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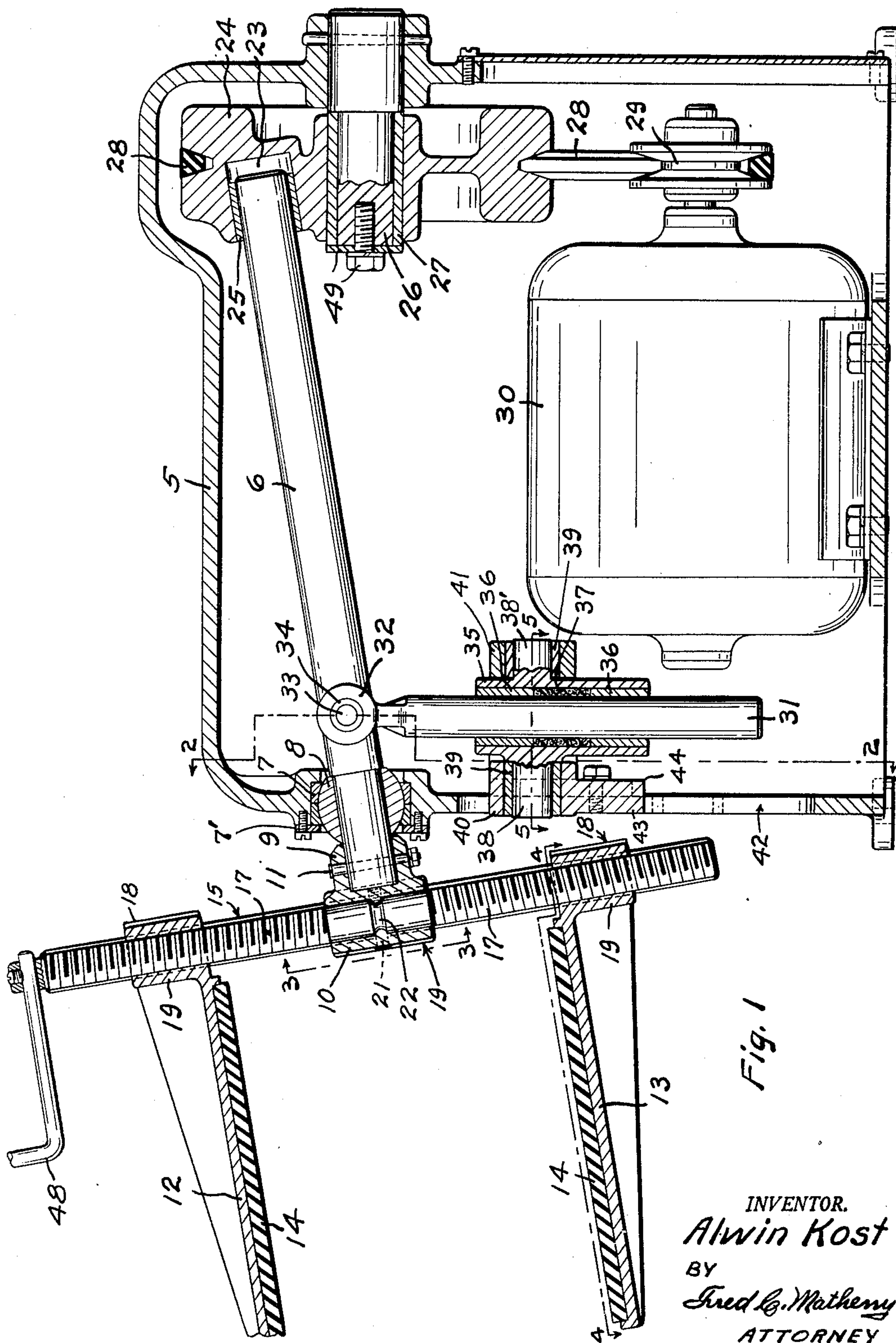
A. KOST

