Nov. 17, 1953 H. L. TRAUTMANN 2,659,273

HARPOON

Filed Aug. 16, 1948 2 Sheets-Sheet 1

Fig. 1.

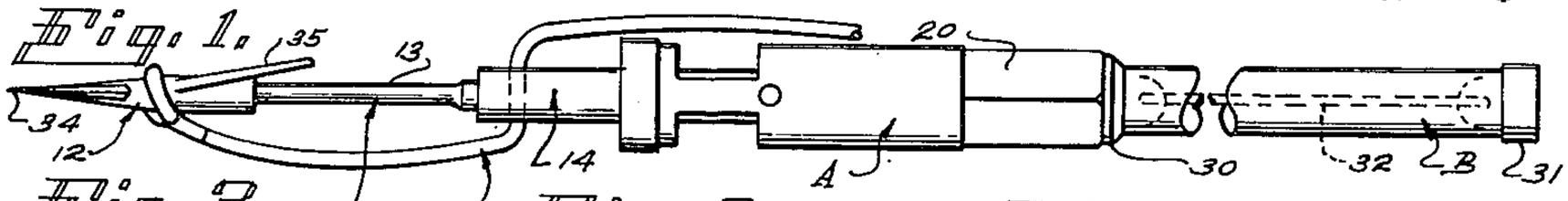

Fig. 3.

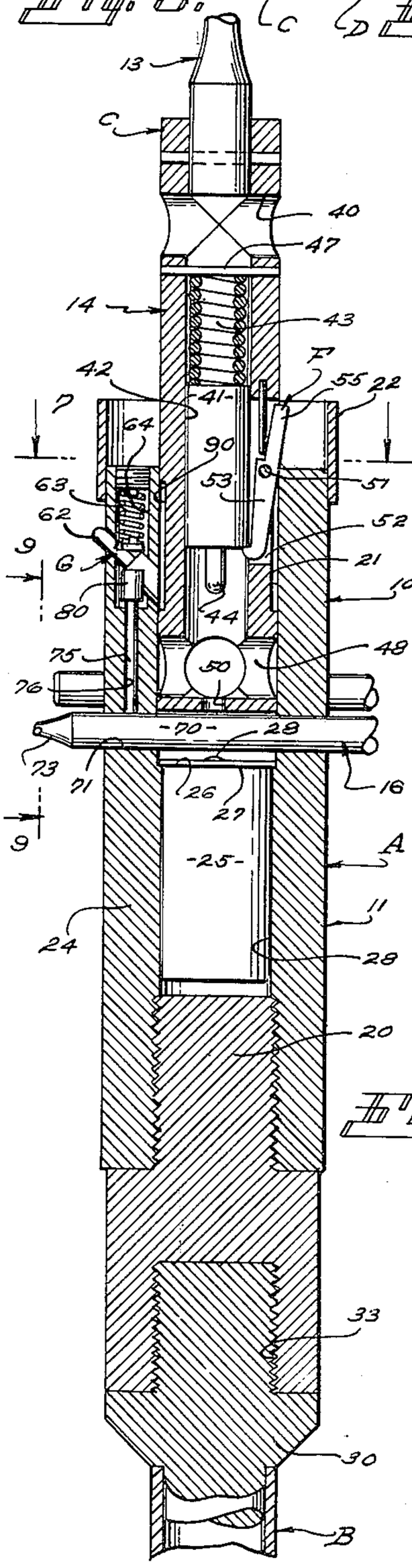

Fig. 2.

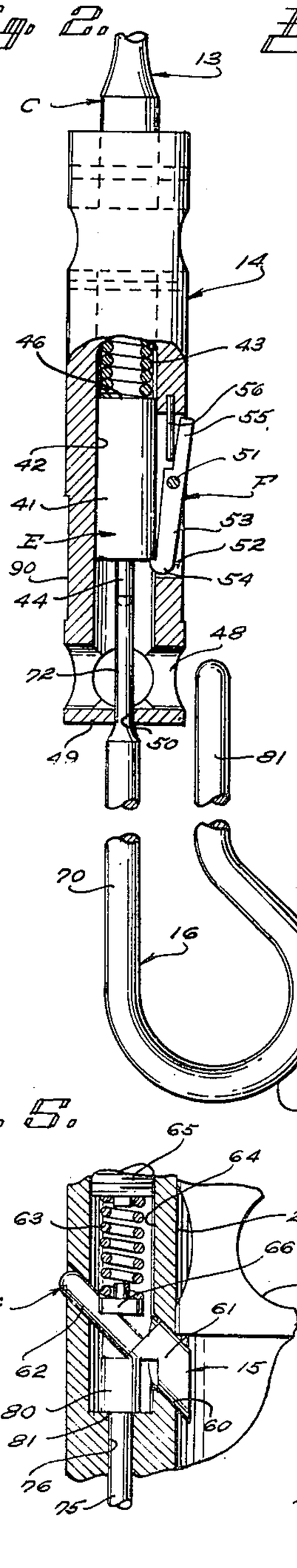

Fig. 4.

