

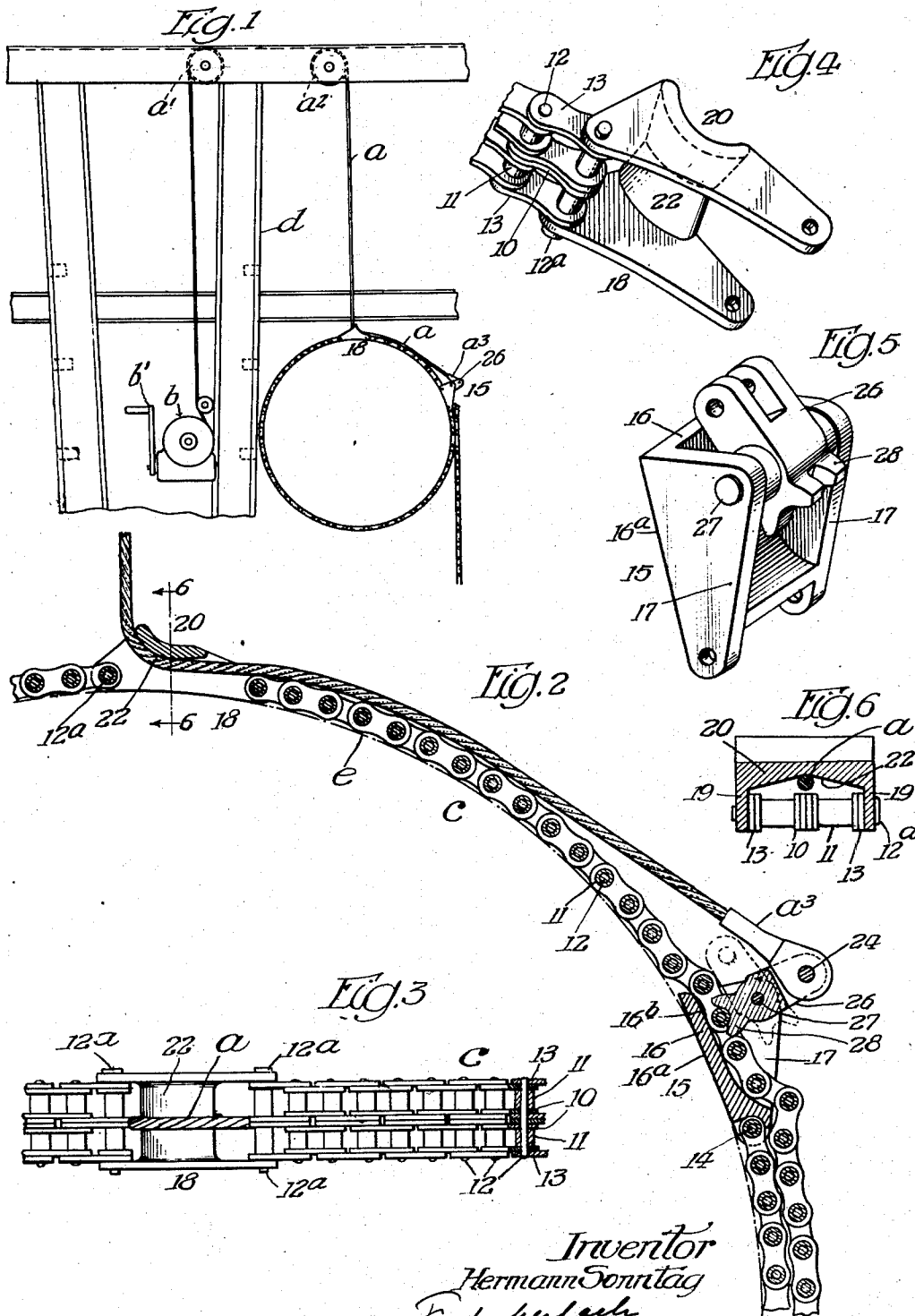
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HOISTING SLING

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HOISTING SLING

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The invention relates to hoisting slings.

In handling loads in aircraft, particularly the heavier types of bombs and torpedoes, the restricted areas available around the bomb racks have made it necessary to use a plurality of hoisting mechanisms and slings for loading the bombs into the racks. The necessity of synchronizing the movements of the hoisting cables and the duplication of the hoisting mechanisms for the slings and the attachment of the hoisting mechanisms to the airplane structure, and the hazard of slippage of the load in the slings, present problems in the installation and operation of bomb hoisting mechanisms in aircraft.

