

Nov. 15, 1949

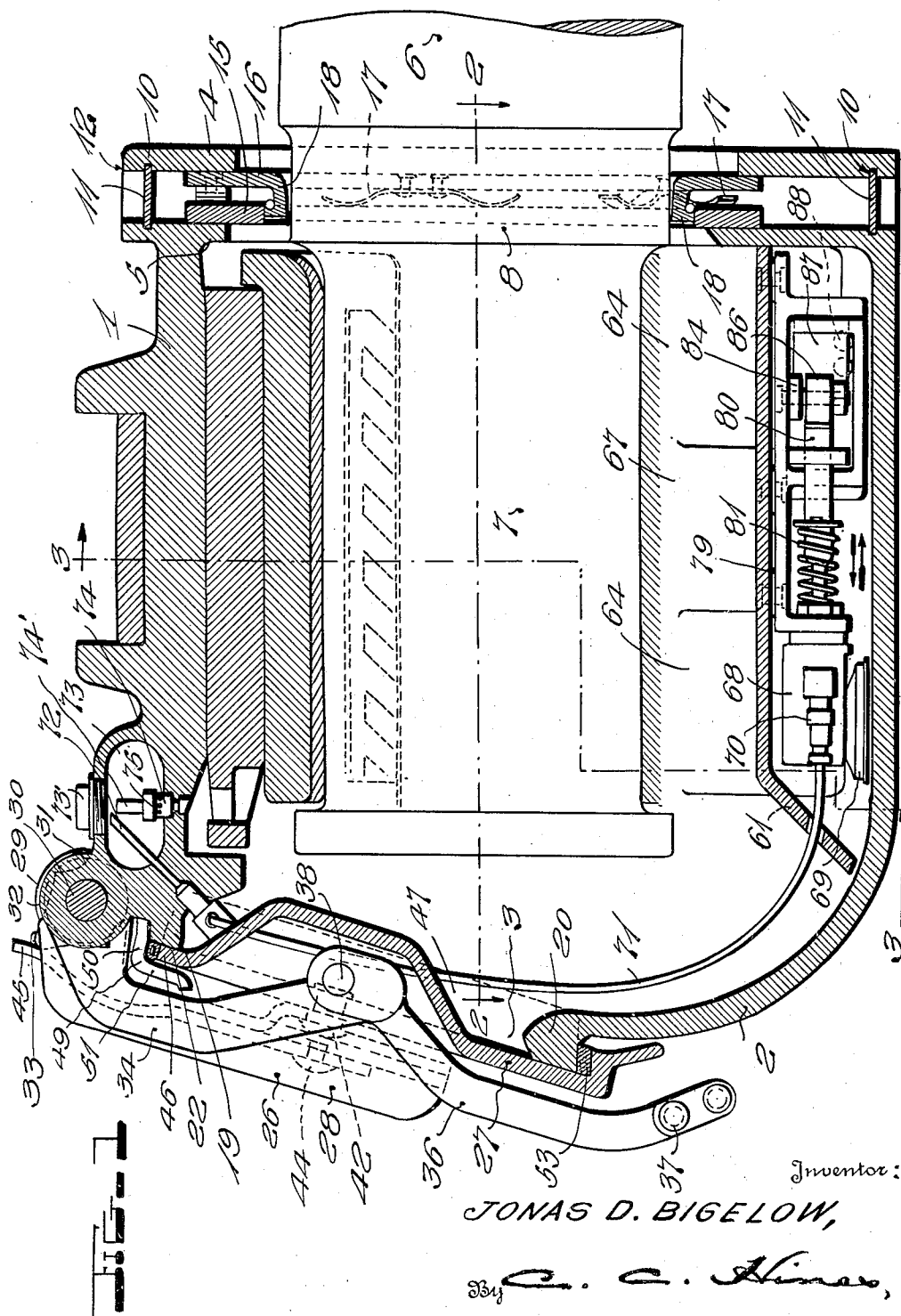
J. D. BIGELOW

2,488,162

JOURNAL BOX CONSTRUCTION

Filed May 25, 1945

6 Sheets-Sheet 1



Nov. 15, 1949

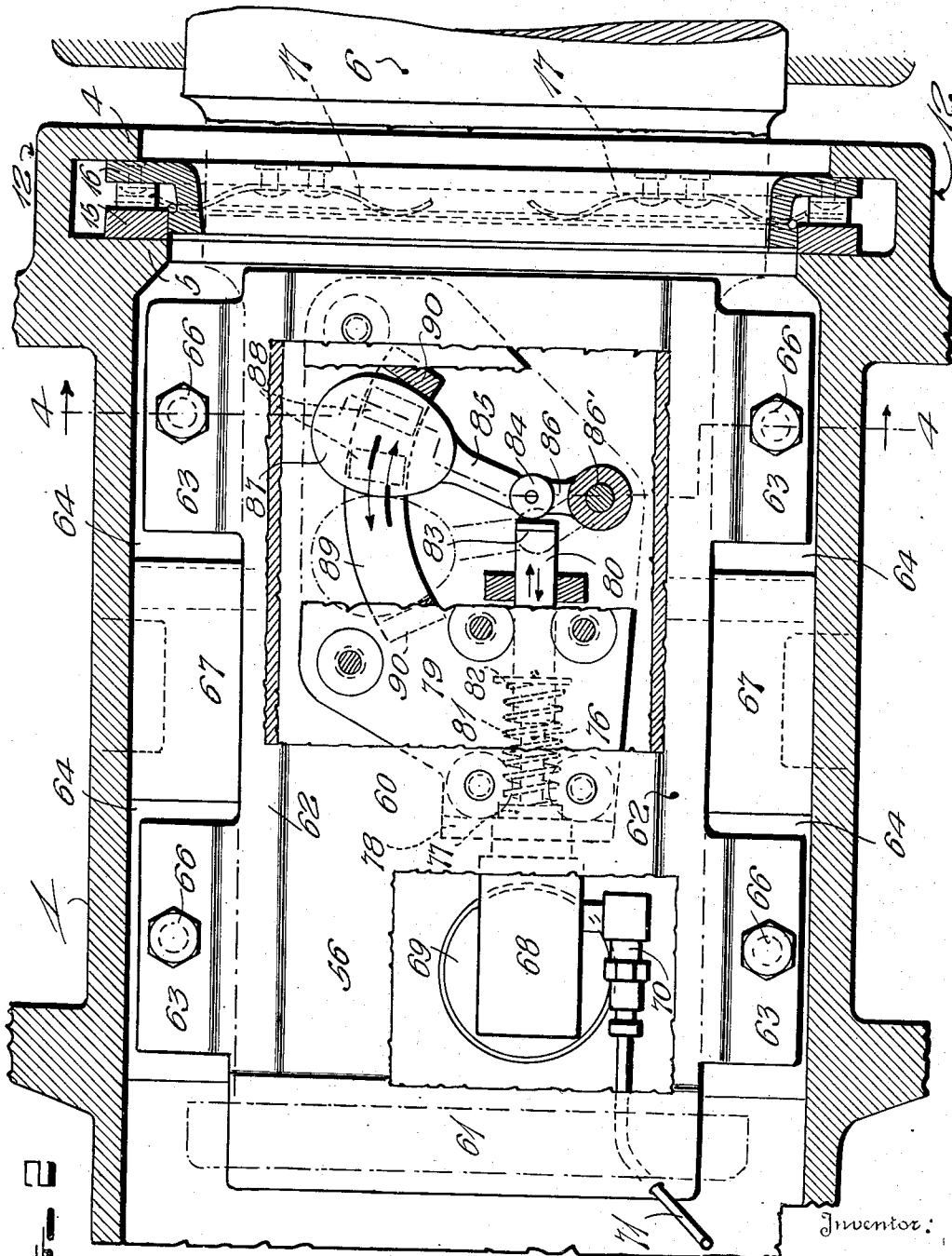
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JOURNAL BOX CONSTRUCTION