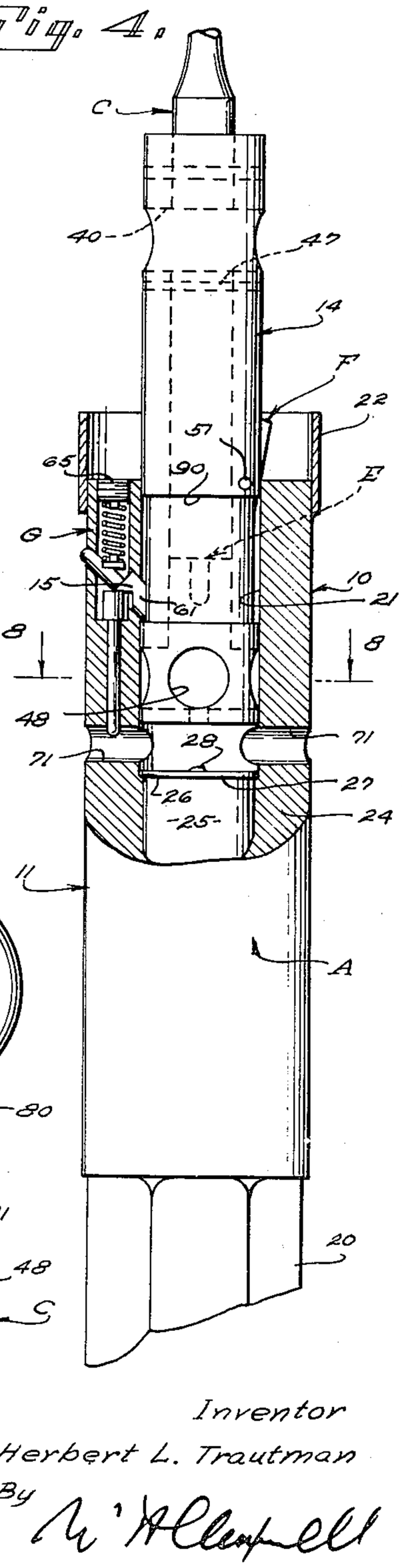

Fig. 5.

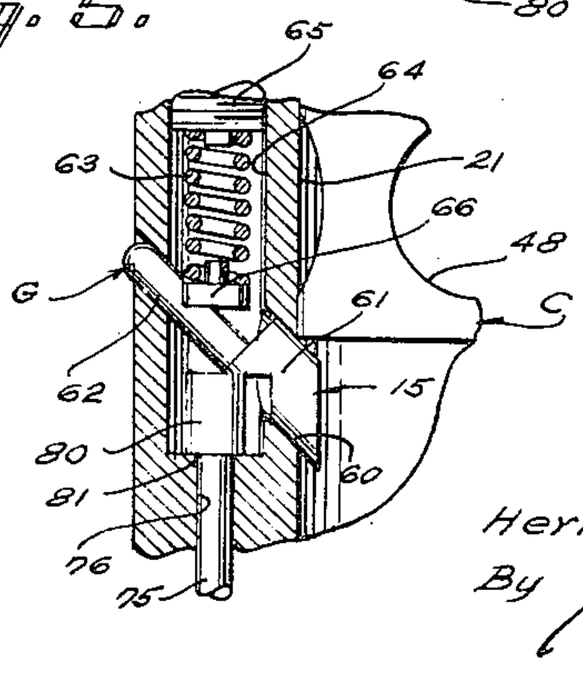

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Fig. 6.

