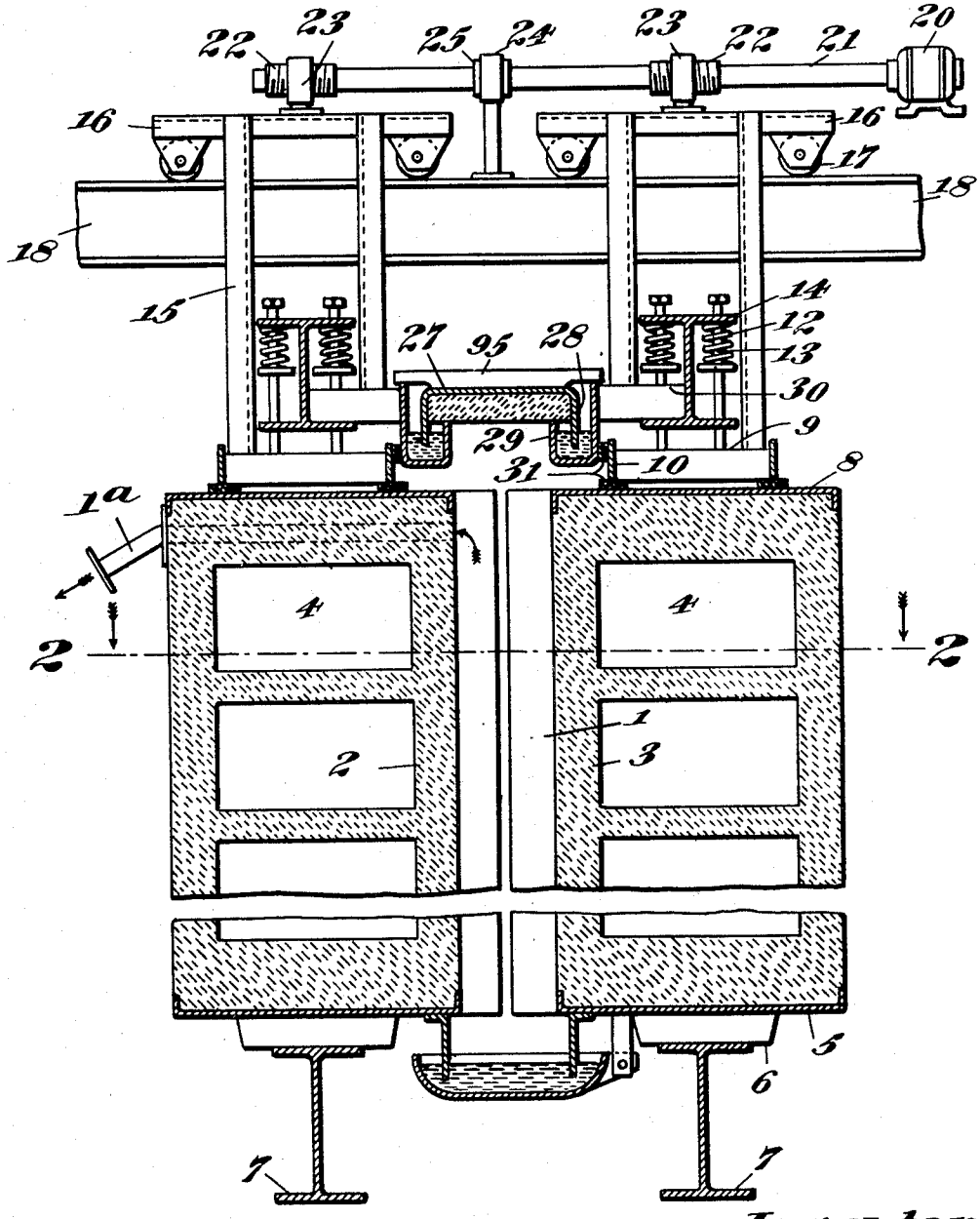
Dec. 6, 1949 F. PUENING ET AL 2,490,090

SEALING DEVICE FOR COKE OVENS WITH MOVABLE WALLS

Filed Dec. 27, 1946 10 Sheets-Sheet 1

Fig. 1.



Inventors

and Franz Puening.

Alvin L. Bower.

Dec. 6, 1949 F. PUENING ET AL 2,490,090

SEALING DEVICE FOR COKE OVENS WITH MOVABLE WALLS

Filed Dec. 27, 1946 10 Sheets-Sheet 2

Fig. 2.

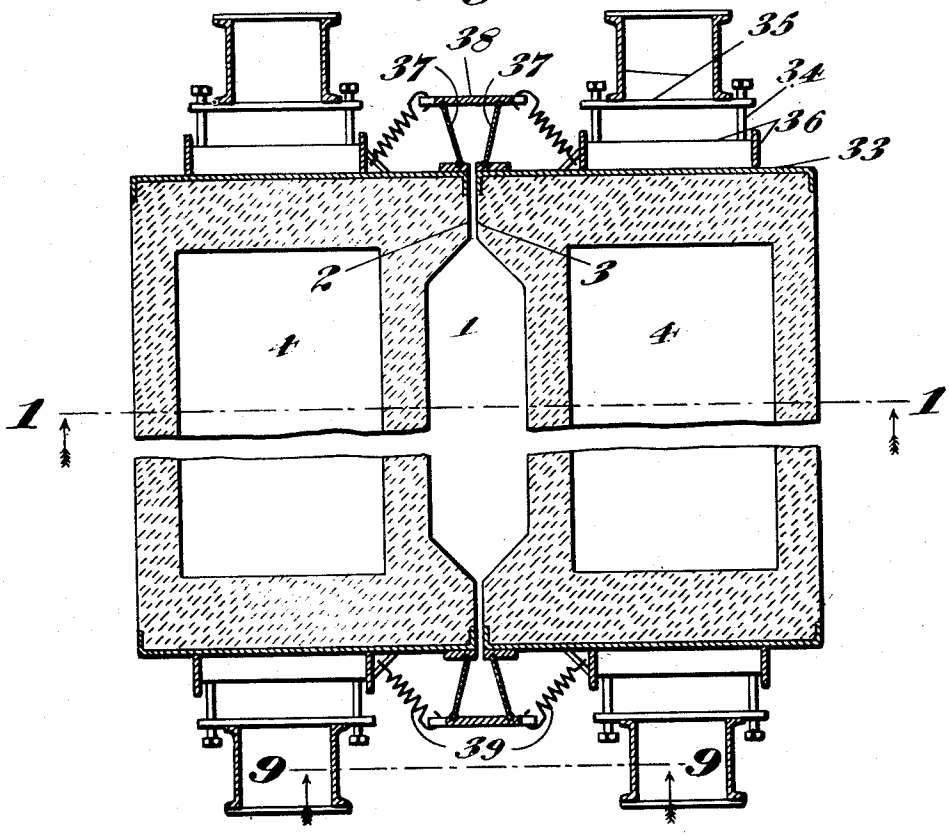
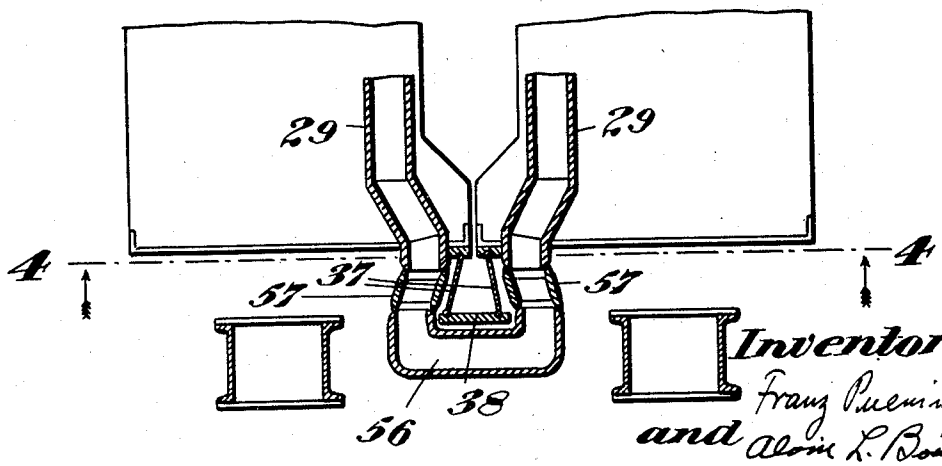


Fig. 3.



