

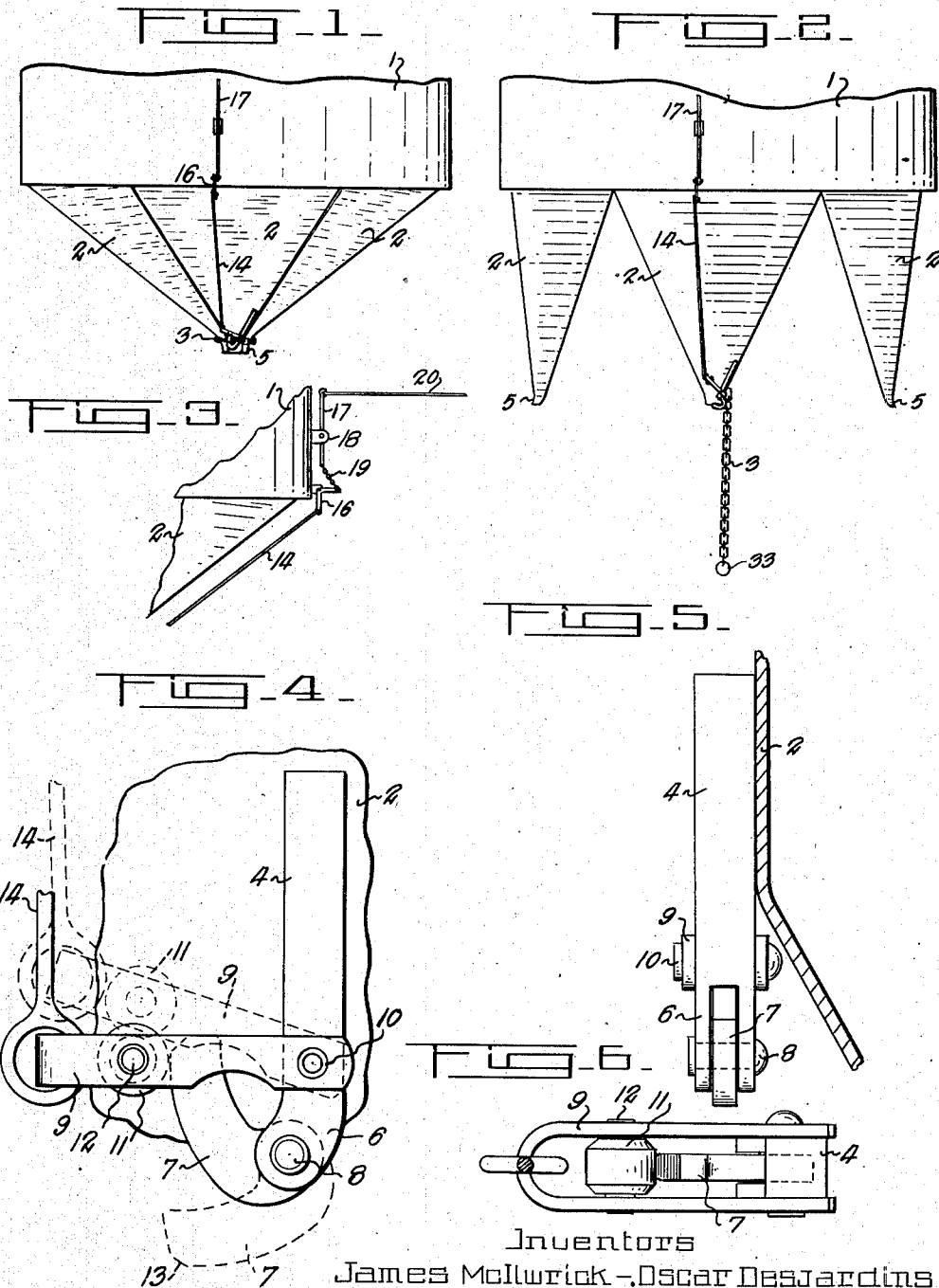
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CHARGING BUCKET FOR ELECTRIC FURNACES AND THE LIKE

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## UNITED STATES PATENT OFFICE

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CHARGING BUCKET FOR ELECTRIC  
FURNACES AND THE LIKEJames McIlwrick and Oscar Desjardins,  
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Our invention relates to a quick-release device for tripping open the bottom of a charging bucket as used in conjunction with electric furnaces and the like, and the object of our invention is to provide a manually operated device which will take the place of rope which is generally used for securing the bottom of the bucket.

The bottom of a standard furnace charging bucket is generally formed of a plurality of triangular members which are hingedly secured to the open bottom of the bucket; these members are adapted to swing inwardly to form an inverted pyramidal bottom for the bucket. A length of rope is passed around the apices of the triangular members to hold them in engagement with each other and when the charging bucket is swung over the furnace the heat from the furnace burns away the rope, consequently releasing the triangular members and thus permitting them to swing downwardly and the charge to drop through the thus opened bottom of the bucket into the furnace.

