Feb. 6, 1940. G. M. CROFT 2,189,280

SOAKING PIT COVER

Filed Dec. 2, 1938 4 Sheets-Sheet 1

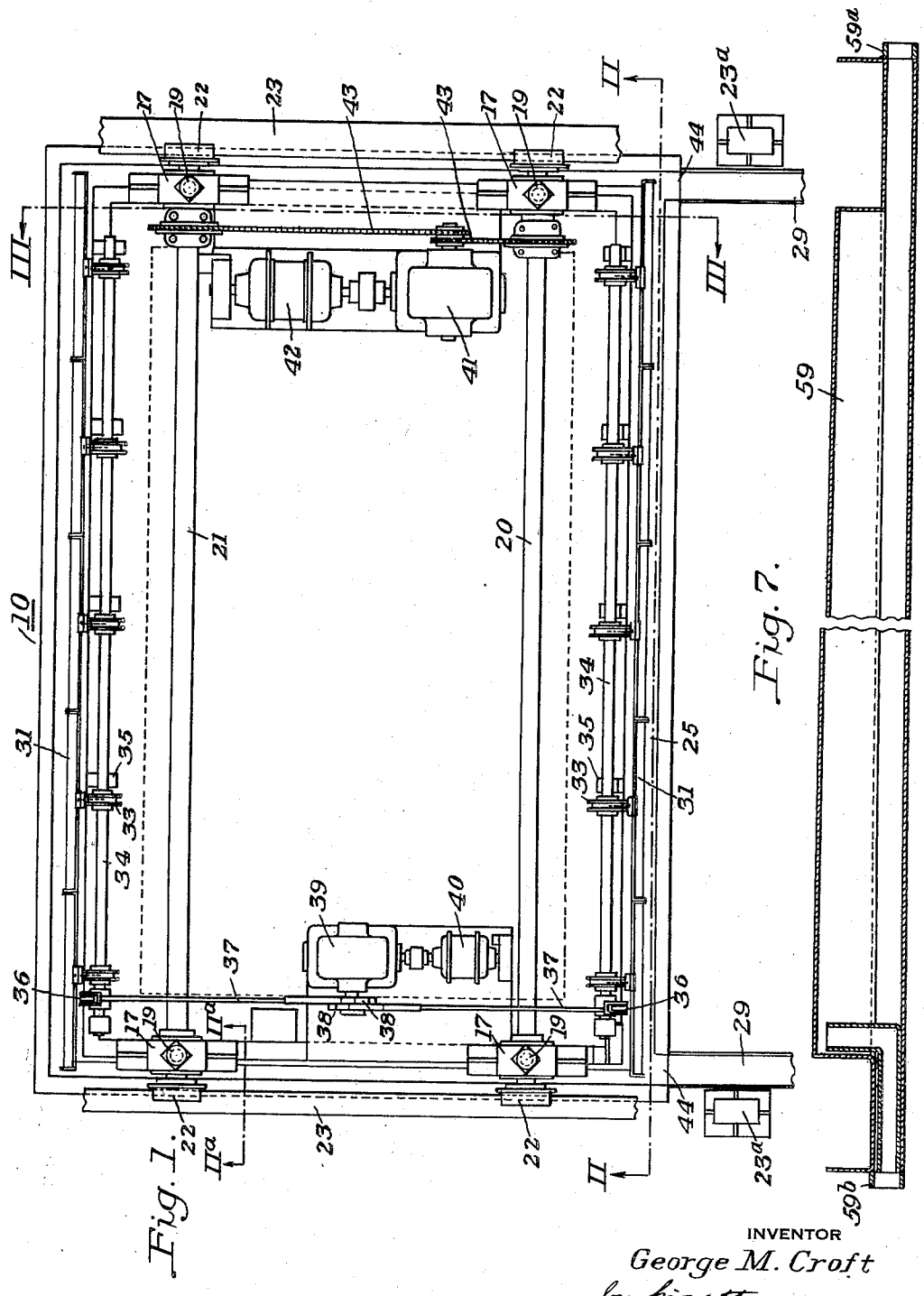



Fig. 1.

Fig. 7.