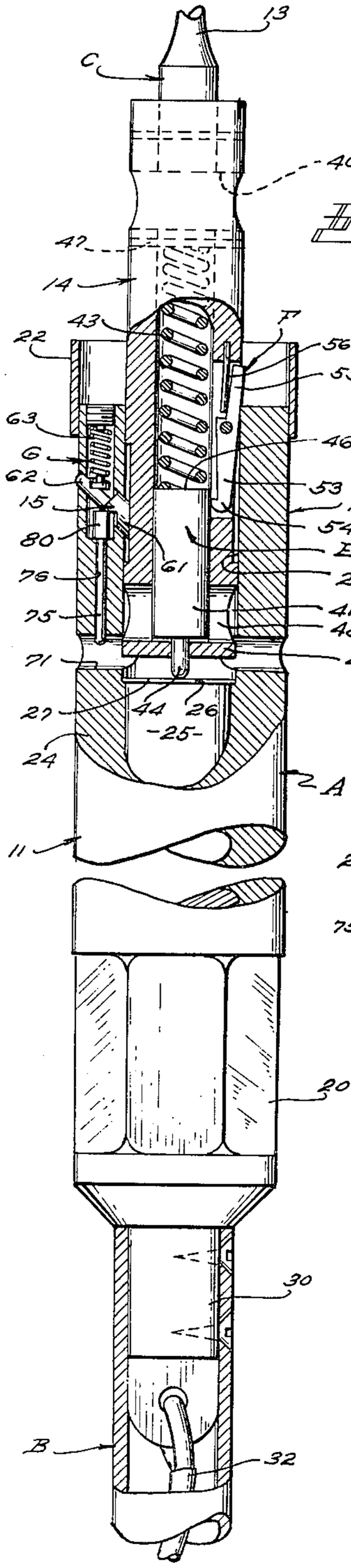


Fig. 7.

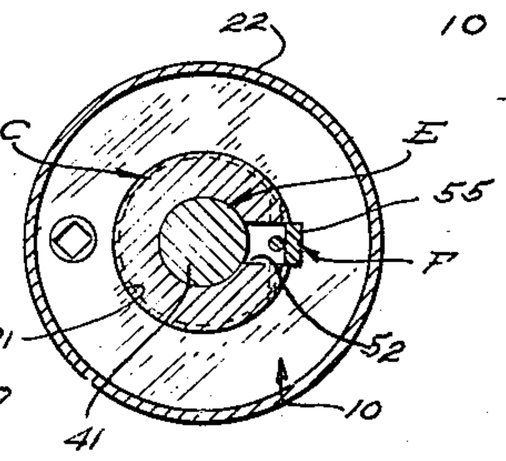


Fig. 8.

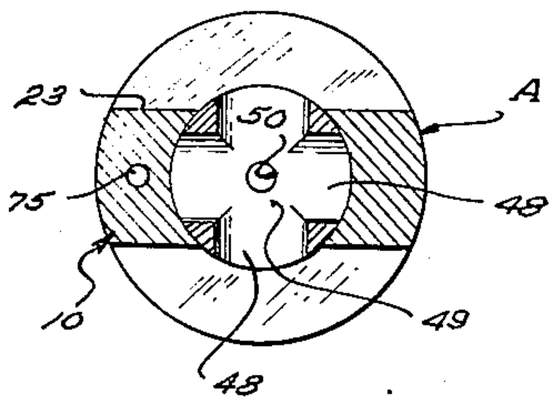


Fig. 9.

