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Gunnebobruk, Sweden
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 [31] **16953/67**

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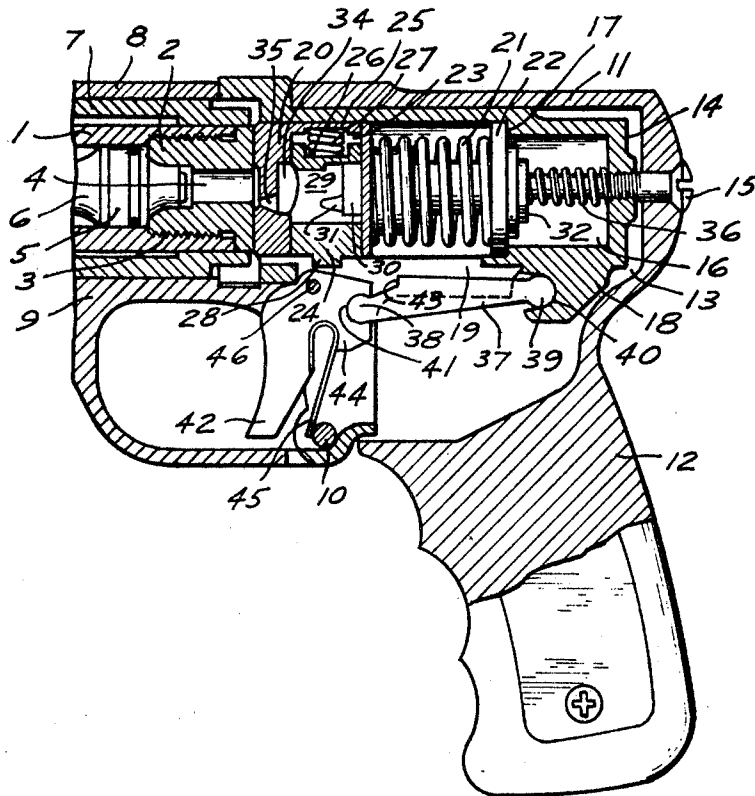
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[54] **DEVICE FOR NAILING GUN**
2 Claims, 5 Drawing Figs.

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 [51] Int. Cl..... B25c 1/14
 [50] Field of Search..... 227/8, 9,
 10, 11; 124/31; 42/69, 69 A

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ABSTRACT: A nail-driving gun comprises a bolt mounting the striker pin and retractable jointly with the barrel of the gun relative to the casing of the gun. The striker pin is actuated by pulling the trigger of the gun but is normally held by the bolt in a position in which it cannot be actuated by the trigger. Retraction of the barrel for purpose of driving a nail places the bolt and thus the striker pin into a position in which the pin can be actuated by the trigger. For this purpose, a rigid link bar is hinged at one end to the casing of the gun and at the other end to the trigger. The link bar is positioned opposite to the bolt when the latter is retracted. Pulling of the trigger pivots the link bar into pressure engagement with the bolt thereby displacing the same transverse of the barrel axis into a position in which the striker pin is positioned for effecting firing of the gun by pulling of the trigger.