INVENTOR

George M. Croft

by his attorneys

Stebbins, Blenko & Parmelee

Feb. 6, 1940. G. M. CROFT 2,189,280

SOAKING PIT COVER

Filed Dec. 2, 1938 4 Sheets-Sheet 2

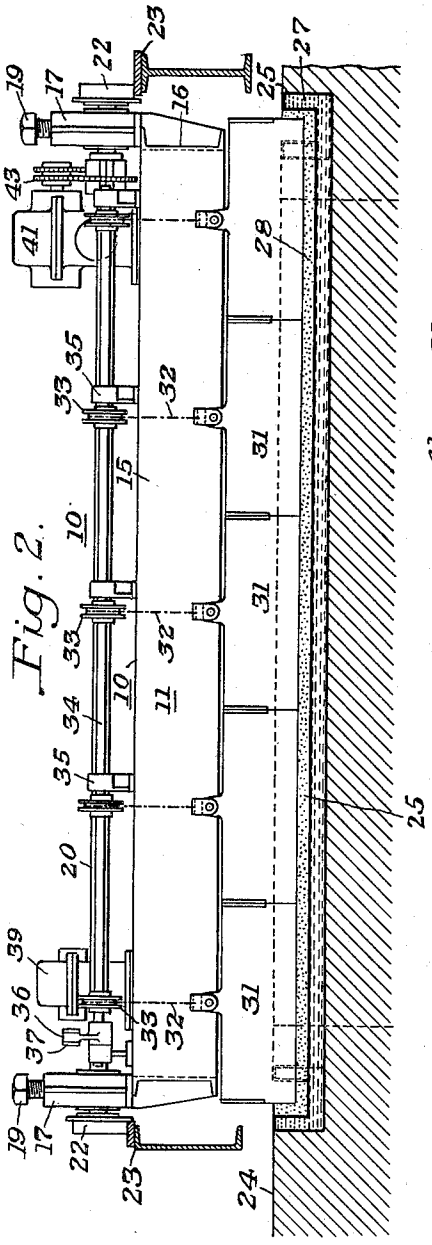


Fig. 2.

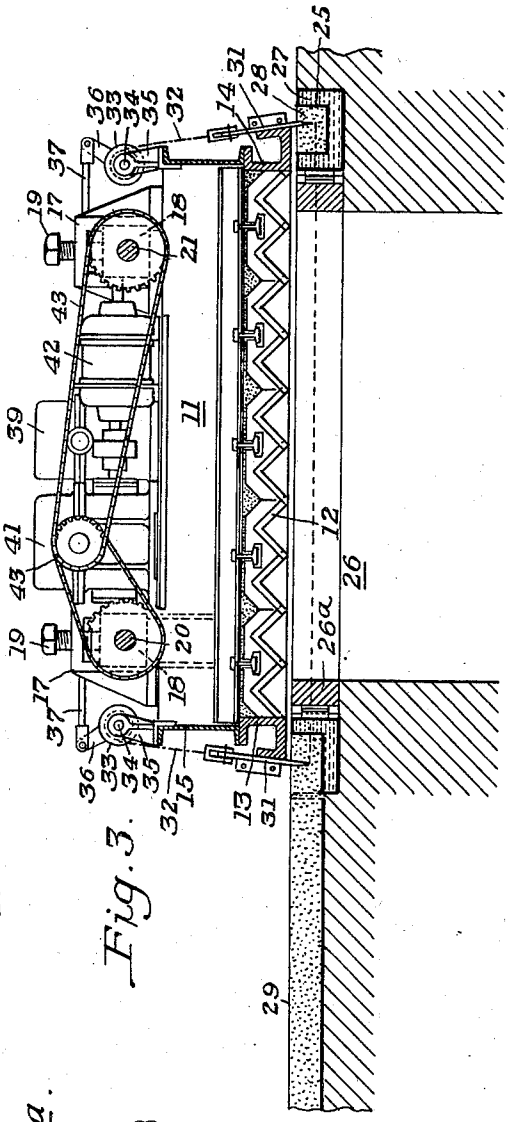


Fig. 3.

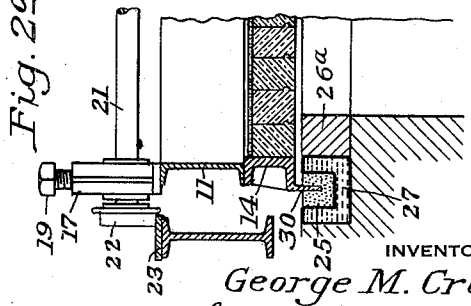


Fig. 2a.