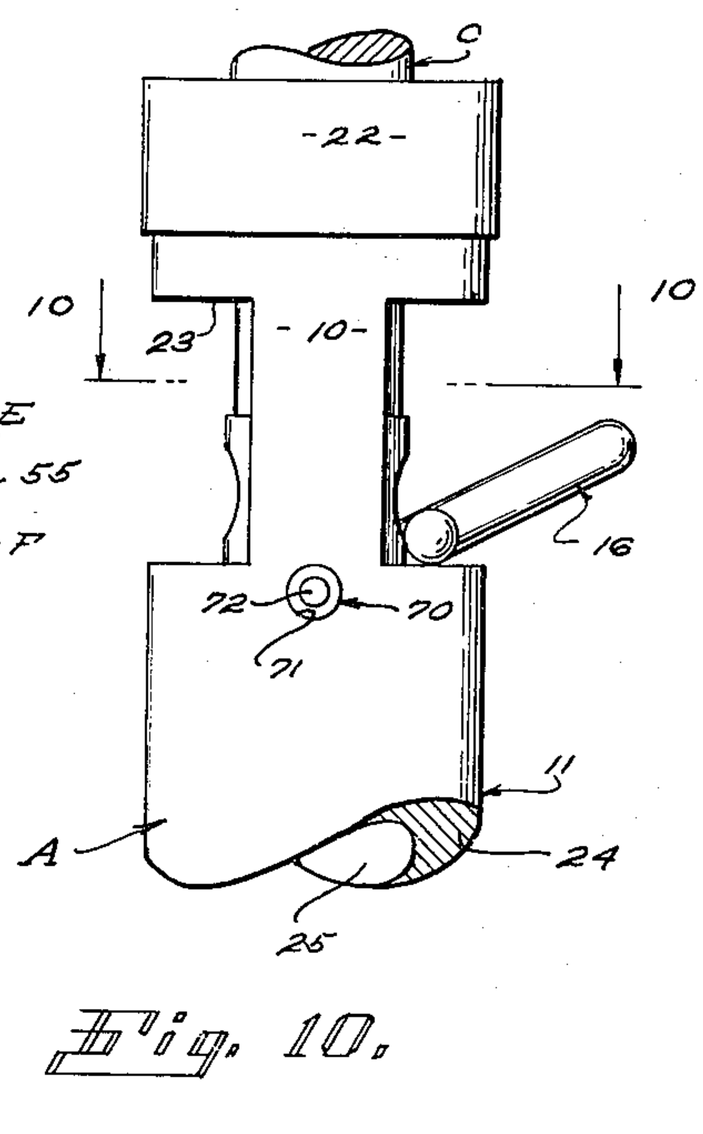
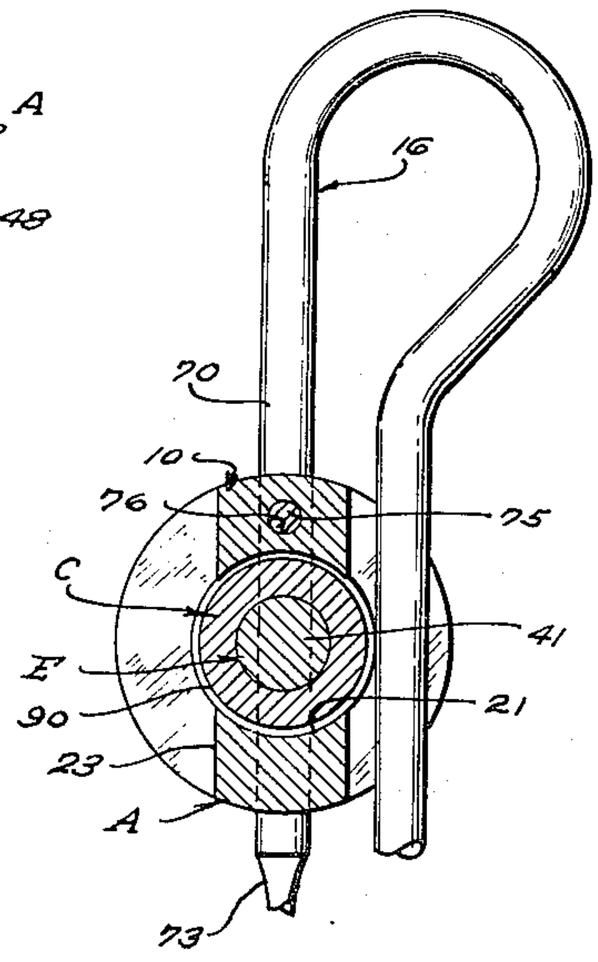


Fig. 10.



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UNITED STATES PATENT OFFICE

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HARPOON

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Application August 16, 1948, Serial No. 44,505

9 Claims. (Cl. 89—1)

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This invention is concerned with a harpoon, it being a general object of the invention to provide a structure which is safe, effective and accurate for the taking of prey where the prey may be approached to a point where an implement wielded by the user can be operated to strike the prey.

The device provided by the present invention is such as to be particularly useful and practical for the taking of large fish, for example, sword fish, and it therefore may be referred to in this connection and the device shown and described is particularly suitable for such use. However, it is to be understood that the structure may be used on any form or type of prey whether on land or at sea, and that modifications or variations in the construction may be made as circumstances require.

It is a general object of this invention to provide a structure which involves, generally, a charge carrying barrel provided with a shank and such that it may be manipulated or wielded toward the prey to be taken, and a projectile carried by the barrel and related thereto through means causing the charge to ignite and thrust the projectile into the prey upon the projectile being brought into contact with the prey with pressure such as may be readily generated by the operator.

Another object of this invention is to provide a structure of the general character referred to wherein a hammer is supported by or carried on the projectile. With the construction provided by the present invention the charge is placed in the barrel and is so located that it cannot become ignited or discharged until such time as the projectile with the striking device set has been arranged in a predetermined position relative to the barrel.

Another object of this invention is to provide a safety mechanism relating a charge carrying barrel and a hammer carrying projectile so that these elements cannot be positioned ready for operation until a safety pin has been applied to the barrel in a predetermined manner and the projectile with the hammer cocked has been applied to the barrel while the safety pin is in place.