Inventors

Franz Puening

and Alonzo L. Bower

Dec. 6, 1949 F. PUENING ET AL 2,490,090

SEALING DEVICE FOR COKE OVENS WITH MOVABLE WALLS

Filed Dec. 27, 1946 10 Sheets-Sheet 3

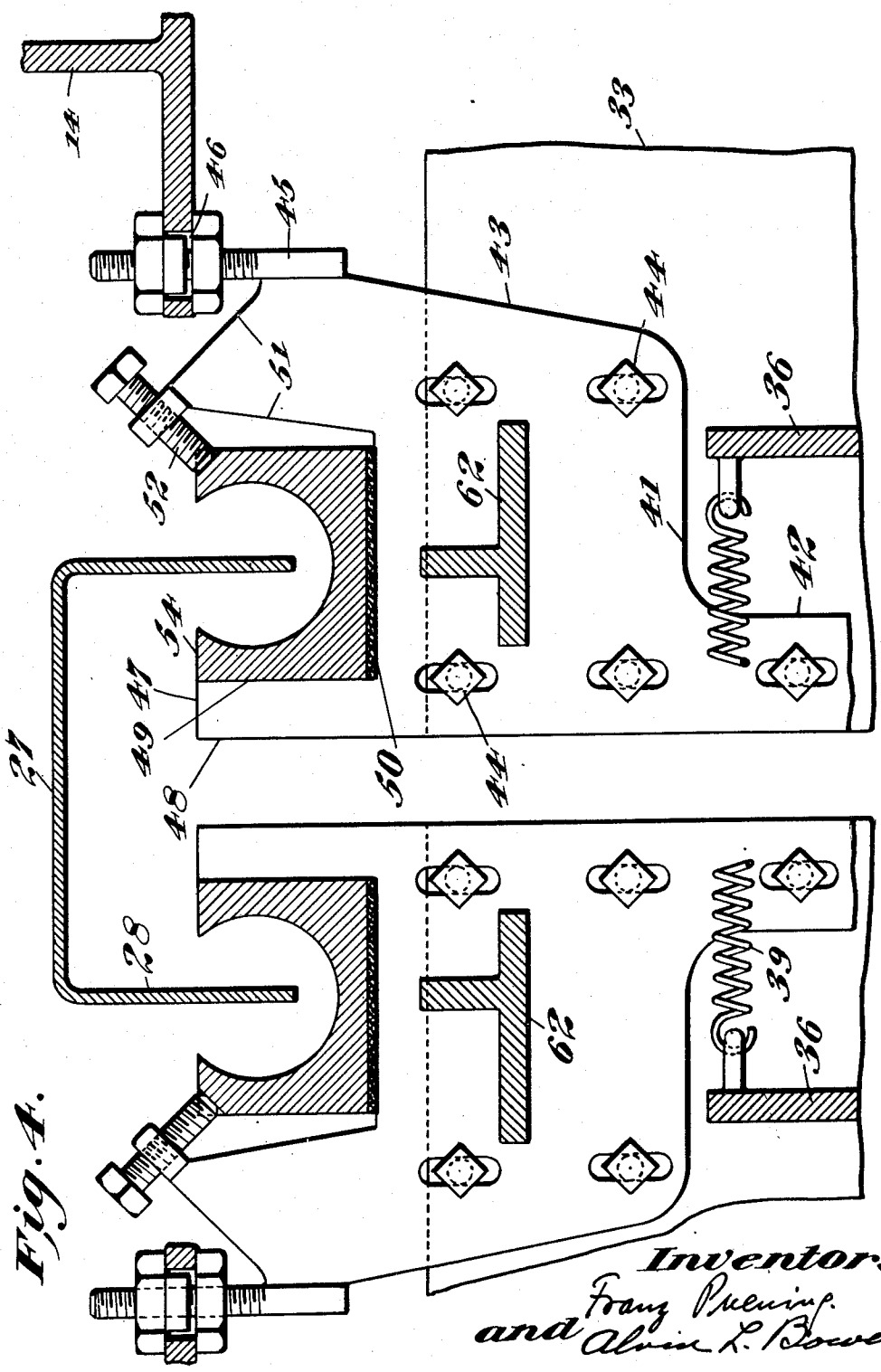


Fig. 4.

Inventors
Franz Puening
and Alvin L. Bower.

Dec. 6, 1949 F. PUENING ET AL 2,490,090

SEALING DEVICE FOR COKE OVENS WITH MOVABLE WALLS

Filed Dec. 27, 1946 10 Sheets-Sheet 4

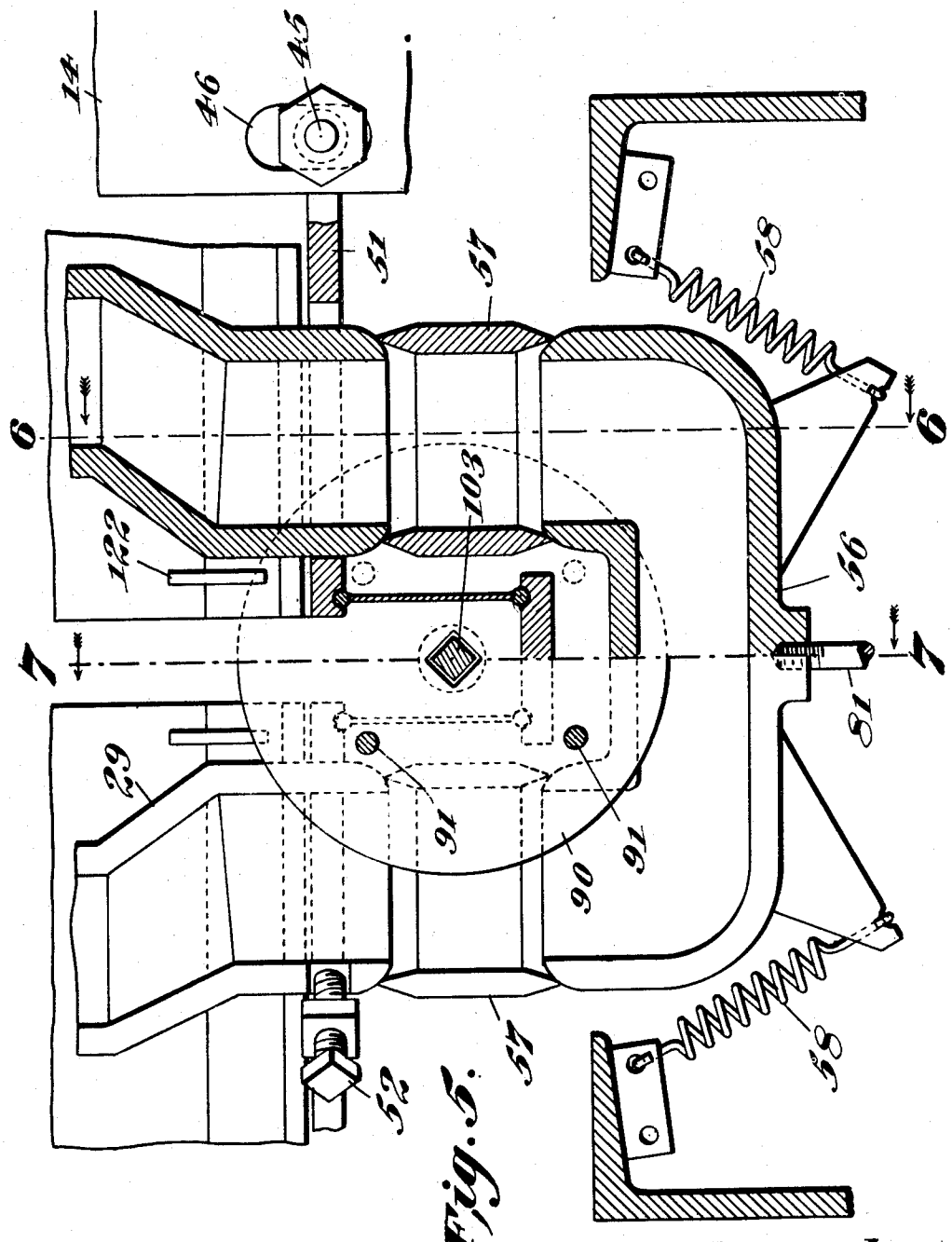


Fig. 5.