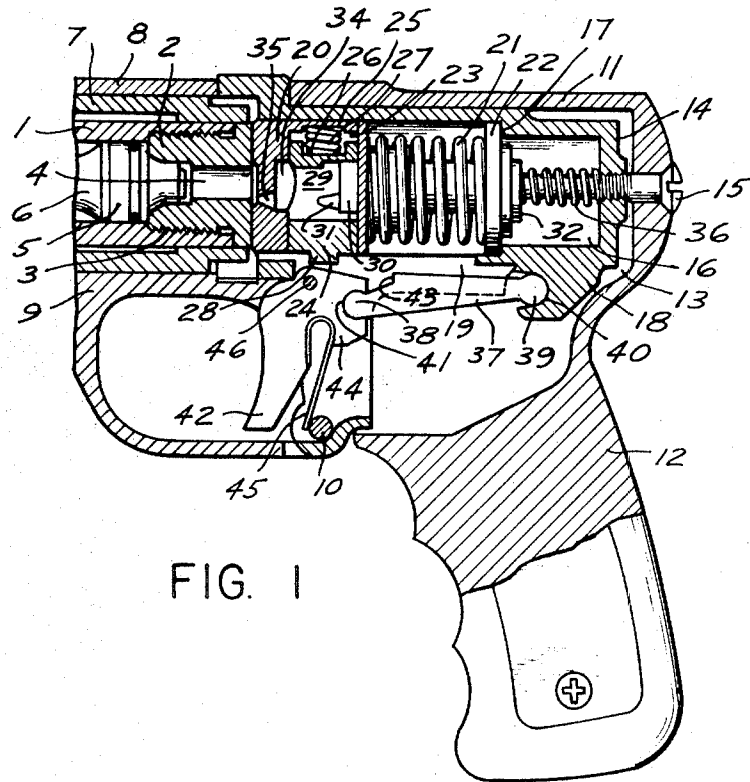


FIG. 1

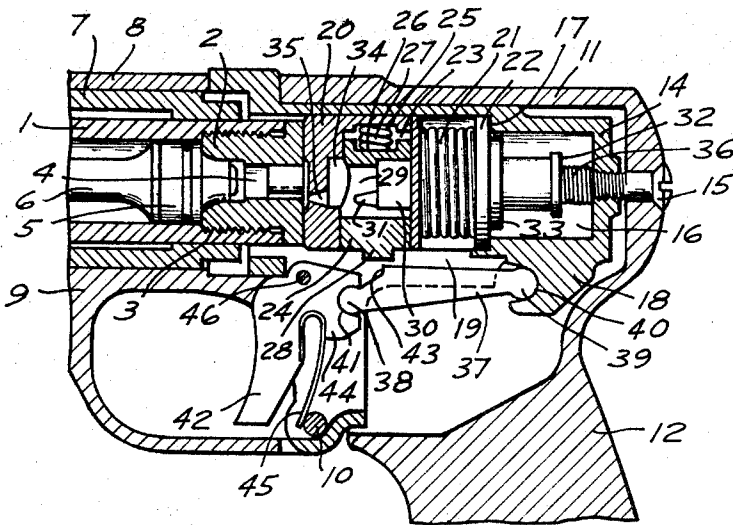


FIG. 2

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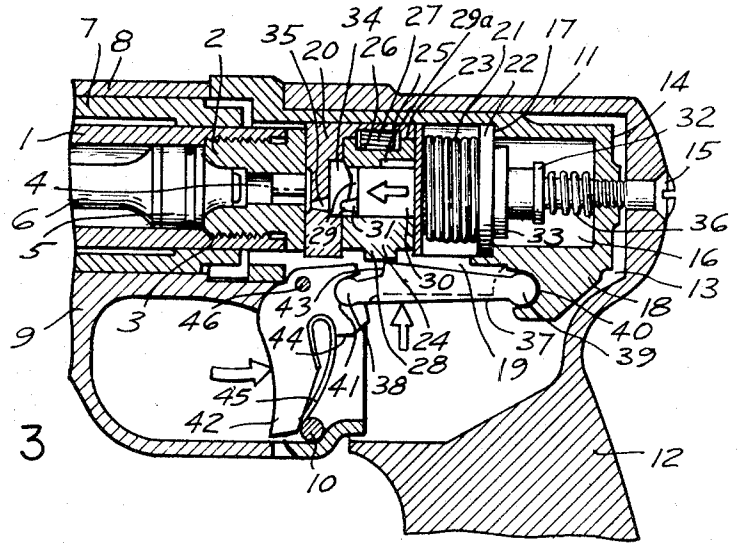