INVENTOR

George M. Croft

by his attorneys

Stebbins, Blenkol Parmelee

Feb. 6, 1940. G. M. CROFT 2,189,280

SOAKING PIT COVER

Filed Dec. 2, 1938 4 Sheets-Sheet 3

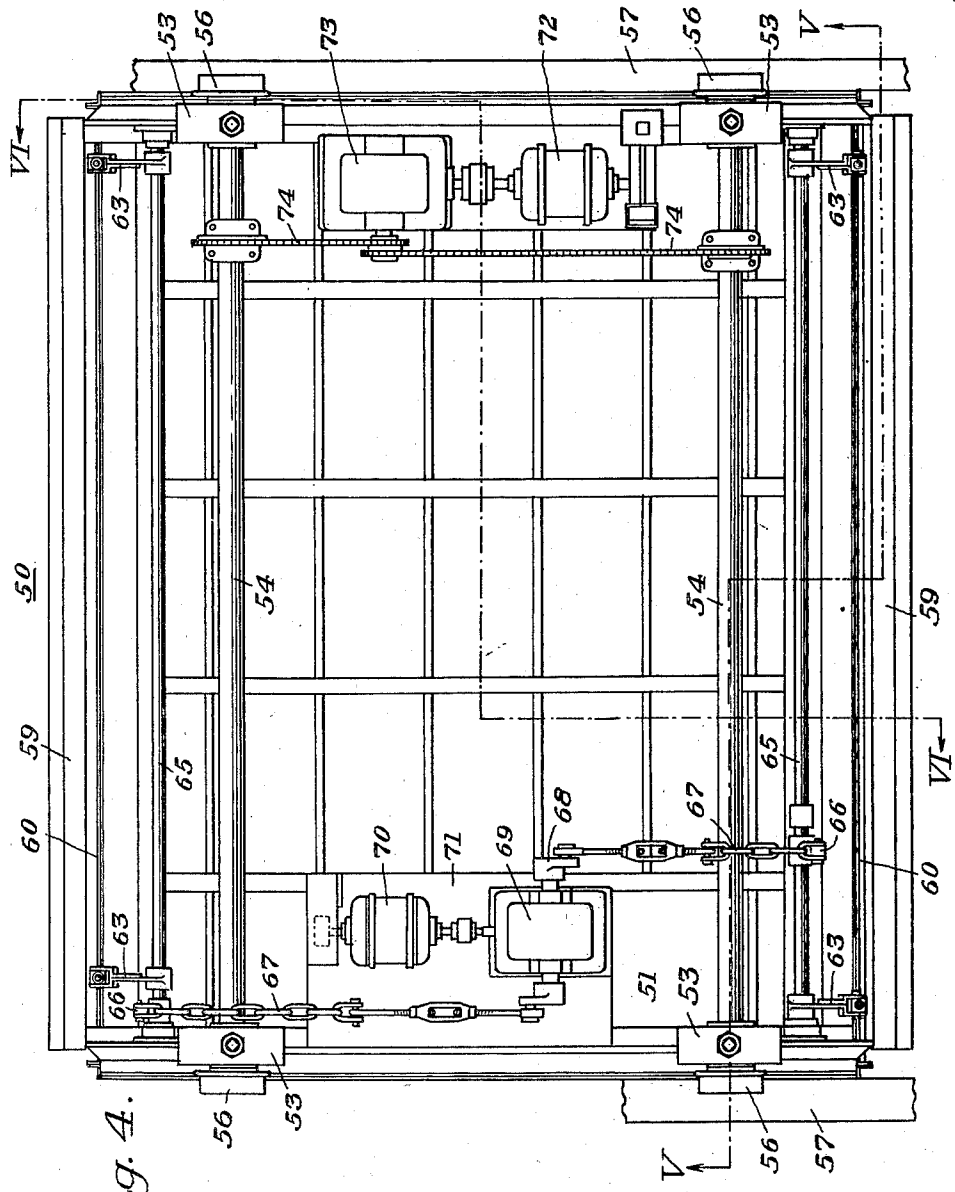



Fig. 4.