One object of the invention is to provide an efficient hoisting sling which is adapted singly to handle a bomb, torpedo and other load, without hazard of slippage of the bomb in the sling, and which can readily be wrapped around and released from the load.

Another object of the invention is to provide an improved hoisting sling which is operable by a single winding mechanism, is simple in construction, adapted to be quickly applied to and automatically tightened around the load to prevent slippage during the hoisting and transportation of the load, and is releasable from the load in the limited area available in aircraft.

Other objects of the invention will appear from the detailed description.

The invention consists in the several novel features hereinafter set forth and more particularly defined by claims at the conclusion hereof.

In the drawing:

Figure 1 is a side elevation of the hoisting mechanism as used in connection with a bomb rack in aircraft.

Fig. 2 is a longitudinal section of the sling illustrating it tightened around a load.

Fig. 3 is an inverted plan of the bearing shoe which is formed as a link of the chain for slidable engagement with the hoisting cable.

Fig. 4 is a perspective of the bearing shoe.

Fig. 5 is a perspective of the fitting and the lever carried thereby, the lever being shown in full lines in its chain tightening position and by dotted lines in position for threading the free end of the chain through the fitting.

Fig. 6 is a section taken on line 6—6 of Fig. 2.

The invention is exemplified with a hoisting cable a which has one of its ends connected to winding mechanism for raising and lowering the load and which may comprise a drum b operable by a crank b' through suitable gearing, as well understood in the art. The cable extends

from the winding drum over a pair of overhead sheaves a' , a^2 from the latter of which the cable extends when under load downwardly as a vertical suspension line. The cable a and winding mechanism b may be associated with a bomb rack d of any suitable construction. The sheaves a' and a^2 and the winding mechanism b are supported on the fuselage structure. The winding mechanism may be of any suitable construction and either manually or power operated, as well understood in the art. The free or load end of the cable a is provided with a coupling a^3 which is provided with an eye for detachably connecting it to the hoisting sling.

The sling comprises a chain of sufficient length to encircle a bomb of the largest diameter. The chain c is preferably formed of dual sections arranged side by side for gripping a sufficient longitudinal area of the bomb to prevent longitudinal tilting of the bomb when it is gripped at its central longitudinal center. Each link-section of the chain comprises two pairs of links 10 , each pair spaced apart by a roller sleeve 11 , cross-pins 12 extending through both pairs of links, and two pairs of links 13 between the pins 12 .

One end of the chain is free so that it can be wrapped around and removed from the load. The other end of the chain c has pivotally connected thereto by a cross-pin 14 a fitting or bracket 15 which carries means for tightening and locking the chain around the load. Fitting 15 comprises a transversely extending base 16 , the inner face 16^a of which is adapted to bear against the periphery of the bomb. The outer face 16^b of base 16 forms a bearing for the chain. Fitting 15 has integral upstanding sides 17 between which the chain is adapted to slide.

A lever 26 is fulcrumed on a cross-pin 27 which extends through the sides 17 of fitting 15 . The outer end of lever 26 is detachably connected by a pin 24 to the coupling a^3 on the load-end of the cable a . The inner end of lever 26 is forked as at 28 to receive and straddle a pair of the sleeve rollers 11 on any of the cross-pins 12 of the chain. The bearing face 16^b on the base 16 coacts with the forked end of the lever to hold the chain engaged by the lever. The face 16^b terminates in an outward curve which angularly deflects the free end of the chain around the portion of the chain which is attached by pin 14 to the fitting 15 . The lever 26 can be swung into the position indicated by dotted lines in Fig. 2, to permit the free end of the chain to be passed through the fitting and drawn taut

around the bomb before the lever 26 is swung into engagement with a pair of the roller-sleeves 11 on one cross-pin 12 of the chain.

