

[54] GOLF BALL GUN WITH VALVE ADJUSTMENT AND TRIGGER LINKAGE

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[51] Int. Cl.F41f 1/04

[58] Field of Search.....124/11, 13 A, 15; 251/280

FOREIGN PATENTS OR APPLICATIONS

1,377,593	9/1964	France.....	124/11
82,288	1/1935	Sweden.....	251/280

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[57] ABSTRACT

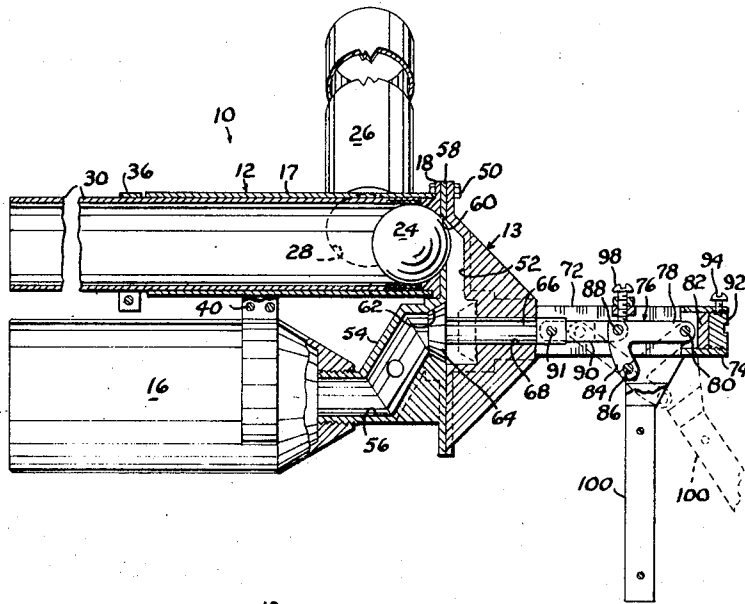
A ball holding magazine is connected with a gun barrel containing one ball in firing position. A housing supports the gun barrel and forms an air chamber, communicating with the ball to be fired, which communicates by an air passageway, with a reservoir containing air under pressure. A trigger operated valve, connected with the housing, opens the air passageway for applying reservoir pressure to the ball for firing. Minor adjustments may be made to the seating of the valve by the movement of a threaded nut, wherein the nut acts on the valve through an intermediate guide and linkage system. The linkage system also serves to connect the valve to a trigger handle.

[56] References Cited

UNITED STATES PATENTS

1,693,095	11/1928	Ritchie et al.....	251/280 X
2,574,408	11/1951	Moe.....	124/11
495,767	4/1893	Winans.....	124/11 X
2,626,124	1/1953	McCarthy.....	251/280
678,994	7/1901	Burroughs.....	251/280 X

