Sept. 29, 1942. F. J. WEST ET AL 2,296,965

RETORT DISCHARGE MECHANISM

Filed Aug. 30, 1941 4 Sheets-Sheet 1

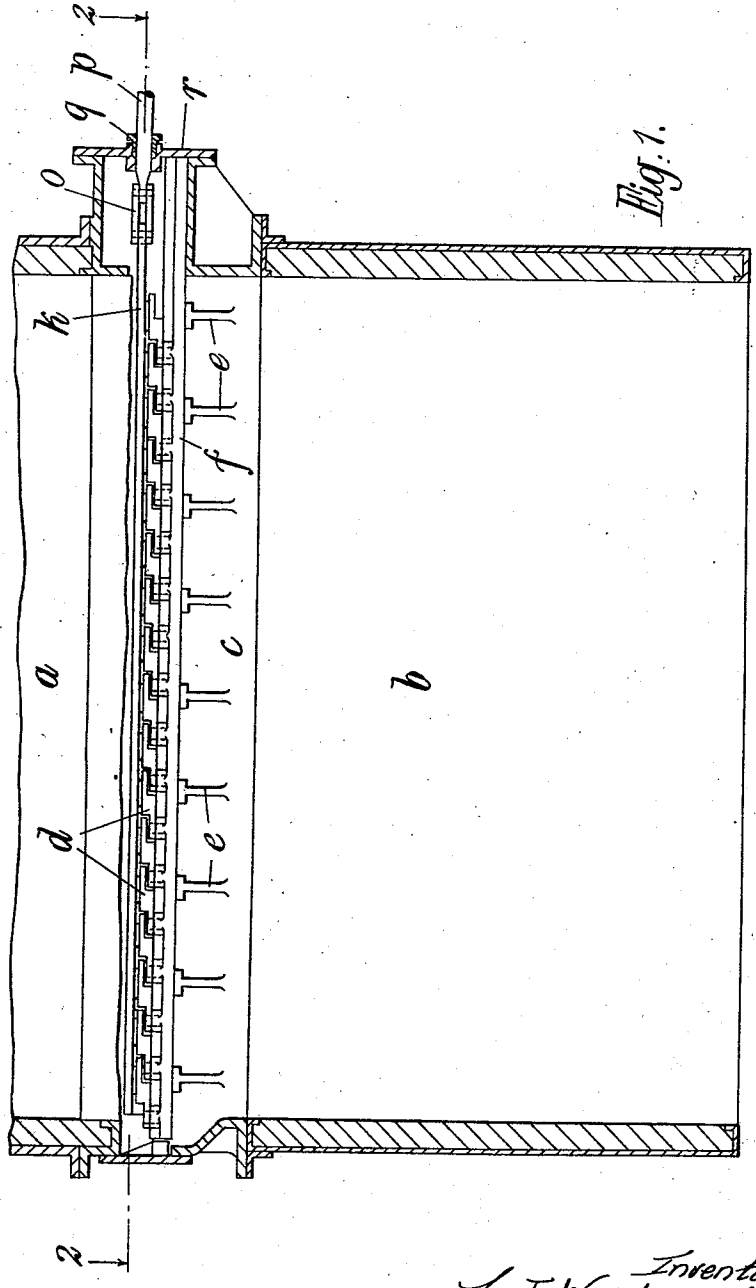


Fig. 1.

