J. REID.

CLOSURE CLAMP.

APPLICATION FILED APR. 30, 1919.

1,320,175.

Patented Oct. 28, 1919.

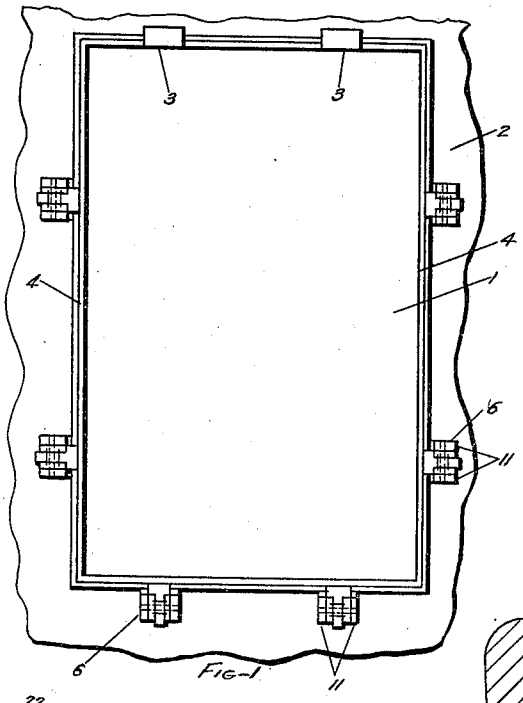


FIG. 1

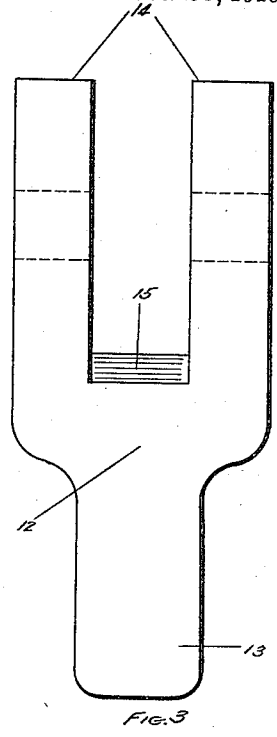


FIG. 3

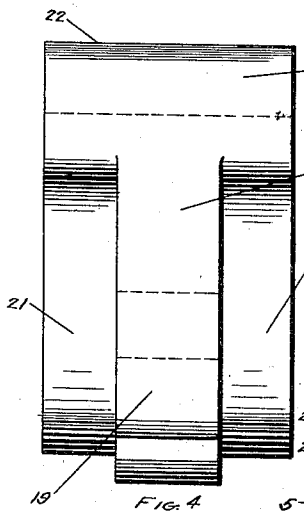


FIG. 4

FIG. 2

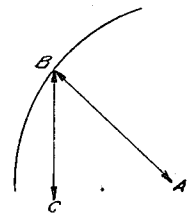


FIG. 5

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UNITED STATES PATENT OFFICE.

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CLOSURE-CLAMP.

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Application filed April 30, 1919. Serial No. 293,891.

To all whom it may concern:

Be it known that I, JOHN REID, a subject of the King of Great Britain, and residing at 30 Church street, in the city of New York, in the State of New York, in the United States of America, have invented a new and useful Closure-Clamp, of which the following is the specification.

The invention relates to closure clamps, as described in the present specification and illustrated in the accompanying drawings that form part of the same.

The invention consists essentially of the novel means employed, whereby the door is engaged with a force that insures it a firm seat on the frame continuously until the pressure is released.

The objects of the invention are to maintain a door closely to its seat, particularly in furnace doors of comparatively light weight, that are apt to be affected by the varying temperatures incidental to furnace structures, such as the smoke box doors leading to the boiler tubes; to minimize the exertion required to close in the door to its seat and in doing so exert a maximum pressure on the door; to facilitate the operations of the fireman and at the same time increase the heating efficiency of the furnace; to coordinate with my numerous improvements in furnace fronts tending toward furnishing standard articles in furnace equipment; and generally to provide a safe and tight fastening for doors of furnaces, vaults, packages or other receptacles or chambers.

In the drawings, Figure 1 is a plan view of a door and wall, the latter broken away, showing the clamping fasteners in engagement with the door.

Fig. 2 is an enlarged sectional view, showing the clamp, the operating lever and the door flange.

Fig. 3 is an enlarged detail of the lever.

