

G. A. WEARHAM.
 COUPLING MEANS FOR RELEASABLY SUSPENDING A MASS.
 APPLICATION FILED FEB. 10, 1921.

1,383,252.

Patented June 28, 1921.

Fig. 1.

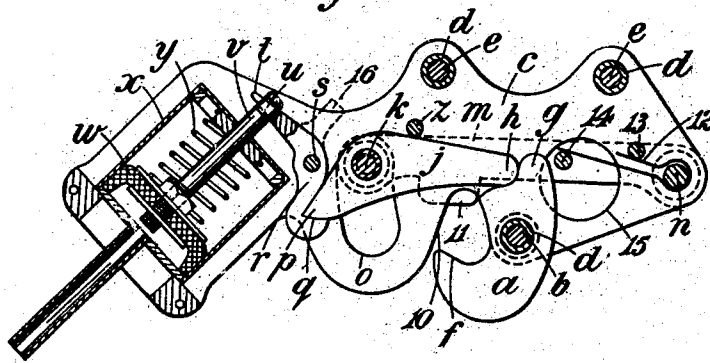
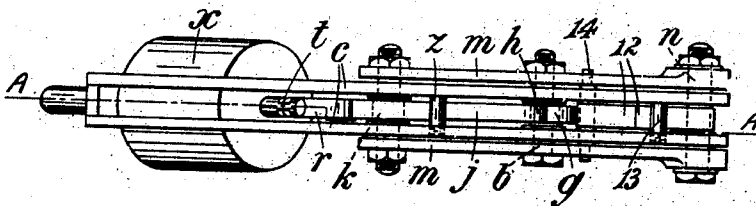


Fig. 2.



Inventor.

Gordon A. Wearham

*By (Rosen, Kennedy & Campbell
 Attys.*

UNITED STATES PATENT OFFICE.

GORDON AUGUSTUS WEARHAM, OF LONDON, ENGLAND.

COUPLING MEANS FOR RELEASABLY SUSPENDING A MASS.

1,383,252.

Specification of Letters Patent. Patented June 28, 1921.

Application filed February 10, 1921. Serial No. 443,952.

To all whom it may concern:

Be it known that I, GORDON AUGUSTUS WEARHAM, a subject of the King of the United Kingdom of Great Britain and Ireland, and residing at Myrtle Lodge, 159 Lewisham road, London, S. E. 13, England, have invented new and useful Improvements in or Relating to Coupling Means for Releasably Suspending a Mass, (for which I have filed application in England, Sept. 26, 1919, No. 23,678,) of which the following is a specification.

This invention has for its object the rapid and easy release of a suspended mass with a minimum expenditure of force, such force being independent of the weight to be released, or proportional to only a very small fraction thereof, and relates to apparatus in which the suspension hook is pivoted in a frame or housing in such manner that a mass suspended therefrom tends to rock said hook about its pivotal axis to release said mass, said hook being formed with a nose adapted to bear, when a mass is suspended from it, against the adjacent end of a detent, pivotally mounted on an arm. According to this invention the arm is pivoted in said frame on an axis in line or nearly in line with the point of contact of the hook and the detent and with the pivot of the detent while a bent or projection is provided and adapted to be engaged by a trigger lever, the arrangement being such that when a mass is suspended from the hook, the mouth of the latter is closed and the direction of the thrust of the nose of the hook against the detent coincides or nearly coincides with the line joining the pivots of the detent and the arm, so that whatever the weight suspended, no stress due thereto or only so small a stress as may be desired, is transmitted to the trigger lever. Means may be provided for automatically throwing the pivot of the detent or of the arm out of the aforesaid alinement when the bent of the detent is disengaged from the trigger-lever. Alternatively, the said automatic means may be dispensed with if the pivots of the detent and the arm be slightly out of line with the point of contact of the detent and the nose of the hook, and the parts so located that the suspended weight tending to turn the hook tends also to move the detent and the arm to permit it to turn so as to release the suspended mass, the said movement being prevented by a trigger lever.

Further, the extent to which the two pivots and the point of contact between the detent and the nose of the hook are out of line may be regulated by making the trigger adjustable in position, so that as small a fraction as may be desired of the force due to the weight to be released is transmitted to the trigger.