A particular object of our invention is to provide a quick-release device which will take the place of the rope and thus eliminate the cost of rope replacement and also the time which must necessarily be lost in waiting for the rope to burn off.

A further and particular object of our invention is to provide a length of chain, or any other suitable metal band which will take the place of the rope, and to anchor one end of the chain to a releasable latch which will positively hold the chain in its encircling position but which can be instantly and positively released.

With the foregoing and other objects in view, as shall hereinafter appear, our invention consists of a quick-release device all as hereinafter more particularly described and illustrated in the accompanying drawing in which:

Figure 1 is a side elevational view of the lower portion of a charging bucket showing the inverted pyramidal bottom thereof closed.

Figure 2 is a similar view to Figure 1 showing the bottom of the bucket open.

Figure 3 is an elevational view of a fragmentary portion of the bucket showing the operable connection which extends from the quick-release.

Figure 4 is an enlarged front elevational view of the latch mechanism showing it welded or otherwise attached to a fragmentary portion of one of the triangular members.

Figure 5 is a side elevational view of the assembly shown in Figure 4, and

Figure 6 is a plan view of the mechanism.

Like characters of reference indicate corresponding parts in the different views in the drawing.

Figures 1, 2 and 3 illustrate the general basic construction of the standard charging bucket which consists of a receptacle 1 adapted to receive the pieces of metal with which the furnace is charged. The bottom of the receptacle 1 carries a plurality of downwardly extending hinged triangular plates 2 which are adapted to swing inwardly toward each other to form a bottom of inverted pyramidal shape. In general standard practice a rope is tied around the apices of the triangular plates and when the loaded bucket is swung over the furnace the heat gradually burns the rope away until it parts and permits the plates 2 to swing downwardly and discharge the bucket.

In our device, we use a chain 3 or other suitable type of band which is adapted to encircle the apices of the triangular plates 2 in the same manner as the rope. In our construction one end of the chain 3 is anchored to one of the plates 2. The other end is left free to be passed around the plates 2 when they are in the closed position, as illustrated in Figure 1. The free end of the chain 3 is secured to a latch mechanism, as illustrated in Figures 4, 5 and 6.

The latch mechanism comprises a solid bar 4 which is welded, or otherwise secured to the face of one of the members 2 in the vicinity of its apex portion. The apices 5 of the members 2 are slightly hooked to carry rope or the chain of our device. The lower end of the bar 4 is substantially in alignment with the hooked apices 5 and is formed with a bifurcated curved end 6 between the jaws of which a curved latch member 7 is pivoted on a bolt or spindle 8. The latch member 7 is adapted to be received within a link or ring 33 on the end of the chain 3 and when the device is locked the latch is in the upright position shown in full lines in Figure 4.

The latch is retained in its upright chain-retaining position by a substantially U-shaped release member 9. The open end of the member 9 straddles the bar 4 and is pivotally mounted thereon, being carried on a spindle or bolt 10 which passes through the legs of the member 9 and also through the bar 4.

A roller 11 is mounted between the legs of the member 9 and is carried upon a suitable spindle 12. The roller is so positioned that it engages the outer edge of the face of the latch 7 in the vicinity of the upper end of the latch when the latch is in the closed position. The latch rests against the

roller which prevents the latch from swinging downwardly into the position illustrated in dotted lines in Figure 4. It will be apparent that when the member 9 is swung upwardly towards the position as illustrated in dotted lines in Figure 4, the roller 11 will pass from out of contact with the latch 7 and thus permit the latch to swing downwardly under the tension of the chain into the position illustrated in dotted lines in Figure 4 whereby the link at the end of the chain will slip off the latch. The loosening of the chain will, of course, permit the bottom of the bucket to open, as illustrated in Figure 2.

Upon reference to Figure 4, it will be seen that the upper corner 13 of the latch 7 is rounded so that as soon as the member 9 is moved upwardly even to a slight degree, the latch will swing downwardly as its rounded corner will be free to pass the roller.

To actuate the member 9 any suitable connection from the bucket to an exterior point may be used. In the drawing, we show a rod 14 which is formed at one end with a ring 15 encircling the end of the member 9 and connected at its other end, as shown in Figure 3, to a bell crank lever 16 which is pivotally mounted upon the bucket. A lever 17 is also pivotally mounted on a lug 18 at the side of the bucket and the lower end of the lever 17 is connected to the bell crank lever by a chain 19.

