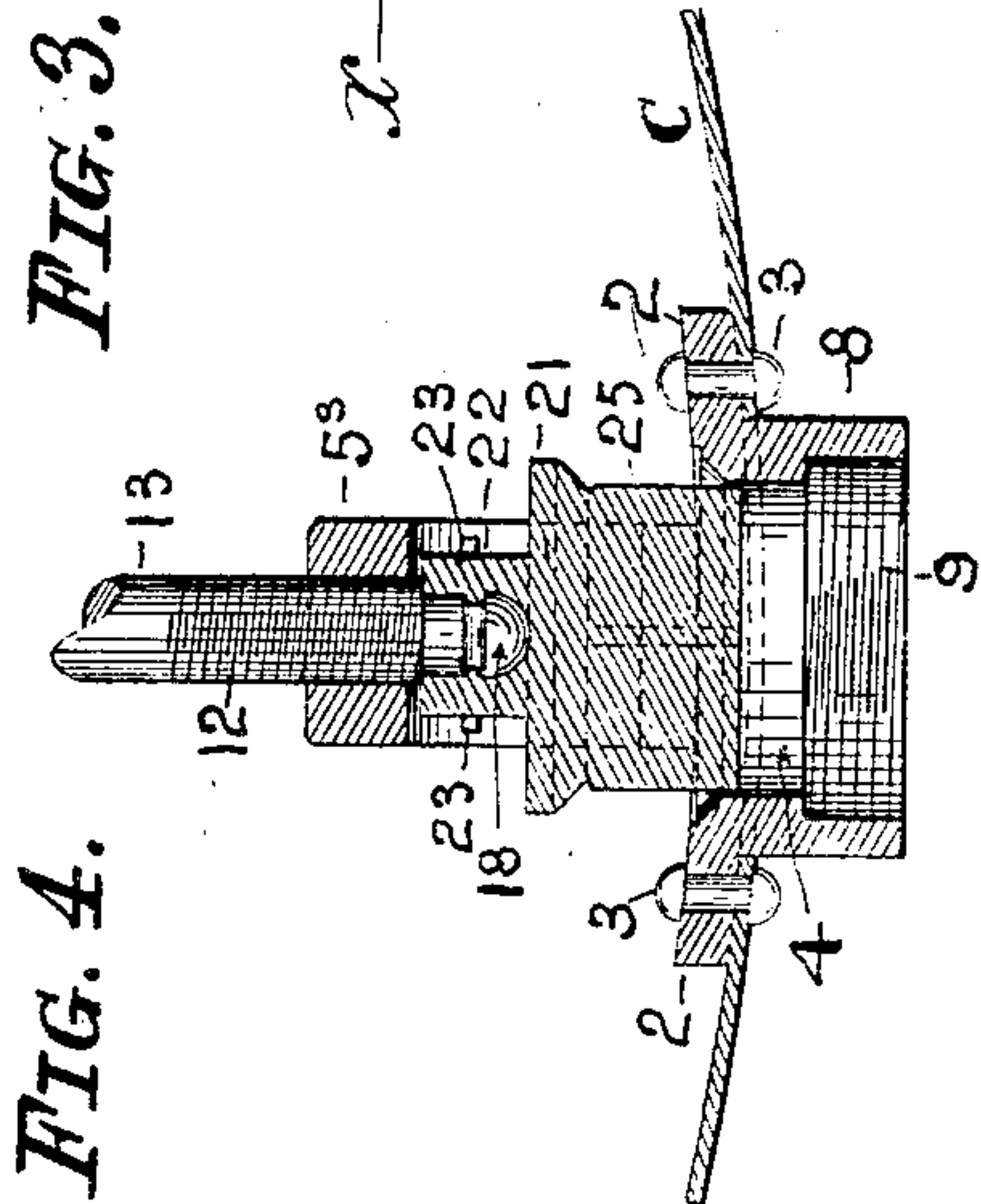
