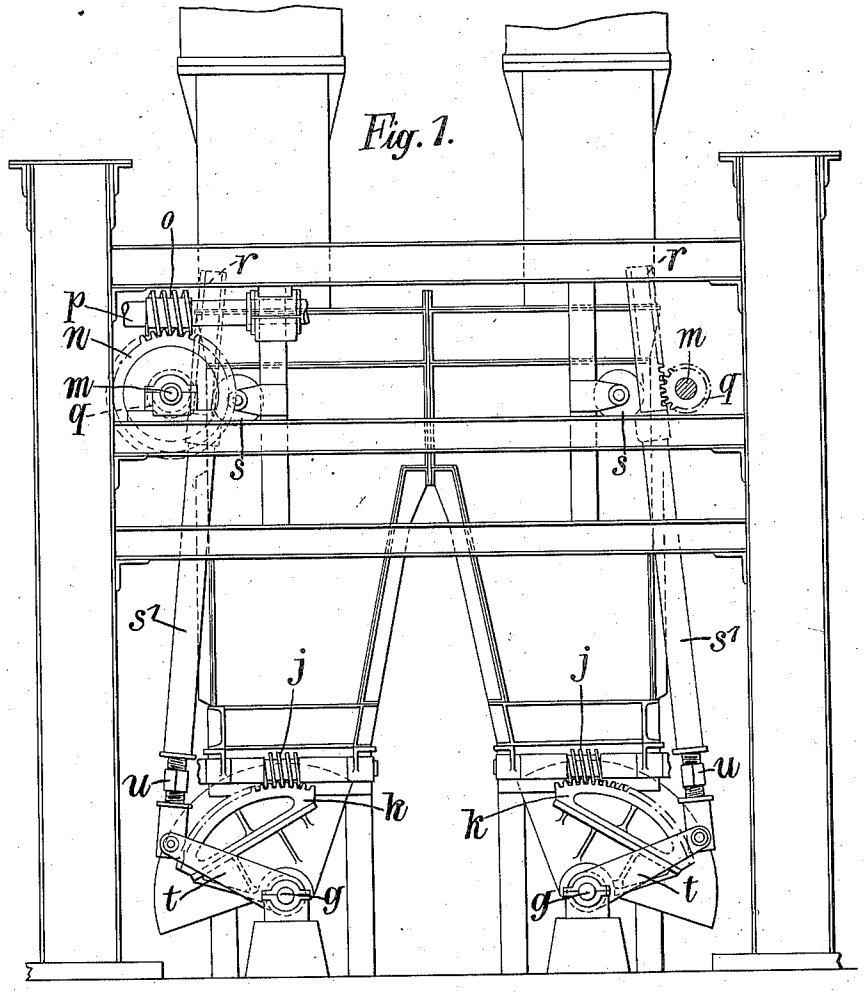
July 27, 1937. F. J. WEST ET AL 2,088,252

VERTICAL RETORT FOR THE CARBONIZATION OF COAL AND LIKE MATERIALS

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Fig. 1.



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Fig. 2.