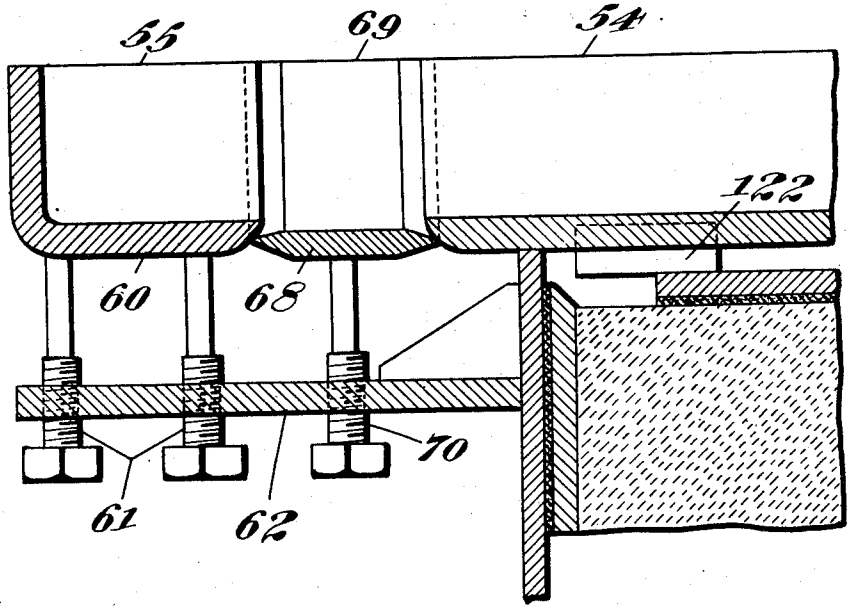
Inventors
and Franz Puening
Alvin L. Power.

Dec. 6, 1949 F. PUENING ET AL 2,490,090

SEALING DEVICE FOR COKE OVENS WITH MOVABLE WALLS

Filed Dec. 27, 1946 10 Sheets-Sheet 5

Fig. 6.



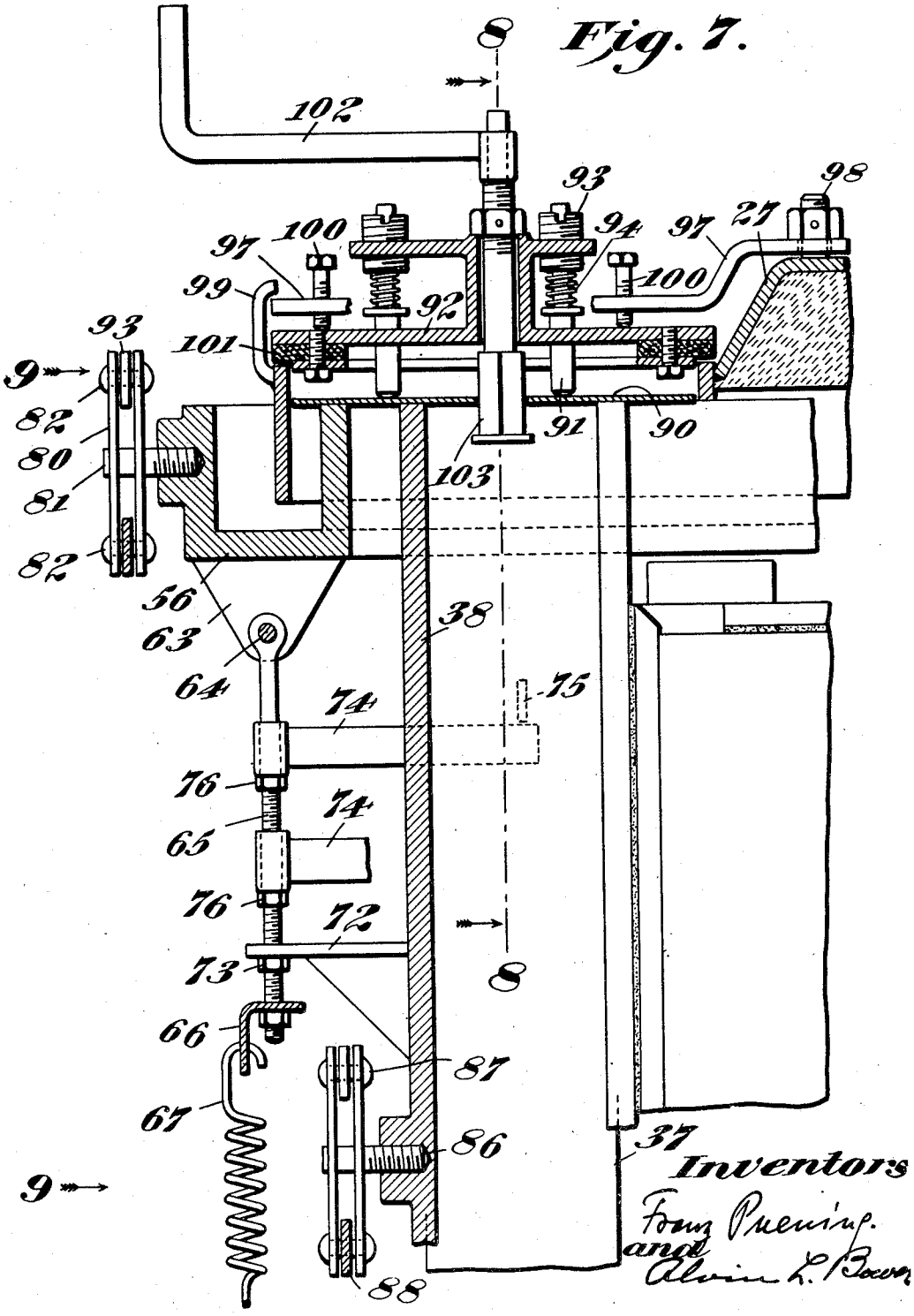
Inventors
Franz Puening
and
Alvin L. Bower

Dec. 6, 1949 F. PUENING ET AL 2,490,090

SEALING DEVICE FOR COKE OVENS WITH MOVABLE WALLS

Filed Dec. 27, 1946 10 Sheets-Sheet 6

Fig. 7.



