F. L. MILLER.

RETORT DOOR SECURING MECHANISM.

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1,144,152.

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FIG.1.

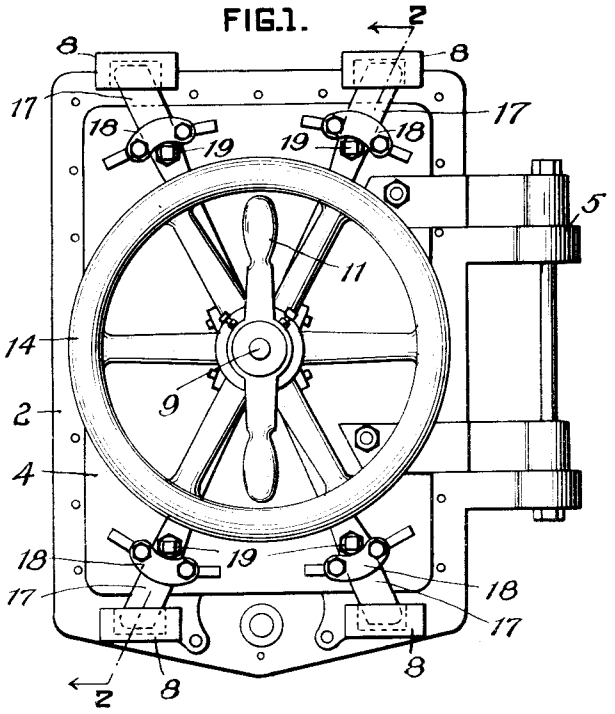


FIG.2.

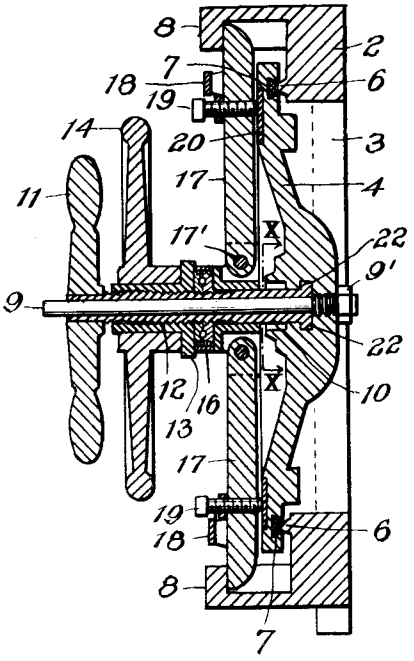


FIG.4.

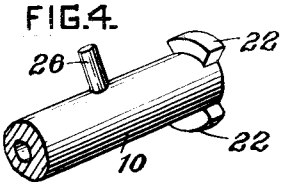


FIG.3.

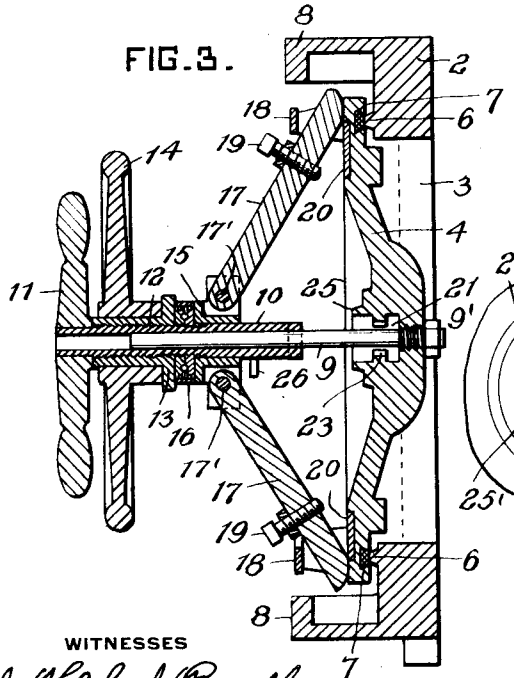


FIG.5.

