H. R. STRAIGHT.

SHEET METAL DOOR FRAME.

APPLICATION FILED JUNE 10, 1914.

1,231,091. Patented June 26, 1917.

Fig. 2.

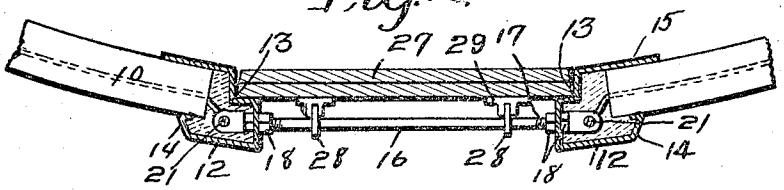


Fig. 3.

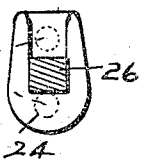


Fig. 1.

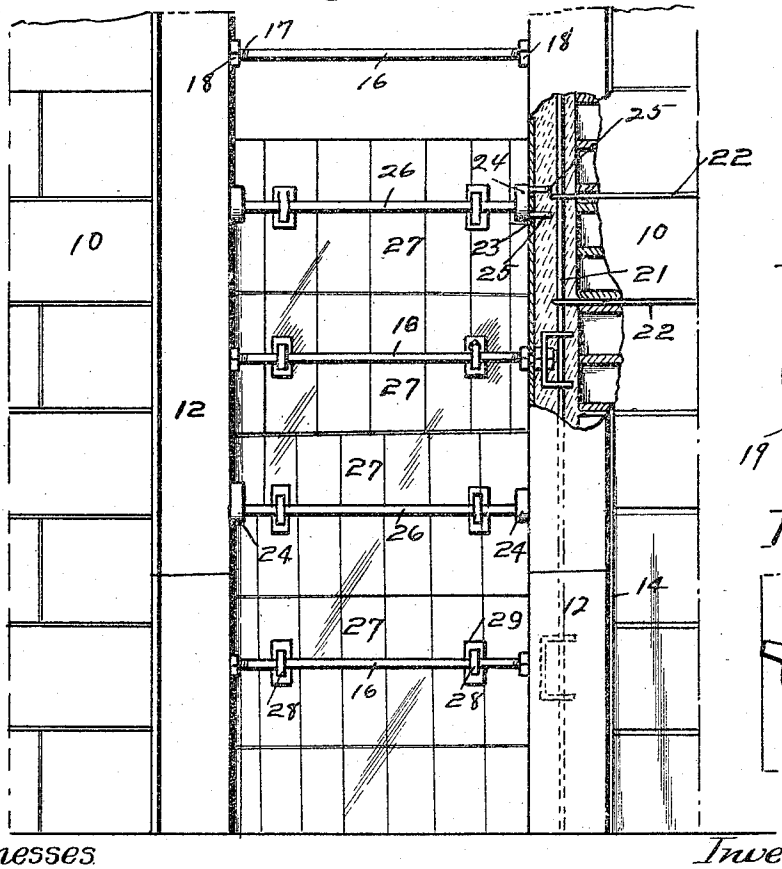


Fig. 4.

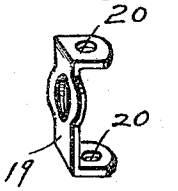
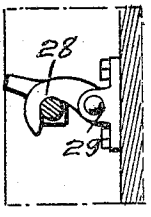


Fig. 5.



Witnesses

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UNITED STATES PATENT OFFICE.

HALVER R. STRAIGHT, OF ADEL, IOWA.

SHEET-METAL DOOR-FRAME.

1,231,091. Specification of Letters Patent. Patented June 26, 1917.

Application filed June 10, 1914. Serial No. 844,374.

To all whom it may concern:

Be it known that I, HALVER R. STRAIGHT, a citizen of the United States, residing at Adel, in the county of Dallas and State of Iowa, have invented a certain new and useful Sheet-Metal Door-Frame, of which the following is a specification.

The object of my invention is to provide a silo door frame of simple, durable and inexpensive construction especially designed to be used in connection with a silo constructed of hollow blocks or cement adapted to fit walls of different thicknesses.

A further object is to provide an improved door frame adapted to be applied to the inner edges of a silo door opening in such a manner that a space may be formed between the frame and the edges of the wall to receive a plastic material for uniting the frame and the edges of the wall together.