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6 Sheets-Sheet 2



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FIG. 3

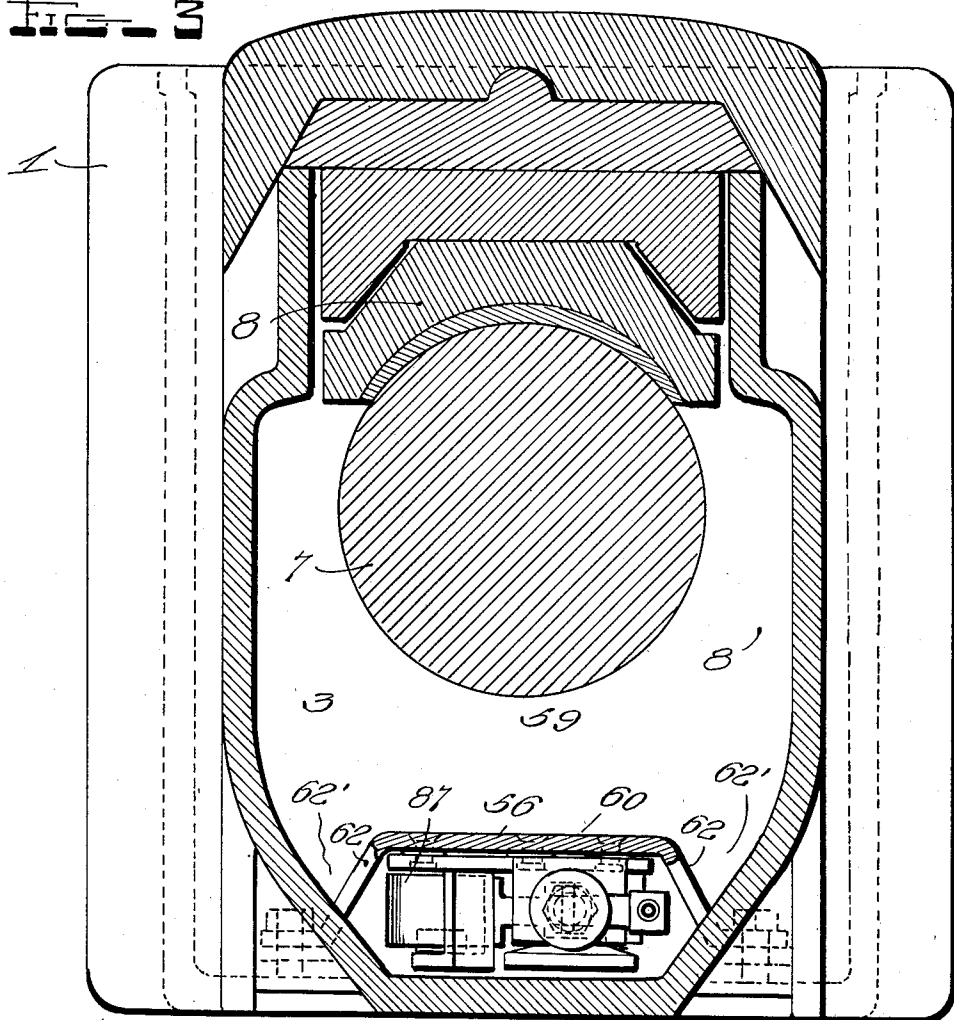
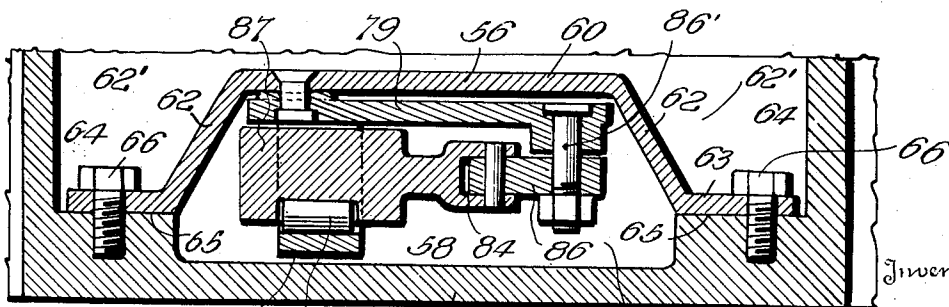


