# United States Patent

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[54] **REMOTELY CONTROLLED SPRING-TYPE BALL PROJECTING DEVICE**
**8 Claims, 7 Drawing Figs.**


[52] **U.S. Cl.** ..... **124/16,** 124/37, 124/34, 273/26 R
[51] **Int. Cl.** ..... **F41b 7/00**
[50] **Field of Search** ..... 124/16, 1, 26, 27, 28, 29, 34, 37, 41, 30, 31; 46/74 R, 74 B; 273/26 B, 26 R, 29 A, 96 R



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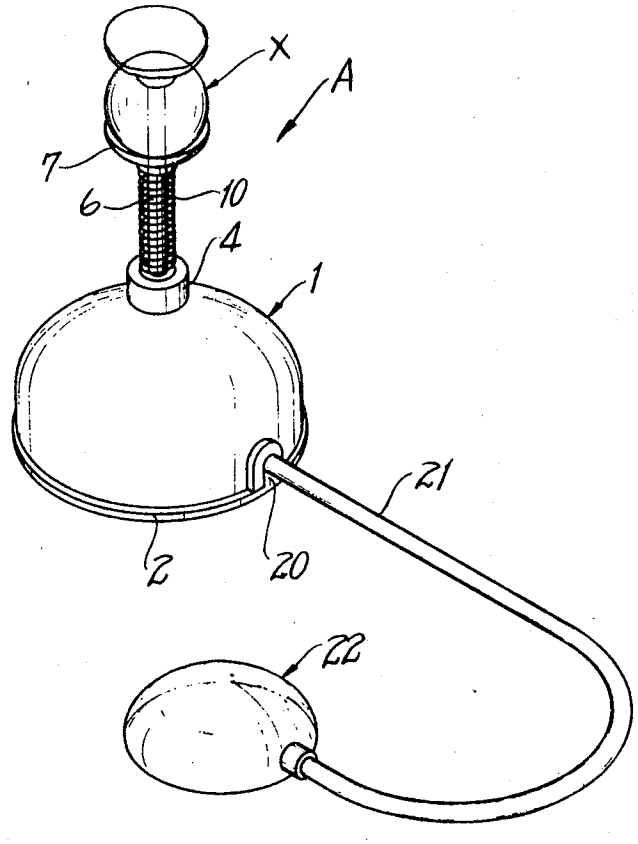
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**ABSTRACT:** A remotely controlled device for practice batting, which comprises a housing, spring-loaded vertically displaceable member for launching a ball, projecting upwardly through an opening of the housing, and means for releasably locking the ball-launching means, provided within said housing and controlled by a remotely situated remote-control device. It can serve not only for improvement of batting technique, but also for physical training and amusement.