A bearing shoe 18 is included as an elongated link of the chain and has its ends connected by cross-pins 12 to the adjacent links of the chain. This shoe comprises a curved transverse wall 20 and inwardly extending integral sides 19 through which the cross-pins 12^a pass. The inner face 22 of the cross-wall 20 is angular or curved and functions as a bearing surface which is slidably engageable with the cable *a*. The cable at its load passes from its vertical suspension line under the bearing surface 22 and around the chain *c* at one side of the shoe and its coupling *a*³ is detachably connectable by pin 24 to the outer end of lever 26. The cable engaging face 22 is arched transversely to centralize the cable longitudinally in the shoe.

The operation, assuming the load to be a bomb, the periphery of which is indicated at *e*, will be as follows: The chain *c* with the shoe 18 included therein, and the fitting 15 attached to one end, will be looped around the bomb located at the point from which it is to be hoisted, and its free end passed through the fitting 15 and between the lever 26 and the cross-wall 16 while the latter is swung into position illustrated by dotted lines in Fig. 2. The chain will be positioned at the longitudinal center of the load and circumferentially so that the usual lugs on the bomb will be positioned for connection to the bomb shackle on the bomb rack on which the bomb is to be loaded when the winding mechanism is operated to lift the bomb. The chain is drawn snugly around the bomb and the forked end of lever 26 will be swung into engagement with a pair of roller sleeves 11 on one of the cross-pins 12. The coupling *a*³ of cable *a* will then be connected by coupling pin 24 to the lever 26. The winding mechanism will then be operated to wind *a* and hoist the bomb. As the cable is wound on the drum, it is subjected to tension as it is initially strained by the load. This tension will cause the cable to slide on the angular bearing surface 22 of the shoe 18 and rock lever 26 to cause its forked end to draw the chain tightly into clamping relation with the bomb. During this operation, the bomb will be automatically centered below the vertical suspension line of the cable. The winding of the cable on the drum of the winding mechanism will be continued until the bomb has been elevated into position where it can be readily latched to a bomb-shackle on the bomb rack. During this lifting operation, the chain and shoe 18 will be tightly clamped around the bomb by the tension on the cable provided by the weight of the bomb. When the bomb has been hoisted into position to be connected to the bomb-shackle on the bomb-rack, the tension on the cable will be released by unwinding it from the drum of the winding mechanism. The coupling *a*³ will then be disconnected from the lever 26 by the removal of pin 24. Lever 26 will be free to swing into position to clear the chain and the free end of the chain will be drawn through and out of the fitting 15. Both ends of the chain will then be free for convenient removal from the bomb while it is suspended in the bomb rack. The chain, having a free end which can be drawn through the fitting 15 to enlarge or decrease the looped portion around the bomb, is adapted for hoisting bombs of widely different diameters or loads of widely different shapes. In practice, the shoe 18 is connected to the chain approximately 36 inches from

the fitting 15 and this adapts the hoisting sling for bombs of 250 lbs. and all weights thereover.

The invention exemplifies a hoisting sling which is usable to load bombs where restricted areas are available, and does not require the use of a plurality of hoists or slings for handling the bombs. The clamping pressure exerted by the bend in the cable produced by the shoe in the chain produces efficient clamping pressure of the sling around the bomb or load. This bearing shoe 18 is adapted to be inserted between the links of the chain. The invention also exemplifies a hoisting sling which is simple in construction, adapted for hoisting bombs of varying sizes, and efficient in operation.

While the invention is particularly advantageous for hoisting bombs, torpedoes or the like, it may also be used for loads of other types which are adapted to be gripped in a sling.

The invention is not to be understood as restricted to the details set forth, since these may be modified within the scope of the appended claims without departing from the spirit and scope of the invention.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:

1. A load sling for a hoisting cable comprising a chain adapted to be wrapped around the load and having a free end, a fitting connected to the other end of the chain and through which said free end can be passed, a shoe connected to the chain in spaced relation from the fitting, having a bearing face for a portion of the cable deflected from its vertical suspension line and for slidable engagement with the cable, and means in the fitting for engaging the chain and to which the ends of the deflected portion of the cable from the shoe is connectable for tightening the chain around the load when the cable is tensioned by the load.

2. A load sling for a hoisting cable comprising a chain adapted to be wrapped around the load and having a free end, a fitting connected to the other end of the chain and through which said free end can be passed, a shoe connected to the chain in spaced relation from the fitting, having a bearing face for a portion of the cable deflected from its vertical suspension line and for slidable engagement with the cable, and a lever fulcrumed in the fitting for engaging the chain and to which the end of the deflected portion of the cable from the shoe is connectable for tightening the chain around the load when the cable is tensioned by the load.

