June 22, 1937. D. BAKER 2,084,722

TORPEDO PLACEMENT HOOK

Filed June 18, 1935

Fig. 1

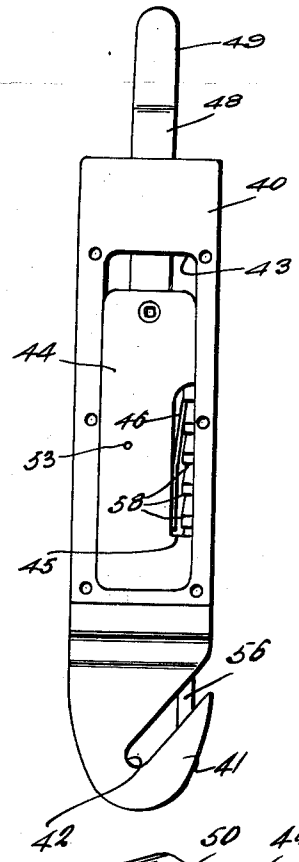


Fig. 2

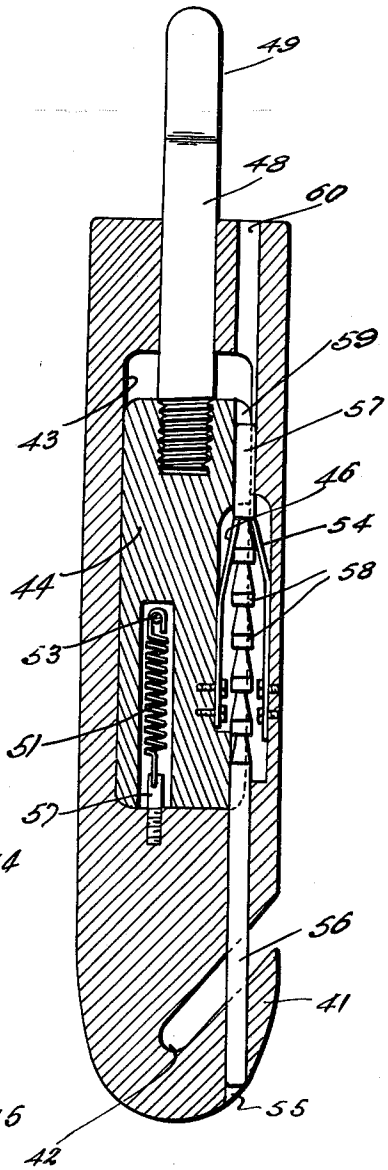
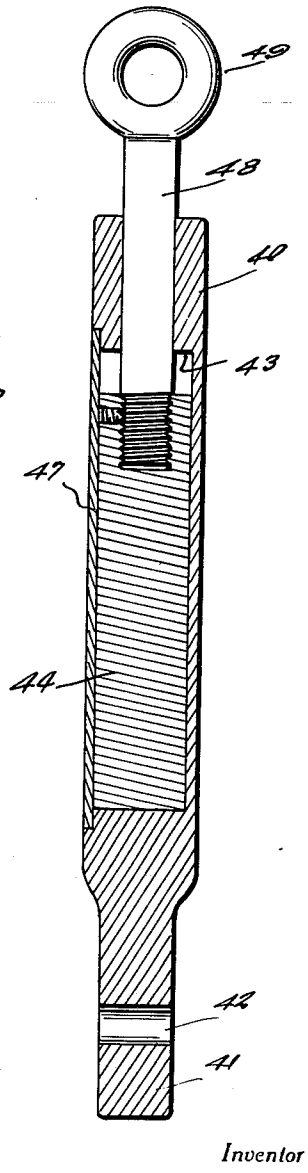


Fig. 3



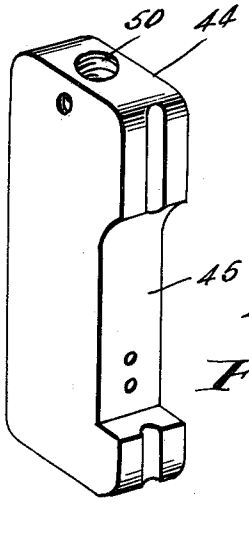


Fig. 4

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TORPEDO PLACEMENT HOOK

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8 Claims. (Cl. 294—83)

This invention relates to a device which may be broadly referred to as a hook for use in oil wells for the purpose of placing explosives such as dynamite, nitroglycerine, solidified glycerine, gelatine, time bombs and the like in position for timed explosion work.

It is a matter of common knowledge that the placement of highly charged explosives in oil wells and similar holes is accompanied by hazards frequently proving disastrous because of improper placement of explosives and premature discharging of the explosives at an undesirable or improperly located point in the well.

Ordinarily, a simple hook with an unguarded bill is employed for the purpose. The eye of the explosive is releasably hung on the bill of the hook and the hook and explosive unitarily lowered by a suspension cable or the like.