The various objects and features of my invention will be fully understood from the following detailed description of a typical preferred form and application of the invention, throughout which description reference is made to the accompanying drawings, in which:

Fig. 1 is a view of a structure embodying the present invention showing the body carried on a

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shank and carrying a projectile ready for operation. Fig. 2 is a side elevation of a portion of the projectile with parts broken away to show in section and showing the safety pin provided by the present invention being employed to set the hammer or striker which is carried by the projectile. Fig. 3 is a detailed sectional view showing a portion of the projectile, with the striker set, applied to the body which is carried by the manipulating shank while the safety pin is engaged with the body enabling the projectile to be engaged with the body ready for operation. Fig. 4 is a view of parts shown in Fig. 3, a portion of the structure being shown in section and the safety pin being removed so that the mechanism is ready for operation. Fig. 5 is an enlarged detailed sectional view of a portion of the structure shown in Fig. 4. Fig. 6 is a view similar to Fig. 4 showing the projectile operated relative to the body from the position shown in Fig. 4 in such manner as to release the striker and showing the striker fully operated so that it engages the cap of the charge carried by the body. Fig. 7 is a detailed sectional view taken as indicated by line 7—7 on Fig. 3. Fig. 8 is a transverse sectional view taken as indicated by line 8—8 on Fig. 4. Fig. 9 is a side elevation of the part shown in Fig. 3, being a view taken in the direction indicated by line 9—9 on Fig. 3, and Fig. 10 is a plan view taken in the direction indicated by line 10—10 on Fig. 9.

The structure provided by the present invention involves, generally, a body A including a barrel portion 10 and a charge holder 11, a carrier B for the body, preferably in the form of a shaft or rod, a projectile C characterized by a head 12 and a shank 13 which shank has an extension 14 engaged in the barrel 10, a retrieving line D attached to the projectile, a hammer or firing pin E carried by the extension 14, control means F for the firing pin E, and a safety mechanism G characterized, generally, by a stop 15 and a safety pin 16 which elements are cooperatively related to limit entrance of the projectile into the barrel 10 unless the safety pin is in place and obstructing engagement of the firing pin is in place and obstructing engagement of the firing pin with the charge carried by the body should an attempt be made to apply the projectile to the body with the safety pin in place and the firing pin in an actuated position.

The body A of the structure serves primarily as a mounting or carrier for the projectile and the safety mechanism G and in its preferred form its principal portions, namely the barrel

10 and charge holder 11, are integrally connected or are formed of a single body of material. As shown in the drawings an elongate tubular element forms the barrel 10 and charge holder 11 and the plug or closure 20 which closes the inner end of the charge holder 11 serves as a coupling by which the body A is joined to the carrier B.

The barrel 10 may be a simple, straight tubular part with a bore 21 fastened or proportioned to slidably receive the extension 14 of the projectile shank 13. In the preferred form of the invention a projecting lip or guard 22 extends from the outer end of the barrel to shield the means F and one or more lateral openings or passageways 23 are provided in the body at its inner end portion or adjacent the point where it is joined to the charge carrier 11 allowing free circulation of fluid so that operation of the firing pin is not retarded when the device is operated as hereinafter described.

The cartridge holder 11 is characterized by a cylindrical side wall 24 defining an opening 28a receiving a cartridge or charge 25 introduced into a position through the barrel 10. In the preferred arrangement a shoulder 26 is provided in the charge holder at or near the point where the holder joins the barrel 10, the shoulder being such as to receive the flange or ridge 27 provided on the charge 25. In practice the charge 25 may be a body of suitable powder carried in a case such as is employed in a shotgun shell or the like, and a centrally located cap 28 is provided at the end of the charge facing the barrel 10. The charge holder A includes the plug 20 which closes the inner end of the holder and, as shown in the drawings the plug may be threaded into the opening 28a provided in the holder.

The carrier B serves as an element or implement by which the structure may be manipulated and in a typical application of the invention it is a long rod or shaft that enables the user to so manipulate the structure as to thrust the projectile into contact with the object to be taken or pierced by the projectile. In the drawings I have shown the carrier B as a tubular rod closed at its end by fittings 30 and 31, which fittings are joined by a safety tie 32 extending through the tubular rod. In practice the rod may be light and in the event that it should fail the safety tie 32, which may be extended to a point to which it is secured, enables the body to be retrieved. In the particular case illustrated the fitting 30 of the carrier B is shown joined to the plug 20 by a threaded connection 33 which enables the carrier and plug to be separated when desired.

The projectile C may, in practice, vary widely in form and construction depending upon the service to be performed. In the case illustrated the projectile is shown as having a head 12 with a sharpened tip 34 and with projecting barbs 35. The head is carried by the elongate shank 13 and the extension 14 of the shank is in the nature of an enlargement on the end of the shank remote from the head 12. In the preferred arrangement illustrated the retrieving line D which, in practice, has one end anchored at or near the operator, is engaged through an opening 40 provided transversely through the shank extension 14 and it is extended forward from the extension 14 to the head 12 where it is made secure or is anchored.