1 Claim, 6 Drawing Figures



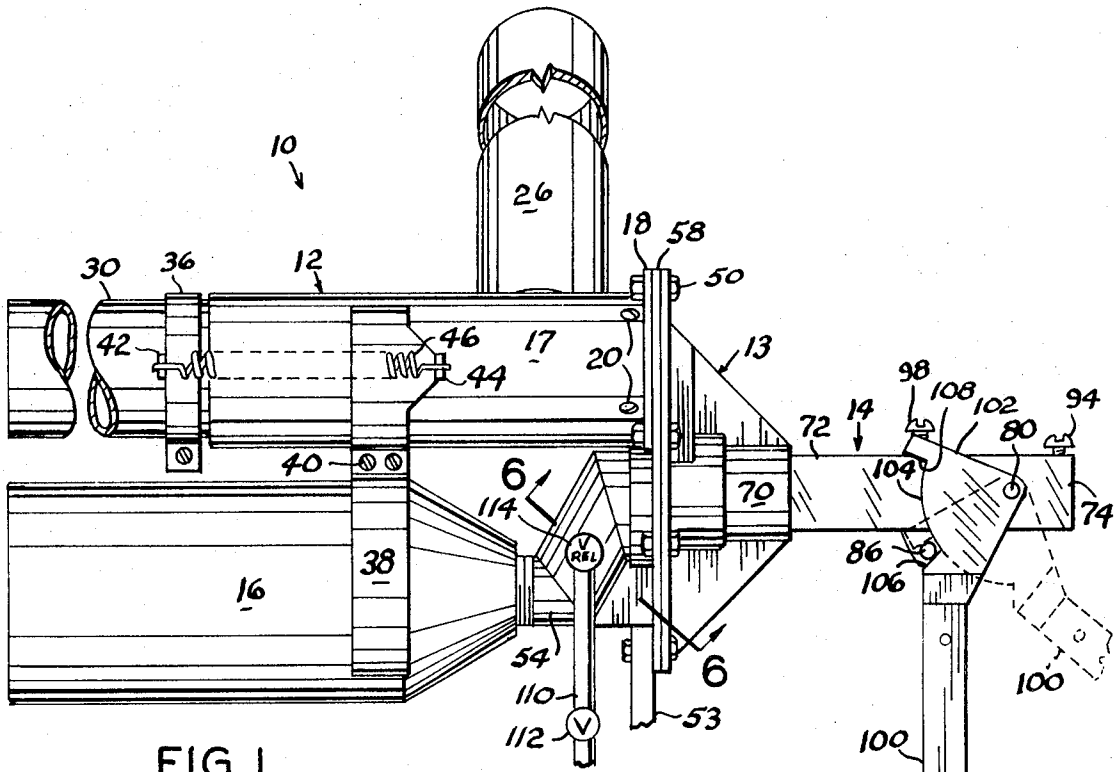


FIG. 1

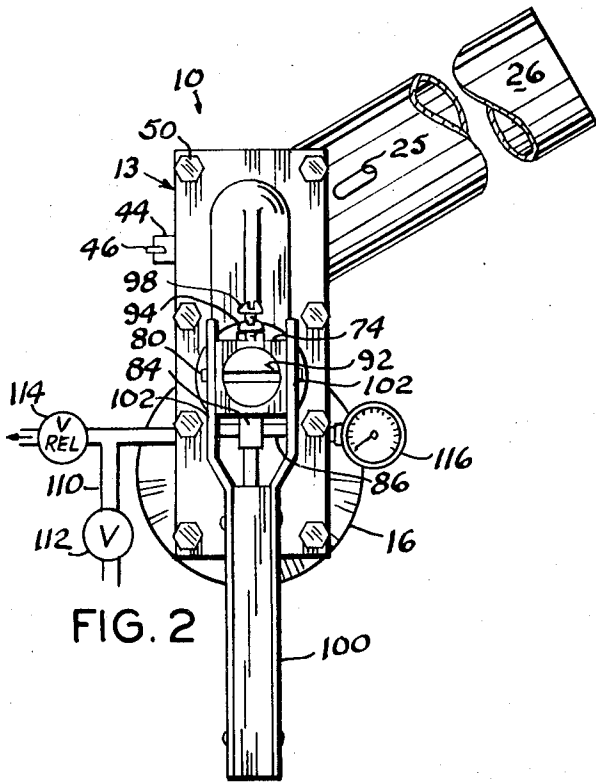


FIG. 2

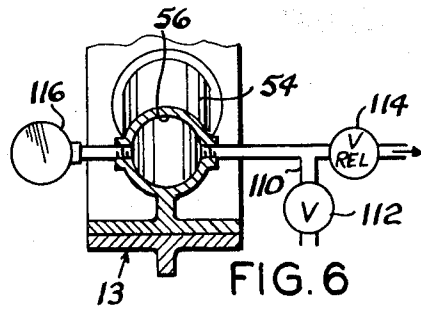


FIG. 6

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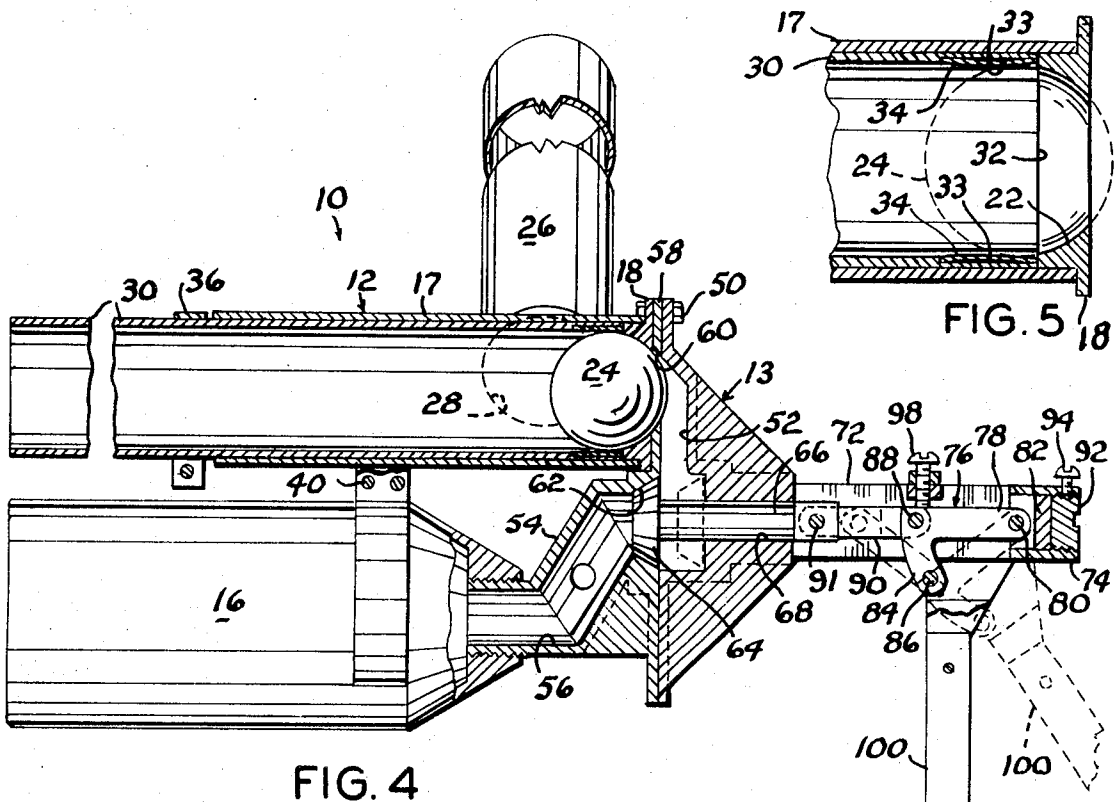


FIG. 4

FIG. 5

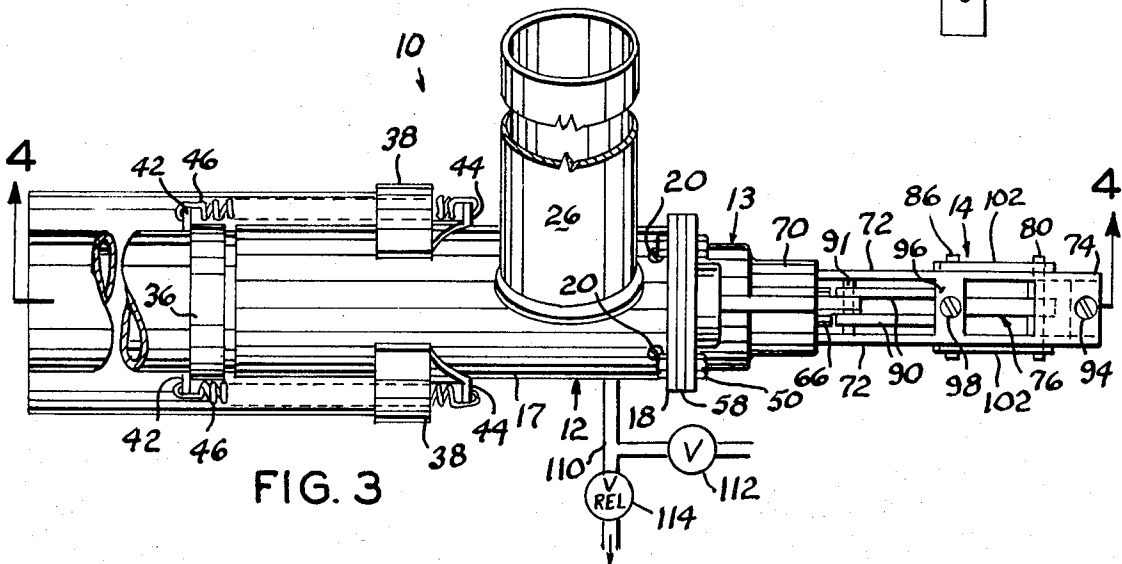


FIG. 3

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GOLF BALL GUN WITH VALVE ADJUSTMENT AND TRIGGER LINKAGE

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to ball throwing devices and more particularly to a compressed gas powered gun-like apparatus for propelling golf balls toward a target.