FIG. 3

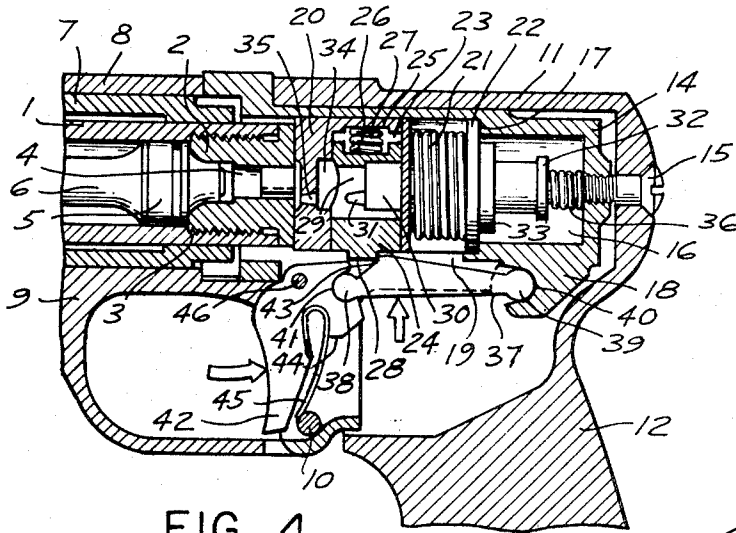


FIG. 4

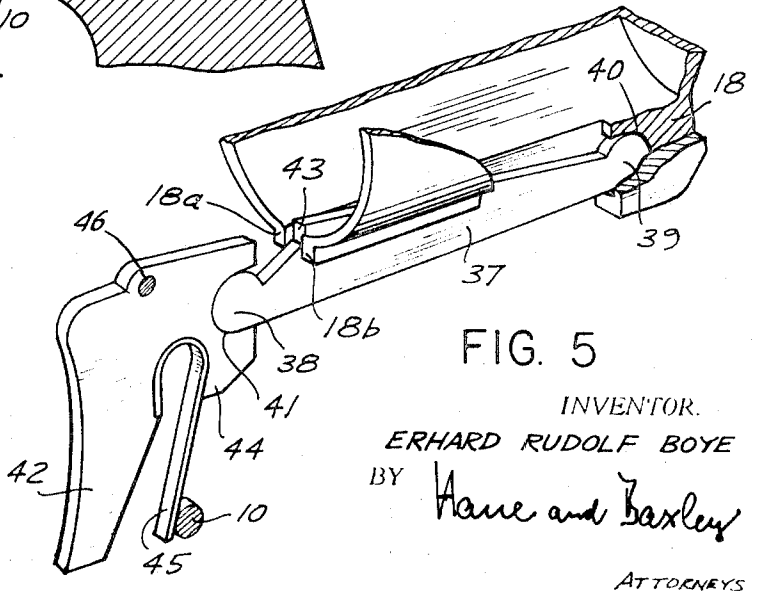


FIG. 5

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DEVICE FOR NAILING GUN

The present invention relates to a nailing gun, and then particularly to an arrangement for a trigger mechanism. The invention particularly relates to a nailing gun of the type described in Swedish Pat. No. 216,217 Such a gun is provided with a barrellike part and with a handle part similar to that of a conventional pistol grip. In the front part of the barrel a nail is placed, which is acted upon by a striking bar which is arranged at a bolt which is movable in the barrel. The bolt is propelled by a cartridge which is placed in the rear part of the barrel. The cartridge is fired by a firing mechanism, which is arranged in the pistol grip, and in a cylindrical cavity, the axis of which coincides with the axis of the barrel. The firing mechanism has a striker pin to which a movement can be imparted through a hole in a cylindrical unit which is movable in said cavity in the grip. The movement of the striker pin is controlled by a spring-actuated transversely movable bolt in said cylindrical unit. The extent of the movement of said bolt should be kept short, in order to reduce the space required for the firing mechanism to a minimum thereby providing a light and easily handled tool with small external dimensions. Furthermore, the bolt must constitute a reliable blocking for the striker pin in case the muzzle part of the tool should be subjected to heavy shocks or impacts in an axial direction. Due to these two requirements the spring which actuates the bolt must be dimensioned for a relatively high-pressing force. This, however, has the disadvantage that the transversely movable bolt will be difficult to operate directly by means of a trigger.