The firing pin E is shown as involving a plunger 41 slidably carried in a guideway 42 formed longitudinally in the extension 14 of the

projectile, an actuating spring 43 for operating the plunger and a striker 44 projecting from the plunger.

The guideway 42 is a central longitudinal opening or bore in the extension 14 and the plunger 41 is a round element slidably carried in the bore. The spring 43 is a compression spring, preferably a helical spring, under compression between the forward end 46 of the plunger 41, and a stop pin 47 extending transversely across the forward end portion of the bore 42. At the rear end portion of the extension 14 there are lateral vent openings 48 which occur opposite the side openings 23 in the barrel 10 when the projectile is in working condition in the barrel 10. Further, at the inner end of the barrel there is a guide member or wall 49 with an opening 50 centrally located and adapted to slidably pass the striker 44. When the firing pin has been operated to a position such as is shown in Fig. 6 the striker 44 projects through the opening 50 and engages the cap 28. When the firing pin is cocked or set ready for operation the plunger 41 is forward in the guideway or bore 42 so that the spring moves the plunger a substantial distance rearwardly, allowing it to gain momentum before the striker engages the cap 28. In the preferred form of the invention the opening 40 through the extension 14 and passing the retrieving line D is at the forward end portion of the extension and is in communication with the forward end of the bore 42. The line D fits the opening 40 with enough clearance so that fluid, either air or water, is admitted into the bore 42 as the plunger 41 is operated rearwardly by the spring 43.

The control F for the firing pin is preferably a spring controlled latch and in the form illustrated it involves a lever type latch carried on a pivot pin 51 in a side opening 52 provided in the extension 14. The pivoted lever has an arm 53 with a hook-like head 54 engaged with the rear end of the plunger 41 when the control is set and it has an arm 55 projecting from the exterior of the extension 14 when the control is set. A suitable spring 56 normally yieldingly holds the pivoted lever in a position to catch and hold the plunger 41 in the set or retracted position such as is shown in Figs. 2 and 3 of the drawings. The arm 53 which catches and holds the plunger 41 projects rearwardly while the arm 55 projects in a forward direction and is such as to offer some resistance to inward movement of the extension 14 in the barrel 10. However, when sufficient pressure is applied the extension 14 will move inwardly in the barrel 10 from the position shown in Fig. 3 and when it does so the arm 55 is depressed, with the result that the arm 53 is disengaged from the plunger 41. When the plunger 41 is thus released the spring 43 is free to act and force the striker into engagement with the cap.

The safety mechanism G involves two principal elements, the stop 15 and the safety pin 16. The stop 15 prevents introduction of the extension into place in barrel 10 except when the safety pin is in place and it is carried by the barrel 10 and is slidably carried in a guideway 60 formed at an angle or so that it is pitched relative to the longitudinal axis of the structure. The angle or pitch of the stop is such that it is pushed out or released by outward movement of extension 14. The stop involves a head 61 which normally extends inwardly and rearwardly into the bore 21 in the barrel 10 while a stem 62 projects outwardly and forward from the head 61. A spring

63 is carried in a chamber 64 provided in the wall of the barrel 10 and is under compression between a stop 65 and a plate 66 that bears on the stem 62. The action of the spring 63 is such as to normally yieldingly hold the head 61 in a position where it projects inwardly into the bore 21 of the barrel 10 as clearly shown in Figs. 4 and 5 of the drawings. When he head 61 of the stop 15 is in its normal position, as shown in Fig. 5, the extension of the projectile cannot be introduced into the barrel 10 far enough to be ready for operation since the end of the extension 14 engages the head 61 in the manner shown in Fig. 5.

The safety pin 16 has a pin or key-like portion 70 adapted to be slidably inserted in an opening 71 extending transversely through the body A at a point where the barrel 10 joins the charge carrier 11. The key portion 70 of the pin has a reduced tip portion 72 joined to the portion 70 by a tapered portion 73.

A push rod 75 is slidably carried in a longitudinal guideway 76 provided in the wall of the barrel 10, the guideway 76 being located to intersect the transverse opening 71 and the push rod being such as to normally project down into the openings 71. When the safety pin is introduced into position in connection with the body, as shown in Figs. 3, 9 and 10 of the drawings, the reduced end portion 72 engages under the push rod 75 following which the inclined portion 73 pushes the rod 75 up until finally the key portion 70 engages under the push rod. A head 80 on the upper end of the push rod engages a downwardly facing shoulder on the head 61 so that when the push rod 75 is moved up through the action just described the head 61 is retracted from the bore or opening 21 of the barrel 10. When the head 61 of the stop 15 is thus withdrawn or retracted the extension 14 of the projectile may be introduced into the barrel 10 until the end part 49 of the extension seats against the key portion 70 of the safety pin. It will be apparent that if the firing pin has not been set preliminary to the extension being introduced into the barrel 10 the striker 44 will project from the end of the extension in such manner as to engage the key portion 70 of the safety pin and the operator will feel this engagement and know that the device is not cocked.