Inventors
Fouz Puening
and
Alvin L. Bacon

Dec. 6, 1949 F. PUENING ET AL 2,490,090

SEALING DEVICE FOR COKE OVENS WITH MOVABLE WALLS

Filed Dec. 27, 1946 10 Sheets-Sheet 7

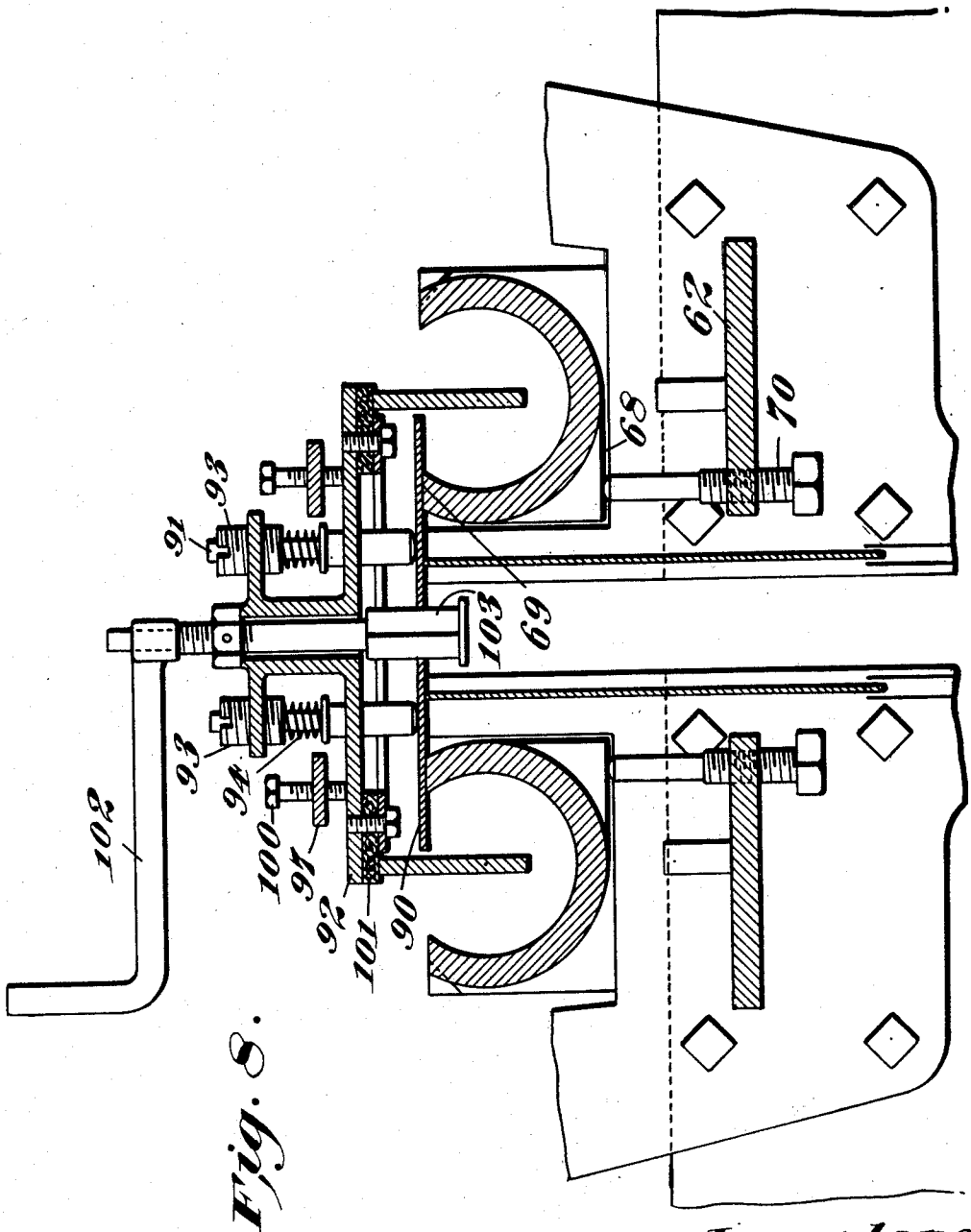


Fig. 8.

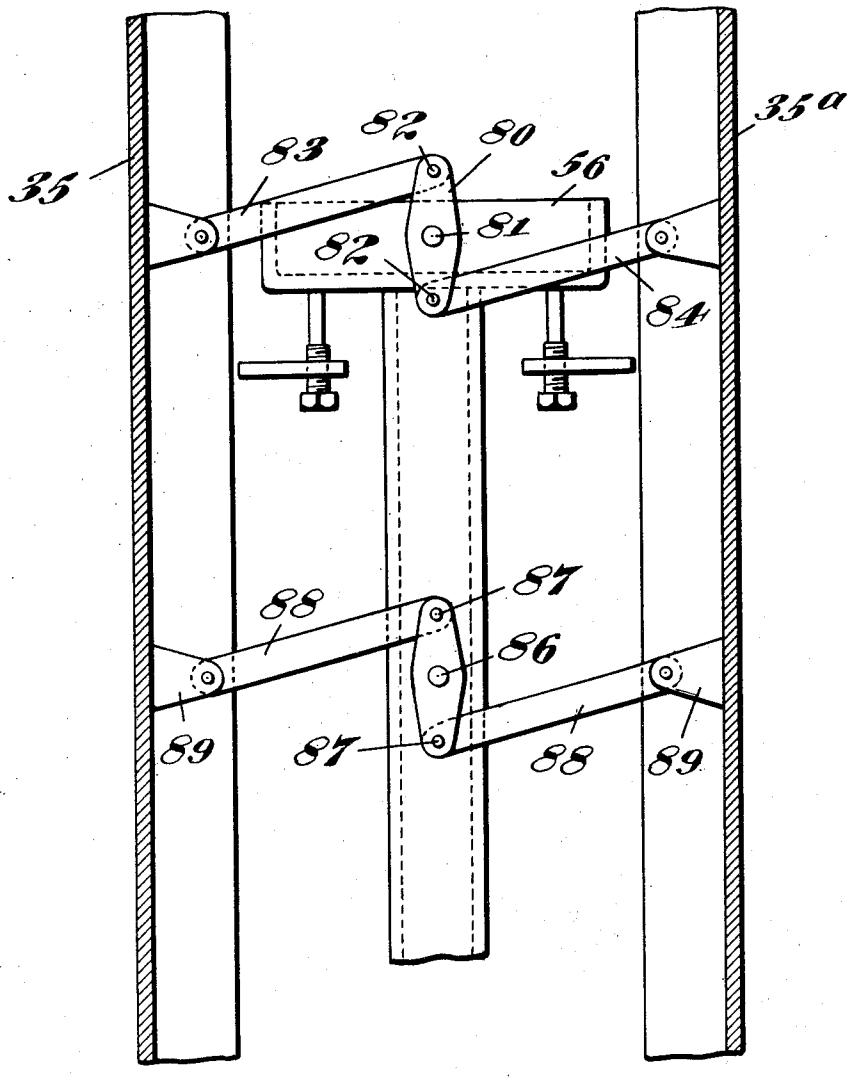
Inventors
Franz Puening
and Alvin L. Bower

Dec. 6, 1949 F. PUENING ET AL 2,490,090

SEALING DEVICE FOR COKE OVENS WITH MOVABLE WALLS

Filed Dec. 27, 1946 10 Sheets-Sheet 8

Fig. 9.



Inventors

and Franz Puening
Alvin L. Bower

Dec. 6, 1949 F. PUENING ET AL 2,490,090

SEALING DEVICE FOR COKE OVENS WITH MOVABLE WALLS

Filed Dec. 27, 1946 10 Sheets-Sheet 9

Fig. 10.

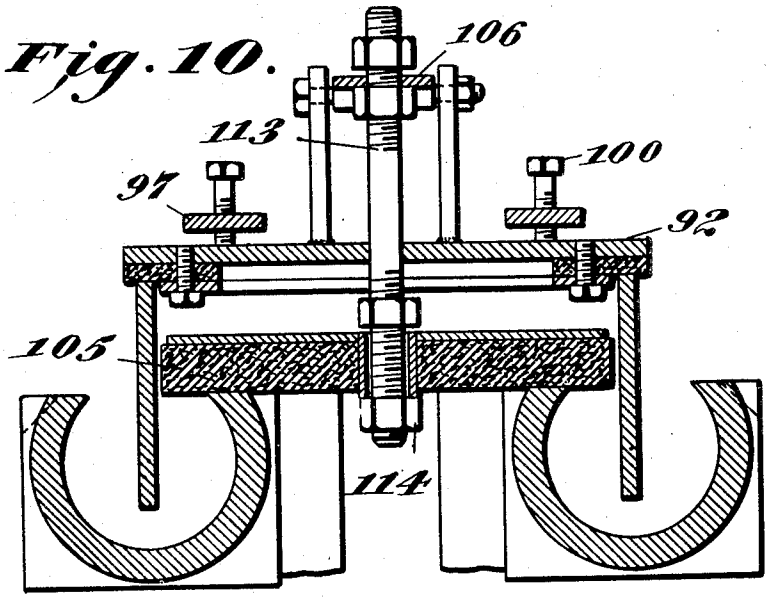
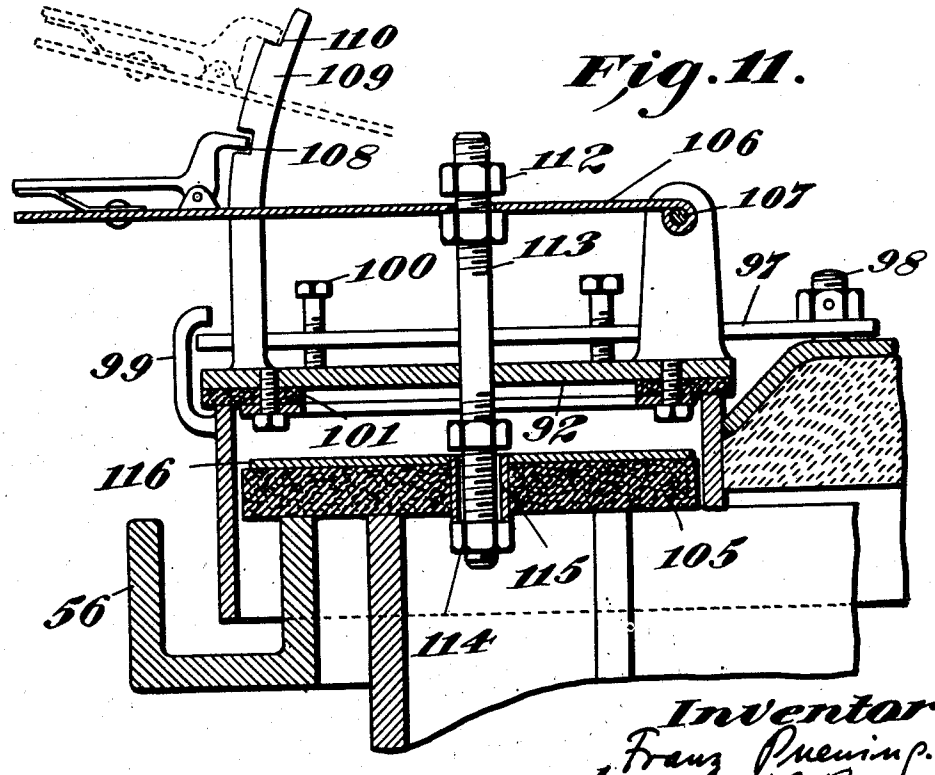