2,527,556

PAINT MIXING MACHINE

Filed June 24, 1946

2 Sheets-Sheet 1



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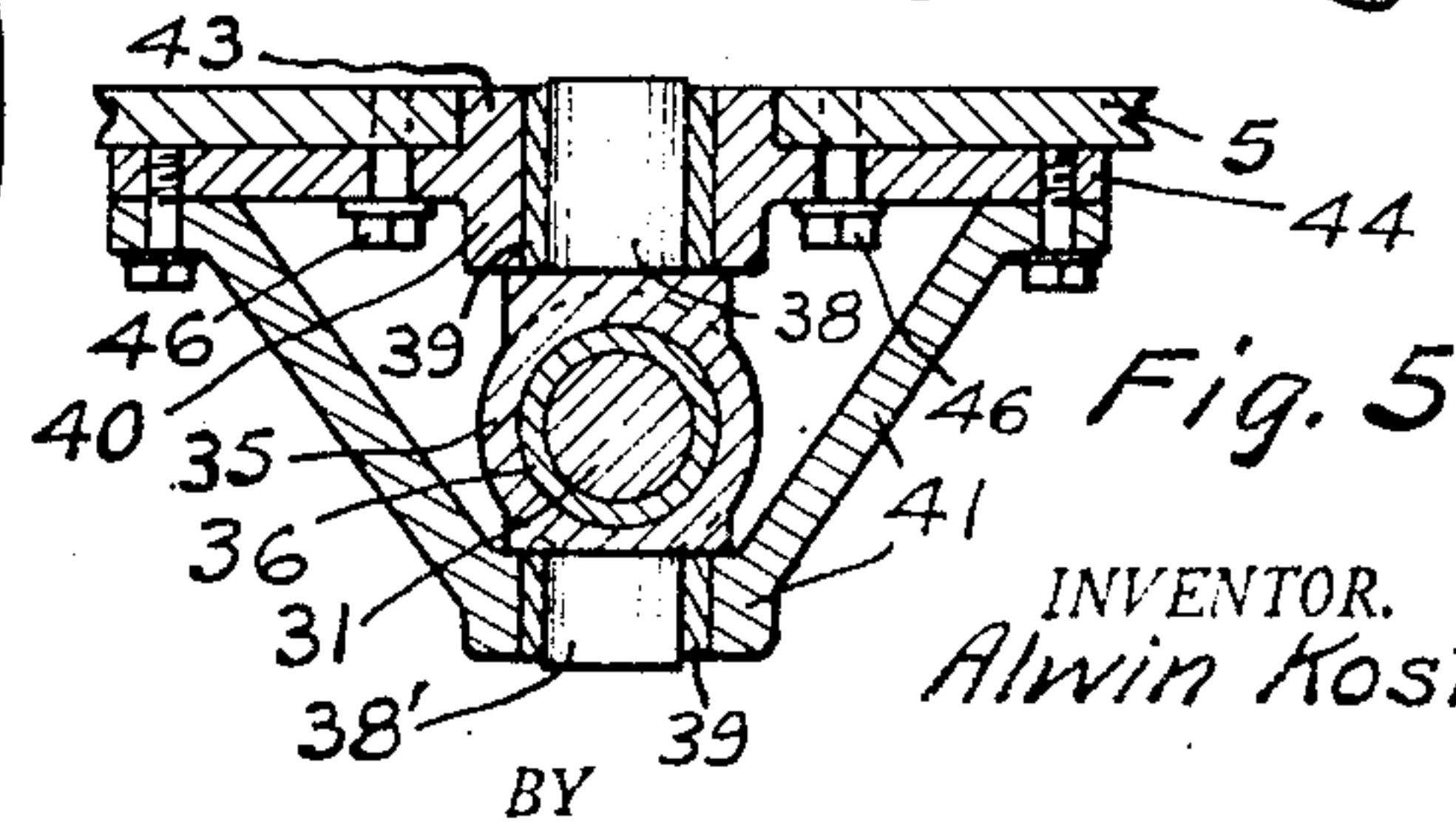