A further object is to provide a metal door frame to be used in silos having continuous door openings in connection with new and improved means for securing the doors in position, the said means also being designed to form a ladder to be used in connection therewith.

A further object is to provide a metal door frame for silos having new and improved means for securing the reinforcing rods of the walls thereto.

My invention consists in certain details, in the construction, arrangement and combination of the various parts of the device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 shows a front elevation of a portion of a silo wall with my improved silo door frame in position, a part of the door frame being broken away to show the interior construction thereof.

Fig. 2 shows a plan, sectional view of the same.

Fig. 3 shows a detail view of one of the detachable rod supporting devices with the rod in cross section.

Fig. 4 shows a detail, perspective view of one of the devices for securing the reinforcements to the frame, and

Fig. 5 shows a detail, end elevation of one of the hook devices for securing the doors in position.

Referring to the accompanying drawings, the numeral 10 indicates a silo wall composed of hollow building blocks, and 11 the door opening therein. The frame is composed of sheet metal upright members 12 formed substantially U-shaped in cross section and arranged with their open sides extending outwardly. The inner side is provided at one corner with a longitudinal notched portion 13 designed to form a door jamb.

The outer flange of the upright members is turned inwardly at 14 and the other flange 15 is arranged substantially in line with the inner face of the wall 10. The flanges 14 and 15 are formed of flexible metal so that the space between their outer edges may be varied to fit walls of different thicknesses. When the upright members 12 are applied to the edges of a door opening they are so placed that a space will be provided between their inner faces and the edges of the wall. This space is for the purpose of receiving cement or the like, as the wall is built up.

For securing the upright members 12 in proper alinement with each other, I have provided transverse rods 16, the ends of which extend through the inner faces of the upright members 12 and are provided with screw threaded portions 17. The screw threaded portions 17 are designed to receive lock nuts 18 to engage each side of the central portion of the upright 12. Adjacent to the outer ones of the nuts 18 is a U-shaped bar 19 having openings 20 in their flange members. These openings are designed to lie in a perpendicular line and are for the purpose of receiving upright reinforcing rods 21. These upright rods 21 are supported in the central portions of the upright members 12, in the space provided therein.

Horizontal anchor rods 22 have their ends securely fastened to the upright reinforcing rods 21. These reinforcing rods 21 extend continuously from the bottom to the top of the door frame.

By this construction it will be seen that the ends of the anchor rods 22 will have a rigid support in the upright reinforcements 21 and the transverse rods 16. It will furthermore be seen that by having a continuous upright reinforcement rod, as illustrated, the ends of the anchors 22 may be secured at any point thereon regardless of the distance between said anchor rods.

Between each one of the fixed transverse rods, I have provided a pair of openings 23

in the inner member of the upright 12. The rods 16 are spaced far enough apart so that material from within the silo may be readily thrown between them a distance of about two feet in actual practice.

I have provided a number of U-shaped blocks 24 with one side closed. This closed side is provided with laterally extending pins 25. These pins 25 are designed to enter the opening 23 in the member 12 and are of such a length as to extend inwardly a considerable distance, the blocks on one side being arranged in a horizontal line with those on the opposite side.

I have provided a detachable bar 26 designed to have its ends enter the U-shaped notches in two of said blocks. These bars 26 are spaced midway between the rods 16. Thus it will be seen that the rods 16 and the bars 26 form a ladder by which a man may enter the silo when it is partially filled.

I have provided a number of doors 27 designed to rest against the shoulder 13. There is one door for each of the rods 16 and 26. The doors are held in position by means of hooks 28 pivotally secured to the brackets 29. There are two hook devices for each door. The hook devices are so arranged that the hooks 28 will engage one of the rods 16 or 26 to hold the doors in position against the jambs 13.

When it is desired to remove ensilage from the silo the top door opposite the top one of the bars 26 will be removed and afterward the top bar will be removed. The next door beneath will be removed from the rod 16. This will provide a door opening through which a man may enter the silo to remove the ensilage therefrom. After two of the doors have been removed from the silo, when it is necessary to remove the next door beneath it will be again adjusted in position on the second rod above and so on as the ensilage is removed.

The upright members 12 are constructed in sections and are held in position while being erected by means of a wooden frame erected for that purpose. After the cement has been poured into the space left for that purpose the members will be rigidly secured together.