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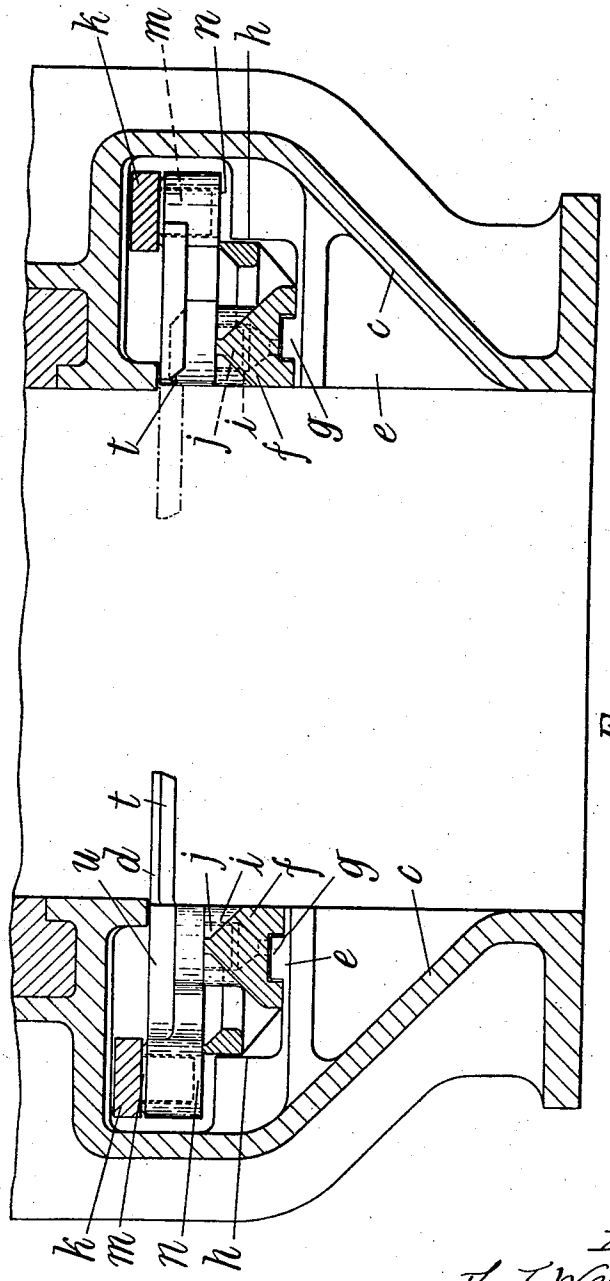


Fig. 4.

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RETORT DISCHARGE MECHANISM

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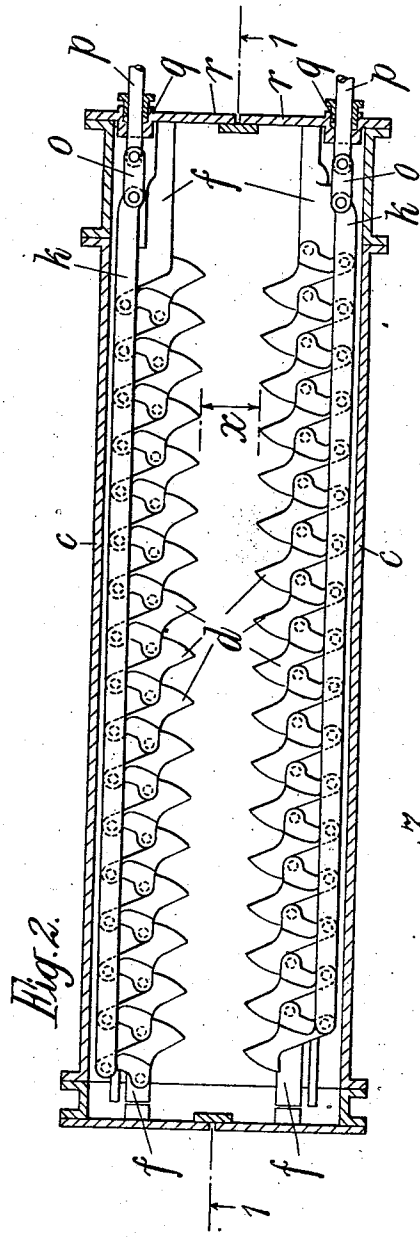


Fig. 2.

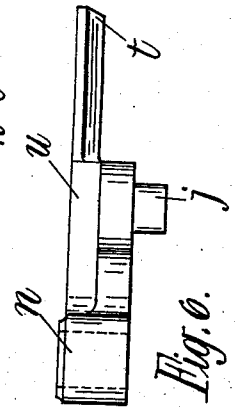


Fig. 6.



Fig. 7.

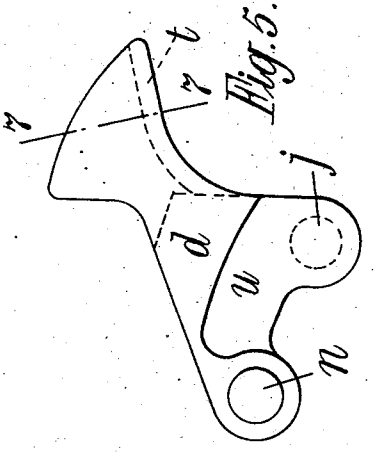


Fig. 5.