FIG. 4

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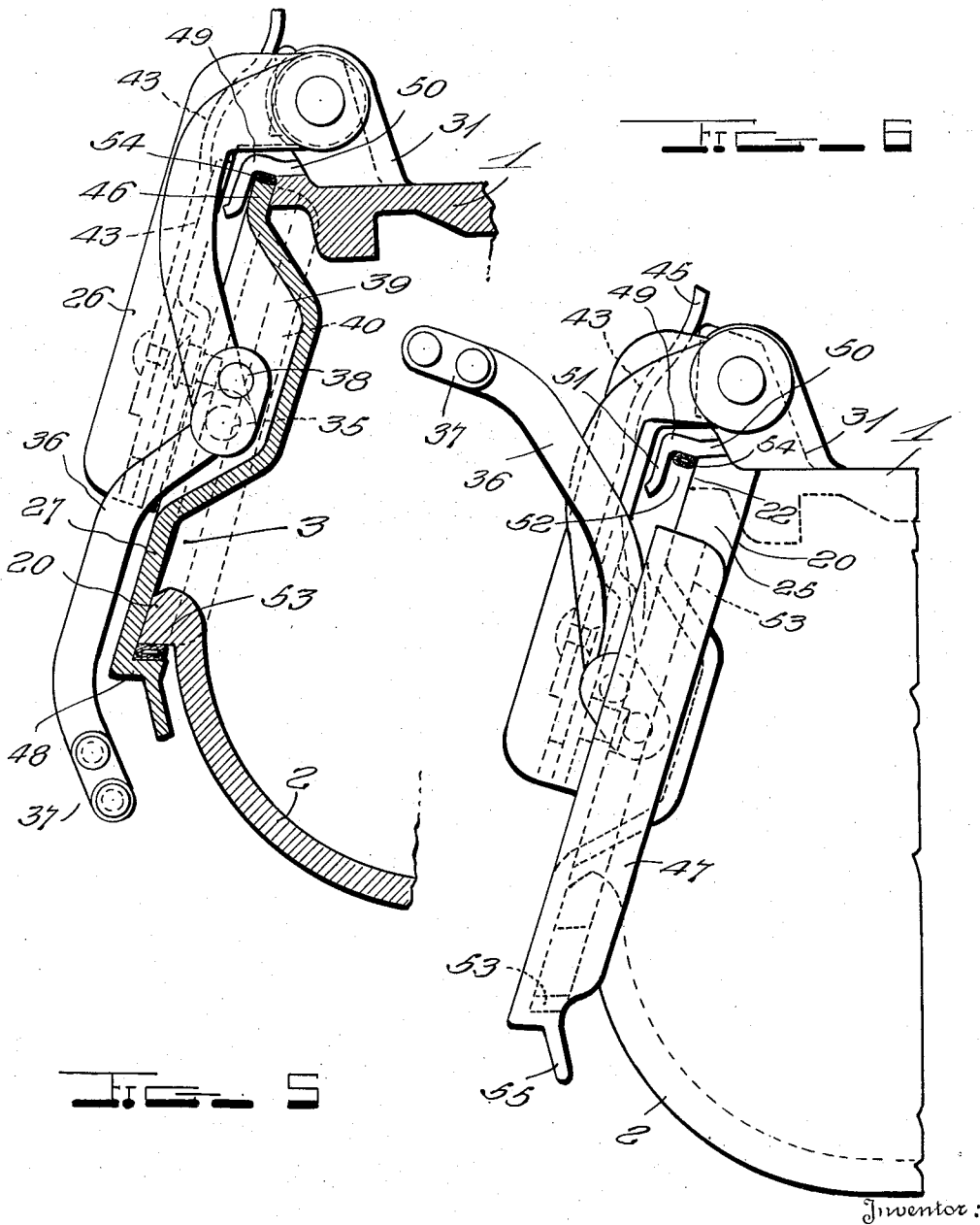
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6 Sheets-Sheet 4