Thus gun-like apparatus is for playing games such as throwing or shooting balls at a target and to develop the skill of a plurality of players in firing golf balls at a target.

2. Description of the Prior Art

Prior patents disclose a plurality of gun-like devices operated by a compressed gas for firing small ball-like objects, such as BBs or pellets. Examples of this type of ball propelling guns are disclosed by the rifle-like air gun of U.S. Pat. No. 471,176 and pistol type air guns as shown by U.S. Pat. Nos. 2,633,838 and 3,204,625. U.S. Pat. No. 2,574,408 relates to an automatic ball pitching machine which features a boot at the free end of a sleeve sliding within a stationary barrel so that another ball is positioned for firing each time the previous ball is fired.

The principal distinction of this device over these patents is its manner of construction wherein a greater volume of air is applied to the ball containing gun barrel for forcing the ball out of the barrel when aimed at a target.

SUMMARY OF THE INVENTION

A stationary barrel is connected in communicating relation with a ball containing magazine. One end of the stationary barrel is mounted on a housing containing a firing chamber communicating with the barrel. A sleeve within the stationary barrel forms a movable barrel which admits a ball from the magazine and positions the ball to be fired adjacent the firing chamber. The housing is connected by a gas passageway with a reservoir containing a gas under pressure. The gas passageway is opened and closed by trigger means connected with the housing. Means connected with the gas passageway supplies gas under pressure from a supply source for filling the reservoir after each ball is fired.

The principal object of this invention is to provide a ball firing gun-like device powered by a gas under pressure which may be aimed at a target to be hit by the ball.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary side elevational view of the gun;

FIG. 2 is a fragmentary right end elevational view of FIG. 1;

FIG. 3 is a fragmentary top elevational view of FIG. 1;

FIG. 4 is a fragmentary vertical cross-sectional view, partially in elevation, taken substantially along the line 4-4 of FIG. 3 and illustrating, by dotted lines, the trigger and valve action;

FIG. 5 is a fragmentary vertical cross-sectional view of the ball containing end of the gun barrel illustrating the position of a ball therein by dotted lines; and,

FIG. 6 is a fragmentary cross-sectional view, partially in elevation, taken substantially along the line 6-6 of FIG. 1.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Like characters of reference designate like parts in those figures of the drawings in which they occur.

In the drawings:

The reference numeral 10 indicates the device, as a whole, comprising a gun barrel means 12, a housing 13, a trigger means 14 and reservoir 16 connected with the housing. The gun barrel means includes a stationary barrel 17 connected at one end to a plate 18 by screws 20. The plate 18 is provided with an arcuate recess 22 formed on a radius cooperatingly nesting a spherical portion of a ball 24, such as a golf ball. An angularly upward directed tubular magazine 26 is connected at one end to a peripheral portion of the rearward end portion of the stationary barrel 17 around an opening 28 formed therein. The magazine 26 contains a supply of the golf balls 24. A slot 25 (FIG. 2), formed in the depending end portion of the magazine wall, visually exposes the lowermost ball in the magazine. An elongated sleeve, forming an inner movable gun barrel 30, is telescopically received coaxially by the stationary barrel 17. The movable barrel 30 is substantially greater in length than the stationary barrel 17 so that when the rear portion of the barrel 30 is telescoped completely into the stationary barrel 17 a substantial portion of the barrel 30 will project from the stationary barrel 17. The inwardly directed end 32 of the movable barrel 30 is normally disposed in end abutting relation against the plate 18 around the arcuate opening 22 therein. The bore of the movable barrel 30 is slightly greater than the diameter of the balls 24. The inner wall surface of the movable barrel end 32 is provided with a plurality of grooves 33 having a like plurality of inwardly bowed spring members or fingers 34 respectively connected at one end with the respective movable barrel groove for the purpose of lightly contacting a ball 24 and positioning it in contiguous contact with the plate recess 22. The configuration of the spring fingers 34, with respect to the movable barrel grooves 33, is such that the spring fingers are completely nested by the grooves during the firing action of the ball.

The reservoir is substantially cylindrical and has its longitudinal axis disposed in spaced parallel relation with respect to the axes of the barrels 17 and 30. The reservoir 16 preferably has a minimum capacity of 70 cubic inches.