Fig. 11.



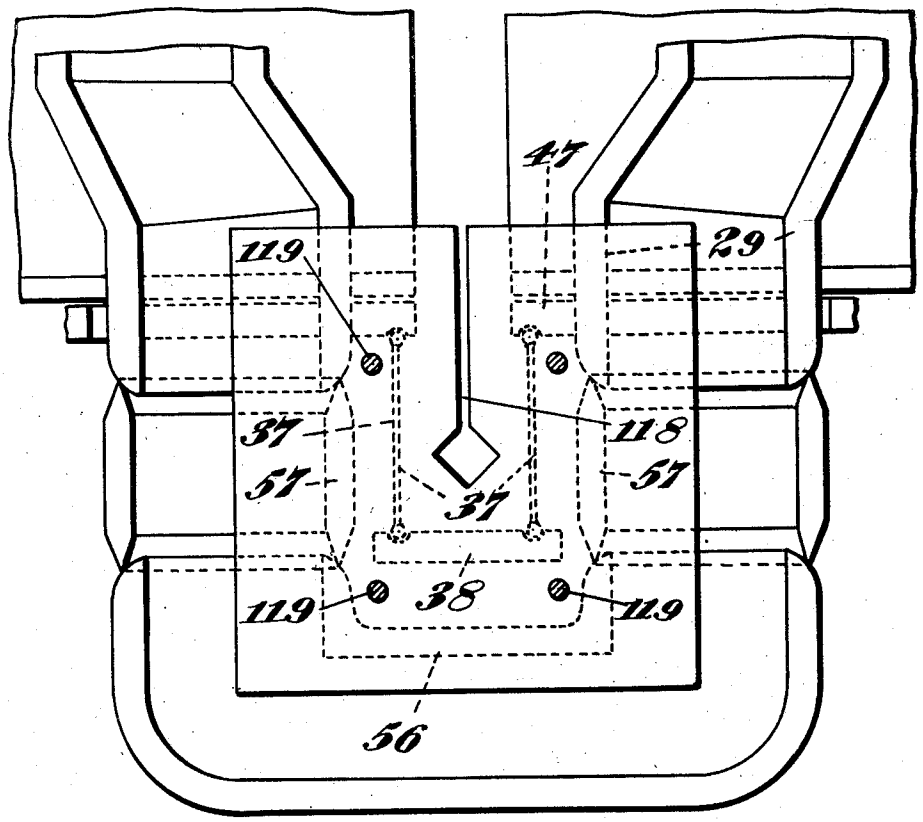
Inventors.
Franz Puening
and Alvin L. Barber.

Dec. 6, 1949 F. PUENING ET AL 2,490,090

SEALING DEVICE FOR COKE OVENS WITH MOVABLE WALLS

Filed Dec. 27, 1946 10 Sheets-Sheet 10

Fig. 12.



Inventors
Franz Puening
and
Alvin L. Bower

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UNITED STATES PATENT OFFICE

2,490,090

SEALING DEVICE FOR COKE OVENS WITH MOVABLE WALLS

Franz Puening, Riegelsville, and Alvin L. Bower, Bethlehem, Pa.; said Bower assignor to Bethlehem Steel Company, a corporation of Pennsylvania

Application December 27, 1946, Serial No. 718,790

11 Claims. (Cl. 202—105)

1

This invention pertains to sealing devices for coke ovens with movable walls.

In coke oven plants it is of utmost importance that each coking chamber is kept gastight during operation, in order to prevent losses of byproducts, or infiltration of air. Furthermore there must be no frequent interruptions of operation caused by the necessity of patching up gas leaks. An average large coking plant will daily produce about $120,000 worth of coke and byproducts, so that an interruption of operation of only 15 minutes per day would already cut the output by some $430,000 per year.

In case of ovens with movable walls the sealing devices used for making the coking chambers gastight must be of an especially high quality. In the United States Patent No. 2,311,349, issued February 16, 1943, and also in the Patent No. 2,413,335, issued December 31, 1946, such ovens with movable walls are described in which the horizontal top and bottom doors are water sealed, while the vertical sides of the chambers are made gastight by vertical flexible side seals.

These patents show special arrangements for keeping gastight the points of junction between the horizontal top water seals and the vertical flexible side seals, but these arrangements are not altogether satisfactory, one of the reasons being that the packing material which is used at these points must not only be flexible but must also be able to expand and contract. These requirements have led to water inflated gasketing bags, which can be inflated and deflated, but the severe conditions of motion and heat and chemical attack under which these bags must work make it difficult to find a highly durable material for the bags. A small gas leak arising near one of the bags caused for instance by a failure of water supply and consequent cessation of the inflating or cooling effect exerted by the water can start gas flames near these bags, damaging them and entailing an expensive interruption of plant operation.

The present invention overcomes this situation.

In order that the nature of the invention may be more clearly appreciated, particular embodiments will now be described with reference to the accompanying drawings, in which:

Figure 1 is a sectional side elevation taken through a coking oven comprising one coking chamber, located between two movable coking walls, the section being taken on the line 1—1 of Figure 2;

Figure 2 is a section on the line 2—2 of Figure 1;

2

Figure 3 is a plan view of part of the oven with the top cover removed;

All subsequent figures are drawn on a larger scale.

Figure 4 is a section on the line 4—4 of Figure 3;

Figure 5 is a plan view like Figure 3, with the top cover omitted, but showing details shown in Figure 4;

Figure 6 is a sectional side elevation taken on line 6—6 of Figure 5;

Figure 7 is a sectional side elevation taken on line 7—7 in Figure 5 showing details of the new method for making a gastight junction between the side seals and the top seals;

Figure 8 is a sectional elevation taken on lines 8—8 in Figure 7;

Figure 9 is a front elevation showing only the details marked by arrows 9 in Figure 7;

Figure 10 is a sectional elevation of an alternative for the device shown in Figures 8 and 7;

Figure 11 is a sectional side elevation of the same alternative shown in Figures 7 and 8; and

Figure 12 is a plan view of another alternative for the device shown in Figures 5, 7 and 8, with the top cover omitted.