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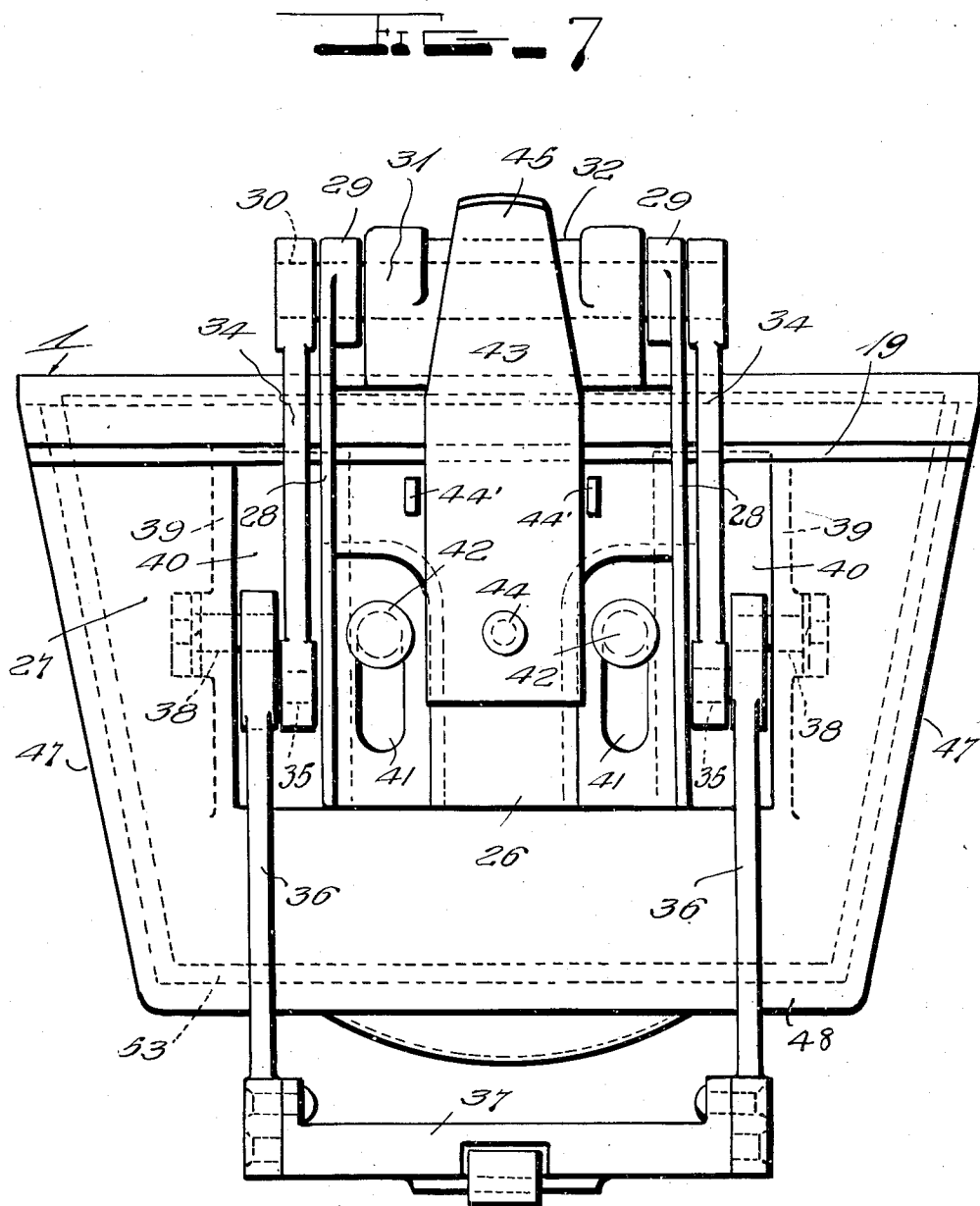
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6 Sheets-Sheet 5



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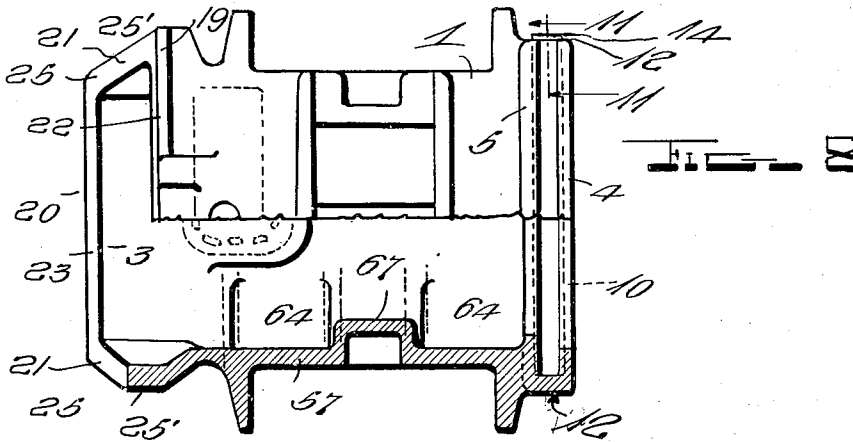
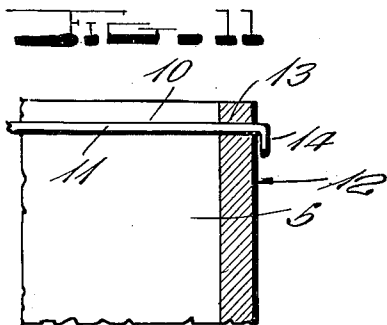
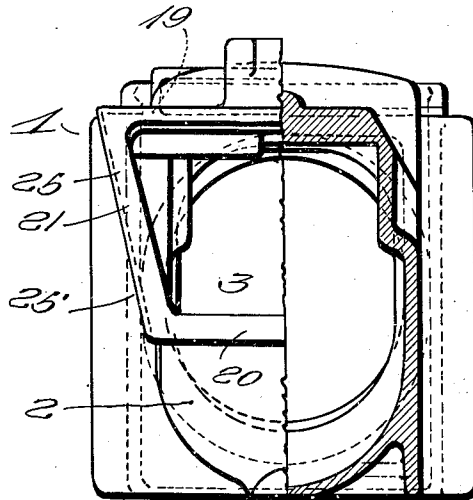
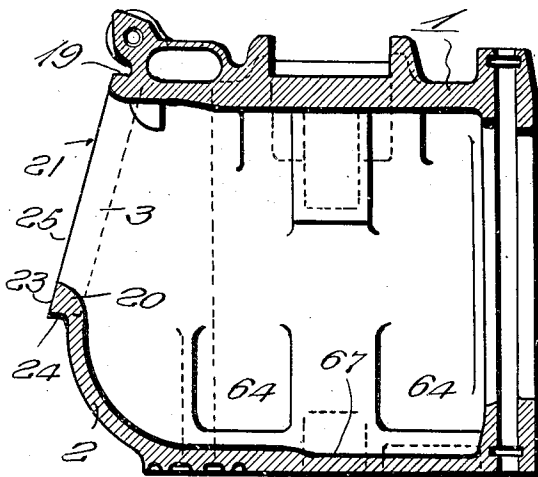
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JOURNAL BOX CONSTRUCTION

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6 Sheets-Sheet 6



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UNITED STATES PATENT OFFICE

2,488,162

JOURNAL BOX CONSTRUCTION

Jonas D. Bigelow, Yonkers, N. Y.