Fig. 4 is an enlarged detail of the clamp.

Fig. 5 is a diagrammatic view, showing by indicating arrows and arc the fulcrum of the leverage and the direction of the resulting pressure.

Like numerals of reference indicate corresponding parts in each figure.

Referring to the drawings, the door 1 is shown as permanently secured to the furnace wall 2 by the hinges 3. The angle bars 4 are mounted on three sides of the door 1 at the edges thereof, so that the section 5 of each bar projects outwardly and is flush with each edge face of the sides.

The brackets 6 are rigidly secured to the furnace wall 2 adjacent to the door opening closed by the door 1 and are made with a base 7 forming a bed 8 having toward the far end from the door the rise 9 approached by the curve 10, said bed being between the lugs 11.

The lugs 11 form the pivot bearings for the lever 12, which is formed with the handle 13 spreading into the spaced arms 14 and forming therebetween the inclined operating surface 15, being the web separating the two arms 14. The lever 12 is pivotally held in the lugs 11 by the pin 16 and straddles the clamp 17, which is also mounted on the pin 16 but is formed with an oval pin slot 18, and rotated by the eccentrically mounted arms 14.

The clamp 17 is formed with a central body 19, through which said pin slot 18 is made, and which merges into the clamping section 20. The clamping section 20 extends outwardly at each side from the lower portion of the body 19 in the tapering and arc-shaped spreaders 21 to the full extent of the width of the bed 8. The spreaders 21 at their upper end terminate in the clamp head 22, which reaches out beyond both spreaders 21 and body 19 to form the angle bar engaging surface 23. On the opposite side of the body 19 from the head 22, a lug 24 projects for clearing the clamp from the door and this is done by swinging the handle 13, which engages the lug 24 and lifts the clamping section 20 from the door flange.

In this invention, it will be seen by reference to Fig. 5, that its operation is based on the leverage principle and in this figure the letter A denotes the point of fulcrum, A—B the lever, and B—C the direction of the force employed, and in referring to the actual parts in describing the operation, the relationship between them and the diagrammatic illustration will be readily understood.

The head of the clamp is brought into engagement with the angle bar of the door by throwing over the lever toward the door. By doing so the web of the crotch engages the body of the clamp, and this brings the spreaders 21 at their narrowing ends into contact with the rise of the bed formed in

the base and from that point the clamp swings as a lever with the lever handle, for in bringing said clamp around the oval pin slot has also been turned, consequently the wall of the slot in turning acts against the pin though the swing is from the fulcrum point represented by the rise in the base bed.

The result of this movement is the engagement of the clamp head with the angle bar on the door and the consequent squeezing in of the door to its seat.

This construction is particularly applicable to furnaces, because of the customary rough usage in handling, but it may be applied in many different forms of doors or closures and as to its parts, they may be changed without departing from the spirit of the invention, and so long as such changes are within the scope of the claims for novelty following, the protection accorded shall not be invalidated.

What I claim is:—

1. In a closure clamp, a rotatable clamp engaging the closure, a bracket forming a bearing member for said clamp and having a rising surface engaging said clamp in rotation, and a lever journaled in said bearing member and fulcrumed through said clamp on said rising surface.

2. In a closure clamp, a bracket having pivot bearing lugs and a clamp bed therebetween, a lever pivotally secured between said lugs, and a clamp operatively engaged by said lever and having a substantially oval pivot slot and surfaces engaging said clamp bed and said closure respectively.

3. In a closure clamp, a bracket having pivot bearing lugs, a lever having spaced arms extending from a handle, a pivot pin pivoting said lever, and a clamp having an oval pivot slot and mounted on said pin between said arms and terminating at one side in a head engaging the closure and at the other side in a formed surface adapted to fulcrum on the bed of the base between said lugs.

4. In a closure clamp, a bracket having twin lugs and a bed therebetween, said bed having a rising surface toward one end, a lever having arms extending from a handle and an inclined clamp engaging surface between said arms, a pin pivoting said arms in said bracket, a clamp having a central body portion and an oval pin slot therethrough, a clamping section formed by outspreading tapering curved sides terminating at the upper end in a contact head and at the lower end in the surface engaging the aforesaid rising surface and a lug at the outer side of the head engaged by said lever in disengaging said head and an angle piece rigid with the closure and engaged by said contact head.

Signed at the city of New York this 16th day of April 1919.

JOHN REID.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."