Without attempting to list the various ways and means whereby these improperly held explosives become accidentally displaced, it is sufficient to say that many accidents occur in the field because of the inadequate means employed for lowering the explosives into place. Under the circumstances, I have discovered the need for a provision of a special hook equipped implement or device having a safety latch which serves to temporarily close the hook so that the explosive can properly be lowered into place, means being provided whereby the latch can be released at the desired interval of time to permit the lowering implement to be disconnected from the explosive only after it has reached the bottom of the hole.

Needless to say, in reducing the invention to practice, I have been confronted with difficulties of perfecting a structure which is sufficiently correct mechanically and scientifically to be sensitive enough to insure guarded lowering of the explosive and satisfactory disconnection from the same when it has been properly placed in the bottom of the hole. After much experimentation involving careful deliberation and forethought I have discovered that it is possible to employ a safety latch for adequately keeping the bomb attached to the lowering hook, said safety latch being in the nature of a pin and being operable by special means susceptible of being controlled by a successive raising and lowering of the cable and implement in unison while the explosive is attached to the then guarded hook.

Stated a little more explicitly, novelty is predicated upon the adoption and use of a special latch equipped lowering hook wherein the hook is provided with a slidable safety pin, bar or the like to function as a closing latch, said hook, that is the body portion thereof, having mounted thereon a slidable spring returned unit to which the lowering and raising cable is attached, and coacting means being provided between the slidable unit and the body of the hook to actuate the latch pin by allowing the parts to come together and move apart by simply raising and lowering the structure through the instrumentality of the cable when it has reached the bottom of the hole.

In accordance with my conception, I have perfected a comparatively simple mechanical device which can be satisfactorily controlled irrespective of the depth of placement of the explosive. Moreover, I have developed an arrangement characterized by adequate compensating means susceptible of remote or distant control by the cable, utilizing the weight of the bomb itself as a special factor in the control and release of the safety latch.

The explicit details and their relative structural arrangement and coordination will become more readily apparent from the following description and drawing.

In the drawing:

Figure 1 is what may be called a side elevational view of the new and improved torpedo placement hook, as constructed in accordance with the principles of the present invention, the detachable cover plate being removed to expose the internal mechanism.

Figure 2 is a sectional and elevational view based on Figure 1, and illustrating to advantage the intermittently operable spring fingers and associated latch pin or rod.

Figure 3 is a central longitudinal sectional view through Figure 1, that is, a view at right angles to Figure 1, showing the removable cover plate in place.

Figure 4 is a perspective view of the slidable pin actuating member or block.

By way of introduction to the succeeding detailed description, it will be observed that novelty is predicated on an ingenious torpedo placement hook construction characterized by a hook-equipped body having a latch pin accommodating bore, a shouldered latch pin slidably mounted in said bore, detent means mounted on the body and progressively engageable with the shoulders on said pins to hold the pins in successive adjusted positions, pin actuating means slidably mounted in the body, a spring return connection between said means and body, and an intermittent operating connection between said means and the

shouldered portion of the pin, all of which is now specifically described.

Reference being had now to Figures 1 to 3, inclusive, it will be observed that the "hook" is characterized primarily by a longitudinally elongated body generally denoted by the numeral 40, the same being provided at one end with a torpedo accommodation hook having an appropriate seat to accommodate the conventional explosive. The central portion of the body is recessed to provide a cavity or chamber 43 to accommodate the correspondingly shaped slidable block-like body 44 of the slidable latch actuating unit. This part 44 is of the shape better shown in Figure 4 where it is provided on one edge with a notch 45 to accommodate an outbent lifting spring finger 46 as shown in Figure 2. These parts are concealed in the primary views by the removable cover plate 47. The shank portion 48 of the cable attaching eye 49 is threaded and fitted into the socket 50 in the upper end of the block. The return spring is indicated at 51 and is anchored on the body as denoted at 57. At its opposite end it is fastened to the block 44 as indicated at 53. This provides a simple arrangement whereby the spring is properly housed for sensitive control.

I call attention at this time to the numeral 54 in Figure 2 which indicates a laterally bent spring strip or element which is in effect a retaining pawl. The numeral 55 designates a passage in the bill portion of the hook to accommodate the latch pin 56. This pin as shown, for example, in Figure 2 is of a bodily removable and insertable type. The upper end portion 57 functions in one instance as a pilot element and in another instance as a finger gripping element. The intermediate portion is provided with notched longitudinally spaced elements 58 which function as teeth or shoulders. These are adapted to accommodate the lifting and return action of the flexible end of the lifting finger 46 as is evident in Figure 2. Also shown in Figure 2 is a guide notch or seat 59 for the adjacent end portion 57 of the latch pin. Then too, at 60 is a passage in the upper part of the body 40 which allows this portion 57 of the pin to pass therethrough and therebeyond in an evident manner. It takes this position (not shown) when the latch pin is completely released.