Application May 25, 1945, Serial No. 595,762

14 Claims. (Cl. 308—47)

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This invention relates to journal box closure means for positively retaining oil in the box and securely closing or sealing the box against entrance of dust or other oil contaminating substances, abrasives, water and other foreign matter.

One object of the invention is to provide novel and improved means for closing the front of the journal box in a secure manner to seal the opening against escape and waste of oil and to close the opening against the entrance of moisture and dust or other solids.

Another object of the invention is to provide a door or closure for the front of the journal box which is provided with or adapted to be used in conjunction with sealing means to tightly close the door opening and which includes operating means for opening and closing the door and placing the sealing means under sealing pressure.

Still another object of the invention is to provide a novel construction of journal box, door and door operating means whereby the above noted objects are obtained in a simple, reliable and efficient manner.

Still another object of the invention is to provide journal box closure or sealing means which is especially desirable and adaptable for use on journal boxes using pressure feed lubrication and means for holding and retaining waste in proper working position and against displacement.

With these and other objects in view, the invention consists of the novel and improved features of construction, combination and arrangement of parts hereinafter fully described and claimed, and as shown in the accompanying drawings, in which:

Fig. 1 is a vertical longitudinal section through a journal box embodying my invention, showing the journal box door in closed and sealing position.

Fig. 2 is a horizontal transverse section, through the box, with parts broken away, taken substantially on line 2—2 of Fig. 1.

Fig. 3 is a vertical transverse section through the box taken substantially on line 3—3 of Fig. 1.

Fig. 4 is a detail section on the line 4—4 of Fig. 2.

Fig. 5 is a vertical section through the forward portion of the box showing particularly the door structure, the door appearing in closed position.

Fig. 6 is a side elevation of so much of the box as is shown in Fig. 5, showing the door released for movement to open position or to closed and sealing position.

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Fig. 7 is a view in front elevation of the journal box with the door in closed position.

Fig. 8 is a view, partly in top plan and partly in horizontal section, of the journal box per se.

Fig. 9 is a view, partly in front elevation and partly in vertical transverse section, of the box.

Fig. 10 is a vertical longitudinal section through the box per se.

Fig. 11 is a detail section on the line 11—11 of Fig. 8.

Referring now more particularly to the drawings, 1 designates a journal box of generally standard type, but embodying the improved features hereinafter described, said box having a lower front wall portion 2 above which is located the door-way or opening 3, and said box as shown preferably having spaced outer and inner rear wall portions 4 and 5 forming a dust guard or sealing well. The box is designed to receive the end of the axle 6, having the usual journal portion 7 and the shoulder portion 8, which latter extends through the axle receiving opening formed in and by the sealing elements of the dust well of the box. The well is or may be of the general construction shown in my prior Patents Nos. 2,177,606, dated October 24, 1939, and 2,237,287, dated April 8, 1941, with the exception that it is open at its bottom as well as at its top or mouth portion and provided in its walls 4 and 5, adjacent to but respectively above and below its top and bottom surfaces, with guide and sealing grooves 10 to receive closure plates 11 which close the top and bottom of the well against entrance of dust and moisture. These grooves open outward through the side wall portions 12 of the well which are slotted at 13 to permit insertion and removal of the plates by longitudinal sliding movements. The plates are made of sheet metal or other suitable material and are of a length, when fitted in position, to project outward beyond the wall portions 12 and provide catch portions 14 which may be bent upward or downward to hold the plates from displacement. Instead of bending the plates to provide catch portions, suitable retaining means formed on or applied to the projecting portions 14 may be employed to secure the plates against displacement. If the ends 14 are designed to be bent to form catches, it is simply necessary to rebend either or both of the bent ends of a plate back to normal position to permit removal of the plate when desired. Disposed in the well and surrounding the shoulder portion of the journal is a sealing device or casing comprising spaced liners or sealing disks 15 and 16 held in sealing engagement

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with the well walls 4 and 5 by interposed springs 17. A sealing collar or flange 18 may be provided on one of the disks to close the space between the walls and about the shoulder of the journal. The construction and arrangement of the casing or sealing device may be the same as or similar to any of the sealing devices shown in my aforesaid patent, or it may be of any other suitable or preferred construction. An advantage of this construction of well and its closure plates is that the sealing device may be applied or removed as a unit through either the top or bottom of the well, and another advantage is that the closure plates when applied cannot become loose or displaced under shocks, jars, vibrations or relative movements of the box or journal. The sealing means above described at the rear of the box provides an effective means for preventing loss of lubricant or entrance of dust, dirt or other foreign substances at the rear of the box.

The doorway or opening 3 at the front of the journal box comprises a lintel portion 19, sill portion 20 and side portions or jambs 21 formed on the corresponding walls of the journal box. The portion 19 is provided with a front seat face 22, the portion 20 with a front seat face 23 and a bottom seat face 24, and the portions 21 with front and outer side seat faces 25, 25. The seat faces 22, 23 and 25 are flat and lie in the same plane, while the seat face 24 is beveled or undercut and inclines in an outward and downward direction. The surfaces 25 are or may be plane or slightly tapered and are inclined convergently downwardly and inwardly toward the bottom and center of the doorway, thus giving the doorway a wedge-shaped conformation. The door for closing this doorway is correspondingly shaped and comprises a carrier frame member or plate 26 and a door or lid 27 carried thereby.

