Dec. 30, 1930. G. J. DOERING 1,786,523

TRIP HOOK

Filed March 19, 1929

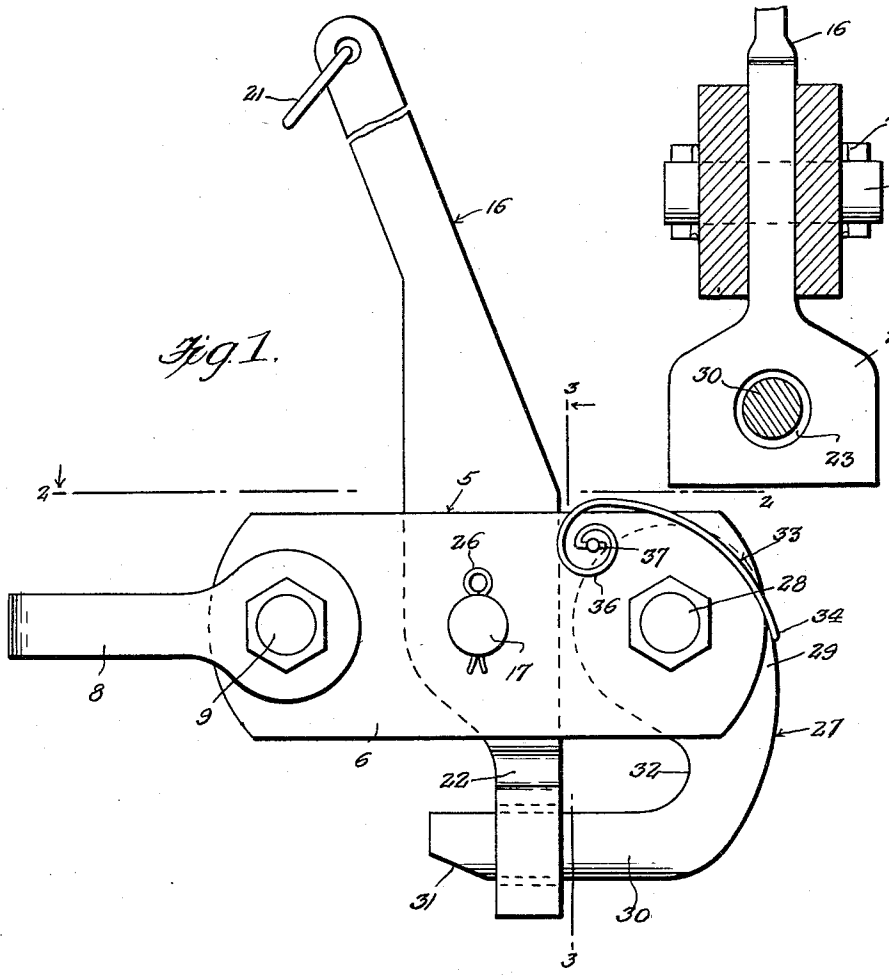


Fig. 1.

Fig. 3.

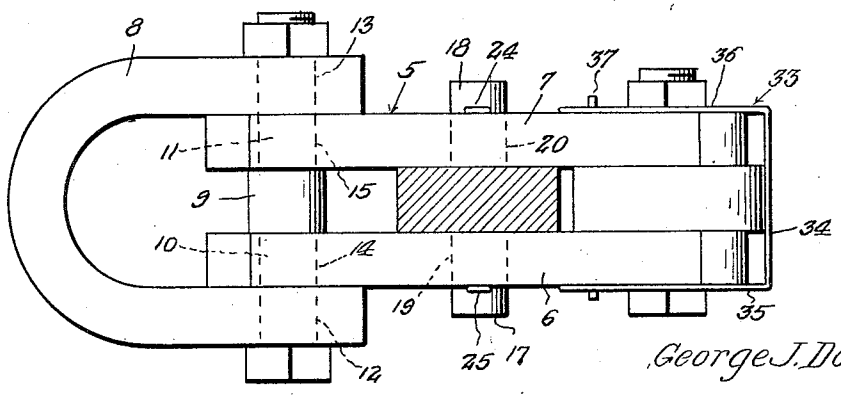


Fig. 2.

Inventor

George J. Doering,

By Clarence A. O'Brien

Attorney

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GEORGE J. DOERING, OF EVANSTON, ILLINOIS

TRIP HOOK

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This invention relates to trip hooks to be used in conjunction with releasing weights whereby the weight is dropped upon objects such as steel, frozen earth, brick walls for the purpose of breaking the object dropped upon into smaller particles.