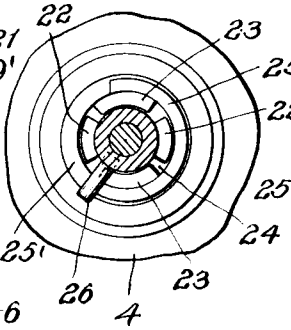
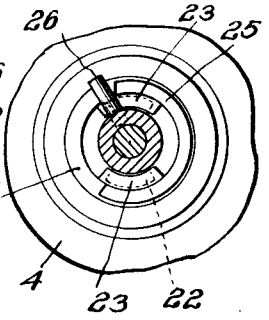


FIG.6.



WITNESSES

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UNITED STATES PATENT OFFICE.

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RETORT-DOOR-SECURING MECHANISM.

1,144,152. Specification of Letters Patent. Patented June 22, 1915.

Application filed June 29, 1914. Serial No. 847,990.

To all whom it may concern:

Be it known that I, FRANK L. MILLER, a citizen of the United States, and resident of Parkersburg, in the county of Wood and State of West Virginia, have invented certain new and useful Improvements in Retort-Door-Securing Mechanism, of which the following is a specification.

The object of this invention is to provide simple and efficient mechanism for securing retort doors in closed position, the mechanism being arranged to exert pressure on the closed door in such manner as to seal the joint between the door and door frame against the passage of steam or other fluid that may be maintained under more or less pressure within the retort. The locking mechanism is mounted on the door and its operating means provides a convenient handle for opening and closing the door.

In the accompanying drawings, Figure 1 is a front elevation of a retort door and door frame having the improved mechanism applied thereto. Fig. 2 is a sectional elevation on the diagonal line 2—2 of Fig. 1 with the door closed and locked. Fig. 3 is a view similar to Fig. 2 with the door closed but with the locking mechanism released. Fig. 4 is a detail view of a portion of the movable sleeve which detachably engages the door. Figs. 5 and 6 are sectional views taken on line X—X of Fig. 2, Fig. 5 showing the sleeve of Fig. 4 in interlocking engagement with the door, and Fig. 6 illustrating the same in position to be detached therefrom.

Referring to the drawings, 2 designates the door frame for opening 3 of a retort or other structure, the retort not being shown, and 4 is a door therefor which may be hinged at 5 or mounted in any other suitable manner for opening and closing. A bead 6 surrounding the door opening projects from the front face of frame 2, and adapted to bear against the bead is the soft metal 7 which is inset in the inner face of the door for sealing the joint between the frame and door under the pressure exerted on the door when the door is locked, as hereinafter described. The door frame is provided with suitable devices for receiving the locking bolts or arms, in the present adaptation these devices being embodied in the integral keeper-forming lugs 8, as here shown two such lugs being arranged at the top of the door opening and two at the bottom.

Projecting outwardly from the center of door 4 is a bar 9 which may have its extremity secured to the door by nut 9′. Slidable and rotatable on bar 9 is sleeve 10 having a handle 11 secured to its outer end. The outer portion of the sleeve is threaded externally at 12 to receive the threaded nut 13, and secured to the latter is the hand wheel 14. Slidable on the unthreaded inner portion of sleeve 10 is head 15, with a thrust bearing 16 interposed between the head and nut.

17 are locking arms or bolts which are pivoted at their inner ends at 17′ to head 15. The bolts extend outwardly beneath guides or keepers 18 which are so located on the door as to direct the arms into keepers 8. A fulcrum screw 19 is adjustable through each bolt or arm and is adapted to engage a bearing surface 20 on the face of the door.

Bar 9 extends through a depression 21 formed in the front face of the door, and sleeve 10 is adapted to be entered in this depression when the mechanism is in locking position, as shown in Fig. 2. The sleeve extremity is formed with the opposite laterally extending lugs 22 which are adapted to turn behind similar lugs 23 projecting into depression 21, thereby interlocking the sleeve with the door, for this manipulation the sleeve being turned by handle 11. When entering or withdrawing the sleeve it is turned as in Fig. 5, thereby placing the sleeve lugs 22 in register with spaces 24 which separate lugs 23. The lip or flange 25 surrounding the open end of depression 21 may be cut away at 25′ to receive stop pin 26 projecting from sleeve 10, the pin being adapted to engage one extremity of the interrupted rim to indicate the released or non-interlocking position of the sleeve, and the opposite extremity of the arm to define its fully engaged or interlocked position.