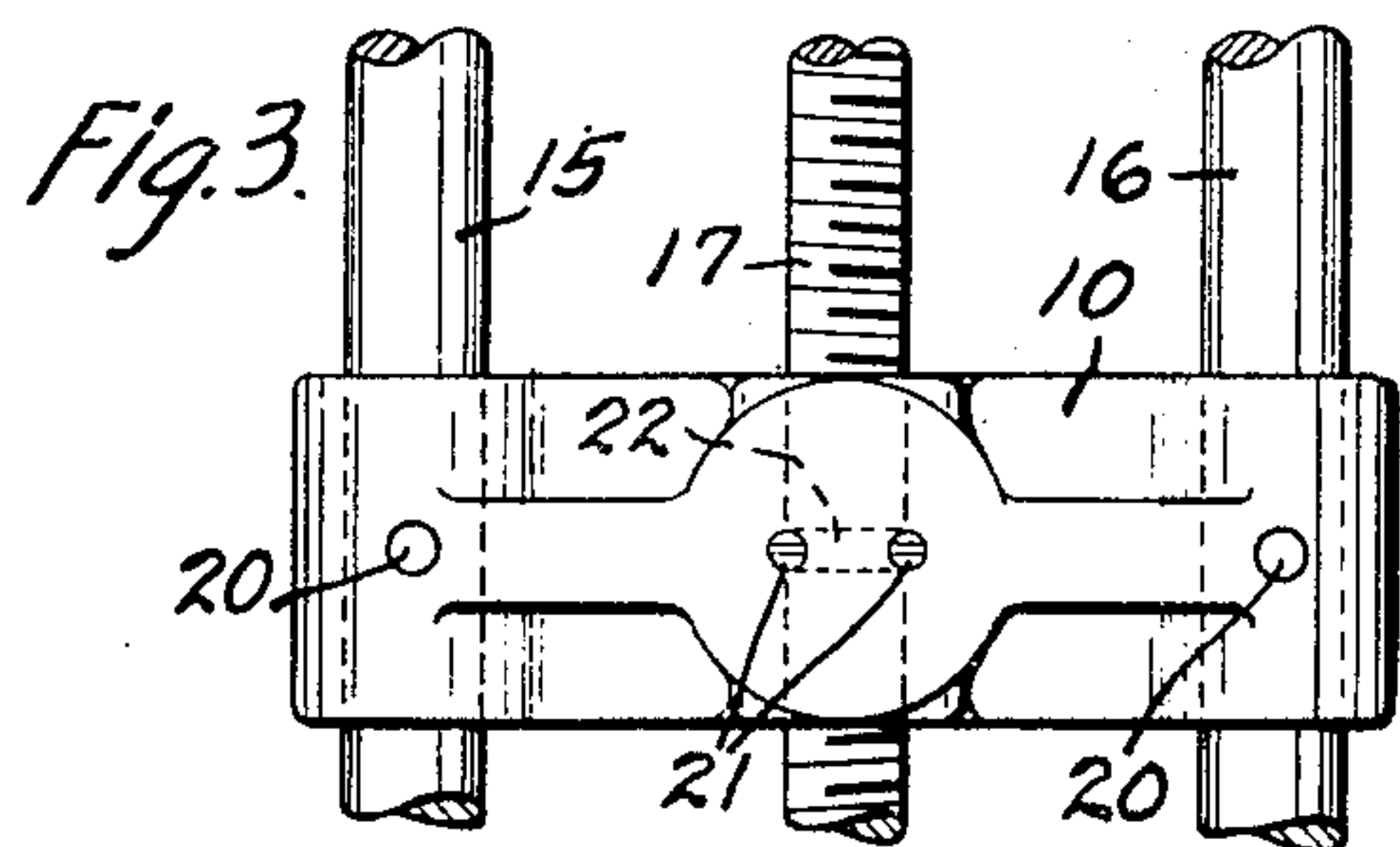
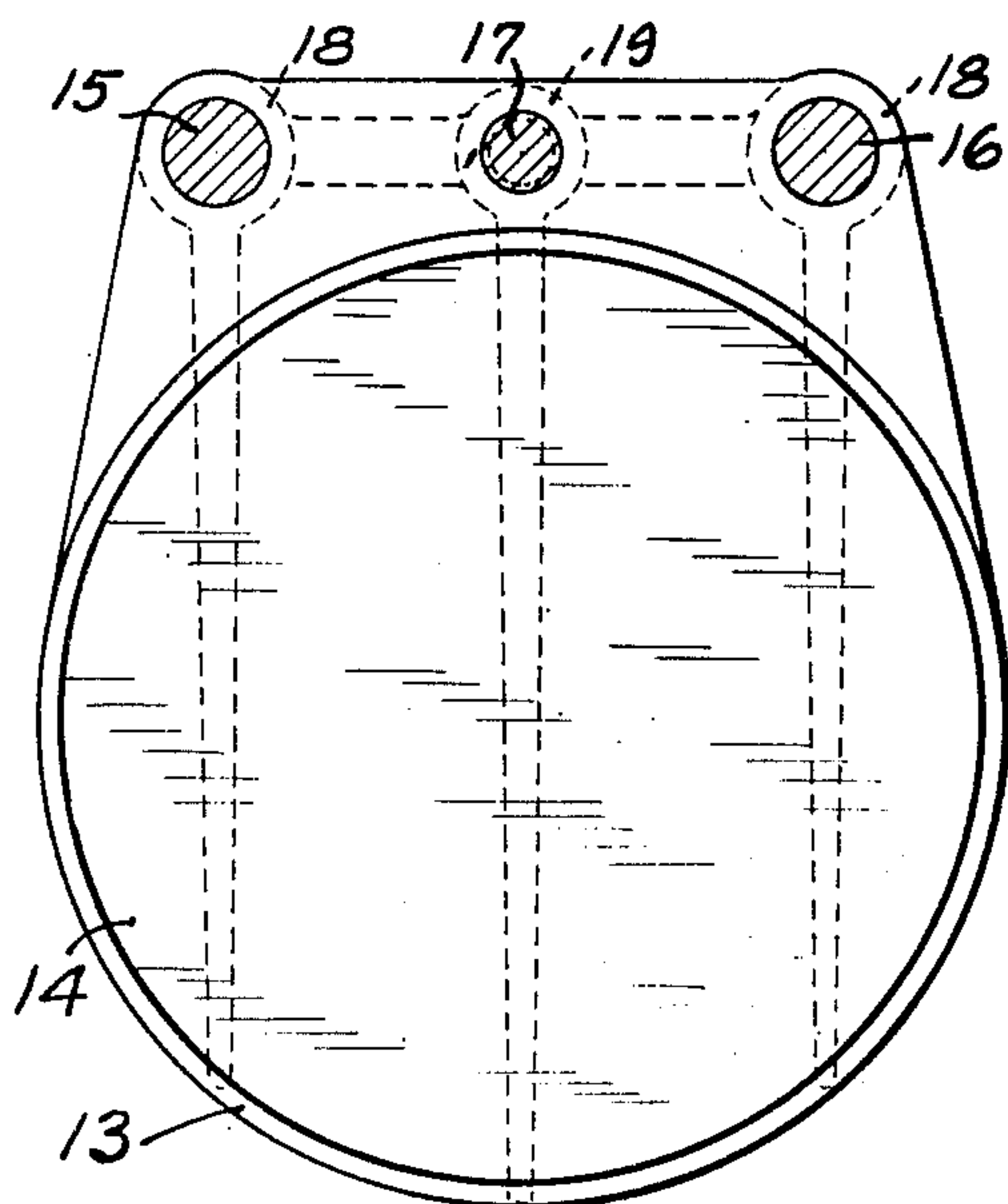
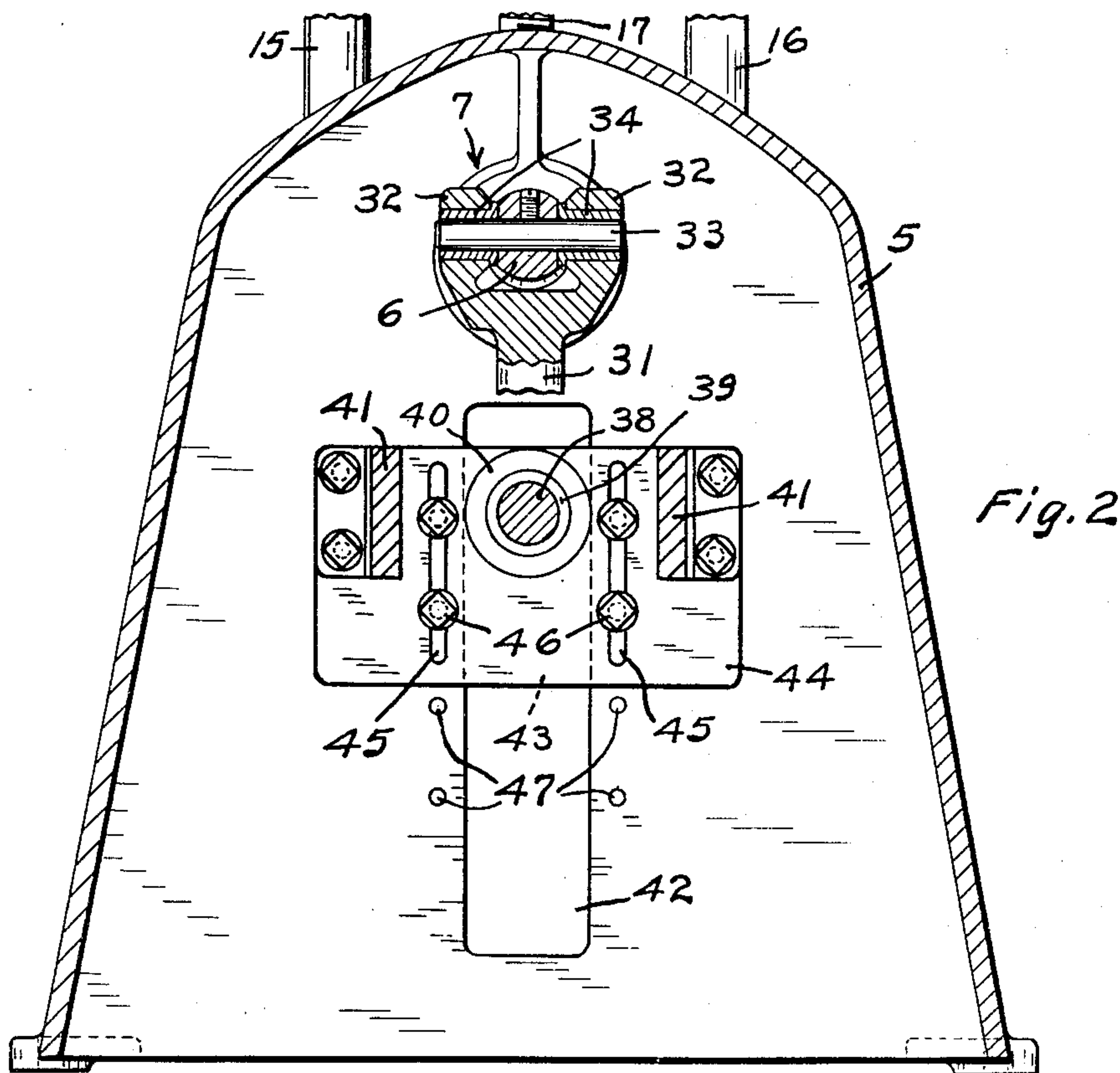
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2 Sheets-Sheet 2