Referring to Figure 1, the numeral 1 designates a coking chamber located between two movable coking walls 2 and 3, having heating flues 4. The walls are at their bottom supported by bottom frame plates 5, bars 6 and bottom beams 7. The tops of the walls are covered by top frame plates 8 and bars 9 and 10 which are pressed upon the plates 8 by springs 12 and bolts 13 which are held in position by top beam 14. Bottom beams 7 and top beams 14 are connected with each other by vertical buckstays 15 which extend upwardly and are fastened to trucks 16 having wheels 17 running on girders 18. The spreading apart of the movable walls is accomplished by rotation of motor 20 which turns shaft 21 with opposite-hand screws 22 passing through threaded nuts 23 attached to trucks 16. Axial motion of shaft 21 is prevented by bearing 24 fixed to girder 18 and collars 25 fixed to the shaft. This mechanism for supporting and spreading the walls is described in detail in the above-mentioned Patent No. 2,413,335, issued December 31, 1946.

Fig. 1 shows a conduit and vapor offtake pipe 1a, which serves to conduct the byproduct gases and vapors away from coking chamber 1 into a byproduct recovery plant not shown. The unintentional and wasteful escape of byproducts from chamber 1 into the atmosphere is prevented by

top cover 27 which is bell shaped having a continuous longitudinal sealing curtain 28 extending down into the water contained in the rigid sealing trough portions 29. These rigid sealing trough portions are in gastight connection with top frame plates 8 by means of brackets 30 which hold troughs 29 in proximity to bars 10 and by means of elastic packings 31.

Figure 2 shows the manner in which the coking walls 2 and 3 are held together by side frame plates 33 which are pressed upon the brickwork by bolts 34 located in buckstays 35 and pressing upon grid bars 36.

The lateral escape of the coal from chamber 1 is blocked by the close proximity of the coking walls 2 and 3 shown in Figures 1, 2 and 3, which proximity prevails during the coking operation, and the lateral escape of byproducts is blocked by the flexible vertical side seals, composed of 2 side pieces 37 and one center piece 38 all pressed upon the side frame plate by spring 39.

Figure 3 is a partial plan view showing only the lower part of Figure 2. It shows the vertical flexible side sealing pieces 37 and 38 extending upward and shows the water filled top troughs 29 extending horizontally beyond the flexible side sealing pieces and completely surrounding them.

Figures 4 to 12 show on a larger scale the new improved method for sealing the side sealing pieces 37 and 38 against the water-filled top troughs 29. In the interest of clarity the coking walls 2 and 3 in these drawings are shown to be spread apart about one half of the spreading distance, required for discharging the coke.

Figure 4 shows a special base plate 41 which is narrow in its lower parts 42 and wide in its upper parts 43 pressed upon each side frame plate 33 by bolts 44 with a gasket being interposed between the base plates and the side frame plates. Each base plate is anchored to its corresponding horizontal top beam 14 by means of anchor bolt 45 movable in slotted hole 46, the said slotted hole permitting a sufficient lateral motion of the anchor bolt and the base plate while the oven is being heated up.

The upper portion of each base plate is specially shaped, having a contour line, comprising the top terminal face 47 on top of base plate extension 48, or so-called sealing ring-post 48, and further comprising the foundation surfaces 49 and 50, the latter forming a right angle between them, and bracket 51 holding anchor bolt 45 and bolt 52.

Against the foundation surfaces 49 and 50 the outermost ends of the rigid sealing trough portions 29 are pressed, with sufficient pressure to make gastight seals but to permit longitudinal motion of troughs 29 when the oven is being heated up. The pressure is exerted by bolts 52 positioned under an angle in bracket 51, the angle being such as to create pressure upon each foundation surface. The vertical extent of the foundation surface 49 and the vertical dimension of the outermost end of top troughs 29 are such that the top terminal faces 47 and the top terminal faces 54 of the outermost ends are at exactly the same elevation, allowing if desired for the insertion of very thin gaskets between the trough and the horizontal foundation surface 50 in order to force top terminal surface 54 up to the level of top surface 47.

The portions of the water-filled top troughs (see Figure 5) which extend beyond and surround the vertical side sealing pieces have the form of ball-jointed return-troughs, each composed of one

return elbow 56 and two sockets 57 which are pressed upon each other and upon the ball-faced end portions of top troughs 29 by means of springs 58. Return elbow 56 is equipped with a bottom seating surface 60 (see Figure 6) which is made parallel to the top terminal face 55 of the same elbow. The elbow is supported on set screws 61 pressing against the seating surface, making it possible to adjust the position of the elbow till its top terminal face 55 is level with the top terminal face 47 of the sealing ring-posts 48. Said set-screws 61 are positioned in brackets 62 which are attached to the enlarged portions 43 of the base plate. Means are provided for pulling return elbow 56 firmly down upon set-screws 61 (see Figure 7) consisting of ribs 63 forming part of elbow 56 and of shaft 64 to which screw 65, ring 66 and tension spring 67 are attached, the lower end of the spring being attached to buckstays 35, not shown, thus making certain that return elbow 56 is pulled down upon set screws 61.

The two ball sockets 57 (see Figures 6 and 8) are also equipped with bottom seating surfaces 68 parallel to their top terminal faces 69 and set screws 70 are provided also located in brackets 62 for pushing top terminal faces 69 up to the exact level of the top terminal face 47 of sealing ring-post 48 and for keeping them there in spite of wear and tear.

The three vertical side sealing pieces 37 and 38 are also made adjustable in their elevation (see Figure 7). Center-piece 38 is equipped with bracket 72 surrounding screw 65, the nut 73 being adjusted till the top terminal face of center piece 38 is located exactly at the level of the top face of sealing ring-post 48.

Two rotatable brackets 74 are provided, surrounding screw 65, each bracket extending to a position below one of the ribs 75 which are welded onto side pieces 37. By rotating nuts 76 the elevation of the top terminal faces of the side pieces 37 is adjusted till they are also located exactly at the level of the top terminal faces of the sealing ring-posts 48.

Means have also been provided for keeping return trough 56 and side seals 37 and 38 in positions co-axial to the center plane of the coking chamber as well as to each other, (see Figures 7 and 9). For this purpose return elbow 56 is equipped with double crank 80, rotatable around shaft 81 and having 2 crank pins 82, one of the pins being connected by connecting rod 83 to buckstay 35, while the other crank pin 84 is connected to buckstay 35*a*. Upon spreading the coking chamber, the receding buckstays effect a rotating motion of the double crank 80, thereby keeping the return elbow in its co-axial position. The same mechanism is used for keeping the vertical side sealing devices in their co-axial positions, as indicated by shaft 86, crank pins 87, connecting rods 88, ribs 89 and buckstays 35. In high ovens, several of these latter devices will be used above each other.

The final sealing operation is effected by pressing one common gap-sealing disk 90 upon each set of completely assembled top terminal faces. The disk is made of a corrosion resisting metal, for instance, stainless steel. The seals is thus effected by metal-to-metal contact. To obtain perfect contact and gastightness the top terminal faces may be ground or polished into perfect alignment. The pressure exerting means are so located that the pressure is well distributed, as shown in Figures 5, 7 and 8, in which a number

of pressing pistons 91 extend through small doors 92 located at the ends of the maintop cover, each piston individually adjustable in the amount of pressure it exerts by means of collars 93 and springs 94 and each geographically so located that it presses upon disk 90 at a point best suitable for equitable pressure distribution.

Each gap-sealing disk is given freedom of motion independent of top cover 27, enabling it to effect sealing contact with the top terminal faces, even if the top cover, which for large ovens is very long, should bend for instance as a result of a cold rain. Tilting of the main top cover in its water troughs is prevented by ribs or fins 95 shown in Figure 1 welded onto the cover 27 and resting upon the outer side walls of troughs 29 in conjunction with the fact that the compression strength of springs 94 is not quite sufficient to carry the entire weight of top cover 27. The weight of the cover due to its length and its insulating material is however so great, that a firm pressing down of the sealing disks upon the top terminal faces is assured, thus assuring gastightness.

