Feb. 17, 1942. J. H. BOWERS 2,273,690

DOOR

Filed April 20, 1939 2 Sheets-Sheet 1

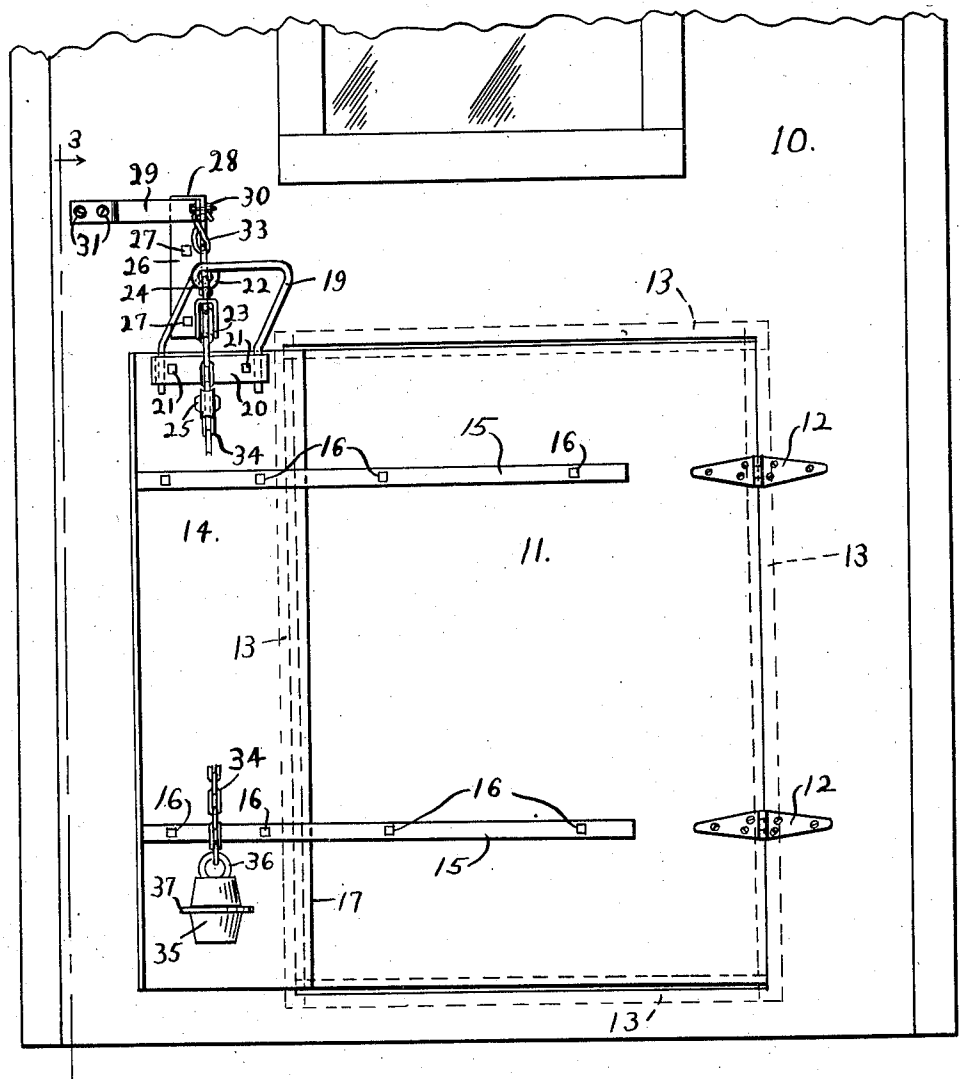


Fig. 1.