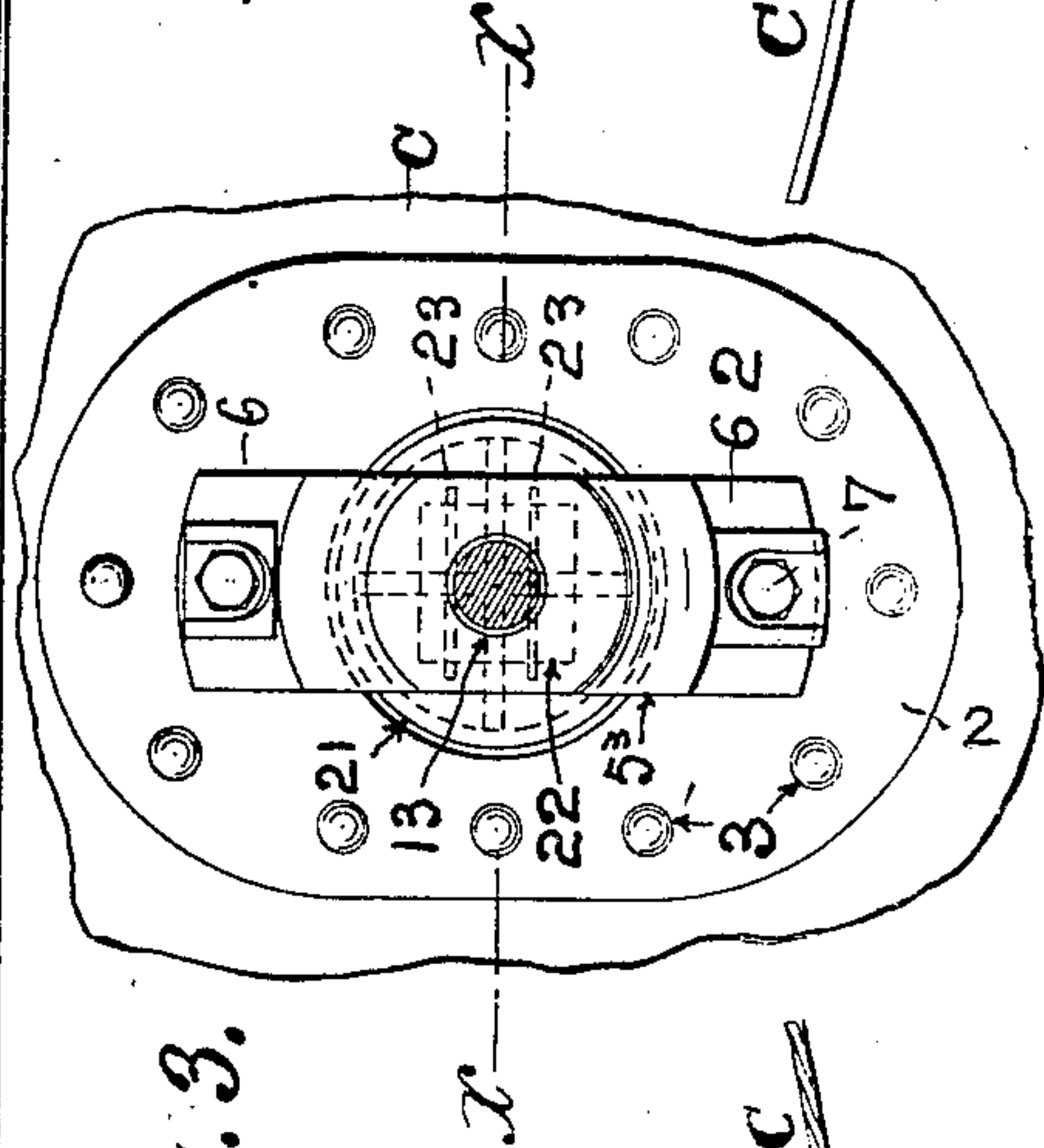