The carrier frame member 26 is of less width and height than the door or lid 27 and is disposed at the outer side thereof. This frame is provided with flanges 28 which extend above the frame in the form of hinge knuckles or eyes 29 which pivotally engage the ends of a bolt or shaft 30 extending through a bearing boss 31 formed or provided on the top of the journal box, which boss is provided with a guide surface 32 having a locking cam, lug or projection 33. Links 34 are fixed at their upper ends to the ends of the bolt or shaft 30 and are pivotally coupled at their lower ends by trunnions 35 to the upper ends of the side arms 36 of a bail-shaped handle 37 which in turn are pivotally coupled by trunnions 38 to the side wall portions 39 of inset pockets or recesses 40 formed in the door lid. Slots 41 are provided in the frame member which receive headed studs 42 on the door lid whereby the lid is slidably mounted on the frame member for up and down movements into and out of sealing and locking positions and whereby the frame member and lid are pivotally supported on the box for swinging movements between open and closed positions.

It will be noted that the links and handle are longitudinally curved to adapt the upper ends of the links and free end of the handle to respectively overlie the top of the box and underlie the sill of the doorway, and to adapt the pivotally coupled ends of the links to swing into the pockets or recesses 40 when the door is in closed position, as shown in Figs. 1, 6 and 7. By this means, provision is made for a compact arrangement of all the parts and their disposition in

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close relationship to the front of the box when the door is closed. At the same time the links and handle will be disposed to allow proper arrangement of the sealing means for engagement to close the joints between the doorway and door and to bring the jointed ends of the link and handle in the plane of the upper pivoted ends of the links, so that the joint connections will operate to draw the sealing elements in tight engagement and serve in a large measure as a locking means to assist in holding the door closed. To secure a positive holding of the door in open and closed positions a pressure spring latch 43 is provided, the same comprising a plate spring fastened at its lower end to the frame member 26 by means of a rivet or other fastening means 44 and having a reduced reentrantly curved free end 45 to ride upon the guide surface 32, and bear upon the projection 33 of the boss 31. The pressure of this spring will serve to hold the door sections in both the closed and released positions shown in Figs. 5 and 6 and to hold the door open to permit convenient access to the journal box when required. The spring lies between lugs 44' on the frame member 26, whereby it is held from pivotal movement and lateral displacement.

The sealing means for tightly closing the joints between the doorway and door comprises a contact portion 46, side flanges 47 and a bottom flange 48 on the door for cooperation with the sealing faces of the doorway, together with a keeper plate 49 which forms a retaining member and moisture-shedding eaves projection on the box at the top of the doorway. This plate 49 includes a body portion 50 resting on top of the box and having a down-bent flange 51 disposed in front of the lintel 19 and spaced from the seat face 22 to provide an interposed keeper recess 52. The member 49 as thus arranged overhangs the upper front portion of the box and the upper edge of the door when the latter is closed to shed and deflect rain water or other moisture away from the joint between the lintel and top of the door. A sealing lining 53 of a suitable waterproof, flexible packing material is secured on the side of flanges 47 and bottom flange 48 of the door for sealing arrangement with the seat surfaces 21 and 24 of the doorway when the door is closed. This lining may be continuous or sectional and may in practice be reversed as to position or applied to the surfaces 21 and 24 for engagement with the inner surfaces of the flanges 47 and 48 when the door is closed. A similar lining or strip 54 of packing material is disposed within the recess 52 and secured to the body of the keeper member 49 for sealing engagement with the upper edge of the closed door. This lining may also be reversed in arrangement if desired, that is, applied to the upper edge of the door instead of to the keeper member.

Figs. 1, 5 and 7 show the door in closed position, while Fig. 6 shows the door in released position or the position which it occupies when disengaged from the sealing surfaces of the doorway, from which position it may be swung open or moved into closed position. To facilitate and render easier the opening of the door 27 after it has been moved downward to the released position by means of the handle 37, the door may be provided with a bottom flange 55 forming a hand grip whereby it may be tilted upward and the door as a whole swung over onto the top of the box in which position it will be retained by the spring 43. In moving the door from the position

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shown in Figs. 1, 5 and 7 to the position shown in Fig. 6, the handle 37 is swung upwardly, thus through the pivotal crank connection 35, 38 imparting downward sliding movement to the door from the engaged position shown in Figs. 1, 5 and 7 to the position shown in Fig. 6. This movement is permitted by reason of the sliding connection 41, 42 between the door and its carrier frame member 26. In such movement the door is withdrawn from engagement with the keeper 49 and the sealing surfaces from engagement with each other. Downward movement of the door 27 also releases it from binding engagement with the downwardly converging jambs 21, so that the door is free to be swung open. To close the door after being opened it is swung downward to the position shown in Fig. 6 in which the frame member 23 is arranged substantially in the position it occupies when the door is closed, but in which the door 27 laps over upon the jambs 21 and hangs pendent and out of closing and sealing engagement with the doorway. To move the door 27 from the released position of Fig. 6 to the closed and sealing position shown in Figs. 1, 5 and 7, handle 37 is swung downward, whereby through the toggle link mechanism the door is moved upward on the jambs and into sealing engagement therewith and the handle and links swung inward so that the pivotal connections therebetween fold into the pockets 40 and into alignment with the pivots 30 so that the operating means tends to hold or lock the door in closed position. This action is supplemented by the pressure of the spring 43, whereby the door is held tightly closed under pressure. In the upward movement of the door its edge 46 is brought into engagement with the strip 54 in the keeper 49 and the sealing lining on its flanges 47 and 48 are brought into engagement with the seat surfaces 23 and 24, so that the sealing strips or liners are compressed to seal all the joints between the seat surfaces of the door and doorway.