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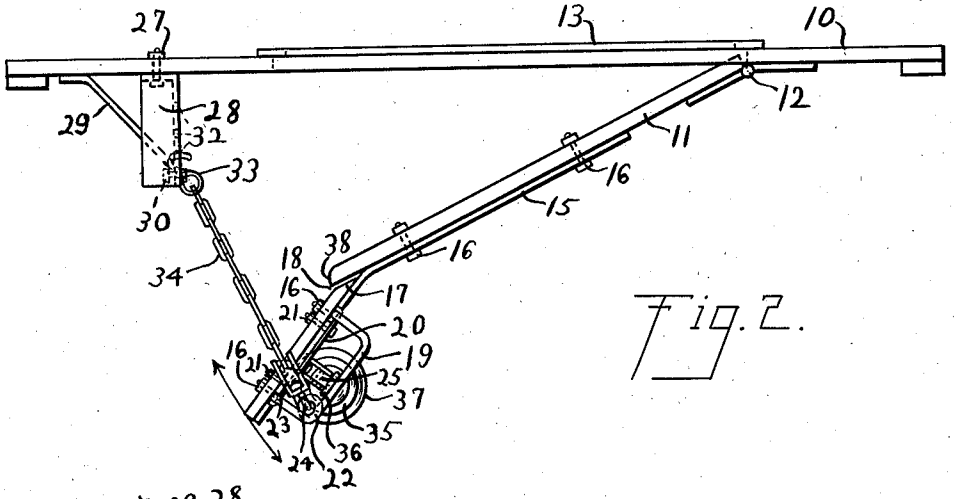
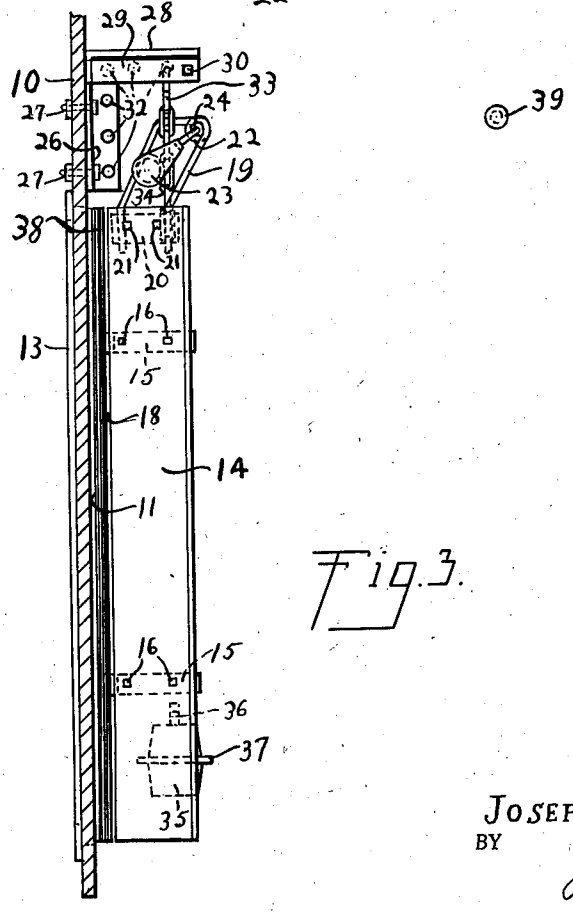


Fig. 2.



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Fig. 3.

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2,273,690

DOOR

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Application April 20, 1939, Serial No. 268,932

5 Claims. (Cl. 20—16)

This invention relates generally to doors and particularly to doors for hog houses and the like.

In the raising of hogs it is very necessary that the animals be permitted to get outside as much as possible. The pens will thereby be cleaner and will require little cleaning and the animals will get the exercise they need to keep healthy. This applies to little pigs as well as adult animals.

It is further necessary that the hog house itself be kept relatively free from drafts, particularly during damp and chilly weather. A cold draft through the house may result in sickness and death of the animals, particularly small pigs.

It is therefore an important object of my invention to provide a hinged, horizontally swinging door which the animals themselves may operate whereby they may open the door from either side at will.

Another object of the invention is to provide a device of this character that will normally return to the closed position to prevent drafts from sweeping through the hog house from the door opening.

It is another object of the invention to provide a device of this character that has a tension adjustment for the means for yieldingly retaining the door in the normally closed position.

It is still another object of the invention to provide a device of this character so constructed that even relatively strong winds will not force open the door.

A further object of the invention is to provide a device of this character wherein the tension of the door closing means may be adjusted to be very slight for the first few inches of the opening swing of the door and said tension being relatively stronger for the remaining portion of the operating range of the door swing.

A still further object of the invention is to provide a device of this character wherein the opening and closing of the door may be effected easily and smoothly.

Still another object of the invention is to provide a device of this character that is simple in construction, installation and operation, and that is relatively inexpensive to manufacture and install.

Numerous other objects and advantages of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a front elevation of a door embodying my invention, said door being in the closed position.

Figure 2 is a plan view of same showing the door partly open, the chain being shown only to the upper pulley.

Figure 3 is a vertical section taken on line 3—3 of Figure 1 showing an end view of the door slightly open. The stabilizing pulley and a portion of the chain behind the wing are not shown.

Referring more particularly to the drawings reference numeral 10 indicates the side wall of a building having a door opening with a door 11 therefore, said door 11 being hinged at 12 and adapted to swing outwardly horizontally as shown in Figure 2, there being a door stop strip 13 about the door opening against which the door rests when closed.