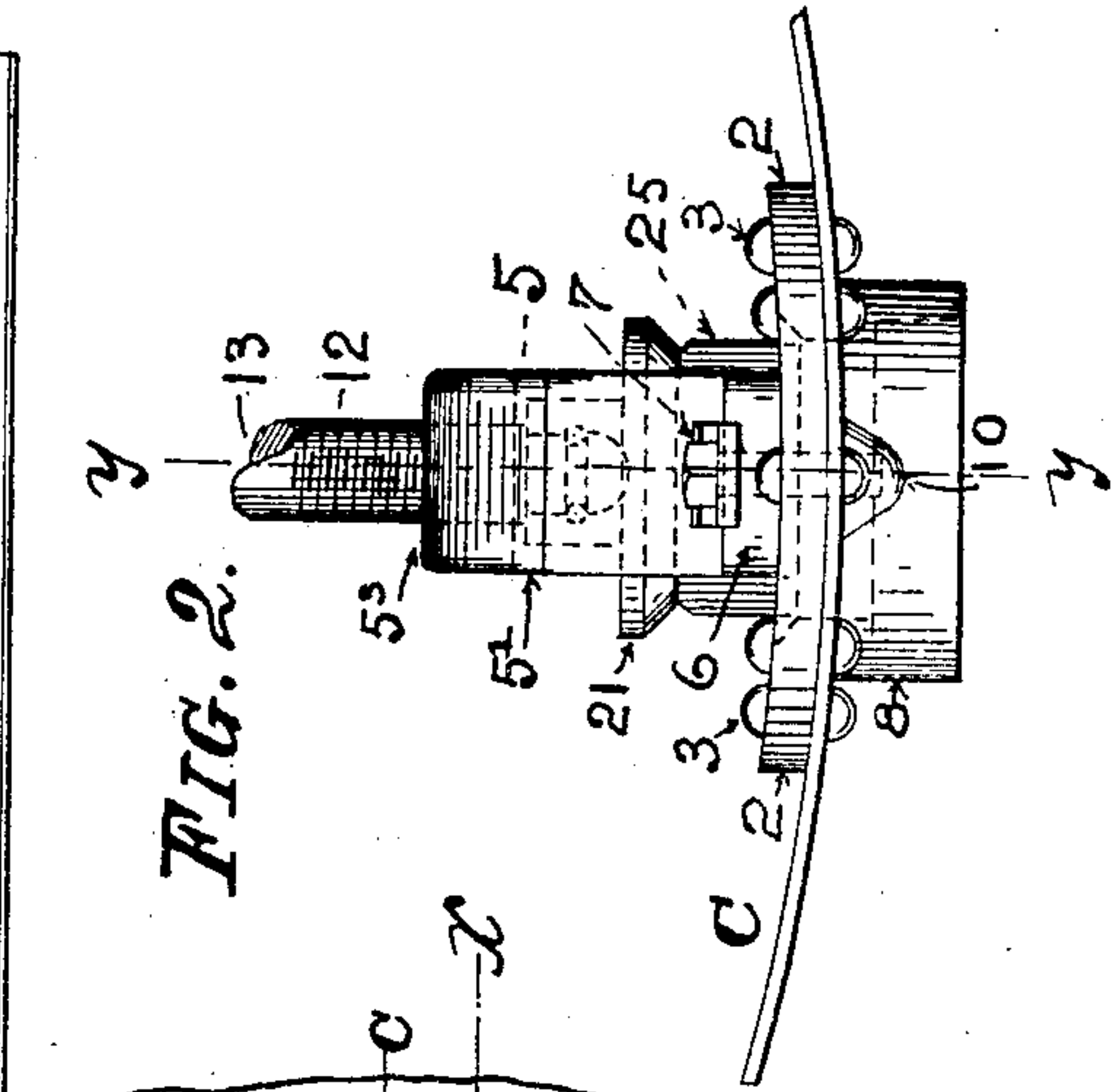