The purpose of the present invention is to facilitate the operation of the trigger with a firing mechanism which is safe for a high-impact energy. According to the invention, this is achieved by causing the trigger to act upon one end of a link bar, the other end of which is movably supported in a fixed part of the pistol grip said link bar actuates said transverse bolt by engaging the same at an intermediate portion of bar.

According to an advantageous embodiment of the link bar, the same is provided with a more or less vertical shoulder surface for coaction with said transverse movable bolt, and particularly with a stud on same. It is assumed, as is described in Swedish Pat. No. 216,217, that said bolt cannot be actuated by the trigger until it has reached a predetermined position in axial direction in relation to the direction of the barrel. Due to the shoulder surface, firing can be prevented when the trigger is actuated while said transversely movable bolt is moving towards the position in which axial movement of the bolt can take place.

The present invention will be described in more detail in connection with the attached drawings, in which:

FIG. 1 shows the rear part of a gun of the type described in Swedish Pat. No. 216,217 before the gun is readied for firing;

FIG. 2 shows the same part of the gun as in FIG. 1 but in the firing position;

FIG. 3 shows the same part as in FIG. 1 when the gun is fired;

FIG. 4 shows the same part of the gun as FIG. 1 but when the trigger of the gun is actuated and the barrel of the gun is in the firing position; and

FIG. 5 shows a perspective view of the part of the gun of FIG. 1 including the trigger mechanism.

In the figures, a cylindrical housing 1 constitutes the barrel of the gun. At the left-hand end (not shown), the barrel has a muzzle, into which a nail can be inserted in a conventional manner. At the inner end of the barrel, one end of a striking bar 6 is inserted fastened to a bolt 5 which is movable in said barrel 1. The right-hand end of the barrel is closed by a plug or bolt 2, which is screwed into place by means of threads 3 in the barrel 1. The bolt 2 has an axial bore 4 which a firing cartridge can be placed which when fired generates gas pressure propelling the bolt 5 to the left. The barrel 1 is encased by an outer sleeve or jacket 7 movable relative thereto. A ring 8 about the jacket mounts a trigger guard 9 to which a pin 10 is

secured. The handle or grip of the gun is rotatably supported on this pin and has a handle part 12 and an upper part 11. In said upper part 11 there is a cylindrical recess 13 into which a cylindrical sleeve 14 is inserted. This sleeve has along its lower part an axially extending protrusion 18, which is guided in a groove in the bottom of recess 13. The sleeve 14 is secured to the part 11 by means of a threaded screw 15, which is screwed into a hole in the bottom of the sleeve 14 and penetrates into a cavity 16 of the sleeve 14. The inner diameter of sleeve 14 is widened to define a shoulder 17. A lengthwise slot 19 in protrusion 18 defines two sidewalls 18a and 18b (FIG. 5). A cylindrical member 20 is axially slidable in the sleeve. One end of a spring 21 abuts against member 20 thereby biasing the same toward the left, the other end of the spring abutting against a washer 22 which, in turn, abuts against the previously mentioned shoulder 17. The cylindrical member or assembly 20 is provided with a vertical hole 23, which is open at its lower end but closed at its upper end. A movable bolt 24 is arranged in the hole. In the inner end of the bolt there is a recess 26, which is opposite a recess 25 in the closed end of the cylindrical member 20. Between the bottoms of these two recesses a spring 27 biases the bolt 24 downwardly. At its lower end the bolt 24 is provided with a nose or stud 28 for coaction with a link bar 37, which will be described in more detail in the following. The bolt 24 has a hole 29, transverse in relation to the direction of movement of the bolt. This hole has a shouldered surface 29a, as is shown in the figures, for coaction with a cylindrical striker pin 30, which has a point 31. The striker pin 30 is in the form of a tube which has at its right-hand end a flange 32 bearing against a flange 33. A spring 36 is interposed between flange 32 and the bottom of the sleeve 14. To the left the cylindrical member 20 has a recess 34 and a through hole 35 for passage of the striker pin 30 and its point 31.