The doorway construction and sealing means in the well at the rear of the box serve to effectually prevent loss of lubricant and entrance of dust or other foreign substances. By reason of this fact, contamination of the lubricant used and excessive wear on the journal parts are prevented and at the same time the box is particularly adapted for the use therein of means for preventing displacement of waste in the box and for force feeding lubricant to the top of the box for efficient distribution to the bearing surface. One form of waste holding and oil supplying means of this character is herein shown, but other equivalent forms, such as shown in my copending application filed of even date herewith, may be employed. As embodied, a horizontal partition plate 56 is disposed in the box above its bottom 57 and this plate forms and separates a chamber 58 from the waste containing space 59. The plate has an elevated main body portion 60 which bears at its rear edge against the well wall 5, a downwardly and forwardly inclined front portion 61, and downwardly and outwardly inclined side portions 62, the latter terminating in spaced lugs 63 seated in recesses 64 in the sides of the box and resting on the bottom walls 65 of the recesses. These lugs are perforated for the passage of screws 66 securing the plate to the walls 65. The portion 61 is of less width than the plate and projects outwardly into the front of the box between partitions formed by the forward walls of the front recesses 64, whereby the chamber 58

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is closed at that joint. The side edges of the portions 62 between the lugs bear against the walls 67 arranged between the walls of the recesses 64, while the edges of the lugs bear against the sides of the box and the walls of the recesses, whereby the chamber 58 is closed at its sides from the space 59. The upper surface of the plate forms a support for the oil saturated waste used in the box and the depressed parts 62 form with the sides of the box pockets 62' in which portions of the waste may seat by which displacement of the body of waste is prevented.

The chamber 58 serves as a reservoir for lubricant and as a container for a force feed lubricating mechanism operated by jolts, jars or vibrations of the box or by relative movements of and between the box and axle journal. This mechanism comprises a cylinder 68 having a feed inlet connection 69 with the chamber and having an outlet 70 for discharge of the lubricant into a feed tube or pipe 71. This tube or pipe 71 extends upwardly at the front of the box and is coupled at its delivery end to a nozzle 72 for discharge of the lubricant into a reservoir 73 located at the top of the box. This reservoir has a clean out and inspection opening closed by a removable plug 73' and has fitted in its bottom an outlet nozzle 74 provided with inlets 75 and having its lower end extending downwardly into the upper portion of the box for delivery of the oil or lubricant in regulated quantity to the journal and cooperating bearing surfaces. This arrangement ensures that the oil will be distributed along the length of the journal 7 and also to the shoulder 8, which latter is not sufficiently lubricated in journal box structures in general use. The nozzle 74 may have connected therewith a vent tube 74'.

The piston rod 76 of the cylinder piston passes outwardly through a stuffing box 77 extending through a flange 78 of a supporting bracket plate 79 secured to and arranged beneath the partition plate 56, said rod being coupled to one end of an axially aligned motion transmitting or operating rod 80. A coiled spring 81 is arranged about the coupled ends of the rods and between the stuffing box and an abutment 82 on the rod and serves to impart a return motion to the piston and coacting working parts at the end of each working stroke thereof. The other end of the rod 80 has an abutment head 83 engaging an abutment portion 84 of a lever 85, pivoted at one end to a link 86 pivoted at 86' to the bracket plate 79, and having its other end secured to a primary operating element or member 87. This member is in the form of a weighted lever including the stem 86 and the part 87 which is in the form of an enlarged portion or head. This primary operating element is disposed at one side of the longitudinal center of the box and transversely thereof at right angles to the box. The element 87 is of spherical or ovoidal shape and is arranged to swing in a general direction longitudinally of the box on friction bearing rollers 88 carried by a guide bracket 89 fixed to the bracket plate 79 and having stop lugs 90 to limit the swinging movements of the head 87. It will thus be understood that any relative longitudinal or reciprocating movements of or between the box and journal, or any vibratory or other movements of the box in such general direction, will cause the element 87 to swing and, through the lever connection 85 and spring, effect reciprocating movements of the piston in its cylinder to pump oil to the reservoir. As such movements occur frequently and many

times in the normal travel of a freight or passenger car, the pump will be operated always a sufficient number of times to keep the bearing surfaces well supplied with oil, and, as the supplied oil is fed in at the top of the box so that it may feed by gravity, an effective distribution of the oil to the bearing surfaces, including the shoulder of the journal, is ensured.

From the foregoing description, taken in connection with the drawings, the construction, mode of operation and advantages of my invention will be readily understood without a further and extended description, and it will be seen that the invention provides a simple, reliable and efficient construction of means for the stated purposes. It is to be understood that while the structure shown is preferred, changes in the form, construction and arrangement of parts may be made within the scope of the appended claims, without departing from the spirit or sacrificing any of the advantages of the invention.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In a car axle journal box, a box provided with a doorway, a swinging door for closing the doorway, the doorway and door having seat faces, and means for sealing the joints therebetween when the door is closed, said door including a pivotally mounted frame member and a closure member mounted to swing therewith into and out of closing position and to slide thereon into and out of sealing engagement with the surfaces of the doorway, and means for swinging the door frame and sliding the closure member.

2. In a car axle journal box, a box having a wedge-shaped doorway, a door carrying member pivoted to the box to swing vertically between door opening and closing position, a wedge-shaped door mounted on said member for up and down sliding movements, the box and door having upwardly and outwardly inclined and diverging surfaces engageable by upward sliding movement of the door, to sealingly close the doorway and to lock the door carrying member and door from outward swinging movement and disengageable by downward sliding movement of the door to release the door carrying member and door for outward swinging movement, and means connected to the door carrying member and door for conjointly swinging the door carrying member and door and sliding the door on the door carrying member.

3. In a car axle journal box, a box provided with a doorway having top, bottom and side sealing surfaces, said side sealing surfaces being inclined and diverging in an upward direction, a swinging door for closing the doorway, said door including a pivotally mounted frame member and a door member mounted to swing therewith into and out of closing position and to slide thereon into and out of engagement with the sealing surfaces of the doorway, said door member having sealing surfaces to engage the sealing surfaces of the doorway including inclined surfaces for wedging engagement with the inclined surfaces of the doorway.