INVENTOR

George M. Croft

by his attorneys

Stebbins, Blenko & Parmelee

Feb. 6, 1940. G. M. CROFT 2,189,280

SOAKING PIT COVER

Filed Dec. 2, 1938 4 Sheets-Sheet 4

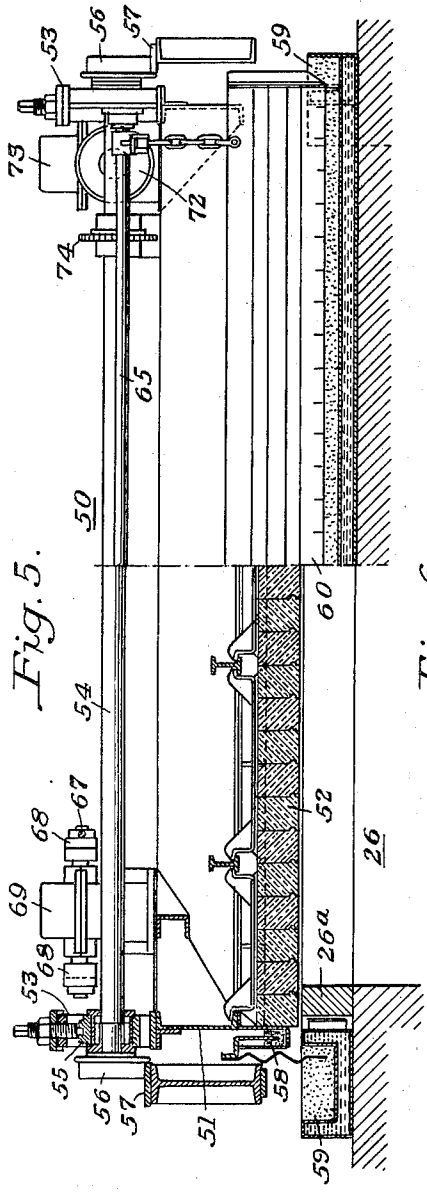


Fig. 5.

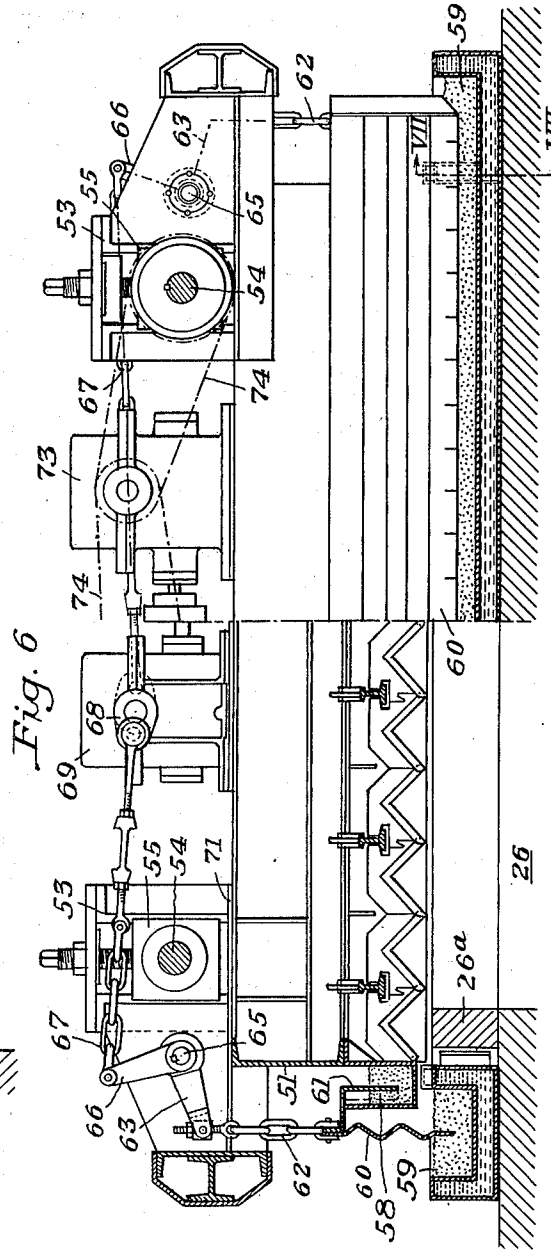


Fig. 6

INVENTOR
George M. Croft
by his attorneys
Stebbins, Blenko & Parmelee

Patented Feb. 6, 1940

2,189,280

# UNITED STATES PATENT OFFICE

2,189,280

## SOAKING PIT COVER

George M. Croft, Vandergrift, Pa., assignor to Blaw-Knox Company, Blawnox, Pa., a corporation of New Jersey