The link bar 37 is arranged in slot 19, both ends of the bar forming pivots 38 and 39 respectively. Pivot 39 is supported in a socket 40 in the protrusion 18 and the pivot 38 is supported in a socket 41 in a trigger blade 42. The left end of the link bar is provided with a shoulder surface 43 for coaction with stud 28. The trigger blade is further provided with a recess 44 for a spring 45, the other end of which bears against pin 10. The trigger is pivotal about a pin 46.

The previously mentioned spring 27 has a strength such that it would be difficult to move the bolt 24 upwardly by means of a conventional trigger. The purpose of such heavy spring is to impede unintentional firing.

The gun as described above functions as follows. When a cartridge has been inserted in the hole 4 and a nail (not shown) has been placed in the previously mentioned muzzle, the barrel of the gun is pushed back by pressing the muzzle against an object. Rearward pushing of the barrel also moves the cylindrical member 20 back, thereby loading springs 21 and 36 as shown in FIG. 2, which shows the gun with the barrel in its pushed back position. In this position, the stud 28 is located directly below a flat surface of the link bar 37. When now the trigger is actuated as shown in FIG. 3, the bolt 24 is moved upwards, so that the striker pin loses contact with the shouldered surface 29a in hole 29 of the bolt 24. As a result, spring 36 forces the striker pin to move toward the left, so that the striker pin will enter into the recess 34 and its point into the hole 35 thereby firing the cartridge. Due to the provision of the link bar 37, the force required to pull the trigger 42 is reduced substantially in relation to what would have been the case if the trigger would act directly upon the stud 28. In a practical example of the device a reduction by 50 percent of the force on the trigger has been obtained.

The link bar according to the present invention is also advantageous for preventing firing when the trigger blade 42 is pulled. FIG. 4 shows such a situation. It is assumed that the user has pulled the trigger blade 42 and then in some way or other strikes some object with the muzzle of the gun so as to cause a rapid rearward movement of the barrel. The shoulder surface 43 will now engage the side surface of the stud 28, so

that firing is positively prevented. Due to its design and the arrangement of its supporting means, the link bar can absorb very great forces without being damaged.

It should be obvious that the firing mechanism as described in detail above may be varied in many respects without deviating from the concept of the invention, for instance, an increase in the force of the spring 27 may be compensated by an arrangement of the link bar so that a corresponding increase of the force as required to pull the trigger is not obtained.

I claim:

1. A nail-driving gun comprising in combination:

a casing mounting the trigger of the gun;

a barrel slidable in said casing;

an assembly secured to the barrel for axial movement in unison therewith, said assembly including a bolt and a striker pin and being displaceable transverse of the barrel axis by coaction with the trigger, said pin being displaceable relative to the bolt in the direction of the barrel axis for movement of the pin into a firing position;

a first spring means also included in said assembly biasing the bolt into a transverse position in which the striker pin is retained against displacement relative to the bolt;

a second spring means in the casing biasing the barrel in unison with the assembly into a rest position in which the bolt is in a position incapable of coacting with the trigger, axial pressure applied to the muzzle end of the barrel retracting the latter and the bolt relative to the casing

causing loading of the second spring means and positioning the bolt for coaction with the trigger; and

a rigid link bar hinged at one end to said casing and at the other end to said trigger, said link bar being positioned opposite to the bolt when the latter is positioned for coaction with the trigger, pulling of the trigger with the barrel in said retracted position pivoting said link bar about said one end thereof and into pressure engagement with the bolt for lifting the same against the action of the first spring means into a position in which the striker pin is released from said bolt and the second spring means are released for propelling the striker pin into the firing position, said bolt having on its side facing the link bar a nose engaged by the link bar when the latter is pivoted by pulling the trigger, and said link bar having on its side coacting with the bolt a shoulder defining a recess in said side, said recess and shoulder being positioned to be engaged by the nose when the trigger is pulled prior to retracting the barrel into the position in which the bolt is positioned for coaction with the trigger thereby positively preventing lifting of the bolt.

2. The nail-driving gun according to claim 1 wherein said link bar is positioned with reference to the bolt so that an intermediate portion of the bar is engageable with the bolt when the trigger is pulled after displacing the barrel by applying axial pressure to the muzzle end thereof.

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