4. In a car axle journal box, a box provided with a doorway having sealing surfaces, a swinging door for closing the doorway, said door including a pivotally mounted frame member and a closure member carried thereby and mounted to swing therewith into and out of closing position and to slide thereon into and out of engagement with the sealing surfaces of the doorway,

and a toggle lever mechanism including links mounted to swing with the door and an operating handle pivotally coupled to the links and closure member for supporting and swinging the door and sliding the closure member on the frame member.

5. In a car axle journal box, a box having a doorway, a door carrying member pivoted to the box to swing vertically between door opening and closing positions, a door mounted on said member for up and down sliding movements, the box and door having coacting locking surfaces at the sides thereof engageable by upward sliding movement of the door to close the doorway and to lock the door carrying member and door from outward swinging movement and disengageable by downward sliding movement of the door to release the door carrying member and door for outward swinging movement, and means for pivotally mounting the door carrying member on the box and connected to the door-carrying member and door for conjointly swinging the door carrying member and door and sliding the door on the door carrying member.

6. In a car axle journal box, a box provided with a doorway having sealing surfaces, a swinging door for closing the doorway, said door including a pivotally mounted frame member and a door member mounted to swing therewith into and out of closing position and to slide thereon into and out of engagement with the sealing surfaces of the doorway, swinging links carried by the box, a swinging handle, and crank connections between the handle and links and handle and door member for supporting the door for swinging movements with the links and sliding the door member on the door carrying member.

7. In a car axle journal box, a box provided with a doorway having sealing surfaces, a swinging door for closing the doorway, said door including a pivotally mounted frame member and a door member mounted to swing therewith into and out of closing position and to slide thereon into and out of engagement with the sealing surfaces of the doorway, links suspended from the top of the box, and a handle coupled to the links and door member and cooperating with the links for supporting and swinging the door and sliding the door member.

8. In a car axle journal box, a box having a doorway, a door carrying member pivoted to the box to swing vertically between door opening and closing positions, a door mounted on said member for up and down sliding movements, the box and door having inclined locking surfaces at their lateral margins wedgingly engageable by upward sliding movement of the door to sealingly close the doorway and to lock the door carrying member and door from outward swinging movement and disengageable by downward sliding movement of the door to release the door carrying member and door for outward swinging movement, and means connected to the door carrying member and door for conjointly swinging the door carrying member and door and sliding the door on the door carrying member to bring said surfaces into engagement.

9. In a car axle journal box, a box provided with a doorway having sealing surfaces, a swinging door for closing the doorway, said door including a pivotally mounted frame member and a door member mounted to swing therewith into and out of closing position and to slide thereon into and out of engagement with the sealing surfaces of the doorway, links pivoted at their upper

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ends to the box above the doorway, and a handle having pivotal crank connections with the door member and lower ends of the links and cooperating therewith for supporting and swinging the door and sliding the door member to bring said surfaces into engagement.

10. In a car axle journal box, a box provided with a doorway having sealing surfaces, a swinging door for closing the doorway, said door including a pivotally mounted frame member and a door member having inwardly extending recessed portions and mounted to swing with the frame member into and out of closing position and to slide thereon into and out of engagement with the sealing surfaces of the doorway, curved links pivoted at their upper ends to the box above the doorway, and a handle having pivotal crank connections with the lower ends of the links and with walls of the recessed portions of the door member and cooperating with the links for supporting and swinging the door and sliding the door member and to bring the pivotal crank connections into the plane of the upper ends of the links when the door is closed.

11. In a car axle journal box, a box having a doorway provided with sealing surfaces, a door carrying member pivoted to the box to swing vertically between door opening and closing positions, a door mounted on said member for up and down sliding movements, the door having sealing surfaces engageable by upward sliding movement of the door with the sealing surfaces of the doorway to sealingly close the doorway and disengageable therefrom by downward sliding movement of the door, and means connected to the door carrying member and door for conjointly swinging the door carrying member and door and sliding the door on the door carrying member to bring said surfaces into engagement.

12. In a car axle journal box, a box provided with a doorway having sealing surfaces, a swinging door for closing the doorway, said door including a pivotally mounted frame member and a door member mounted to swing therewith into and out of closing position and mounted to slide thereon into and out of engagement with the sealing surfaces of the doorway, and a toggle link mechanism including swinging links on the box and a swinging lever coupled to the links and

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door member for supporting the door and swinging the door and sliding the door member.

13. In a car axle journal box, a box provided with a wedge-shaped doorway having upwardly diverging locking surfaces at the sides thereof, a swinging door including a door carrier frame and a wedge-shaped door mounted to swing therewith into and out of closing position and mounted to slide thereon the locking surfaces of the doorway by upward and downward sliding movements of the door on the door carrier frame, and means connected to the door carrier frame and door for swinging the door into and out of closing position and sliding the door carrier frame into and out of engagement with the doorway surfaces and to lock the door in closed position.

14. In a car axle journal box, a box having a doorway, a door carrying member pivoted to the box to swing vertically between door opening and closing positions, a door mounted on said member for up and down sliding movements, the box and door having locking surfaces at their lateral margin wedgingly engageable by upward sliding movement of the door to close the doorway and to lock the door carrying member and door from outward swinging movement and disengageable by downward sliding movement of the door to release the door carrying member and door for outward swinging movement, and a toggle link mechanism including swinging links on the box and a swinging lever coupled to the links and door member for supporting and conjointly swinging the door carrying member and door and sliding the door on the door carrying member.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
352,171	Wendell	Nov. 9, 1886
673,620	Marshall	May 7, 1901
690,975	Marshall	Jan. 14, 1902
760,748	Mohun	May 24, 1904
858,208	Patten	June 25, 1907