In operation, it is understood that the lifting and lowering cable (not shown) is attached to the eye 49. Then with the latch released, the explosive (not shown) is engaged over the hook 41 and drops into the seat 42. Now the operator takes the latch bolt or pin 56 and inserts the upper end 57 into the passage 55. It goes through this passage and up through the accommodating space between the parts as shown in Figure 2 where the upper end 57 is lodged temporarily in the guide groove 59. The notched or toothed portion 58 is thus disposed between the diametrically opposed flat springs 46 and 54 and the explosive is thus latched in place and lowered in an evident manner. When it reaches the bottom of the hole and the weight is temporarily relieved, the extended slide block 44 is pulled down under the tension of the spring 51, thus pulling the lifting finger 46 down beneath the first shoulder or tooth. Then by bodily lifting the entire assemblage, that is the hook as a unit, and the explosive hanging on it, the block 44 slides upwardly and in turn through the action of the finger 46 and pin, lifts the pin one notch. This action is repeated, that is, the lifting and lowering action is repeated until the finger 46 gradually disengages the latch pin 56 from the hook 41. While the pin goes upwardly the trigger or retaining element 54 holds it in set position.

In the preceding paragraph I have explained how the latch pin 56 is inserted at the bottom and gradually and progressively worked up through the accommodation bore. It is yet to be pointed out, however, that when this latch pin moves completely up to released position, the upper end 57 moves up into and beyond the passage 60. As said upper end 57 is projected beyond the extreme top of the body 40, it is then in a position to be grasped with the fingers and pulled out bodily to allow it to be reinserted as previously described.

It is thought that persons skilled in the art to which the invention relates will be able to obtain a clear understanding of the invention after considering the description in connection with the drawing. Therefore, a more lengthy description is regarded as unnecessary.

Minor changes in shape, size and rearrangement of details coming within the field of invention claimed may be resorted to in actual practice, if desired.

Having thus described the invention, what is claimed as new is:

1. In a structure of the class described, a recessed body provided at one end with a hook, said body being further provided with aligned passages cooperable with the hook, a block-like member slidable in said recess, spring connecting means between the block-like member and adjacent portion of the body, cable attaching means connected with said block-like member, a spring lifting finger carried by said block-like member, a multiple shouldered latch pin mounted in the passages and bodily insertable and removable, said lifting finger being engageable therewith, and retaining means for said pin.

2. As a component part of a structure of the class described, an operating block notched on one edge and provided with aligned guide grooves, a lifting spring finger mounted in the notched portion, a return spring carried by said block, a cable eye attached to said block.

3. As a component part of a structural assemblage of the class described, a bodily insertable and removable latch pin, said pin being longitudinally elongated and of cylindrical cross sectional form from end to end, the intermediate portion of said pin being formed with longitudinally spaced conical portions defining longitudinally spaced annular spring detent accommodation and engaging shoulders, one end portion of the pin serving as a finger grip and pilot element, the opposite end portion of the pin serving as a guard for cooperation with an explosive lowering hook in the manner described.

4. As a component part of a structural assemblage of the class described, a longitudinally elongated body formed at one end with a lifting and lowering hook, said body being substantially centrally formed with a cavity to accommodate a relatively slidable complemental part, said body being further provided with a longitudinal bore extending from the top through the bottom in a manner to permit insertion and removal of a bodily detachable latch forming rod, and a resilient ratchet finger mounted in the body and having its effective ratcheting end projecting into said bore.

5. In a structural assemblage of the class described, a body formed at one end with an adapter hook, and having a longitudinal passage opening through its upper and lower ends, a ratcheting spring finger in the body having one end portion projecting into said bore, a companion relatively slidable unit cooperable with said body and having resilient spring connections therewith, said unit having a cable accommodation eye and a lifting finger opposed to said ratchet finger and projecting into said bore for cooperation with a latch pin in the manner and for the purposes described.

6. A torpedo placement hook of the class described comprising a body having a hook at one end thereof, the bill portion of said hook being formed with a latch pin passage, said body being provided with a complemental pin accommodation passage in alinement with said first-named passage and said complemental passage opening through the end of said body opposite to said hook, a bodily insertable and removable latch pin mounted in said passages and having a predetermined portion thereof bridging the mouth of said hook, said pin being provided with longitudinally spaced stop and lifting shoulders, a resilient detent fixedly mounted in the body and projecting into the adjacent portion of the passage for engagement with the shoulders on said pin, a pin actuating member slidably mounted on said body and provided with a cable connection, and a spring lifting finger carried by said actuating member and opposed to said detent and intermittently engageable with said shoulders as described.

7. A torpedo placement hook construction of the class described comprising a hook-equipped body, formed with a latch pin bore, a resilient check forming detent mounted in said body and projecting into said bore, a latch pin slidably mounted in said bore and provided with longitudinally spaced shoulders with which the detent is progressively engageable to retain the pin in successive adjusted positions, a latch pin actuating member slidably mounted on said body and provided with a cable connection, a spring return connection between said actuating member and body and a spring lifting finger carried by said actuating member and projecting into said bore and intermittently engageable with the shoulders on said pin.

8. A torpedo placement hook construction of the class described comprising a hook-equipped body having a latch pin accommodating bore, a multiple shouldered latch pin slidably mounted in said bore, detent means mounted on the body and progressively engageable with the shoulders on said pin to hold the pin in successive adjusted positions, pin actuating means slidably mounted on said body, a cable connection carried by said means, a spring return connection between the means and body, and an intermittent operating connection between said means and the shoulders on said pin in the manner and for the purposes described.

DEL BAKER.