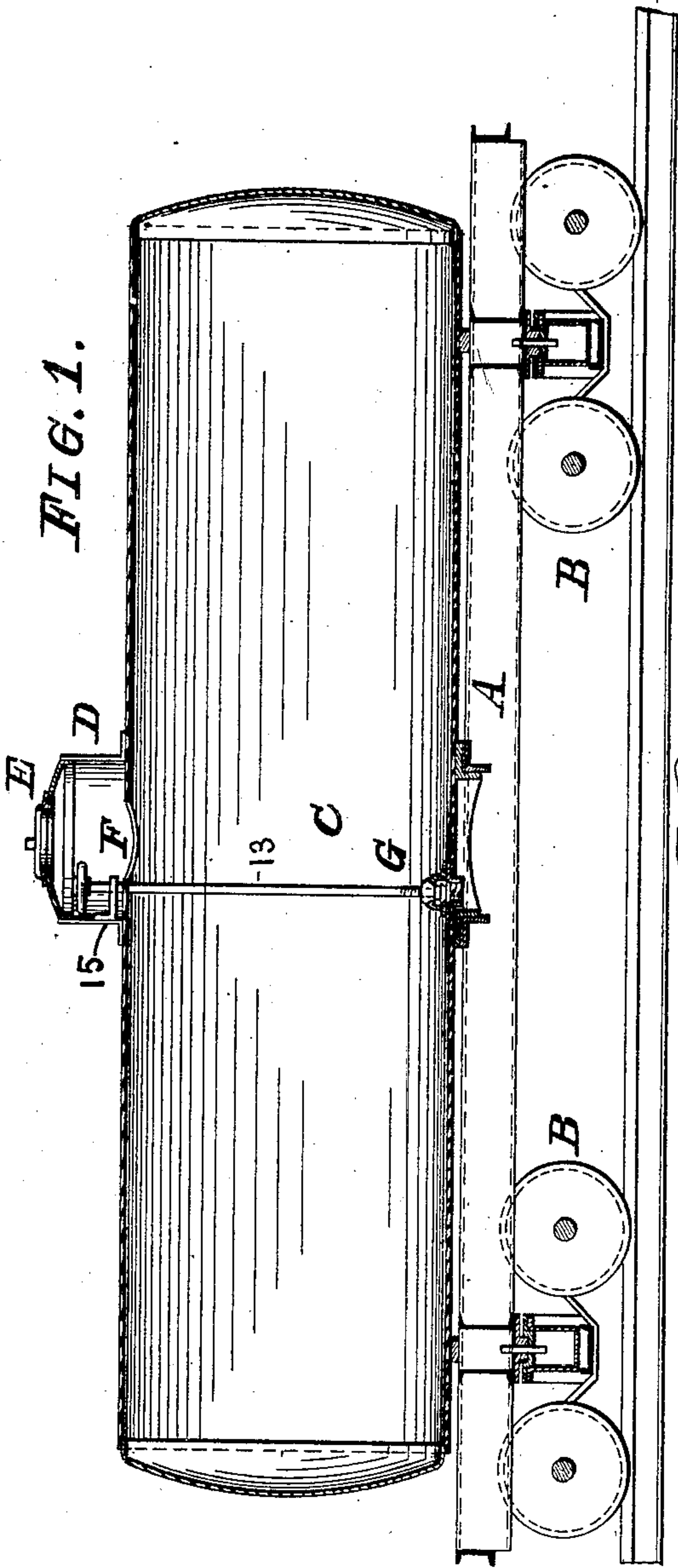