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PAINT MIXING MACHINE

Alwin Kost, Portland, Oreg.

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5 Claims. (Cl. 259—72)

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My invention relates to a mixing machine that is particularly well adapted to be used as a paint mixer for subjecting cans or receptacles containing paint to complex movements to efficiently mix the paint in said receptacles.

My present invention is, in some respects, an improvement on devices disclosed in my prior patent on a Mechanical movement, No. 2,246,689, issued June 24, 1941.

An object of this invention is to provide a simple and efficient mixing machine that is adapted to receive and hold a receptacle, such as a can of paint, and to impart to said can of paint a combined swash plate and oscillating movement that will quickly and efficiently mix any settled or separated paint pigment with the liquid in said can.

Another object is to provide a mixing machine of simple, efficient and inexpensive construction that can be advantageously used for mixing or agitating other liquids beside paint.

Another object is to provide a mixing machine having novel means for moving a lever in a conical path and novel means for simultaneously oscillating said lever on its own axis.

Another object is to provide a power operated paint mixing machine of shaker type which is substantially free from vibration and noise.

Other objects of the invention will be apparent from the following description taken in connection with the accompanying drawings.

In the drawings—

Fig. 1 is a vertical sectional view of a paint mixer constructed in accordance with my invention, parts being shown in elevation.

Fig. 2 is a view partly in section and partly in elevation of said paint mixer taken substantially on broken line 2—2 of Fig. 1.

Fig. 3 is a fragmentary view in elevation of parts of the device looking in the direction of broken line 3—3 of Fig. 1.

Fig. 4 is a view partly in section and partly in plan looking in the direction of broken line 4—4 of Fig. 1.

Fig. 5 is a fragmentary sectional view taken substantially on broken line 5—5 of Fig. 1.

Like reference numerals designate like parts throughout the several views.

This paint mixer comprises a housing 5, preferably of tapered cross sectional shape, as shown in Fig. 2. A lever 6, which may be of cylindrical cross section like a shaft and which is mounted for oscillation, is disposed within the housing 5 and extends outwardly through a bearing member 7 in the front end portion of said housing.

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A ball member 8 is secured on the lever 6 and mounted for oscillation in the bearing member 7. The ball member 8 can be made as a separate piece and pressed onto the lever 6 or it can be made as an integral part of the lever 6. This ball member 8 will oscillate freely in the bearing 7 and will also prevent longitudinal movement of the lever 6. The bearing 7 is held in place by a cap 7' which is secured to the housing by screws or any other suitable means.

The forward end portion of the lever 6 fits into a hub 9 of a cross yoke 10 and is secured to said hub 9, as by a taper pin 11.

The cross yoke 10 is connected with apparatus for receiving and holding a receptacle, such as a paint can, that is to be subjected to complex movements for the purpose of mixing the contents of such receptacle, such as paint in a can.

The receptacle holding means comprises two spaced apart plates 12 and 13, Figs. 1 and 4, which may be of duplicate construction and are adapted to receive therebetween a receptacle, such as a paint can. The face of each plate 12 and 13 that engages with the receptacle has a rubber pad 14 secured thereto to receive the end of receptacles of various sizes and to securely hold said receptacles.

The plates 12 and 13 are supported on two spaced apart guide bars 15 and 16 and on a medially positioned adjusting screw 17, all of which are carried by the cross yoke 10. The guide bars 15 and 16 are slidably received in hubs 18 of the plates 12 and 13. The adjusting screw 17 is threaded through a similar hub 19 of each plate 12 and 13. The portions of the adjusting screw 17 that engage with the respective plates 12 and 13 are oppositely threaded, as indicated in Fig. 1, so that rotation of the screw 17 in one direction will move the plates 12 and 13 toward and away from each other.

The guide bars 15 and 16 and adjusting screw 17 are supported by the cross yoke 10.

Taper pins 20 can be used to secure the guide bars 15 and 16 to the cross yoke 10. The screw 17 is preferably secured to the yoke 10 by two spaced apart pins 21 that operate in an annular groove 22 in said screw 17. The pins 21 prevent longitudinal movement of the screw 17 but allow said screw to be rotated for the purpose of adjusting the plates 12 and 13 toward and away from each other. A crank 48 is provided for rotating the screw 17.