The top terminal faces with which the sealing disk is in contact constitute a practically continuous metal line. Into the joint between the vertical foundation surface 49 and the abutting vertical end portion of top water trough 29, no gasket is inserted or only a very thin one. Similarly no gasketing material or only very little separates the side sealing pieces 37 from the special base-plate 41 and from the central side sealing piece 38, because the edges of the side sealing pieces 37 have the form of cylindrical rods of such diameter that they practically fill the vertical grooves in which they oscillate. The existence of thin gaps in the continuous metal line of top terminal faces would however not be objectionable because fine gaps will be plugged by tar condensate and coal dust. Furthermore the fine gaps can be eliminated by omitting the gasketing material entirely and relying on fine workmanship in the shaping of the co-acting metal surfaces.

The main top cover 27 is preferably equipped at each end with a special small door 92, shown in Figures 7 and 8, permitting inspection and cleaning of the top terminal faces and replacement of the sealing disk without turning the top cover upside down. The small doors are clamped down upon the main cover by means of a quick clamping device, composed of bars 97 turning around bolts 98 and being secured under hooks 99. Screws 100 are used for initially regulating the desired pressure upon door gasket 101. The sealing disk is preferably attached in loose connection to the underside of the small door by means of handle 102 which at its lowest end has the shape of square bar 103 allowing rotation of the sealing disk by virtue of a square opening in the disk, thus permitting cleaning of the disk and the top terminal faces.

The gap-sealing disk 90 made of metal is preferred in cases of coal of swelling type, in which the coking walls may be moved apart during the coking operation, the smooth surface of the disk permitting the sliding of the top terminal faces below the disk without damage to the disk. However, in case of a non-swelling coal the metal disk may be replaced by a soft sealing cushion 105 shown in Figures 10 and 11 made for instance of asbestos or fine spun glass or wire. In this case the walls are only spread apart after the coking operation is completed, but the sealing cushion is preferably lifted off the top terminal sealing faces, before the spreading motion begins. This lifting motion can be performed without removing the main top cover by means of elastic leaf spring 106, turning around fulcrum 107. An upward motion of leaf-spring 106 from its position 108 in rack 109 to position 110 lifts nut 112 and bolt 113 and nut 114 and thereby tube 115 and metal plate 116 to which the cushion 105 is fastened by cement or wires or otherwise.

The gap-sealing disk may be rectangular as shown in Figure 12 and it may be cut by a slot 118, this slot giving the disk U-shape and greater flexibility. The small circles 119 indicate the position of the pistons 91 for pressing the disk down upon the continuous line of top terminal faces indicated by numerals 37, 38, 56, 57 and 47.

Initially, when the oven is heated up for operation the horizontal expansion of the brickwalls pushes each side frame plate 33 away from the center of the oven and therefore an open space is created between the top of the brickwall and the underside of the top sealing trough. This space does not require a flexible sealing mechanism of any type ond is sealed by packing enough asbestos or luting clay into it, which may be removed in case the plant is shut down. Bar 122 shown in Figures 5 and 6 is provided to act as a back stop to prevent the asbestos from being pushed too far.

In case of small ovens the special base plate 41 can be omitted. In this case the top portion of the side frame plate 33 will itself be given the top contour of the special base plate, i. e., it will have sealing ring-post 48 with top terminal face 47, foundation surfaces 49 and 50 and it will be equipped with anchor bolt 45 for fixing its elevation and with bracket 51 and bolt 52 for pressing the top trough against the sealing ring-post and with brackets 62. The sealing ring-post 48 is therefore an upward extension of either the side frame plate 33 or the base plate 41, or of both, the base plate being in reality a component part of the side frame plate, similar in purpose to a layer of chromium precipitated upon a steel plate. The term "side frame plate" as used in the claims is therefore intended to cover the case of either the side frame plate or the special base plate or both.

If the type of the coal or the type of the oven operation are such that deposits are formed upon the sliding surfaces of the ball-joints, which interfere with their longevity, then the ball-joint return troughs may be replaced by corrugated return troughs, as shown in Figures 14 and 15 of the United States Patent No. 2,311,349. In this case means are again employed, like those described for forcing the inner top terminal edge of the pliable trough up to exactly the level of the top terminal face of the sealing ring-post so that again a continuous uninterrupted line of top terminal faces is formed upon which the gap sealing disk is pressed down and if necessary the inner top edge may be reinforced so that it can withstand the pressure of the gap sealing disk.

The invention has important advantages. At each junction of vertical side seals and horizontal top seals it creates a continuous sealing ring composed of sealing ring posts, rigid top troughs, return trough and side seals, in which all members have metal-to-metal contact. It creates gastight sealing pressure between the abutting members of the ring by metallic means, such as bolt 52, pressing the top trough against

the sealing ring post, thereby securing the position of the top trough within the sealing ring. It avoids the use of packing material, caulked around the top trough, as a means for securing the elevation of the top trough and for exerting pressure between the members of the sealing ring.

It fixes and supports all top terminal faces of the co-acting members of the sealing ring at one common level, presenting a continuous line of metal sealing faces, and it prevents their yielding under pressure exerted by the gap-sealing disks.

It effects final sealing by the use of durable metal gap-sealing disks, which are elastically pressed down upon the line of metal sealing faces, thus creating a durable mechanism even for ovens which must be spread during coking operation. For ovens which are spread only after the coking operation durability of the final sealing operation is assured by means of pliable sealing cushions which can be lifted off the sealing faces before spreading-after-coking begins.

Each time when the main top cover is taken away all top terminal sealing faces become fully visible and can be cleaned. Occasionally they may be re-ground or re-polished without removing them. The main top cover is equipped with small doors, located above the gap-sealing disks, the doors being of such size, that the disks can be removed to be cleaned or exchanged.

The freedom of movement of the gap-sealing disks within the main top cover is valuable because it allows the main top cover a considerable freedom to bend or twist as a result of a cold rain or to occupy a somewhat tilted position due to imperfect workmanship, without thereby lifting the sealing disks from the top terminal sealing faces.

Whenever the main top cover is removed, it takes the sealing disks with it, thus interrupting bodily contact between the vertical side seals and the flexible return troughs and creating an open air gap between them, permitting a current of atmospheric air to rise thus keeping the top terminal faces cool. The difficult gasketing problem, heretofore existing involving for instance the use of vulnerable inflated gaskets is eliminated.

These advantages are obtained whether a special base plate 41 is used or not. If special base plates are used, they have the advantage that they can be removed and refinished without removing the side frame plates 33 which are indispensable for holding the brickwork together. While the drawings show only one type of vertical side seals, other types may be used as shown in the aforementioned Patent No. 2,311,349.

We claim:

1. In a coke oven having an expendable vertical cooking chamber between two movable coking walls laterally bound by side frame plates, the vertical sides of the chamber being sealed by flexible vertical side seals pressed upon said side frame plates and the top of the chamber being surrounded by a continuous flexible water-filled top trough, said trough passing around upward extensions of said side seals at a distance and around upward extensions of said side frame plates called sealing ring-posts, leaving an open gap between itself and said upward extensions, and a double-duty top cover having the form of a bell with a continuous vertical sealing curtain resting in said continuous water-filled trough, said top cover carrying at its ends two gap-sealing disks lying in the same plane with the top surfaces presented by said side seals, said sealing post, and by said top trough surrounding said open gaps, and means adapted for pressing the disks elastically down upon said top surfaces.

2. In a coke oven having an expandable vertical coking chamber between two movable walls laterally bound by side frame plates, the vertical sides of the chamber being sealed by flexible vertical side seals pressed upon said side frame plates and the top of the chamber being surrounded by a continuous flexible water-filled top trough, said trough passing around upward extensions of said side seals at a distance and around the upward extensions of said side frame plates called sealing ring-posts, leaving an open gap between itself and said upward extensions, the topmost limiting surfaces of said side seals and of said sealing ring posts and of the proximate trough walls being substantially horizontal and located at the same elevation, a double-duty top cover having the form of a bell with a continuous vertical sealing curtain resting in said continuous water-filled trough, said top cover carrying at its ends two gap sealing disks and means adapted for pressing the disks elastically down upon the topmost limiting horizontal surfaces presented by said side seals, said sealing posts, and by said top trough surrounding said open gaps, and means adapted for rotating said disks.