930,101.

Patented Aug. 3, 1909.

2 SHEETS—SHEET 1.



Witnesses:

B. B. Knudsen
A. G. Peterson.

Inventor:

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C. N. STEVENS.
TANK CAR.

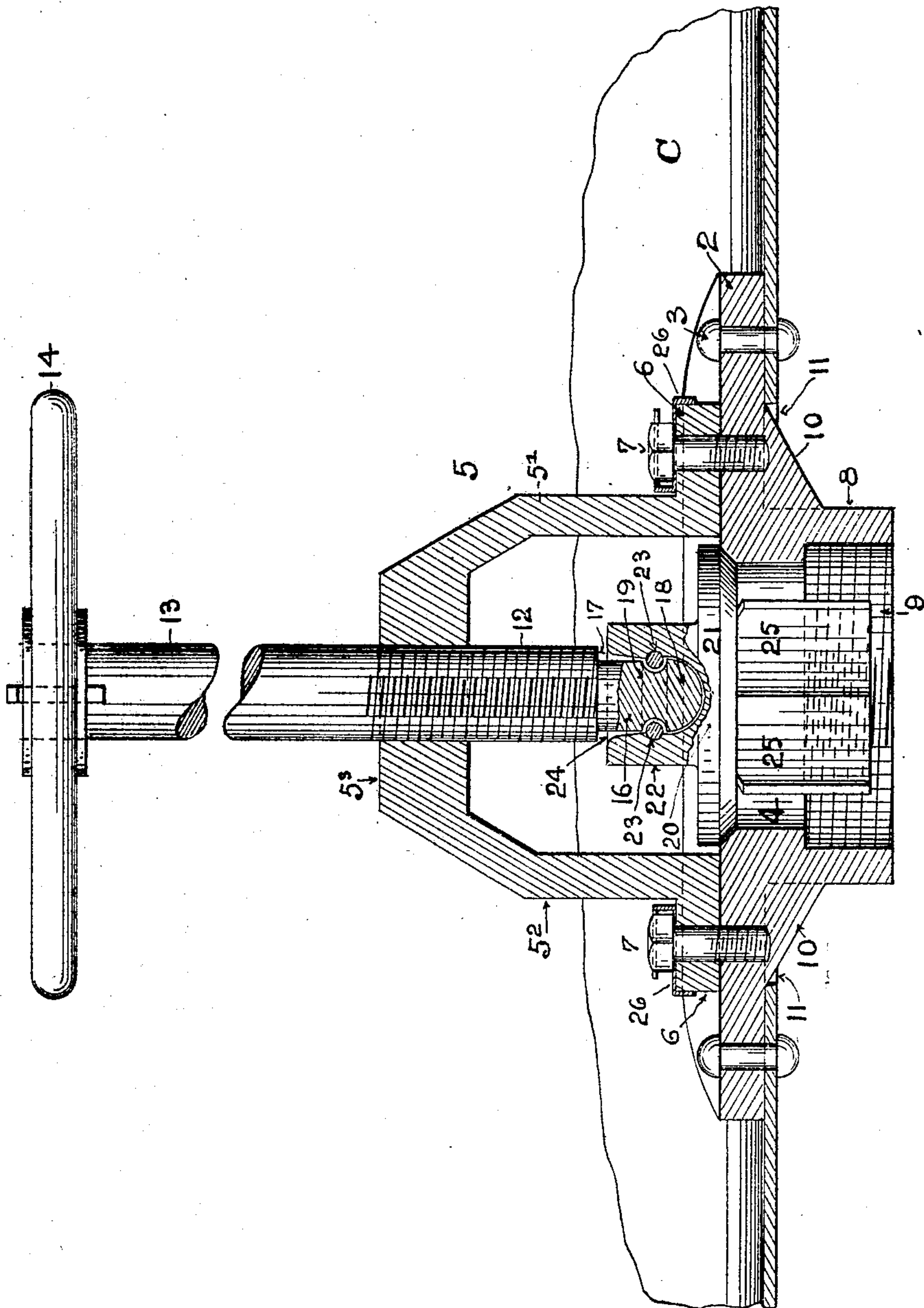
APPLICATION FILED AUG. 7, 1908.

930,101.

Patented Aug. 3, 1909.

2 SHEETS—SHEET 2.

FIG. 5.



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UNITED STATES PATENT OFFICE.

CHESTER N. STEVENS, OF CHICAGO, ILLINOIS.

TANK-CAR.

No. 930,101.

Specification of Letters Patent.

Patented Aug. 3, 1909.