The rear end portion of the lever 6 extends into a socket 23 that is provided in an off-center position in a flywheel 24 which functions as a

crank or crank disc. Preferably a bushing 25 is provided within the socket 23 to receive the end of the shaft 6. The flywheel 24 is large enough and heavy enough so that its momentum will contribute substantially to the maintenance of a smooth and even speed at all times. The flywheel 24 is rotatively mounted on a fixed bearing pin or journal member 26 that is rigid with the frame 5. Preferably a bushing 27 is provided within the hub portion of the flywheel 24 for rotary movement on journal 26. A cap screw and washer 49 can be used to secure the flywheel 24 on the journal 26. The flywheel 24 is driven by a V belt 28 that passes around said flywheel 24 and around a grooved pulley 29 on the shaft of a motor 30.

When the flywheel 24 is rotated it will cause the lever 6 to be moved in conical paths which have their apexes at a common point coinciding with the center of the ball member 8. This will impart a wobbling or swash plate movement to the two bars 15 and 16 and screw 17 which carry the plates 12 and 13.

Means are also provided for oscillating the lever 6 on its own axis at the same time said lever 6 is moved in conical paths. This lever oscillating means comprises an upright lever oscillating arm or shaft 31 having a forked upper end portion 32 that is connected by a cross pin 33 with the lever 6. Bushings 34 preferably are provided in the forked portions 32 of arm 31 for engagement with the pin 33.

The arm 31 is slidably disposed in a bearing tube 35, which preferably has bushings 36 in which the arm 31 slides. Oil impregnated material 37 preferably is provided between the bushings 36 to insure proper lubrication of the bushings and arm 31.

The bearing tube 35 has two oppositely protruding bearing pins 38 and 38' integral therewith and extending at right angles therefrom. The bearing pins 38 and 38' are journaled in bushings 39 that are carried by bearing members 40 and 41 which are rigid with the frame 5. The use of two diametrically opposite bearing pins 38 and 38' with two bearings 40 and 41 on opposite sides of the tube 35 provides a very strong and substantial bearing structure for withstanding the strains to which the tube 35 is subjected. If desired, the bearing member 40 can be cast as an integral part of the frame 5 and the bearing member 41 can be bolted directly to the frame 5 to provide a non-adjustable bearing. However the drawings show these parts as mounted for vertical adjustment.

It is preferable but not essential to have the bearing member 40 adjustably supported so that its distance from the lever 6 can be varied. Such an adjustment makes it possible to vary the angle of oscillation that will be imparted to the lever 6 as said lever is moved in a conical path. One way of providing this adjustment is to provide, in the frame 5, a vertical slot 42 that slidably receives a boss 43 on a plate 44 that is integral with the bearing member 40. The plate 44 overlaps the frame 5 at the sides of the slot 42 and has vertical slots 45 therein. Cap screws 46 extend through the slots 45 and are threaded into the frame 5 to adjustably but rigidly secure the bearing member 40 to the frame 5. The slots 45 provide for a limited adjustment of the bearing member 40 by loosening the cap screws 46 and moving the plate 44 up or down. Further adjustment can be had by removing the cap screws

46 and threading them into other threaded holes 47 in the frame.

When the lever 6 is moved in a conical path the shaft 31 will be angularly moved back and forth about the axis of the bearing pin 38. Obviously this will impart a twisting movement or axial oscillation to the lever 6.

In the operation of this device a receptacle, such as a can of paint that has been kept in one position, as on a shelf, long enough for the pigment thereof to settle, is placed in this machine with its two ends in contact with the pads 14 on the plates 12 and 13. The screw 17 is then turned by taking hold of the crank 48 on one end thereof, and the plates 12 and 13 are tightened or pressed against the ends of the can. This causes the ends of the paint can to be depressed into the pads 14 and the paint can will be held very firmly.

The motor 30 is then started so as to rotate the flywheel 24 and move the lever shaft 6 in conical paths. This conical movement of the shaft 6 will impart a wobbling or swash plate movement to the yoke 10, and paint can holding parts carried thereby. At the same time the lever shaft 6 will be oscillated by the upright shaft 31 and this oscillating movement will be transmitted to the wobbling yoke 10 and paint can holding parts carried thereby. This will simultaneously impart to a can of paint a swash plate or wobbling movement and an oscillating movement and will quickly and efficiently mix any settled pigments with the liquids in the paint can.