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RETORT DISCHARGE MECHANISM

Filed Aug. 30, 1941 4 Sheets-Sheet 4

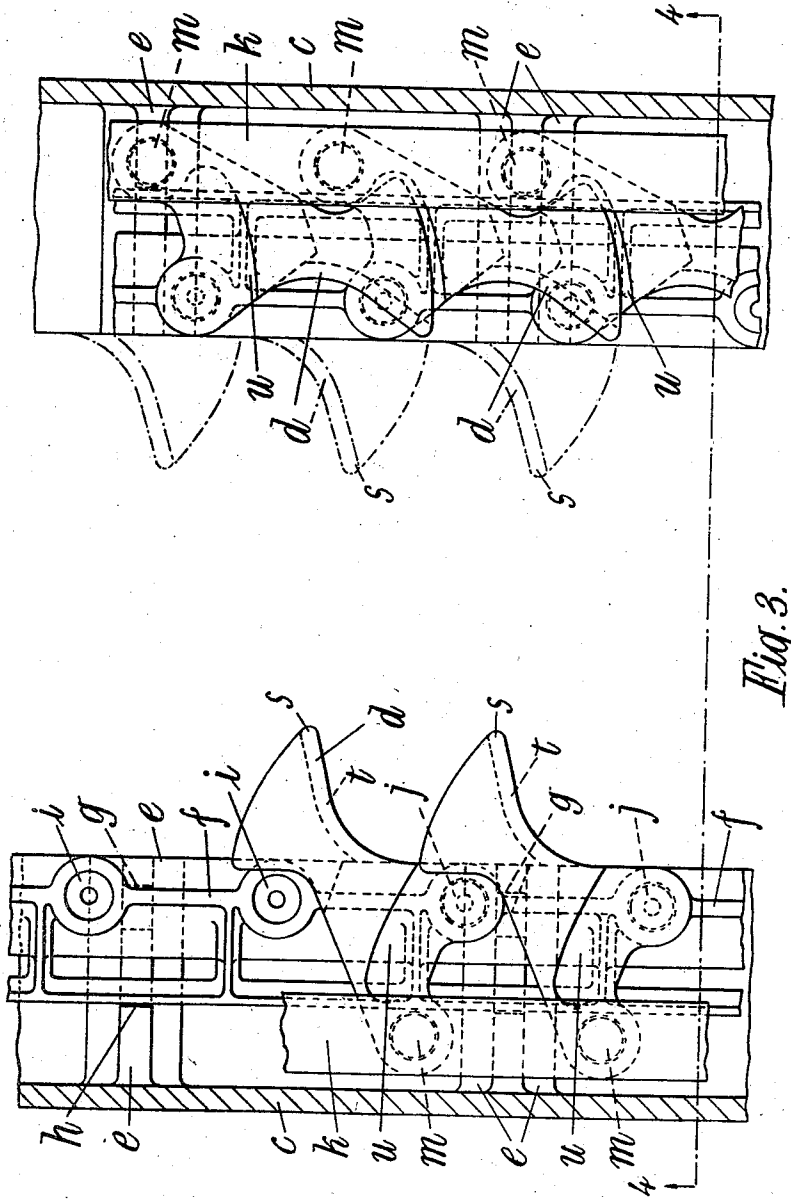


Fig. 3.

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UNITED STATES PATENT OFFICE

2,296,965

RETORT DISCHARGE MECHANISM

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Application August 30, 1941, Serial No. 409,083
In Great Britain September 14, 1940

2 Claims. (Cl. 214—35)

This invention relates to intermittently operating vertical retorts for the distillation of carbonaceous materials such as coal, shale and the like, and has for its object to provide improved means for supporting the charge in the retort and separating such charge from the coke being discharged.

Referring to the accompanying explanatory drawings:

Figure 1 is a sectional elevation on the line 1—1 of Figure 2 and Figure 2 a sectional plan on the line 2—2 of Figure 1 showing charge supporting means constructed and arranged in one convenient form in accordance with this invention.

Figure 3 shows a portion of what is shown in Figure 2 drawn to a larger scale.

Figure 4 is a cross sectional view on the line 4—4 of Figure 3.

Figure 5 is a plan view, Figure 6 a side elevation and Figure 7 a sectional view on the line 7—7 of Figure 5 showing the details of a charge gripping and supporting finger.