To cock the firing pin preliminary to the extension being introduced into the barrel 10 to the position shown in Fig. 3 the reduced extension 72 of the safety pin may be introduced through the opening 50 to engage the striker 44 and depress it until the plunger 41 is caught and held by the control F. The manner in which the safety pin may be employed to cock the firing pin is illustrated in Fig. 2 of the drawings.

In accordance with the preferred form of the invention the safety pin has a loop shaped handle portion 80 projecting from the key portion 70 and an arm 81 projects from the handle portion 80 to extend into one of the side openings 23 of the barrel 10 when the key is engaged in the opening 71, as shown in Figs. 3, 9 and 10 of the drawings. The arm 81 is proportioned to slidably or frictionally engage the side of the projectile extension 14 and thus releasably retain the projectile as clearly shown in Figs. 1, 9 and 10. When the firing pin is thus in position or cocked and the projectile 14 is in position ready for use the safety pin is positioned as shown in Fig. 3 and the projectile is effectively held against displacement from the barrel 10 and the structure can be handled with safety and without danger of the

projectile being struck in such manner as to cause undesired operation of the device. It will be apparent that the device cannot operate under any circumstances until the safety pin 16 has been removed. With the firing pin cocked and the extension 14 engaged in the barrel 10 as shown in Fig. 3, the device is made ready for operation by simply withdrawing the safety pin. When the safety pin has been withdrawn the stop 15 is released to project into the bore 21 of the barrel 10 and it enters a reduced or undercut portion 90 of the extension 14. The undercut portion 90 is of such extent as to allow the extension 14 of the projectile to move freely inward in the barrel 10 until such time as the control F has been operated to release the plunger 41. As above pointed out, the arm 55 of the control F offers some resistance to inward movement of the extension 14 in the barrel 10. However, this resistance is not such as to prevent movement necessary to effect release of the means F when the head of the projectile strikes the object against which the device is thrust.

From the foregoing description it will be apparent that the charge or cartridge 25 may be readily placed in the charge holder 11 by being dropped or introduced into place through the barrel 10. When the charge is in place the firing pin E is cocked by introduction of the safety pin through the opening 50 in the manner shown in Fig. 2 of the drawings. With the firing pin thus set or cocked and with the safety pin inserted in the opening 71 the extension 14 of the projectile may be introduced into the barrel 10 until the arm 55 of the control F is protected by the guard 22 and the end port 47 of the extension is in engagement with the key portion 70 of the pin. The safety pin may be left in this position and the device handled freely and with perfect safety until such time as the operator wishes to thrust the projectile into engagement with the prey. At this time the safety pin is removed or disengaged. The structure is manipulated by means of the carrier B so that the projectile is thrust into pressure engagement with the prey in such manner as to cause the extension 14 of the projectile to move inwardly in the barrel 10 until the control F is released. When the control F is released the plunger 14 is moved by the spring 43 so that the striker 44 engages and operates the cap. When the cap 28 is operated the charge 25 is ignited and the extension 14 is driven out of the barrel 10 and through or into the prey. The retrieving line D being anchored or attached to the projectile is effectively anchored in or to the prey making it possible for the operator to readily retrieve the prey. It is to be observed that when the charge is ignited it is directed toward the prey and the force or explosive action of the charge may, in many cases, effectively stun the prey, making it easy to take.

Having described only a typical preferred form and application of my invention, I do not wish to be limited or restricted to the specific details herein set forth, but wish to reserve to myself any variations or modifications that may appear to those skilled in the art and fall within the scope of the following claims.

Having described my invention, I claim:

1. Apparatus of the character described including, a body with an elongate opening adapted to receive a holder carrying an explosive charge, a projectile separable from the body and having a portion slidably engageable in the opening to be driven therefrom by operation of the charge,

a spring actuated firing pin carried by the projectile and shiftable therewith and adapted to be operated relative thereto and relative to the holder to ignite the charge in the holder a control latch carried by the projectile and releasably holding the pin in an unactuated position and releasable by movement of the projectile relative to the barrel, and a safety means limiting insertion of said portion into the opening and including, a releasable stop carried by the body and engageable with the said portion of the projectile and adapted to normally project into the opening and limiting insertion of said portion into the opening, and a key engageable with the body and adapted to release the stop and limit insertion of said portion into the opening.