Application December 2, 1938, Serial No. 243,539

9 Claims. (Cl. 110—173)

This invention relates to soaking pit covers or the like and, in particular, to a soaking pit cover of such construction as to be movable laterally from the pit without being lifted.

Numerous expedients have been resorted to heretofore for transporting soaking pit covers from a position over the pit to a position laterally thereof to permit the charging of ingots into the pit and their removal therefrom. Numerous forms of apparatus have been proposed, for example, for lifting a cover from the pit and then transporting it horizontally. Despite obvious objections to covers so constructed, they have continued in use for the lack of a better construction. The objections to the soaking pit covers known heretofore include the fact that a frame must be provided for supporting the brick lining of the cover and the frame must be strong enough to permit vertical movement of the cover relative to the usual supporting car. A further objection is that it has usually been necessary to provide a motor powerful enough to lift the cover as well as means for driving the car on which the cover is usually suspended. As the weight of the cover is considerable, the power required to lift it is substantial.

I have invented a soaking pit cover which avoids the aforementioned objections and is characterized by other novel features and advantages. In a preferred form of the invention, a soaking pit cover is suspended on wheels adapted to travel from a position over a pit to a position laterally thereof. The cover is normally carried at an elevation slightly above that of the working floor surrounding the pit. A sealing channel extends around the pit and the cover is provided with sealing means adapted to cooperate therewith to close the joint between the cover and the wall of the pit. The sealing means may comprise fixed plates mounted on the ends of the cover and movable plates mounted on the sides of the cover adapted to be lowered into and raised out of the sealing channel. In this form of the invention extensions are provided for the sealing channel in which the fixed sealing plates travel on movement of the cover. In another form of the invention, the sealing plates at the sides and ends of the cover are movable as a unit into and out of the sealing channel.

The sealing channel is filled with sand to the desired depth, and the sealing plates are so mounted that they extend down into the sand when in sealing position. Sand ordinarily used for sealing contains impurities which cause it, when heated, to bake hard and form crusts, lessening its sealing ability. To avoid this, I provide special means for cooling the sealing channel, specifically a water jacket having connections whereby cooling water or other fluid may be circulated therethrough.

A complete understanding of the invention may be had from the following detailed description and the accompanying drawings referred to therein, illustrating the embodiments above mentioned. In the drawings:

Fig. 1 is a plan view of one form of the invention;

Fig. 2 is a partial sectional view taken along the line II—II of Fig. 1 showing parts in elevation;

Fig. 2—*a* is a partial sectional view taken along the line II*a*—II*a* of Fig. 1;

Fig. 3 is a sectional view taken along the line III—III of Fig. 1;

Fig. 4 is a plan view of a modified form of the invention;

Fig. 5 is a sectional view taken along the line V—V of Fig. 4 showing parts in elevation;

Fig. 6 is a sectional view taken along the line VI—VI of Fig. 4; and

Fig. 7 is a sectional view through the inner wall of the sealing channel only, taken substantially on the plane of line VII—VII of Fig. 6.

Referring now in detail to the drawings and, for the present, to Figs. 1 through 3, a soaking pit cover embodying my invention is indicated generally at 10 and comprises a frame 11 of structural members provided with a refractory lining 12. The frame 11 comprises lower longitudinal and transverse structural members 13 and 14 respectively, and upper longitudinal and transverse channels 15 and 16 respectively, secured to the members 13 and 14.

Bearing posts 17 are mounted on the channels 16 adjacent the corners of the frame 11 and are provided with bearing chucks 18 adjustable vertically therein. Screws 19 threaded through the posts 17 are provided for adjusting the frame 11 relative to the bearing chucks.