When the door is unlocked the mechanism is in the position shown in Fig. 3, and wheel 14 serves as a convenient handle for swinging the door. With the door closed the first operation is to move sleeve 10 inwardly on bar 9 by means of handle 11, and after the sleeve has been entered in depression 21 it is turned from the position shown in Fig. 5 to that of Fig. 6, thereby interlocking lugs 22 and 23. The same movement projects the outer extremities of bolts or arms 17 into keepers 8, and with sleeve 10, secured to the door head 15 is forced inward by nut 13

through the rotation of hand wheel 14, thereby exerting sufficient inward pressure on the door to press the metal 7 into sealing engagement with the lip or bead 6. In this bolt setting operation screws 19 serve as fulcrums, the screws bearing inwardly against bearing surfaces 20 and the extremities of the bolts bearing outwardly on the ends of keepers 8 as will be understood. The fulcrum screws are adjustable as may be desired for varying the lever movement of the arms or bolts necessary to secure the door. For unlocking the door the stress of the bolts or arms 17 may be relaxed by retracting nut 13, and then by turning sleeve 10 to the releasing or disengaging position shown in Fig. 5, the sleeve may be withdrawn as in Fig. 3, carrying with it head 15 and the adjusting nut and hand wheel and retracting the bolt extremities from keepers 8.

While the invention is designed primarily for securing and sealing the door of a steam retort, for instance a retort for steaming wood preparatory to bending, it is adapted for any use wherein a door is not only to be secured in closed position but also held under such pressure as to maintain a sealed joint.

I claim:—

1. The combination of a door frame provided with keepers, a door, a support projecting from the door, a sleeve slidable on the support and adapted to be secured to the door, a head adjustable on the sleeve toward and from the door, and arms movably secured to the head and adapted to be projected thereby into the keepers.

2. The combination of a door frame provided with keepers, a door, a support projecting from the door, a sleeve slidable on the support toward and from the door, means for detachably securing the inner end of the sleeve to the door, a head adjustable on the sleeve toward and from the door, and arms movably secured to the head and adapted to be projected thereby into the keepers.

3. The combination of a door frame provided with keepers, a door, a support projecting from the door, a sleeve rotatable on the support and movable thereon toward and from the door, means providing an interlocking connection between the sleeve and door with said connection adapted to be made and broken by rotating the sleeve, a head adjustable on the sleeve toward and from the door, and arms movably secured to the head and adapted to be projected thereby into the keepers.

4. The combination of a door frame provided with keepers, a door having a shouldered cavity in its outer face, a support projecting outwardly from the door, a headed device slidable and rotatable on the support with said device shaped to interlock with the cavity shoulders when the device is rotated, a head adjustable on said device toward and from the door, a hand wheel having threaded engagement with said device for moving said head, and arms movably secured to the head and adapted to be projected thereby into the keepers.

5. The combination of a door frame provided with keepers, a door having a depression in its outer face and with separated shoulders projecting into the depression, a support projecting from the door depression, a sleeve slidable and rotatable on the support with shoulders at the inner end of the sleeve adapted to interlock with the cavity shoulders, a head movable on the sleeve toward and from the door, head moving means, and arms pivoted to the head and adapted to be projected thereby into the keepers.

6. The combination of a door frame provided with keepers, a door, a support projecting from the door, a sleeve slidable on the support toward and from the door, means for detachably securing the sleeve to the door, an externally threaded sleeve slidable on the support, a hand wheel adjustable on the threaded sleeve, a head movably mounted on the sleeve and adapted to be actuated by the hand wheel, and arms pivotally secured to the head and adapted to enter the keepers.

7. The combination of a door frame provided with keepers, a door, a support projecting from the door, a rotatable sleeve movable on the support toward and from the door, a handle for rotating the sleeve, means made effective by rotating the sleeve for detachably securing the latter to the door, a head movable on the sleeve toward and from the door, head moving means, and arms pivoted to the head and adapted to be projected thereby into the keepers.

8. The combination of a door frame provided with keepers, a door, a support projecting from the door, a head movable on the support toward and from the door, head moving means, arms movably secured to the head and adapted to be projected thereby into the keepers, guides on the door through which the arms are projected into engagement with the keepers, and adjustable door-engaging fulcrums mounted on the arms.

In testimony whereof, I affix my signature in presence of two witnesses.

FRANK L. MILLER.

Witnesses:
E. P. CRITES,
J. T. CALLANAN.