The complex movement imparted to the receptacle held by the plates 12 and 13 is very efficient in mixing the contents of this receptacle. Also the movement of the parts is very smooth and well balanced and it has been found that this machine will operate with substantially no vibration and with very little noise.

The foregoing description and accompanying drawings clearly disclose a preferred embodiment of my invention but it will be understood that this disclosure is merely illustrative and that changes may be made within the scope and spirit of the following claims.

I claim:

1. A mixing machine comprising a lever; fulcrum means for said lever positioned between the two ends of the lever and closer to one end than the other and supporting said lever for universal movement; receptacle holding means carried by the shorter end portion of said lever; means for moving the other end portion of said lever in a circular path to thereby impart a swash plate movement to said receptacle holding means; a lever oscillating arm positioned approximately at right angles to said lever and radially of said lever; pivot means connecting one end of said lever oscillating arm with said lever, the axis of said pivot means being perpendicular to and intersecting the axis of said lever; and pivotally supported socket means slidably supporting the outer end portion of said lever oscillating arm to thereby oscillate said receptacle holding means simultaneously with the swash plate movement thereof.

2. A mixing machine comprising a housing; a lever disposed in said housing and extending outwardly through a wall of the housing; universal fulcrum means supporting said lever for universal tilting movement at the location where said lever passes through the housing wall; receptacle holding means carried by the end portion of said lever external to said housing; means within the housing for moving said lever in

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conical paths; a lever oscillating arm pivotally connected at one end with said lever and extending sidewise therefrom; guide means slidably receiving said arm; and pivot means supporting said guide means for oscillation on an axis substantially perpendicular to said arm and substantially parallel to said lever.

3. A mixing machine comprising a housing; a lever disposed in said housing and extending outwardly through a wall of the housing; universal fulcrum means supporting said lever for universal tilting movement at the location where said lever passes through the housing wall; receptacle holding means carried by the end portion of said lever external to said housing; a driven crank member in said housing in axial alignment with said universal fulcrum means; means connecting an end portion of said lever to said crank means whereby said lever will be moved in conical paths by rotation of said crank means; a lever oscillating arm positioned in a radial plane of said lever and approximately at right angles to said lever; a forked end portion of said lever-oscillating arm fitting over said lever; pivot means connecting said forked end portion with said lever, the axis of said pivot means being perpendicular to and intersecting the axes of said lever and said lever oscillating arm and a pivotally mounted guide through which the lever oscillating arm slidably extends, the axis of the guide pivot being substantially perpendicular to said arm.

4. A mixing machine comprising a housing; a lever disposed in said housing and extending outwardly through a wall of the housing; universal fulcrum means supporting said lever for universal tilting movement at a location where said lever passes through the housing wall; receptacle holding means carried by the end portion of said lever external to said housing; means within the housing for moving said lever in conical paths; a lever oscillating arm pivotally connected at one end

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with said lever and extending sidewise therefrom; guide means slidably receiving said arm; pivot means supporting said guide means for oscillation on an axis substantially perpendicular to said arm and substantially parallel to said lever; and devices for adjusting the pivotal support of said guide means toward and away from said lever to thereby vary the amplitude of oscillation of said lever.

5. A mixing machine comprising a housing; a lever disposed in said housing and extending outwardly through a wall of the housing; universal fulcrum means supporting said lever for universal tilting movement at a location where said lever passes through the housing wall; receptacle holding means carried by the end portion of said lever external to said housing; means within the housing for moving the lever in conical paths; a lever oscillating arm pivotally connected at one end with said lever and extending sidewise therefrom; a guide tube slidably receiving said arm; two aligned bearing pins rigid with said guide tube and projecting radially therefrom in opposite directions; and two bearing members receiving said bearing pins and supporting said guide means for oscillation on an axis substantially perpendicular to said arm and substantially parallel to said lever.

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