In Figure 1, *a* indicates the lower portion of the vertical retort in which carbonisation is effected, and *b* the coke chamber into which discharge from the retort takes place. Between *a* and *b* is arranged the metal framework *c* in which are supported and operated the hook like or pointed fingers *d* which when in their service positions support the charge in the retort and when withdrawn allow discharge to take place from the retort to the coke chamber beneath. The framework *c* provides a series of brackets *e* at each side of the through space of the retort upon which are supported rails *f*, the latter being located by raised ribs *g* on the brackets which enter grooves in the base of the rails, and by the vertical faces *h* on the brackets. Each rail *f* has a series of holes *i* therein to receive depending plug like projections *j* on the undersides of the fingers *d*, such holes and plugs forming the fulcrum or swivel points of the fingers. The oscillating movements of the fingers are effected by bars *k* which have depending plug like projections *m* thereon which enter holes *n* in the fingers. One end of each bar *k* is coupled by links *o* to a rod *p* which extends through a stuffing box *q* in the end cover *r* of the framework *c* and is coupled to suitable operating means, not shown.

The fingers *d* are shaped with a pointed end *s* which is adapted to bite into the coke mass which descends from the retort proper *a* to the coke chamber so as to grip the mass after the predetermined amount of coke has been allowed to pass into and fill the coke chamber. The leading edge of each finger is wedge shaped or bevelled as shown at *t* in Figure 7 in order to assist in securing a ready entry of the finger into the coke. Each finger is cut away at *u*, see Figures 5 and 6, to accommodate a portion of an adjacent finger when the fingers are nested together in their out-of-service or withdrawn position as shown at the right hand side of Figures 3 and 4. It will of course be appreciated that the fingers at both sides of the retort are moved simultaneously into their service and out-of-service positions, but in Figures 3 and 4, the fingers at one side are shown in service and at the other side out of service.

If it be desired to withdraw the fingers from the framework *c* for inspection or renewal purposes, this can readily be done by removing the end covers *r* (see Figures 1 and 2) and pulling out the rails *f* and bars *k* which will bring the fingers with them. The rails *f* and bars *k* may be made in sections which can be dismantled as withdrawal from the framework takes place. This reduces the clearance necessary in front of the covers *r* for the withdrawal of the rails *f* and bars *k*.

It will be appreciated from a consideration of Figures 2, 3 and 4 which show the fingers *d* in their service positions, that the two rows of fingers do not come close together in order to support the charge in the retort. They bite into the opposite sides of the charge (which at this point is completely carbonised) for a short distance and key themselves in the coke mass. Thus in a retort which is about 16½ inches wide, that is the vertical dimension in Figure 2, there may be a distance of not more than 8 inches, between the ends of the fingers, i. e. the distance X in Figure 2, but the keying of the fingers into the mass, ensures that it is effectively supported. When a discharge from the retort *a* into the coke chamber *b* is to take place, the fingers are withdrawn by a suitable movement of the bars *k*. After the charge thus released has dropped to the extent necessary to fill the coke chamber, it comes to rest and the fingers are then forced outwards towards one another by a reverse movement of the bars *k*, in order to grip the charge in the manner previously described and prevent further descent of that portion of it in the retort above them, while the contents of the coke chamber below them are discharged (either immediately or after an interval of time) through a suitable door (not shown) at the base thereof.

With our improvement we are enabled to support the charge in the retort and separate it

from the coke in the coke chamber with the expenditure of but a small amount of power as the fingers are readily operated, have not to cut through the coke mass, and are not heavy devices such as are frequently employed to support retort charges.

What we claim is:

1. Means for supporting the charge in a vertical retort for the carbonisation of coal and the like, comprising, in combination, rails extending along two opposite sides of and supported beneath the retort, a series of hook like fingers fulcrumed in said rails on vertical fulcra, bars extending parallel with the rails and pivotally connected with the fingers fulcrumed in said rails, and means for moving said bars longitudinally in one direction to turn said fingers and cause their leading pointed ends to penetrate for a short distance only into the coke mass at the base of the retort in which they become keyed and so hold up and support the charge in the retort and in an opposite direction to withdraw the fingers clear of the coke mass to permit coke to drop from the retort.

2. Means for supporting the charge in a vertical retort for the carbonisation of coal and the like, comprising in combination, a metal framework disposed beneath the retort, brackets along two opposite sides of said framework providing aligned horizontal surfaces beneath and at two opposite sides of the retort, a rail carried upon each series of aligned horizontal surfaces and held against lateral relative movements thereto by cooperating ribs and grooves, a series of vertical sockets in each rail, two series of hook like fingers with plugs projecting from their undersides which enter the sockets in the rails, bars extending parallel with the rails above the fingers and pivotally connected to the latter by plug and socket connections, means for moving said bars to a limited extent only back and forth in order to turn the fingers about their fulcra in the rails, and a cover on one end of the framework through which the rails, fingers and bars can be withdrawn.

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