3. A load sling for a hoisting cable comprising a chain adapted to be wrapped around the load and having a free end, a fitting connected to the other end of the chain and through which said free end can be passed, a shoe forming a link in the chain in spaced relation from the fitting, having a bearing face for a portion of the cable deflected from its vertical suspension line and for slidable engagement with the cable, and means in the fitting for engaging the chain and to which the end of the deflected portion of the cable from the shoe is connectable for tightening the chain around the load when the cable is tensioned by the load.

4. A load sling for a hoisting cable comprising a chain adapted to be wrapped around the load and having a free end, a fitting connected to the other end of the chain and through which said free end can be passed, a shoe forming a link in the chain in spaced relation from the fitting,

having on its under side a bearing face for a portion of the cable deflected from its vertical suspension line and for slidable engagement with the cable, and a lever fulcrumed in the fitting for engaging the chain and to which the end of the deflected portion of the cable from the shoe is connectable for tightening the chain around the load when the cable is tensioned by the load.

5. The combination with a hoisting cable, of a sling comprising a chain adapted to be wrapped around the load and having a free end, a fitting connected to the other end of the chain and through which said free end can be passed, a shoe connected to the chain, in spaced relation from the fitting, having a bearing face for slidable engagement with a portion of the cable extending angularly from its vertical suspension line, and means in the fitting for engaging and tightening the chain, the cable being flexed from its vertical suspension line around and under the angular bearing face on the shoe and having its load-end detachably connected to said means for tightening the chain when the cable is tensioned by the load.

6. The combination with a hoisting cable, of a sling comprising a chain adapted to be wrapped around the load and having a free end, a fitting connected to the other end of the chain and through which said free end can be passed, a shoe connected to the chain, in spaced relation from the fitting, having a bearing face for slidable engagement with a portion of the cable extending angularly from its vertical suspension line, and a lever fulcrumed in the fitting for engaging and tightening the chain, the cable being flexed from its vertical suspension line around and under the angular bearing face on the shoe and having its load end detachably connected to the lever for tightening the chain when the cable is tensioned by the load.

7. The combination with a hoisting cable, of a sling comprising a chain adapted to be wrapped around the load and having a free end, a fitting connected to the other end of the chain and through which said free end can be passed, a shoe forming a link in the chain in spaced relation from the fitting, having on its under side a bearing face for slidable engagement with a portion of the cable extending angularly from its vertical suspension line, and a lever fulcrumed in the fitting for engaging and tightening the

chain, the cable being flexed from its vertical suspension line around and under the angular bearing face on the shoe and having its load end detachably connected to the lever for tightening the chain when the cable is tensioned by the load.

8. The combination with a hoisting cable, of a sling comprising a chain adapted to be wrapped around the load, having a free end, a fitting connected to the other end of the chain and through which said free end can be passed, a shoe forming a link in the chain in spaced relation from the fitting, and comprising a cross-wall having on its under side a bearing face for slidable engagement with a portion of the cable extending angularly from its vertical suspension line and sides having their ends pivoted to contiguous links in the drum, and a lever fulcrumed in the fitting for engaging and tightening the chain, the cable being flexed from its vertical suspension line around and under the bearing face on the shoe and having its end detachably connected to the lever for tightening the chain when the cable is tensioned by the load.

9. A load sling for a hoisting cable comprising a chain adapted to be wrapped around a load and having separable ends, a shoe included in the chain, having a bearing face for slidable engagement with the cable and by which a portion of the cable is deflected partially around the load from the vertical suspension line of the cable, and means connected to the end of the deflected portion of the cable and between the ends of the chain for tightening the load by tension on the cable when it is operated to move the load.

10. A load sling for a hoisting cable comprising a chain adapted to be wrapped around a load and having separable ends, a shoe included in the chain, having a bearing face for slidable engagement with the cable and by which a portion of the cable is deflected partially around the load from the vertical suspension line of the cable, and a lever operatively connected to one end of the deflected portion of the cable, having a fulcrum connected to one end of the chain and hooked means for engaging the other end of the chain for tightening the chain around the load by tension on the cable when it is operated to move the load.

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