A strap iron clamp 36 frictionally surrounds the movable barrel adjacent the free end of the stationary barrel 17. A second clamp means, comprising a pair of strap-like members 38, extending between and disposed on opposite sides of the barrels and reservoir and partially surrounds a peripheral portion of the stationary barrel intermediate its ends and partially surrounds a peripheral portion of the reservoir 16. The strap members 38 are in close contact with each other intermediate their ends and are held together in gun barrel and reservoir clamping relation by screws 40. Outstanding apertured lugs 42 and 44, formed on the respective clamps 36 and 38, support a pair of helical springs 46, respectively, extending between the lugs 42

and 44 on opposing sides of the barrels which normally urge the movable barrel inner end 32 in end abutting relation against the plate 18. A ball 24 is placed within the movable barrel by manually pulling it forwardly against the resistance of the helical springs 46 until the inner end 32 exposes the magazine opening 28 so that one ball 24 may fall by gravity into the stationary barrel 17. The movable barrel 30 is then released to allow the springs 46 to return it to its inwardly and disposed position wherein the groove springs 34, lightly contacting a peripheral portion of the ball 24, positions it in contact with the plate recess 22.

The housing 13 is secured at one end portion by bolts 50 to the plate 18. The other end portion of the housing projects beyond the plate 18 in depending relation and forms a firing chamber 52 communicating with the movable barrel 30 through the plate 18. The depending end portion of the housing is mounted on and supported by a conventional support means 53 (FIG. 1) permitting vertical and horizontal pivoting movement of the housing. A tubular member 54 is secured at one end to the reservoir 16 to form an air passageway 56 communicating, at its end opposite the reservoir, with the firing chamber 52. The end of the tubular member 52, opposite the reservoir, is provided with a plate section 58 which is interposed between the plate 18 and housing 13. An opening 60 in the plate 58 provides communication between the plate recess 22 and firing chamber 52. The inner wall of the tubular member, at its end portion opposite the reservoir, is provided with a seat 62 for sealing with a valve head 64 having a stem 66 slidably received by a suitable bore 68 formed in a circular neck portion 70 of the housing. The end of the valve shaft 66 opposite the head 64 projects beyond the housing neck portion 70 for the purposes presently explained.

A pair of strap-like bars 72 are connected at one end in parallel spaced relation to the free end of the neck portion 70 and are integrally connected at their other end portion to a tube-like ring 74. The bars 72 and tube-like ring 74 form a part of the trigger means 14. The trigger means 14 further includes a bell crank 76 having the free end of one of its arms 78 pivotally connected by a pin 80 extending through suitable transversely aligned longitudinally extending slots, not shown, formed in the bars 72 and through a guide 82 slidably received by the tube ring 74. The other arm 84 of the bell crank 76 projects downwardly between the bars 72 and transversely receives a pin 86 projecting beyond the spaced-apart parallel planes defined by the outer surfaces of the bars 72 for the purposes presently explained.

The apex of the bell crank forming the juncture of its arms 78 and 84 is pivotally connected by a similar pin 88 having a length substantially equal to the spacing between the bars 72 and extending through one end portion of a pair of links 90 pivotally connected at their other end portions by a pin 91 to the end portion of the valve shaft 66 opposite the valve head 64. The length of the links 90, with respect to the bell crank arm 78 and length of the valve shaft 66, is such that when the links and bell crank arm 78 are longitudinally aligned with the valve shaft 66 the valve head 64 is sealed with its seat 62. Minor adjustments of this seating of the valve head is made by a nut 92 threadedly engaged with the