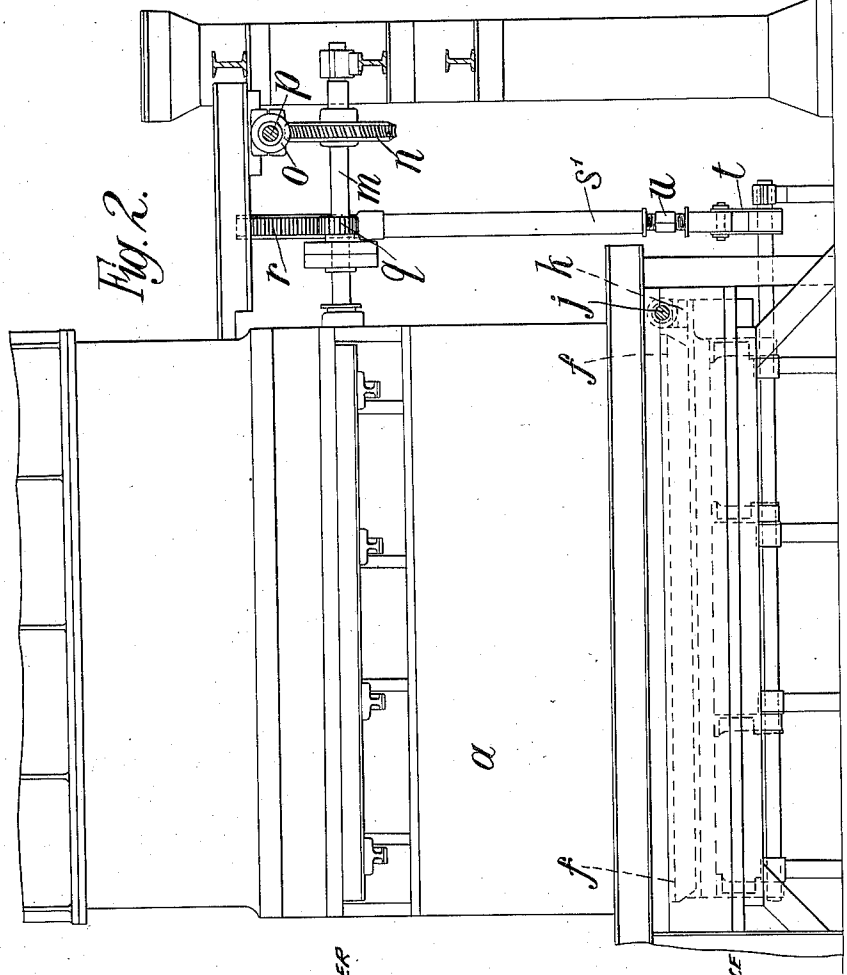
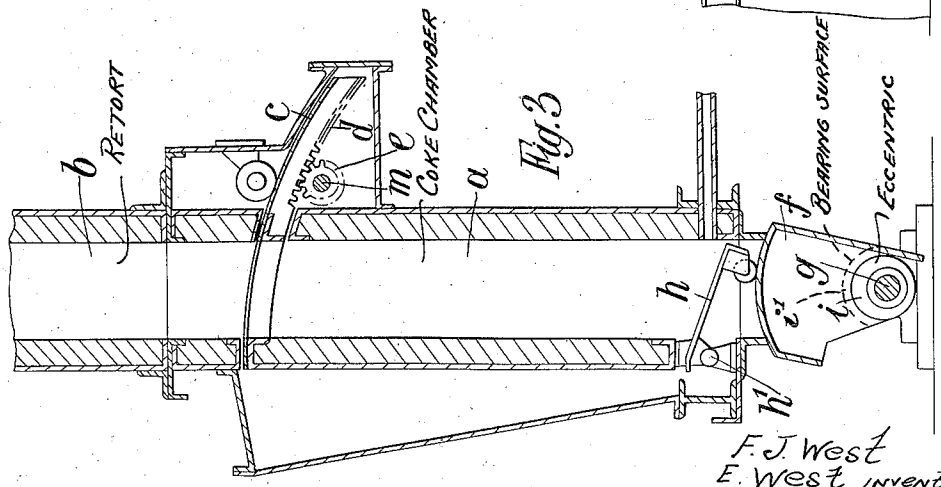


Fig. 3



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UNITED STATES PATENT OFFICE

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VERTICAL RETORT FOR THE CARBONIZATION OF COAL AND LIKE MATERIALS

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Application February 27, 1936, Serial No. 66,096
In Great Britain March 4, 1935

3 Claims. (Cl. 214—18)

This invention relates to vertical retorts for the carbonization of coal and like materials of the type in which a coke chamber is provided at the base of the retort, with a cut-off plate for isolating the retort from the coke chamber when coke discharge is to take place, and with a coke discharge door which when it has been moved to its closed position can be tightened to make a gas tight joint with the coke chamber and can be loosened to permit of its being readily opened when coke discharge is to take place. A retort of the said type is described in our prior United States Patent No. 2,072,392.

The object of our present invention is to provide means for preventing the opening of the discharge door upon the coke chamber until the latter has been isolated from the retort proper.

Our invention comprises the operative interconnection of the means by which the coke chamber is isolated from the retort proper, with the means by which the discharge door is tightened upon its jointing face so that the said door is automatically tightened when the cut-off or isolating plate is in its out-of-service position and loosened or released when the said plate is in its service or cut-off position, whereby opening of the discharge door is prevented until the charge in the coke chamber is cut-off from the retort proper.