Cross shafts 20 and 21 are journaled in bearings mounted in the chucks 18 and are provided with wheels 22 adapted to travel on rails 23. The rails 23 rest on footings 23a. It will be noted in Fig. 3 that the screws 19 are normally so adjusted that the bottom of the cover clears the floor 24 adjacent the cover.

A sealing channel 25 extends around the open top or mouth of the pit indicated at 26, adjacent a heavy metallic rim 26a surrounding the pit mouth. The sealing channel is in the form of a

double-walled trough, L-shaped or U-shaped in section, constructed of metal plate, whereby cooling water may be circulated therethrough as indicated at 27. The trough proper of the sealing channel is filled with granular sealing material such as sand 28. Extensions 29 of the sealing channel form continuations of the portions thereof parallel to the ends of the pit opening. The structural members 14 have sealing flanges 30 depending therefrom into the portions of the channel 25 paralleling the ends of the pit. On movement of the cover 10 by means to be described shortly, the flanges 30 move longitudinally into the extensions 29.

Sealing plates 31 are movably suspended on opposite sides of the cover 10 and are adapted to be lowered into the channel 25 or raised therefrom. The sealing plates 31 are suspended on chains 32 secured to drums 33 mounted on cross shafts 34. The shafts are journaled in bearings 35 carried on the frame 11. Cranks 36 secured to the shafts 34 are connected by links 37 to eccentrics 38 on the slow speed shaft of a speed-reducer 39. A motor 40 is coupled to the speed-reducer 39. When the motor 40 is energized to drive the reducer 39 and operate the eccentrics 38, the links 37 and cranks 36 cause the shafts 34 to rotate whereupon the sealing plates 31 are raised from or lowered into the channel 25. Suitable control means (not shown) are provided for permitting the operator to energize the motor appropriately to cause the desired movement of the plates 31. When the plates 31 have been raised from the channel 25, the cover may be moved laterally from the pit. To this end, I mount a speed-reducer 41 on the cover as well as a driving motor 42 therefor. The shafts 20 and 21 are driven from the reducer 41 through chain and sprocket drives 43.

It will be apparent that the flanges 30 on the frame members 14, being fixed relative to the latter, are permanently in sealing relation with the channel 25 and its extensions 29. It will also be apparent that the cover 10 is free to move laterally along the tracks 23 as soon as the plates 31 have been raised out of the channel 25. Conversely, the space between the bottom of the cover and the edges of the pit opening is fully closed on lowering the plates 31 after restoring the cover to its illustrated position. The circulation of cooling water through the sealing channel prevents overheating of the sealing material and also protects the brickwork adjacent the top of the pit wall. It will be apparent that the outer wall of the channel 25 is interrupted as at 44 to permit movement of the flanges 30 into the extensions 29.

Referring now more particularly to Figs. 4 through 6 illustrating a modification of the invention, the cover 50 comprises a structural frame 51 having a refractory lining 52. The cover 50 is arranged for traveling movement in the same manner as the cover of Fig. 1, viz., by bearing posts 53 secured to the frame, shafts 54 journaled in bearings 55 slidable in the posts, and wheels 56 on the shafts rolling on rails 57. A sealing channel 58 extends around the cover, being mounted on the frame thereof. A sealing channel 59 extends around the mouth of the pit and is similar in construction to the channel 25 of Fig. 1. The sealing channels are preferably constructed in separate sections, one adjacent each end or side of the pit, one such section being shown in Fig. 7 with inlet and outlet connections 59a and 59b. The top of the inner wall of each section is made slightly sloping to avoid air or steam pockets. By this construction the water jacket may be maintained full of water for effective cooling. The circulation of cooling water is so established as to avoid traps, thus insuring continuous flow of water through all portions of the jacket.

A pair of sealing flanges 60 and 61 extend along the sides and ends of the cover, being secured together forming a unitary structure. This assembly of sealing flanges or plates is suspended by chains 62 from cranks 63 secured to cross shafts 65. Cranks 66 also secured to the shafts 65 are connected by links 67 to cranks 68 on the low speed shaft of a speed-reducer 69 driven by a motor 70. The speed-reducer and motor are mounted on a base plate 71 carried on the frame 51. It will be apparent that operation of the motor 70 to move the crank 68 through 180° will cause partial rotation of the shaft 65 and elevation of the sealing flanges or plates 60 and 61. When the sealing flanges have thus been raised, the cover is ready for transport on the wheels 56. The latter may be driven by a motor 72 through a speed-reducer 73 and chain and sprocket drive 74, in the same manner as the cover of Fig. 1.