In the actual construction of this device, two of the uprights 12 are arranged in position parallel to each other and locked in said position by means of the rods 16 and the nuts 18. This forms a rigid frame which is then set on end in the position in which it is to remain when the silo has been built, and is held in that position by means of braces formed for that purpose. After the uprights 12 have been erected, the wall 10 is then started by placing the ends of the blocks within the slots between the members 14 and 15. These slots are somewhat narrower than the width of the blocks and are forced outwardly when the blocks are put in position. This forms a tight joint between the block and the edges of said members 14 and 15.

By making these members of flexible material, it will be seen that walls of different thicknesses may be employed and at the same have tight joints formed between them and the wall. After a portion of the wall has been laid up and the blocks 24 placed in position and the upright reinforcing members secured to the rods 16 the space between the members 12 and the ends of the wall will be filled with cement, thereby forming a solid frame cast integral with the end of the wall.

It will be seen from Fig. 2 that the inner portions of the members 12 are made considerably larger than the ends of the wall 10. This has the advantage of making a frame considerably stronger than if the members 14 and 15 were spaced beyond a distance equal to the thickness of the walls 10.

Thus it will be seen that I have provided a door frame which may be adapted to fit silo walls of different thicknesses and which is easily placed in position; and furthermore forms an anchor for the ends of the horizontal rods 22 whereby said rods are tied together so that they act as a continuous hoop, the strains from the ends of the rods 22 at one side of the door frame being imparted to those at the other side through the rods 16.

The advantages of my device will be readily seen from the foregoing description, and it is my purpose to cover by this application any such changes as may come within the scope of the following claims.

I claim as my invention:

1. In a device of the class described, parallel upright members being hollow and open at one side, transverse rods for securing said upright members in position relative to each other, socket devices secured to each of said uprights between said rods, transverse bars for said sockets detachably connected therewith, and said transverse rods and bars being designed to form a ladder.

2. In a device of the class described, parallel upright members being hollow and open at one side, transverse rods extending through said upright members, means for locking the upright members to said rods, socket devices secured to each of said uprights between said rods, transverse bars for said sockets detachably connected therewith, continuous upright reinforcing rods in the upright members, and means for securing the upright reinforcing rods to the ends of said transverse rods.

3. In a device of the class described, parallel upright members having a series of pairs of openings in their adjacent faces,

transverse rods fixed between said members, means for detachably securing bars parallel with said rods and between the inner faces of said upright members, said means comprising U-shaped blocks having one side closed, parallel pins extending laterally from the closed sides thereof, the said pins being designed to enter the openings in said upright members, and bars having their ends received in said blocks.

4. In a device of the class described, parallel upright members having a series of pairs of openings in their adjacent faces, transverse rods fixed between said members, means for detachably securing bars parallel with said rods and between the inner faces of said upright members, said means comprising U-shaped blocks having one side closed, parallel pins extending laterally from the closed side thereof, the said pins being designed to enter the openings in said upright members, plastic material for holding said pins in position, and bars supported at their ends by said blocks.

5. The combination of a silo wall having a door opening therein, hollow upright members having a longitudinal opening in one side and flexible parallel side members capable of movement to and from each other to receive walls of varying thicknesses between them, the upright members also being provided with shoulders to form a door jamb, the upright members being arranged with their open side extending outwardly, transverse rods extending through the adjacent faces of said upright members, means for locking the upright members to said rods, the rods and hollow upright members being of such length that a space will be left between the adjacent faces of the upright members and the inner edges of the door openings to receive plastic material, continuous upright reinforcing rods in said spaces, and U-shaped devices having means for engaging said upright reinforcing rods, and horizontal bars having their ends supported by said U-shaped devices.

6. The combination of a silo wall having a door opening therein, hollow upright members having a longitudinal opening in one side and flexible parallel side members capable of movement to and from each other to receive walls of varying thicknesses between them, the upright members also being provided with shoulders to form door jambs, the upright members being arranged with their open side extending outwardly, transverse rods extending through the adjacent faces of said upright members, means for locking the upright members to said rods, the rods and hollow members being of such length that a space will be left between the adjacent faces of the upright members and the inner edges of the door openings to receive plastic material, continuous upright reinforcing rods in said spaces, U-shaped devices supported on said uprights, a detachable transverse bar between each of said fixed transverse rods, having its ends supported by said U-shaped devices, a door opposite each of said transverse rods, and means for detachably securing said doors to their adjacent bars or rods and against the jambs of said upright members.

Des Moines, Iowa, May 30, 1914.

HALVER R. STRAIGHT.

Witnesses:

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