One of the objects of the invention is to provide a trip hook of the character described, wherein the hook member is automatically held in coupled relation to the tripping lever so as to insure locking of the parts when the drop or weight is lifted from the ground.

Another object of the invention is to provide, a device of the character referred to, which is very simple in its method of assembling the parts, without sacrificing the durability or safety of the operator.

Further objects of the invention are to provide, a trip hook of the character described, which is strong, durable, and compact, highly efficient for its intended purpose, thoroughly reliable in its operation, formed of light parts in comparison to the weight supported, and comparatively inexpensive to manufacture and assemble.

With the foregoing and other objects in view, the invention consists in the novel construction, combination and arrangement of parts as will be hereinafter more specifically described and illustrated in the accompanying drawings, wherein is shown an embodiment of the invention, but it is to be understood that changes, variations and modifications may be resorted to, without departing from the spirit of the claims hereunto appended.

In the drawings, wherein like reference characters denote corresponding parts throughout the several views:

Figure 1 is an elevation of the device in accordance with its invention.

Figure 2 is an elevation, partly in section, and taken substantially on the line 2—2 of Figure 1 and

Figure 3 is a transverse sectional view in detail and taken on the line 3—3, Figure 1.

In the art of trip hooks for releasing a weight or a drop for breaking objects upon which the drop or weight falls, considerable difficulty has been experienced in fabricating a trip hook which will release the weight when suspended in the air, without sacrificing the safety or lifting factor of the hook portion. Difficulty has arisen from the fact that just prior to a time when the weight is lifted from the ground, the hook portion will be released from the tripping lever, whereby the weight or drop will become detached therefrom and with the attendant danger of rolling upon the operator or otherwise injuring him due to the flying hook that has become released.

Having the foregoing in mind, and referring to the drawings in detail, the body portion indicated generally at 5, is formed of a pair of spaced, complementary plates 6 and 7 of substantially rectangular configuration. At one end of the body portion formed by the spaced plates 6 and 7, a clevis 8 is rockably mounted thereon and the clevis is supported on a bolt 9, having reduced portions 10, and 11 at the opposite ends thereof which extend through openings 12 and 13 on the arms of the clevis and openings 14 and 15 adjacent the end of the plates 6 and 7. All of the openings are in alignment and the adjacent openings 12 and 14 of the clevis and plate and the openings 15 and 13 of the clevis and plate are in registration with each other to form a continuous opening through which the respective reduced portions of the bolt 9 extend. The intermediate enlarged portion of the bolt 9 forms a shoulder where it merges into the reduced portion and said shoulder, on the opposed sides thereof abuts against the inner opposed faces of plates 6 and 7 to form a support to prevent bending of the plates at this end thereof.

A tripping lever indicated generally at 16 is rockably mounted on and supported between the spaced plates 6 and 7 intermediate its ends. The thickness of the tripping lever should be such as to permit it to freely rock between the inner faces of the plates but still frictionally abut said faces to form a support intermediate the ends of said plates.

The tripping lever 16 has a pair of trunnions 17, and 18 formed on its opposite side

faces and projecting laterally therefrom through circular openings 18 and 19 extending through the opposed plates 6 and 7, in alignment with each other. The tripping member 16 extends laterally of the plates forming the body portion, on each side thereof and on one end of said member is formed a loosely mounted ring 21. That portion of the tripping member 16 which projects beyond the other side of the body portion flares outwardly as indicated at 22, and is formed with a circular opening 23, for reception of an end of the hook to be presently described. The opposed trunnions 17, and 18 are formed with slots 24, 25 which extend diametrically through them, at a point where said trunnions emerge from the openings 19, 20 in the plates for the purpose of providing anchoring slots for supporting the cotter pins, one of which is shown at 26.

These pins anchored in the slot prevent lateral movement of the plate on the trunnions, while at the same time they hold said plates in abutting relation to that portion of the tripping member 16 which extends through the plate.