Along the vertical free edge of the door 11 is a wing 14 substantially the full height of said door, said wing being secured to the door by iron straps 15 suitably bolted to the door and wing respectively by bolts 16. The wing 14 extends beyond the free vertical edge of the door and at an outward angle with respect thereto as shown particularly in Figures 2 and 3. The wing 14 does not abut against the outer surface of the door along the secured vertical side edge portion 17 but is spaced slightly therefrom to provide a vertical slot 18 therebetween to relieve the pressure of wind blowing behind the wing between same and the side wall 10 of the building. It would therefore require a very strong wind to create enough pressure behind the wing to force open the door against the means hereinafter described for yieldingly retaining the door in the normal closed position.

The door closing means comprises a frame 19 of heavy wire in the general form of an inverted U, the depending free ends of which are clamped to the upper horizontal edge portion of the wing 14, intermediate the ends thereof, by a clamp member 20 secured to the wing by bolts 21. The frame 19 extends upwardly of the top edge of the wing and is inclined outwardly thereof relative to the plane of the front side of said wing. Adjacent the upper forward portion of the frame, relative to the pivotal axis of the door, a loop 22 is formed and a pulley 23 is secured to said loop by means of an eye member 24 which permits free operative movement of the pulley 23 as will hereinafter be described.

Below the clamp member 20, in operative

alignment with the pulley 23, is a stabilizing pulley 25 fixed by suitable means to the wing 14, such means may be a screw fixed to the pulley sheath or block. Adjacent the frame 19, when the door is closed, is a chain bracket, said bracket being in the shape of an angle iron in cross-section and having a vertical portion 26 secured to the building 10 by means of bolts 27, and a horizontal portion 28 extending outwardly relative to the wall of the building to which portion 26 is secured. A brace 29, to give lateral strength to the bracket, is provided and has one end secured to the horizontal portion 28, adjacent the free end thereof, by a bolt 30 and the other end secured to the adjacent wall of the building by screws 31. Both vertical and horizontal portions of the bracket are provided with longitudinally spaced holes 32 in the free flange or side of the vertical portion 26 and the vertical depending flange or side of the horizontal portion 28 respectively. The holes 32 are adapted to receive hook 33 of chain 34, said chain being passed over the grooved wheel of pulley 23 and on the side of the wheel of pulley 25 adjacent the outer side of wing 14. Chain 34 depends along the outer side of the wing 14 and is provided with a weight 35 at its lower end, said weight providing the tension for yieldingly closing the door 11 by gravitational pull. The weight preferably comprises an upper and lower member on an eye-bolt 36 (the chain being secured to the eye of said bolt 36) with a washer 37 of fiber, leather or rubber or the like fixed between the upper and lower weight members, said washer 37 being of greater diameter than the largest diameter of the weight members. It should be noted that the weight members preferably are slightly frusto-conical in shape with the ends of greatest diameter adjacent each other. This arrangement tends to eliminate the upper and lower ends of the weight from catching on the straps 15 or other adjacent parts as the weight rises or descends upon opening and closing of the door. The washer 37 reduces the impact and attendant noise of the weight against the wing or door should the weight swing outwardly thereof and then swing back against said door.

In operation a hog may readily open the door from the inside of the building by pushing against same. After the animal has passed through, the door normally is returned to the closed position by the pull of the weight. When the hog desires to enter the building it inserts its snout and head between the wall of the building and the wing 14 and pushes, thereby opening the door and permitting the animal to enter easily, the door again closing behind it. It will therefore be readily apparent that except when an animal is passing through the door same is retained in the closed position thereby preventing drafts through the building from the door opening.

By extending the wing 14 from the bottom to the top of the door animals of various heights may readily operate same. However, with young pigs, particularly very young animals, they have relatively less strength to operate the door than larger animals. It is therefore important that the door will open easily, especially throughout the first five or six inches of its opening swing while the pigs are small. This is effected by fixing the hook 33 in the hole 32 adjacent the outer end of the horizontal portion 28 as shown in Figure 3. With the hook 33 in said hole the door may even be slightly ajar so that practically no resistance is offered to the little pigs as they start through the doorway, and no appreciable resistance is offered by the door throughout the outward swing necessary for such small pigs to pass through. As the animals grow and increase in size the normal resistance of the door becomes less important even though the swing thereof is necessarily greater due to the natural broadening of the animals.