2. Apparatus of the character described including, a body with an elongate opening and carrying an explosive charge, a projectile separable from the body and having a portion engageable in the opening to be driven therefrom by operation of the charge, a firing pin carried by the said portion and shiftable therewith toward the charge and adapted to operate relative thereto to ignite the charge, a control latch pivotally carried by the projectile and normally releasably holding the firing pin against operation and adapted to engage and be released by the barrel, and a safety means limiting insertion of said portion into the opening and including, a releasable stop normally yieldingly held in position where it projects into the opening, the stop being retractable from the opening by the said portion of the projectile upon outward movement of said portion in the opening and forming a first positive stop checking inward movement of said portion in the opening, and a key releasably engaged with the body adapted to engage and release the stop and forming a second stop positively checking insertion of said portion into the opening.

3. Apparatus of the character described including, a body having a barrel, and a holder carrying an explosive charge, a projectile having a portion engageable in the barrel to be driven therefrom by operation of the charge, a spring actuated striker carried by said portion and operating relative to the charge to engage and ignite the charge, a control for the striker releasably holding the striker against operation and released by movement of said portion inwardly in the barrel from a predetermined position, a stop carried by the barrel and normally yieldingly held in position to stop movement of said portion into the barrel to said position, and a pin engageable with the body releasing the stop and stopping said portion in the barrel at said position.

4. Apparatus of the character described including, a body having a barrel, and a holder carrying an explosive charge, a projectile having a portion engageable in the barrel to be driven therefrom by operation of the charge, a spring actuated striker carried by said portion and operating relative to the charge to ignite the charge, a control for the striker releasably holding the striker against operation and released by movement of said portion inwardly in the barrel from a predetermined position, a stop carried by the barrel and normally yieldingly held in position to stop movement of said portion into the barrel to said position, and a pin engageable with the body to extend between the striker and charge, releasing the stop and stopping said portion in the barrel at said position.

5. Apparatus of the character described including, a body having a barrel, and a holder carrying an explosive charge, a shaft carrying the body, a projectile having a portion engageable in the barrel to be driven therefrom by operation of the charge, a spring actuated striker carried by said portion and operating relative to the charge to ignite the charge, a control for the striker releasably holding the striker against operation and released by movement of said portion inwardly in the barrel from a predetermined position, a stop carried by the barrel and normally yieldingly held in position to stop movement of said portion into the barrel to said position, and a pin engageable with the body releasing the stop and stopping said portion in the barrel at said position.

6. Apparatus of the character described including, a body having a barrel, and a holder carrying an explosive charge, a projectile having a portion engageable in the barrel to be driven therefrom by operation of the charge, a spring actuated striker carried by said portion and operating relative to the charge to ignite the charge, a spring actuated control lever for the striker releasably holding the striker against operation and released by movement of said portion inwardly in the barrel from a predetermined position, a stop carried by the barrel and normally yieldingly held in position to stop movement of said portion into the barrel to said position, and a pin engageable with the body releasing the stop and stopping said portion in the barrel at said position.

7. Apparatus of the character described including, a body having a barrel, and a holder carrying an explosive charge, a projectile having a portion engageable in the barrel to be driven therefrom by operation of the charge, a spring actuated striker carried by said portion and operating relative to the charge to ignite the charge, a control for the striker releasably holding the striker against operation and released by movement of said portion inwardly in the barrel from a predetermined position, a spring actuated stop carried by the barrel and normally yieldingly held in position to stop movement of said portion into the barrel to said position, and a pin engageable with the body releasing the stop and stopping said portion in the barrel at said position.

8. Apparatus of the character described including, a body having a barrel, and a holder carrying an explosive charge, a projectile having a portion engageable in the barrel to be driven therefrom by operation of the charge, a spring actuated striker carried by said portion and operating relative to the charge to ignite the charge, a control for the striker releasably holding the striker against operation and released by movement of said portion inwardly in the barrel from a predetermined position, a stop carried by the barrel and normally yieldingly held in position to stop movement of said portion into the barrel to said position, and a pin engageable with the body releasing the stop and stopping said portion in the barrel at said position, the pin having an arm extending therefrom and engaging the projectile to resist separation of the projectile from the body.

9. Apparatus of the character described including, a body having a barrel, and a holder carrying an explosive charge, a shaft carrying the body, a projectile having a portion engageable in the barrel to be driven therefrom by op-

eration of the charge, a spring actuated striker carried by said portion and operating relative to the charge to ignite the charge, a spring actuated control lever for the striker releasably holding the striker against operation and released by movement of said portion inwardly in the barrel from a predetermined position, a spring actuated stop carried by the barrel and normally yieldingly held in position to stop movement of said portion into the barrel to said position, and a pin engageable with the body releasing the stop and stopping said portion in the barrel at said position, the pin having an arm extending therefrom and engaging the projectile to resist separation of the projectile from the body.

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