One form of apparatus constructed in accordance with this invention will be described with reference to the accompanying drawings of which Figure 1 is a sectional elevation on the crooked line A—A Fig. 2, and Fig. 2 is a plan with the uppermost distance pieces and tie rods omitted.

A hook *a* from which the mass to be released may be suspended, is pivotally mounted on a spindle *b* in a frame or housing constituted by a pair of plates *c c* connected by distance pieces *d* and tie rods *e*. The pivot of the hook *a* is so placed adjacent the portion *f* thereof that a mass suspended from the portion *f* tends to rock the hook *a* about its pivot *b* to such an extent as to release said mass. At its top, the hook is formed with a nose *g* adapted to bear against the adjacent end *h* of a detent *j* pivotally mounted on a spindle *k* carried by an arm (consisting of a pair of links) *m m*, pivoted on a spindle *n* passing through the plates *c c* on that side of the nose *g* which is remote from the pivot *k* of the detent *j*. The arm *m m* lies outside the plates *c c* which are formed with arcuate slots such as *o o* to give passage to the spindle *k* whereon the detent *j* is pivoted when said arm *m m* swings about its pivot *n*. The detent *j* is formed with a bent *p* adapted to be engaged by the nose *q* of a trigger *r* pivotally mounted on a spindle *s* passing through the plates *c c* and the tail of the said trigger *r* is bifurcated as at *t* and engages peripheral grooves *u* in the rod *v* of a piston *w* of a pneumatic cylinder *x* carried by said plates *c c*, said piston *w* being pressed by a spring *y* against the end of the cylinder *x* so as to prevent oscillation of the trigger *r* and consequent premature release of the mass due to vibration, while for the same purpose a stop pin *z* is disposed between the plates *c c* and above the detent *j* to prevent the latter from rising above its normal position.

A spring 12 bears against a pin 13 attached to the side plates *c c* and against a pin 14 attached to the arm *m m*, and consequently

turns the arm counter-clockwise when the trigger is operated to release the detent *j*. As soon as the arm *m m* has been turned slightly from its normal position this arm and the detent *j* are turned counter-clockwise by the force exerted by the nose *g* of the hook *a* on the end *h* of the detent *j*, and so permit the hook *a* to turn to release the suspended mass.

10 The arm *m m* has lugs 11 which, when a mass is being suspended on the hook *a* are struck by the suspension eye of the mass so as to move the arm *m m* into the position shown in the drawings. The said movement
15 of the arm *m m* also causes the detent *j* to engage the nose *g* of the hook *a* and the trigger *r* so that the parts of the device are automatically set in operative position by the action of attaching the mass to the hook.

20 The side plates *b c* are preferably formed as at 10 so as to prevent the suspension eye of the mass from escaping from the hook *a* until the latter is permitted to turn. In place of or in addition to the spring 12, the
25 trigger *r* may be provided with a projection 16 adapted to strike the arm *m m* or the detent *j*, when the trigger *r* is operated and so move the arm *m m* from its normal position.

30 Alternatively, if the pivot *k* of the detent *j* be slightly below the position shown in the drawings, that is to say, below the line through the pivot *n* and the point of contact between the nose *g* and the end *h* of the
35 detent *j*, the pressure of the nose *g* on the end *h* will tend to move the arm *m m* so as to release the suspended mass.

The invention enables a heavy mass to be released by a very light pull on the trigger and is especially adapted for use on aircraft for bomb dropping. It will be obvious that the employment of the invention as a releasable coupling is not limited to a
40 suspended mass, but will also serve *e. g.* as a slip coupling for railway vehicles and for analogous purposes.

It is obvious that the trigger lever *r* may be applied to the arm *m m* instead of to the detent *j*.

50 The parts may be disposed in other ways than that shown in the drawings without departing from the invention; for instance the arm *m m* may be pivoted at a point on the side of the pivot of the detent *j* opposite to that on which is located the nose *g* of the hook *a*, the essential feature of the
55 invention being that the pivots of the arm *m m* and of the detent *j*, be in a line or nearly in a line with the point of contact between the detent *j* and the hook *a*.