Application filed August 7, 1908. Serial No. 447,456.

To all whom it may concern.

Be it known that I, CHESTER N. STEVENS, a citizen of the United States, and a resident of Chicago, in the county of Cook, in the State of Illinois, have invented certain new and useful Improvements in Tank-Cars; and I do hereby declare that the following description of my said invention, taken in connection with the accompanying sheets of drawings, forms a full, clear, and exact specification, which will enable others skilled in the art to which it appertains to make and use the same.

This invention has general reference to railway tank-cars; and it consists, essentially, in the novel and peculiar combination of parts, and details of construction, as hereinafter first fully set forth and described, and then pointed out in the claim.

In the drawings already referred to, which serve to illustrate this invention more fully, Figure 1 is a longitudinal sectional elevation of a tank-car fitted with my improvements. Fig. 2 is an end elevation of the peculiarly constructed valve employed in this car. Fig. 3 is a plan, and Fig. 4 a transverse-sectional elevation in line $x x$ of Fig. 3. Fig. 5 is a longitudinal sectional elevation in line $y y$ of Fig. 2.

Like parts are designated by corresponding symbols and characters of reference in all the figures.

The object of this invention is the production of a tank-car for transporting oil, tar and other liquids, and fluid products which are introduced into the tank in any convenient manner, usually through a man-hole in the dome of the tank and discharged from the tank through the lower portion of the wall thereof, a valve of peculiar construction especially adapted to this class of tanks being provided to govern the discharge of such liquids or fluids.

In tank-cars there are several conditions which prevent ordinary valves from being employed. One of these is that the tank, when empty, is usually round or circular in cross-section, while when filled it attains a more or less oval form owing to the weight of the liquid. Another condition is that when exposed to the rays of the sun or changes in temperature of the atmosphere, the tanks expand and contract both in length as well as diameter, which influence the valve in various manners to prevent efficient action thereof. To overcome these drawbacks,

I construct this car-tank substantially as follows:

A is the car-body mounted upon trucks and wheels B in the usual and approved manner.

C is the tank secured to the car body A. This tank is furnished with a dome D, having in its head a man-hole and cover E which hermetically closes the tank, and through which, when the cover is removed, access to the interior of the tank may be had, an opening F in the uppermost portion of the tank shell, and within the dome, being provided for this purpose.

Diametrically opposite the dome D and within the tank A there is located the discharge-valve G, which valve consists of a transversely-curved plate 2, of oblong contour, which plate is riveted to the inner surface of the tank by means of rivets 3, as clearly illustrated in Figs. 2, 3 and 4. Centrally, this plate has an annular passage 4, the upper edge of which is outwardly flared to form a valve-seat, as hereinafter more fully referred to. Upon the upper surface of this plate there is removably provided a U-shaped yoke 5, the lower ends, 6, of which are outwardly turned at right angles to the parallel members 5¹, 5², and form flanges whereby the yoke 5, is securely fastened to the plate. The cap-screws 7 held in position by nut-locks, 26, are used to fasten said yoke 5 in position. Below the plate 2 there is located a boss 8, which has an enlarged bore 9, which bore is internally screw-threaded for attachment of a discharge-spout, not shown, braces 10, shown clearly in Fig. 5, being provided to strengthen the plate and at the same time to properly locate the same in the tank and to prevent any possible rotating motion of the plate, said braces or ribs being located within slotted apertures 11, in the lower portion of the tank-shell.

The horizontal member 5³ of the yoke is centrally bored and screw-threaded for the reception of the externally-screw-threaded portion 12 of a valve-spindle 13, which valve-spindle reaches upwardly into the dome D and is provided with a hand-wheel 14, at its upper end, a bracket, 15, secured to the dome and engaging the valve-spindle 13 near its upper end, forming a guide for said valve-spindle at that end. The lower end of the valve-spindle 13 is reduced in diameter at 16 and shouldered at 17. The extreme end of this reduced portion 16 is formed into a

hemisphere 18, an annular groove 19 adjoining the hemisphere 18 being provided to enable the valve proper, 20, being movably secured to said spindle 13.

