.

Some suitable agency is desirably employed for further supporting the tanks in position, and although the movements of the tank with respect to the car body longitudinally are reduced to a minimum, I prefer to employ no rivets that anchor the tank to its supports, but rather employ the tank straps 13, adjustably secured at 14 to the center sills 6, as indicated clearly in Figs. 1 and 2.

The remaining feature of my invention is best illustrated in Fig. 2, though certain details of construction of this feature of my invention appear in Fig. 1. In Fig. 2 I have illustrated radial supporting arms 15, one in each support being upon each side of the car, that are united at their upper ends by sheets of tank steel 16, 17, 18, and which arms are united at their bottom ends by a member 19 constructed preferably of metal, such as cast steel, and desirably made in one piece. The portions 16, 17, 18 extend underneath the tank and carry the same. The structure thus far described comprises two compression members 15, a tension member comprised of the elements 16, 17, 18, and the tension member 19. The upper tension member comprising the elements 16, 17, 18, may be pocketed so as to receive slabbing 20 extending longitudinally of the supported tank to sustain the tank between its supports and beyond the same. The truss structure that I have thus described as being embraced within my improved support, also desirably includes additional compression members 6, 6 which are desirably the center sills of the car structure, these additional compression members not only acting as compression

members for an individual support, but also serving to join different supporting structure to make a very firm and strong mounting for the tank, as will be readily understood. The tension members 19, for sake of economy and advantages that will be apparent, are desirably the body bolsters, which, if formed of metal, may, if desired, have as component parts thereof, elements 21 of center bearings, the companion elements 22 being provided upon the trucks, as will be readily understood by those skilled in the art. Where the truss members 19 are made of metal, they desirably have the shape indicated in Fig. 3 in cross-section in order that they may be as strong as practical.

The center sill construction constitutes an under frame, but I do not wish to be limited to the precise under frame that I have shown. It will be seen that I have provided a construction comprising a tank car provided with head blocks substantially extending completely between end portions of the tank and the buffing surfaces of the car, an under frame to which said head blocks are riveted, the shanks of the rivets that unite each head block with the under frame being positioned to receive coupler thrusts in one direction and tank thrusts in the reverse direction through the intermediation of the head block, whereby said rivets are relieved of shearing strain, said head blocks being of composite construction, the portions thereof that engage the tanks being of wood, said head blocks also including buffing aprons of metal, which receive the coupler blows, said buffing apron of metal extending downwardly for the purpose of receiving the coupler blows and extending upwardly to engage the wood, the portion of said apron engaging the wood being pocketed to secure the wood in position.

The car of my construction preferably also includes as each of a plurality of supports, a bottom member (19), constituting a bolster, center sills (6, 6) located above said bottom member, a tank-carrying element receiving the tank and connected with the upper portions of the center sills, side supporting elements (15) intervening between the bottom member (19) and the tank-carrying element, and a strut (17) joining the upper portions of the center sills.

While I have herein shown and particularly described the preferred embodiment of my invention, I do not wish to be limited to the precise construction shown, as modifications may readily be made without departing from the spirit of my invention, but,

Having thus described my invention, I claim as new and desire to secure by Letters-Patent the following:—

1. A tank car provided with head blocks substantially extending completely between end portions of the tank and the buffing surfaces of the car, an under frame to which said

head blocks are riveted, the shanks of the rivets that unite each head block with the under frame being positioned to receive coupler thrusts in one direction and tank thrusts in the reverse direction through the intermediation of the head block, whereby said rivets are relieved of shearing strain. 70

2. A tank car provided with head blocks substantially extending completely between end portions of the tank and the buffing surfaces of the car, an under frame to which said head blocks are riveted, the shanks of the rivets that unite each head block with the under frame being positioned to receive coupler thrusts in one direction and tank thrusts in the reverse direction through the intermediation of the head block, whereby said rivets are relieved of shearing strain, said head blocks being of composite construction, the portions thereof that engage the tanks being of wood. 75 80 85

3. A tank car provided with head blocks substantially extending completely between end portions of the tank and the buffing surfaces of the car, an under frame to which said head blocks are riveted, the shanks of the rivets that unite each head block with the under frame being positioned to receive coupler thrusts in one direction and tank thrusts in the reverse direction through the intermediation of the head block, whereby said rivets are relieved of shearing strain, said head blocks being of composite construction, the portions thereof that engage the tanks being of wood, said head blocks also including buffing aprons of metal, which receive the coupler blows. 90 95 100

4. A tank car provided with head blocks substantially extending completely between end portions of the tank and the buffing surfaces of the car, an under frame to which said head blocks are riveted, the shanks of the rivets that unite each head block with the under frame being positioned to receive coupler thrusts in one direction and tank thrusts in the reverse direction through the intermediation of the head block, whereby said rivets are relieved of shearing strain, said head blocks being of composite construction, the portions thereof that engage the tanks being of wood, said head blocks also including buffing aprons of metal, which receive the coupler blows, said buffing apron of metal extending downwardly for the purpose of receiving the coupler blows and extending upwardly to engage the wood. 105 110 115 120

5. A tank car provided with head blocks substantially extending completely between end portions of the tank and the buffing surfaces of the car, an under frame to which said head blocks are riveted, the shanks of the rivets that unite each head block with the under frame being positioned to receive coupler thrusts in one direction and tank thrusts in the reverse direction through the interme- 125 130

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are relieved of shearing strain, said head
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tending downwardly for the purpose of re-
ceiving the coupler blows and extending up-
10 wardly to engage the wood, the portion of

said apron engaging the wood being pocketed
to secure the wood in position.

In witness whereof, I hereunto subscribe
my name this 28th day of February, A. D.
1907.

CHARLES A. SHOEMAKER.

Witnesses:

LEON E. STROH,
G. L. CRAGG.