The advantages of my invention will be clear from the foregoing description of the construction and operation involved therein. The cover may be initially adjusted by means of the supporting screws to have the desired clearance relative to the mouth of the pit so that it may be moved laterally thereof without lifting. It is unnecessary, therefore, to provide a car separate from the cover for transporting the latter. I also avoid the necessity for lifting mechanism powerful enough to raise the weight of the entire cover since the only portion thereof which need be raised prior to transport is the sealing plates. It will be obvious that the motor and hoisting mechanism for raising the sealing plates may be much smaller and less expensive than would be required if the entire cover had to be raised relative to a separate supporting car. The cover of my invention is thus much simpler and may be constructed at a cost much lower than covers of the type previously used. At the same time, the space between the cover and edges of the pit opening is tightly closed when the cover is in position.

The cooling jackets of the sealing channels protect the sealing sand from excessive temperatures to which it would be subjected if the channels were formed in the brick adjacent the pit mouth. This keeps the sand from crusting and baking hard, and preserves its sealing ability. The water jacket protects not only the sand in the channel it surrounds but also the sand in the channel 58 mounted on the cover as in the modification shown in Figs. 4–7. The cooling of the sand also prevents overheating of the sealing plates which might cause warping thereof. The water jacket also protects the top of the pit wall to some extent, as well as the rim 26a surrounding the pit opening.

Although I have illustrated and described but two embodiments of the invention, it will be apparent that changes in the construction and operation disclosed may be made without departing from the spirit of the invention or the scope of the appended claims.

I claim:

1. The combination with a cover for a soaking pit mounted for movement from a position over

the pit to a position laterally thereof, of a sealing channel adjacent the pit, and sealing means movably mounted on said cover adapted to cooperate with said channel.

2. The combination with a cover for a soaking pit mounted for movement from a position over the pit to a position laterally thereof, of a sealing channel adjacent the pit, sealing means movably mounted on said cover adapted to cooperate with said channel, and means on said cover for raising and lowering said sealing means.

3. The combination with a cover for a soaking pit mounted for movement from a position over the pit to a position laterally thereof, of a sealing channel adjacent the pit, sealing means fixed on said cover and depending into said channel, and other sealing means movably mounted on said cover and adapted to be lowered into and withdrawn from said channel.

4. The combination with a substantially rectangular cover for a soaking pit mounted on wheels for movement along a predetermined line, parallel to one end of the cover, in a single plane, of a sealing channel extending along the sides of the pit, and sealing means on said cover movable into and from said channel.

5. The combination with a substantially rectangular cover for a soaking pit mounted on wheels for movement along a predetermined line, parallel to one end of the cover, in a single plane, of a sealing channel extending along the sides of the pit, and a sealing plate on each side of the cover adapted to enter said channel, at least those plates perpendicular to said line being movable into and out of said channel.

6. The combination with a substantially rectangular cover for a soaking pit mounted on wheels for movement along a predetermined line, parallel to one end of the cover, in a single plane, of a sealing channel extending along the sides of the pit, and a sealing plate on each side of the cover adapted to enter said channel, said plates being movable into and out of said channel.

7. The combination with a cover for a soaking pit mounted for movement from a position over the pit to a position laterally thereof, of a sealing channel adjacent the pit, sealing means fixed on said cover and depending into said channel, other sealing means movably mounted on said cover and adapted to be lowered into said channel, and extensions from said channel in which said fixed means move with said cover.

8. The combination with a cover for a soaking pit provided with a top opening, said cover being mounted for movement from a position over the pit to a position laterally thereof, of a sealing channel extending around the opening of said pit and sealing means movably mounted on said cover for entry into and withdrawal from said channel.

9. The combination with a cover for a soaking pit provided with a top opening, of wheels normally fixed relative thereto, whereby said cover may travel from a position over a pit to a position laterally thereof, tracks whereon said wheels travel, the projections of said tracks on a vertical plane therealong being straight lines, a sealing channel around the pit opening, and plates supported on said cover for movement into and out of said channel.

GEORGE M. CROFT.