5 The valve proper consists of a disk 21, the lower edge of which is beveled to correspond with the bevel in the plate 2, said disk having an upwardly-projecting, centrally-located, boss 22, which is centrally bored to
10 correspond with the contour of the reduced portion of the valve-spindle, except that it is considerably larger than the valve stem portion 16, so that the valve-proper may freely rock upon said spindle, pins 23, transversely
15 passed through the boss and entering the annular groove 19 in the valve-spindle being used to connect the valve-stem with the valve proper, the upper portion of the internal bore 24 being tapering so as to allow of the
20 play of the valve proper on the valve-stem portion 16. Below the disk 21 there are a number of wings 25 which guide the valve proper within the bore of the plate 2.

It will now be observed that the valve-
25 stem 13 is guided at its upper end by the bracket 15 in the dome D, which bracket slides freely upon the valve-stem when the valve is closed and the tank being filled, and thereby attaining an oval cross-section which
30 will bring the upper portion of the tank-shell nearer to the lower part of said shell. The screw-threaded portion of the valve-stem engaging the yoke at the lower end of said stem and, therefore, in close proximity
35 to the valve proper, the latter will not be affected by this downward movement of the shell. There is also a continuous change in the length of the tank owing to the changes in the temperature of the atmosphere which
40 may cause variations in the alinement of the valve-spindle, but such variations cannot influence the valve proper owing to its free fit on the reduced portion of said valve-spindle and the hemispherical shape of the bearing
45 point of the spindle and the valve proper.

Attention is now called to the fact that in filling these tanks with coal-tar, pitch, &c., the temperature of which varies often as much as 400° at the time of entrance, a
50 consequent elongation of said tank, not only in diameter but also in the length thereof takes place almost simultaneously with the entrance of these hot liquids. These physical changes taking place within said tank
55 would cause leakage at the valve thereof, unless the same was so constructed that these variations in the sizes of the tank cannot affect the valve. Heretofore and before the

introduction of my invention this has been the serious obstacle encountered in the introduction of liquids of widely-varying temperatures into the tank-car. Attention is further called to the fact that in the transportation of tar or pitch or other liquids of heavy viscosity these liquids practically form
60 a jointure between the valve and the valve-seat of the discharging mechanism.

In discharge-valves as heretofore constructed, in attempting to open the same, rotary motion was imparted to the valve disk
65 proper. The jointure formed between the valve and the seat resists this rotary motion and often necessitates the combined strength of several men at the opening-wheel to separate the valve proper from its seat, and the
70 twisting off of a valve-spindle was a common occurrence. By the use of my invention the valve-disk proper does not necessarily rotate upon the first opening of the same. The lines of force lie in a direct perpendicular of the plane of the valve-seat,
75 and if the jointure between the valve and seat by the congealing of tar, pitch or other substances was sufficient to overcome the friction between the valve-stem and the
80 valve, the same would be lifted directly from its seat until the jointure was broken.

Having thus fully described my invention I claim as new and desire to secure to me by
85 Letters Patent of the United States—

A valve for tank-cars, comprising in combination with a tank, a valve seat formed in the lower portion of said tank, a valve fitted to said seat, a hollow boss formed on and projecting above said valve and having an
90 internal annular groove formed thereon, the hollow portion of said boss being flared toward the top, a valve stem extending from the top of said tank and being rotatably connected to said valve, connection therebetween, comprising a reduced portion of said
95 stem which fits said hollow boss and has an annular groove which registers with said internal groove and transverse pins, passing through said registering grooves whereby to
100 rotatably connect said stem and valve but permitting said stem a rocking motion in said flaringly hollowed boss.

In testimony that I claim the foregoing as my invention I have hereunto set my hand
105 in the presence of two subscribing witnesses.

CHESTER N. STEVENS.

Attest:

WILLIAM O. STARK,
ALTA M. DALTON.