Referring to the two accompanying sheets of explanatory drawings:—

Figure 1 is a side elevation and Figure 2 a front elevation of part of a retort setting having our invention applied thereto in one convenient form.

Figure 3 is a sectional view of the coke chamber at the base of the retort showing the parts to which our invention is applied.

In Figure 3, *a* indicates the coke chamber which is continuation of the retort *b* from which the coke chamber is adapted to be cut-off by the valve or plate *c*, having rack teeth *d* thereon engaged by a pinion *e* for the purpose of moving the cut-off plate into position to isolate the retort from the coke chamber or as shown to allow coke to descend from the retort to the coke chamber ready for discharge. At the base of the coke chamber *a* is a discharge door *f* which can be turned about its axis in the shaft *g* to open the lower end of the coke chamber for coke discharge purposes. A plate *h* fulcrumed at h^1 which rides upon the coke discharge door serves to direct the coke to the right in the figure as it is being discharged. The plate *h* also protects the door against wear by the coke and against excessive heating.

The parts so far referred to will be found fully described in the prior specification before referred to.

The discharge door *f* has a cylindrical bearing surface i^1 which turns about eccentrics *i* secured upon the shaft *g*. Each door is operated by a worm *j* gearing with the teeth of a sector *k* secured to the door.

The pinions *e* which operate the several cut-off plates *c* in the retorts at each side of a retort setting are upon a common shaft *m* which has thereon a worm wheel *n* turned by a worm *o* upon a shaft *p*. Upon the said shaft is also a rack pinion *q* with which engages a rack *r* held in engagement with the pinion by a roller *s* which permits the rack to roll about its pinion as the rack moves up and down. The lower end of the rack carrying member s^1 is pivoted to an arm *t* secured to the shaft *g* carrying the eccentrics *i*. The arrangement is such that when the shaft *m* is turned by the worm *o* and worm wheel *n* to place the cut-off plates in service when they isolate the coke chambers *a* from the retorts *b*, the rack *r* and member s^1 cause the turning of the arm *t*, shaft *g* and eccentrics *i* so that the discharge door *f* is slightly lowered from engagement with the base of the coke chamber and can then be turned by the worm *j* and sector *k* to open it.

It will be seen therefore that the operation of putting a cut-off plate into its service or cut-off position loosens the discharge door with respect to the jointing face at the base of the coke chamber, so that the door can be readily opened, but until the cut-off plate is in its service or cut-off position, the discharge door is held firmly against the lower edges of the coke chamber and therefore cannot be opened. In like manner, when the door *f* has been closed, the operation of the worm *o* will put the cut-off plates into their out-of-service positions and simultaneously by turning the eccentrics *i*, lock the doors in place by pressing them firmly against the base of the coke chamber.

Our improvement prevents the doors *f* being opened until the cut-off plates *c* are in action across the tops of the coke chambers and thereby prevents a discharge of a retort directly through the coke chamber.

The connections between the cut-off plates and eccentrics can be adjusted by the right and left hand screwed members *u*.

What we claim is:—

1. Coke discharge mechanism for a vertical retort comprising a coke chamber at the base of

the retort, a cut-off plate at the top of said coke chamber for isolating the coke chamber from the retort, means to move said cut-off plate into and out of its service position, a coke discharge door at the base of said coke chamber, eccentric means about which said coke discharge door is rotated, means to turn said eccentric to raise or lower said coke discharge door, and an operative interconnection between said cut-off plate actuating means and the said means to turn said eccentric, so as to turn the said eccentric in a circular direction to raise the said coke discharge door when the said cut-off plate is in its out-of-service position.

2. Coke discharge mechanism as claimed in claim 1 wherein the operative interconnection specified comprises an arm rotatable with the eccentric, a racked member pivoted to said arm and a rack pinion in mesh with the said racked member and in driving relation with the means to move the cut-off plate specified.

3. Coke discharge mechanism for a vertical retort comprising a coke chamber at the base of the retort, a cut-off plate between said retort and said chamber, means to move said cut-off plate into and out of service position, a coke discharge door in said coke chamber, a seating on said chamber for said door when closed, means to operate said door, means to urge said door securely against the said seating when said door is moved into its non-discharge position, and means interconnecting said door tightening means with said cut-off plate moving means to tighten said door against said seating when said cut-off plate is moved from its service position.

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