A hook member indicated generally as at 27 is formed on one end with an enlarged area which is rockably mounted between the plates 6 and 7, upon the bolt 28 which extends through the respective plates and the enlarged portion 29 of said hook. The enlarged portion 29 merges into a substantially straight end 30, which extends in a plane substantially at right angles to the enlarged portion 29. The straight end 30 is circular in cross section and adjacent the ends of said end, a flat declining face 31 is formed thereon to provide clearance between the rocking movement of the lever 16 and the hook 27. The circular end member 30 of the hook extends through the opening 23 in spaced relation thereto, when the trip is in the position shown in Figure 1 of the drawings. Where the enlarged portion 29 merges with the end portion 30, a curved portion, indicated at 32, forms the neck therebetween upon which the weight or drop is suspended.

A substantially U-shaped spring indicated generally at 33 has a bight portion 34 and opposite legs 35, 36, straddling the lower ends of the body portion 5 formed by the pair of plates.

The ends of the legs of the spring are coiled, one of the coils being shown at 36, and the said coil being attached to the opposed sides of the plates 6 and 7 by means of a pair of hold-fast devices, one of which is shown at 37. The bight portion 34 of the spring abuts against the outer enlarged portion 29 of the hook, exerting a pressure thereon which maintains the hook in coupled relation with the tripping lever 16. The spring 33 automatically moves the hook 27 in coupled relation to the lever 16 as will be clearly understood by references to Figure 1 of the drawings.

In the application of the trip hooks in accordance with this invention, the hoisting line from a derrick, a stationary crane or other device is attached to the clevis 8 and suspended thereby, for raising or lowering the trip hook. A tripping line is attached to the ring 21 on the tripping lever 16 and the other end of the tripping line is held in the hands of the operator. The weight or drop (not shown) usually has a circular loop in the top thereof for attachment to the trip hook. To attach the weight or drop, the tripping lever is rocked on its trunnions until the opening 23 frees itself from the portion 30 of the hook member 27 at which time the beforementioned link on the weight is inserted in the hook member 27 resting in the neck 32 thereof.

At this point the tripping lever is released and the spring 33 automatically holds the hook 27 in coupled relation to the tripping lever 16 so as to maintain the coupled relation until a strain is taken up by the derrick, so that the weight or drop will not become detached from the trip hook until a strain is taken thereby.

When the line from the derrick begins to lift the weight, the lever 16 locks tightly in the opening 23 surrounding the end portion 30 of the hook member 29, thereby sustaining the weight suspended on the neck 32 of said hook.

When the weight has reached the desired height, the operator may pull on the trip line whereby the tripping lever is rocked upwardly and releases the hook 27 which flexes the spring 34, until the weight is released, whereupon the spring returns the hook member 27 to normal position as shown in Figure 1 of the drawings.

Having described my invention, what I claim is:

1. In a trip hook of the character described comprising a body portion formed of a pair of complementary spaced plates, a clevis rockably mounted on one end of said plates, a tripping lever rockably mounted intermediate its ends between an intermediate portion of said plates, said tripping lever having an opening formed in one free end and an attaching ring on the other free end thereof, a hook member having one end rockably mounted between the other end of said plates, the free end of said hook member adapted for detachably seating in the opening in the tripping lever for detachably coupling the hook member and the tripping lever, and means for automatically retaining said tripping lever and hook member in coupled relation.

2. In a trip hook of the character described comprising a body portion formed of a pair of complementary spaced plates, a clevis

rockably mounted on one end of said plates, a tripping lever rockably mounted intermediate its ends between an intermediate portion of said plates, said tripping lever having an opening formed in one free end and an attaching ring on the other free end thereof, a hook member having one end rockably mounted between the other end of said plates, the free end of said hook member adapted for detachably seating in the opening in the tripping lever for detachably coupling the hook member and the tripping lever, means for automatically retaining the said tripping lever and hook member in coupled relation, said automatic means comprising a U-shaped spring secured to said plates and straddling the lower ends thereof.

3. In a trip hook of the character described comprising a body portion formed of a pair of complementary spaced plates, a clevis rockably mounted on one end of said plates, a tripping lever rockably mounted intermediate its ends between an intermediate portion of said plates, said tripping lever having an opening formed in one free end and an attaching ring on the other free end thereof, a hook member having one end rockably mounted between the other end of said plates, the free end of said hook member adapted for detachably seating in the opening in the tripping lever for detachably coupling the hook member and the tripping lever, means for automatically retaining the said tripping lever and hook member in coupled relation, said automatic means comprising a U-shaped spring secured to said plates and straddling the lower ends thereof, said clevis, tripping lever and hook member being rockably coupled to said plates along the longitudinal median thereof.

In testimony whereof I affix my signature.

GEORGE J. DOERING.