3. In a coke oven having an expandable vertical coking chamber between two movable walls laterally bound by side frame plates, the vertical sides of the chamber being sealed by flexible vertical side seals pressed upon said side frame plates and the top of the chamber being surrounded by a continuous flexible water-filled top trough, said trough passing around upward extensions of said side seals at a distance and around the upward extensions of said side frame plates called sealing ring-posts, leaving an open gap between itself and said upward extensions, the topmost limiting surfaces of said side seals and of said sealing ring posts and of the proximate trough walls being substantially horizontal and located at the same elevation, a double-duty top cover having the form of a bell with a continuous vertical sealing curtain resting in said continuous water-filled trough, said top cover carrying at its ends two gap sealing disks and means adapted for pressing the disks elastically down upon the topmost limiting horizontal surfaces presented by said side seals, said sealing posts, and by said top trough surrounding said open gaps, and means for lifting the disks off the top surfaces without removing the main top cover.

4. In a coke oven having an expandable vertical coking chamber between two movable walls laterally bound by side frame plates, the vertical sides of the chamber being sealed by flexible vertical side seals pressed upon said side frame plates and the top of the chamber being surrounded by a continuous flexible water-filled top trough, said trough passing around upward extensions of said side seals at a distance and around upward extensions of said side frame plates called sealing ring-posts, leaving an open gap between itself and said upward extensions, the topmost limiting surfaces of said side seals and of said sealing ring posts and of the proximate trough walls being substantially horizontal and located at the same elevation, a double-duty top cover having the form of a bell with a continuous vertical sealing curtain resting in said continuous water-filled trough, said top cover carrying at its ends two gap sealing disks and means adapted for pressing the disks elasti-

cally down upon the top limiting horizontal surfaces presented by said side seals, said sealing posts, and by the proximate parts of said top trough surrounding said open gaps and means for regulating the pressure exterted by said disks upon said top surfaces, said regulating means being accessible from outside of said top cover.

5. In a coke oven having an expandable vertical coking chamber between two movable walls laterally bound by side frame plates, the vertical sides of the chamber being sealed by flexible vertical side seals pressed upon said side frame plates and the top of the chamber being surrounded by a continuous flexible water-filled top trough, said trough passing around upward extensions of said side seals at a distance and around the upward extensions of said side frame plates called sealing ring-posts, leaving an open gap between itself and said upward extensions, the topmost limiting surfaces of said side seals and of said sealing ring posts and of the proximate trough walls being substantially horizontal and located at the same elevation, a double-duty top cover having the form of a bell with a continuous vertical sealing curtain resting in said continuous water-filled trough, said top cover carrying at its ends two gap sealing disks and means adapted for pressing the disks elastically down upon the top limiting surfaces presented by said side seals, said sealing posts, and by said top trough surrounding said open gaps, said top cover being equipped at each of its ends with a small door adapted to permit the removal of said disks through said top cover.

6. In a coke oven having an expandable vertical coking chamber between two movable coking walls, the walls being laterally bound by side frame plates, the vertical sides of the chamber being sealed by flexible vertical side seals pressed upon said side frame plates and the top of the chamber being surrounded by a continuous flexible water-filled top trough, said trough passing around upward extensions of said side seals at a distance and around upward extensions of said side frame plates called sealing ring-posts, leaving an open gap between itself and said upward extensions, said upward extensions and top troughs forming continuous U-shaped sealing rings surrounding said gaps, means for closing said gaps, comprising means for exerting metal to metal gas sealing pressure between the abutting members of said rings, means for supporting the top terminal faces of the members of said rings at a common level and means for elastically pressing a sealing disk vertically down upon the top terminal faces in each of said rings.

7. In a coke oven having an expandable vertical coking chamber between two movable coking walls, the walls being laterally bound by side frame plates, the vertical sides of the chamber being sealed by flexible vertical side seals pressed upon said side frame plates and the top of the chamber being surrounded by a continuous flexible water-filled top trough, said trough passing around upward extensions of said side seals at a distance and around upward extensions of said side frame plates called sealing ring-posts, leaving an open gap between itself and said upward extensions, said upward extensions and top troughs forming continuous U-shaped sealing rings surrounding said gaps, means for closing said gaps, comprising means for exerting metal to metal gas sealing pressure between the abutting members of said rings, means for supporting the top terminal faces of the members of said rings at a common level, means for keeping the vertical symmetry axes of the side seals and of the return troughs located within the center plane of the coking chamber and means for elastically pressing a sealing disk vertically down upon the top terminal faces in each of said rings.

8. In a coke oven having an expandable vertical coking chamber between two movable coking walls, the walls being laterally bound by side frame plates, the vertical sides of the chamber being sealed by flexible vertical side seals pressed upon said side frame plates and the top of the chamber being surrounded by a continuous flexible water-filled top trough, said trough passing around upward extensions of said side seals at a distance and around upward extensions of said side frame plates called sealing ring-posts, leaving open gaps between itself and said upward extensions, means for closing said gaps comprising means for fixing the top terminal faces of said top troughs and of said upward extensions at one common level, means for effecting gastight metallic but motion-permitting contact between said posts and the flexible vertical side seals and the proximate parts of the water-filled top troughs, two gap sealing disks, and means for pressing the disks elastically and in a gastight manner down upon said top terminal faces.

9. In a coke oven having an expandable vertical coking chamber between two movable coking walls, the walls being laterally bound by side frame plates, the vertical sides of the chamber being sealed by flexible vertical side seals pressed upon said side frame plates and the top of the chamber being surrounded by a continuous flexible water-filled top trough, said trough passing around upward extensions of said side seals at a distance and around upward extensions of said side frame plates called sealing ring-posts, leaving open gaps between itself and each of said side seals, means for closing said gaps comprising means for pressing said top trough against one side of said posts, means for pressing said side seals against another side of said posts, means for elastically pressing a sealing disk upon the top terminal faces presented by the posts and the side seals and upon those top faces of the top troughs which are proximate to the posts and the side seals and means adapted for supporting said top terminal faces in their elevation and preventing their yielding under the pressure exerted by said disks.

10. In a coke oven with an expandable coking chamber between movable coking walls, the walls being laterally contained between side frame plates and being confined on top below a top frame plate, the chamber being closed at its sides by vertical flexible side seals pressed upon the side frame plates and being closed on top by a removable bell-shaped cover extending into water-filled top sealing troughs, said top troughs being composed of long rigid portions having gastight contact with the top frame plates and of flexible return elbows extending beyond said side frame plates and surrounding said flexible side seals leaving two gaps between the return elbows and the flexible side seals, gap-sealing means adapted to seal said gaps, said gap-sealing means comprising four vertical sealing ring-posts being upward extensions of the side frame plates, and comprising upward extensions of said flexible side seals, means for fixing at the same level the top terminal sealing faces of the sealing ring-posts and of the flexible side sealing pieces and of those portions of the water filled sealing troughs which are contiguous to the sealing ring-

post and proximate to the flexible side seals, two gap-sealing disks, and means for pressing said disks upon said top terminal sealing faces and means for pressing the abutting bodies beneath said top terminal faces against each other horizontally.

11. In a coke oven having an expandable vertical coking chamber between two movable coking walls, the top of the chamber being surrounded by a continuous flexible water-filled top trough, the walls being laterally bound by side frame plates, the vertical sides of the chamber being sealed by flexible vertical side seals pressed upon said side frame plates, said side frame plates having upward extensions called sealing ring-posts rising upward in the spaces surrounded by said top trough and reaching up to an elevation equal to that of the top terminal sealing faces of said top trough, said flexible side seals also extending up to the top terminal faces of said top trough, said top trough passing around said sealing ring-posts and said side seal extensions, leaving open gaps between itself and said sealing ring-posts and said side seal extensions, means

for closing said gaps comprising means for pressing said top trough in a gastight manner against said sealing ring-posts, means for elastically pressing a sealing disk downward upon the top terminal faces presented by the sealing ring-posts and the side seal extensions and by those parts of the top trough which are proximate to said sealing ring-posts and said side seal extensions and means adapted for adjusting and supporting said top terminal faces in their elevation and preventing their yielding under the pressure exerted by said disks.

FRANZ PUENING.
ALVIN L. BOWER.

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