As the animals grow the hook 33 may be progressively moved to the inner holes 32 of the horizontal portion 28 of the bracket and eventually to the holes 32 of the vertical portion 26 thereof. Each adjustment inwardly of the hook increases the leverage provided by the pull of the weight with the greatest leverage provided by the lowest hole 32 of the vertical portion 26. Primarily the adjustment is made to provide the proper tension for the particular animals using the door.

As above mentioned, pulley 23 is adapted to move in a short arc on the loop 22 of frame 19, the angle of said pulley 23 being substantially the same as that of chain 34 with respect to the position of the eye-piece or member 24 of pulley 23 on loop 22 as the door swings within its limits of movement. The pulley thus accommodates itself automatically with respect to the angular pull of the chain.

Pulley 25 is provided to relieve pulley 23 of undue stress from swinging of the weighted end of the chain and to prevent an animal from swinging said weighted end of the chain over the top edge of the wing and thereby interfere with the action of the mechanism.

It should be noted that the inner corner of the free vertical edge portion of the door is rounded at 38 to prevent injury to an animal passing through the doorway.

A post 39 or the like is driven into the ground in a position to serve as a stop for limiting the outward swing of the door before weight 35 may rise sufficiently to strike pulley 25, thus injury to the mechanism from this source is eliminated. A latch, not shown, may be provided for securing the door in the closed position.

It is thought that the invention and many of its attendant advantages will be understood from the foregoing description and it will be apparent that various changes may be made in the form, construction and arrangement of the parts without departing from the spirit and scope of the invention or sacrificing all of its material advantages, the form hereinbefore described being merely a preferred embodiment thereof.

Having thus described my invention what I claim is:

1. A door operably hinged in a wall of a building, said door being adapted to swing horizontally in one direction, a vertical horizontally angular wing extending the height of the door and attached to the door adjacent the free vertical edge thereof, a frame secured to the wing adjacent the upper end thereof, a pulley swingably attached to the frame, a bracket, said bracket having a vertical portion attached to the building wall and a horizontal portion extending outwardly of the building wall over the frame when the door is closed, said vertical and horizontal portions of the bracket having a plurality of longitudinally spaced holes therein relative to the respective vertical and horizontal portions, said holes being in substantial alignment with

the pulley, a chain, means for detachably securing one end of the chain in respective holes for adjustment purposes, said chain being passed over the pulley wheel and depending therefrom adjacent the outer side of the wing, and a weight secured to the depending end of the chain, said weight being in upwardly spaced relation to the bottom of the door.

2. A structure as set forth in claim 1 and including a stabilizing pulley secured to the wing beneath the first mentioned pulley in substantial alignment with same, the chain being received on the stabilizing pulley wheel on the side adjacent the wing.

3. A door operably hinged in a wall of a building, said door being adapted to swing horizontally, an angular vertical wing attached to the door adjacent the free vertical edge thereof, a bracket, said bracket having a vertical portion attached to the building wall and a horizontal portion extending outwardly of the wall over the wing when the door is closed, said vertical and horizontal portions of the bracket having a plurality of longitudinally spaced holes therein relative to the respective portions, a chain, means for detachably securing one end of the chain in respective holes, a pulley on the outer side of the wing substantially beneath the horizontal portion of the bracket when the door is closed, said chain being operably received on the wheel of the pulley and depending therefrom, and a weight on the depending end of the chain, said weight being in upwardly spaced relation to the ground beneath same when the door is closed.

4. A door operably hinged in a wall of a building, said door being adapted to swing horizontally in one direction, a vertical wing attached to the door adjacent the free vertical edge thereof, said wing extending forwardly, relative to the hinged edge of the door and at an outward angle relative to the plane of the outer surface of the door, a bracket, said bracket having a vertical portion attached to the building wall and a horizontal portion extending outwardly of the wall over the wing when the door is closed, said vertical and horizontal portions having a plurality of longitudinally spaced holes therein relative to the length of said portions, a chain, means for detachably securing one end of the chain in respective holes for adjustment thereof, a pulley on the outer side of the wing substantially beneath the horizontal portion of the bracket when the door is closed, said chain being operably received on the wheel of the pulley and depending therefrom, and a depending weight on the depending end of the chain.

5. In a device of the class described, a door hinged in a support and adapted to swing horizontally, an angular wing attached adjacent the free vertical edge thereof, and door closing means comprising a bracket extending in the direction of door opening movement, a weight, a flexible, weight supporting member, means for attaching one end of the flexible member in various positions along the bracket, and means for operably connecting the flexible member to the door, said weight supporting member, when attached to the bracket outwardly of the support therefor, depending substantially vertically throughout its length and exerting substantially no closing force on the door when the latter is in the closed position.

JOSEPH H. BOWERS.