Having described my invention, I declare that what I claim and desire to secure by Letters Patent is:—

1. In apparatus for releasably suspending
65 a mass, the combination with a frame or

housing, of a hook from which the mass is suspended pivoted to the housing so as to tend to turn to release the mass, a detent engaging the said hook adapted to prevent such turning, an arm pivoted to the frame, on which the detent is pivoted and a trigger adapted to hold the detent in its hook-engaging position.

2. In apparatus for releasably suspending a mass, the combination with a frame or
75 housing, of a hook from which the mass is suspended pivoted to the housing so as to tend to turn to release the mass, a detent engaging the said hook adapted to prevent such turning, an arm pivoted to the frame, on which the detent is pivoted, a trigger adapted to hold the detent in its hook-engaging position, and means adapted to
80 disengage the trigger from the detent.

3. In apparatus for releasably suspending
85 a mass, the combination with a frame or housing of a hook from which the mass is suspended pivoted to the housing so as to tend to turn to release the mass, a detent engaging the said hook adapted to prevent
90 such turning, an arm pivoted to the frame, on which the detent is pivoted, the pivots of the detent and of the arm being approximately in a line with the point of engagement of the detent and the hook, a trigger
95 adapted to hold the detent in its hook-engaging position and means adapted to disengage the trigger from the detent.

4. In apparatus for releasably suspending a mass, the combination with a frame or
100 housing, of a hook from which the mass is suspended pivoted to the housing so as to tend to turn to release the mass, a detent engaging the said hook adapted to prevent such turning, an arm pivoted to the frame, on which the detent is pivoted, a trigger adapted to hold the detent in its hook-engaging position, means adapted to disengage the trigger from the detent, and means adapted to slightly turn the arm
110 about its pivot when the trigger is so disengaged.

5. In apparatus for releasably suspending a mass, the combination with a frame or
115 housing, of a hook from which the mass is suspended pivoted to the housing so as to tend to turn to release the mass, a detent engaging the said hook adapted to prevent such turning, an arm pivoted to the frame, on which the detent is pivoted, the pivots
120 of the detent and of the arm being approximately in a line with the point of engagement of the detent and the hook, a trigger adapted to hold the detent in its hook-engaging position, means adapted to disengage the trigger from the detent, and means adapted to slightly turn the arm about its
125 pivot when the trigger is so disengaged.

6. In apparatus for releasably suspending a mass, the combination with a frame or
130

housing, of a hook from which the mass is suspended pivoted to the housing so as to tend to turn to release the mass, a detent engaging the said hook adapted to prevent such turning, an arm pivoted to the frame, on which the detent is pivoted, a trigger adapted to hold the detent in its hook-engaging position, and a projection on the arm adapted to be engaged by the mass when the latter is being attached to the hook, so as to move the arm into the position which it occupies when the mass is retained by the hook.

7. In apparatus for releasably suspending a mass, the combination with a frame or housing, of a hook from which the mass is suspended pivoted to the housing so as to tend to turn to release the mass, a detent engaging the said hook adapted to prevent such turning, an arm pivoted to the frame, on which the detent is pivoted, the pivots of the detent and of the arm being approximately in a line with the point of engagement of the detent and the hook, a projection on the arm adapted to be engaged by the mass when the latter is being attached to the hook, so as to move the arm into the position which it occupies when the mass

is retained by the hook, a trigger adapted to hold the detent in its hook-engaging position, and means adapted to disengage the trigger from the detent.

8. In apparatus for releasably suspending a mass, the combination with a frame or housing, of a hook from which the mass is suspended pivoted to the housing so as to tend to turn to release the mass, a detent engaging the said hook adapted to prevent such turning, an arm pivoted to the frame, on which the detent is pivoted, the pivots of the detent and of the arm being approximately in a line with the point of engagement of the detent and the hook, a projection on the arm adapted to be engaged by the mass when the latter is being attached to the hook, so as to move the arm into the position which it occupies when the mass is retained by the hook, a trigger adapted to hold the detent in its hook-engaging position, means adapted to disengage the trigger from the detent, and means adapted to slightly turn the arm about its pivot when the trigger is so disengaged.

In testimony whereof I have affixed my signature.

GORDON AUGUSTUS WEARHAM.