The upper end of the lever 17 is connected to a cable 20. When the cable 20 is pulled, the bottom of the lever 17 swings inwardly and pulls the bell crank lever upwardly through the medium of the chain 19. As the bell crank lever 16 swings upwardly, it pulls the rod 14 which, in turn, lifts the member 9 and permits the latch 7 to swing downwardly under the tension of the chain 3 so that the chain 3 is released. Before the bucket is recharged, the bottom plates 2 are swung inwardly and the chain 3 is passed around the apices and one of its links passed over the latch 7, which is swung upwardly and brought into engagement with the roller 11 in the member 9. The bucket is then ready for charging.

From the foregoing description, it will be apparent that we have devised a very simple and positive quick-release device which will be secure when locked and positive in its releasing action, and, while we have described a particular embodiment of our invention, it is to be understood that we can make such changes and alterations as we may from time to time deem necessary without departing from the spirit of our invention as set forth in the appended claims.

What we claim as our invention is:

1. A quick release device of the character described adapted to encircle the apices of a plurality of downwardly swingable triangular members forming the inverted pyramidal bottom of a furnace charging bucket and comprising a flexible band member encircling the apices of the triangular members, one end of the band being attached to one of the triangular members and the other end being free, a swingable latch extending through an orifice in the free end of the band when the band encircles the triangular members, a latch release member for retaining the latch in engagement with the band, and means actuating the latch release member out of its latch retaining position whereby the latch swings under the tension of the band to disengage therefrom and free the end of the band.

2. A quick release device of the character described adapted to encircle the apices of a plu-

5 rality of downwardly swingable triangular members forming the inverted pyramidal bottom of a furnace charging bucket and comprising a flexible band member encircling the apices of the triangular members, one end of the band being attached to one of the triangular members and the other end being free, a swingable latch extending through an orifice in the free end of the band when the band encircles the triangular members, a latch release lever engaging the free end of the latch for retaining the latch in engagement with the band, and means for actuating the latch release lever out of its latch retaining position whereby the latch swings under the tension of the band to disengage therefrom and free the end of the band.

3. A quick release device of the character described adapted to encircle the apices of a plurality of downwardly swingable triangular members forming the inverted pyramidal bottom of a furnace charging bucket and comprising a flexible band member encircling the apices of the triangular members, one end of the band being attached to one of the triangular members and the other end being free, a swingable latch extending through an orifice in the free end of the band when the band encircles the triangular members, a latch release lever, a roller mounted on said lever to engage the free end of the latch for retaining the latch in engagement with the band, and means for actuating the latch release lever and its roller out of retaining engagement with the latch whereby the latch swings under the tension of the band to disengage therefrom and free the end of the band.

4. A quick release device of the character described adapted to encircle the apices of a plurality of downwardly swingable triangular members forming the inverted pyramidal bottom of a furnace charging bucket and comprising a flexible band member encircling the apices of the triangular members, one end of the band being attached to one of the triangular members and the other end being free, a swingable latch extending through an orifice in the free end of the band when the band encircles the triangular members, a U-shaped latch release member having its open end pivotally mounted on the device and between the legs of which the latch extends, a roller mounted between the legs of the latch release member to engage the free end of the latch for retaining the latch in engagement with the band, and means for actuating the latch release lever and its roller out of retaining engagement with the latch whereby the latch swings under the tension of the band to disengage therefrom and free the end of the band.

5. A quick release device of the character described adapted to encircle the apices of a plurality of downwardly swingable triangular members forming the inverted pyramidal bottom of a furnace charging bucket and comprising a chain encircling the apices of the triangular members, one end of the chain being attached to one of the triangular members and the other end being free, a swingable latch extending through a link in the free end of the chain when the chain encircles the triangular members, a latch release member for retaining the latch in engagement with the chain, and means actuating the latch release member out of its latch retaining position whereby the latch swings under the tension of the chain to disengage therefrom and free the end of the chain.

6. A quick release device of the character de-

scribed adapted to encircle the apices of a plurality of downwardly swingable triangular members forming the inverted pyramidal bottom of a furnace charging bucket and comprising a chain encircling the apices of the triangular members, one end of the chain being attached to one of the triangular members and the other end being free, a swingable latch extending through a link in the free end of the chain when the chain encircles the triangular members, a U-shaped latch release member having its open end pivotally mounted on the device and between the legs of which the latch extends, a roller mounted between the legs of the latch release member to engage

the free end of the latch for retaining the latch in engagement with the chain, a rod connected at one end to the free end of the latch release member, a bell crank lever to one leg of which the other end of the rod is connected, and means for actuating the bell crank lever whereby the rod is pulled to swing the latch release lever and its roller out of retaining engagement with the latch whereby the latch swings under the tension of the chain to disengage therefrom and free the end of the chain.

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