tubular ring 74 opposite the guide 82. A set screw 94, secures the nut 92 in its adjusted position. A bridge 96, extending transversely across the bars 72, threadedly receives an adjusting screw 98 which contacts the bell crank 76. The set screw 98 is adjusted so that the bell crank and link connecting pin 88 has its axis off-set upwardly slightly above a horizontal plane extending through the axis of the pin 80 thus locking the valve head against its seat 62. An elongated handle 100 is bifurcated at one end to form a pair of wings 102 which are positioned in slidable contacting relation on opposing sides of the bars 72 and tube ring 74. The wings 102 are pivotally connected on opposing sides of the bars 72 by the pin 80 and include a recessed or cut-out portion in their edge surface opposite the pin 80 forming an arched surface 104 terminating at each of its ends in edge surfaces 106 and 108 extending radially outward from the axis of the pin 80 for respectively contacting the opposing end portions of the pin 86. Thus, when the handle 100 is positioned in its solid line position of FIGS. 1 and 4 the wing surface 106 contacts the pin 86 and pivots the crank arm and links 90 to the solid line position of FIG. 4 thus seating the valve head 64 and closing the gas passageway 56. When the handle is pivoted to its dotted line position (FIGS. 1 and 4), the wing surface 108 contacts the pin 86 and releases the bell crank 76 and links 90. Air under pressure in the reservoir and air passageway 56 contacting the valve head 64 unseats the valve and pivots the bell crank and links to their dotted line position of FIG. 4. Unseating the valve head 64 moves it to its dotted line position of FIG. 4 and provides communication between the air passageway 56 and firing chamber 52.

The tubular member 54 is connected with a source of air under pressure, such as an air compressor or compressed air tank, not shown, by piping 110 provided with an inlet valve 112 including a relief valve 114. A pressure gauge 116 is also connected with the member 54 for indicating the pressure contained by the reservoir 16 and air passageway 56.

OPERATION

In operation the magazine 26 contains a supply of golf balls 24. One of the balls 24 is placed in firing position, seated in the plate recess 22, by manually pulling the movable barrel 30 forwardly out of the stationary barrel to allow a ball to enter the stationary barrel as described hereinabove.

The reservoir 16 is filled with a gas such as air, to a desired pressure, for example, 200 pounds per square inch, by opening the valve 112. During this operation the handle 100 is positioned in its solid line position of FIGS. 1 and 4 when the valve head 64 is seated. The barrels are then aimed at a selected target and the handle is then manually moved to its dotted line position of FIGS. 1 and 4 wherein the wing surface 108 contacts the pin 86 to release the valve for movement to its dotted line position of FIG. 4 thus placing the firing chamber 52 in communication with the gas passageway 56. Air under pressure is thus applied to the ball 24 for propelling it out of the movable barrel 30.

Different players using this or a plurality of these guns have their golf balls distinguished one from the other by preferably painting or coloring the balls. While golf balls have been described for use by the device 10 obviously other balls may be used, if desired.

Obviously the invention is susceptible to changes or alterations without defeating its practicability, therefore, I do not wish to be confined to the preferred embodiment shown in the drawings and described herein.

I claim:

- 1. A golf ball gun, comprising:
 - a stationary barrel;
 - a ball magazine communicating, at one end, with the rearward end portion of said stationary barrel;
 - a movable barrel slidable in said stationary barrel;
 - spring means normally biasing said movable barrel into said stationary barrel and closing the adjacent end of said magazine;
 - a housing connected with said stationary gun barrel, said housing having a firing chamber communicating with said movable barrel;
 - spring fingers secured to the inwardly disposed end portion of said movable barrel and normally biasing a ball therein toward said firing chamber;
 - a reservoir disposed adjacent said gun barrels;
 - a tubular member forming a gas passageway connecting said reservoir with the firing chamber, said tubular member having a valve seat intersecting the gas passageway;
 - a valve normally seated on said seat and including a valve stem projecting outwardly of said housing; and,
 - trigger means connected with said housing and said valve stem for opening and closing the gas passageway, said trigger means including,

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- a pair of bars connected at one end with said housing in parallel outwardly projecting relation on opposing sides of said valve stem,
- a tube connected with the other ends of said pair of bars coaxial with said valve stem,
- a guide slidably supported within the end portion of said tube connected with said pair of bars,
- a nut threadedly engaged within the end portion of said tube opposite said guide,
- pivottally connected link means interconnecting said valve stem with said guide,
- said link means including a bell crank having one leg portion longitudinally disposed between said pair of bars,
- the other leg of said bell crank having a free end portion projecting beyond the lateral limit of said pair of bars,
- handle means pivotally supported by said pair of bars and engageable with said link means,
- said handle means including a handle having a bifurcated end portion forming a pair of wings disposed, respectively, in vertical planes on opposing side surfaces of said pair of bars, and,
- a pin transversely extending through and beyond the respective side surface of the free end portion of the said other leg of said bell crank whereby the respective end portions of said pin intersect the respective planes defined by the wings of said handle bifurcated end portion.

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