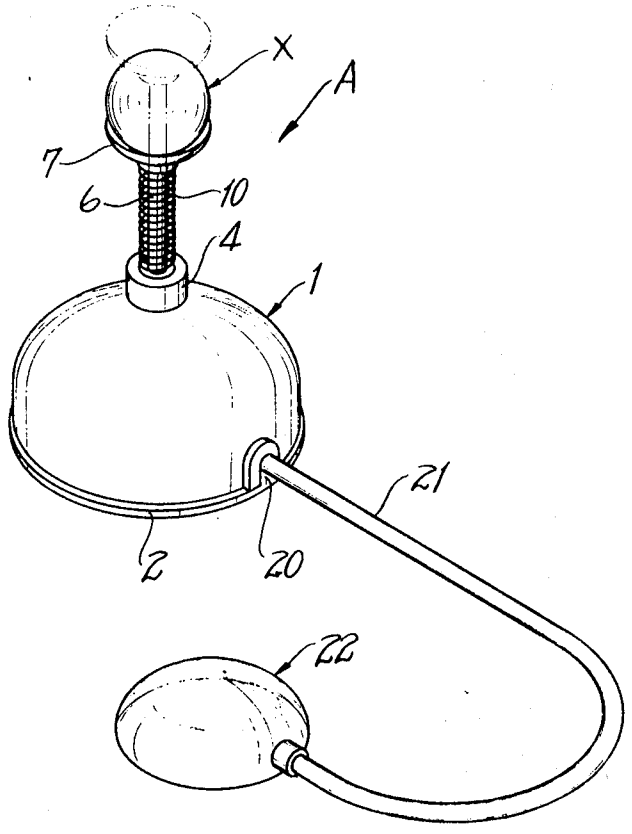



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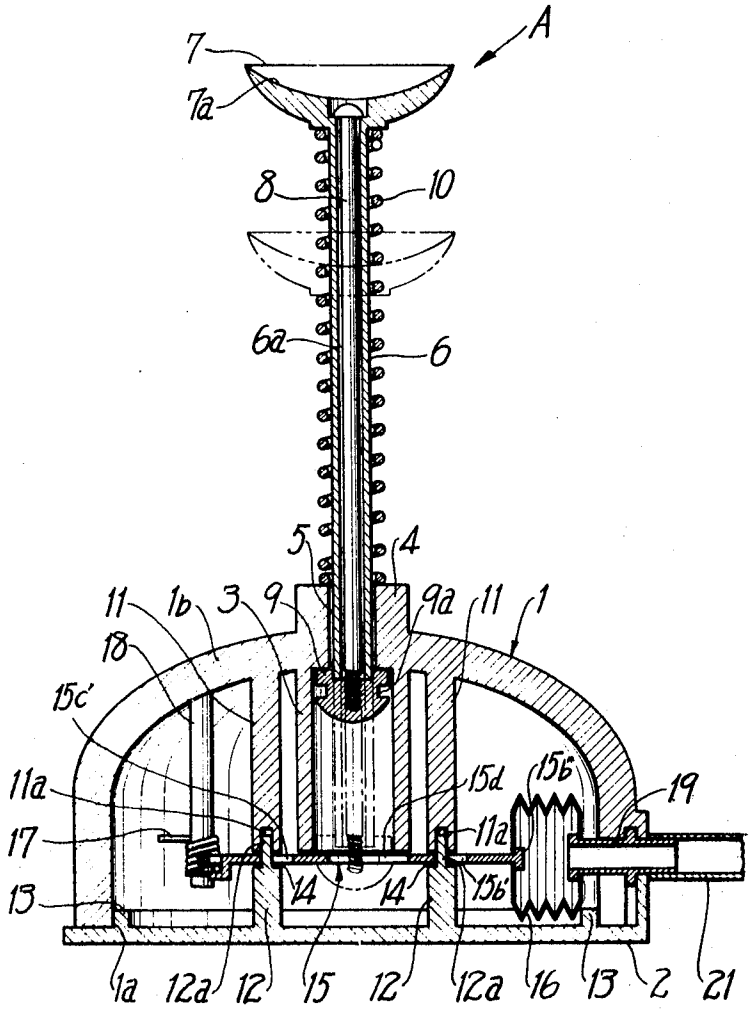
Fig-1




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Fig-2




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FIG-3

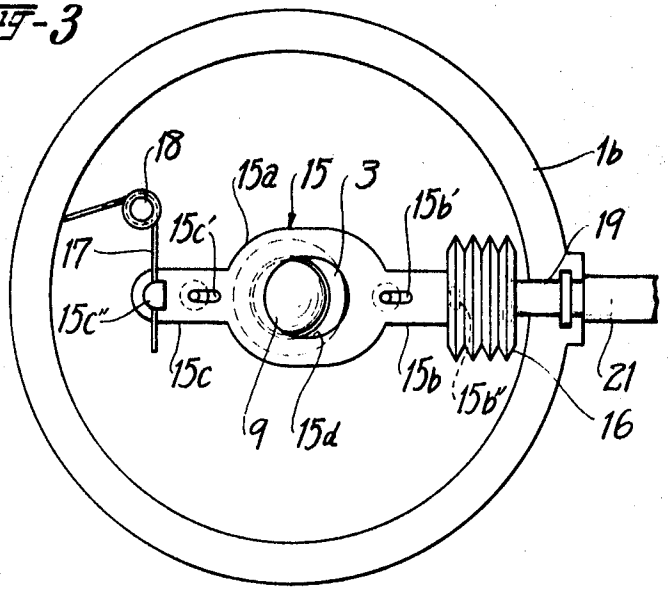



FIG-5

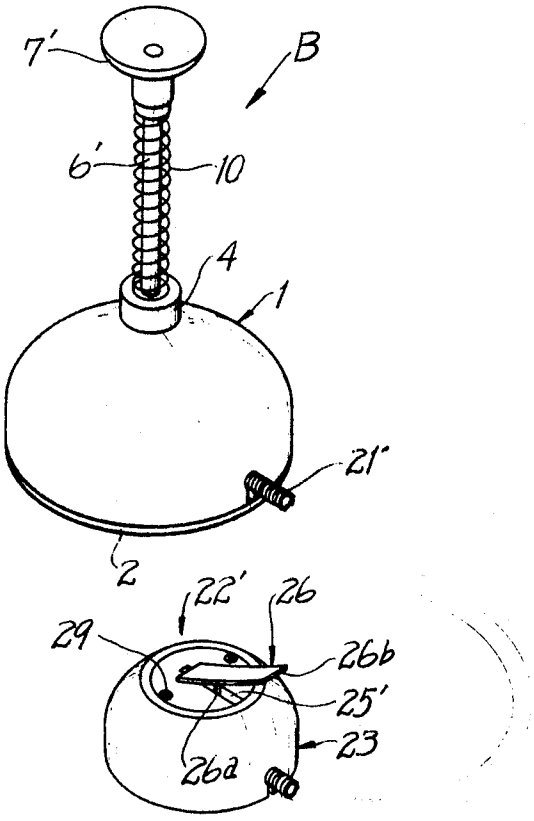
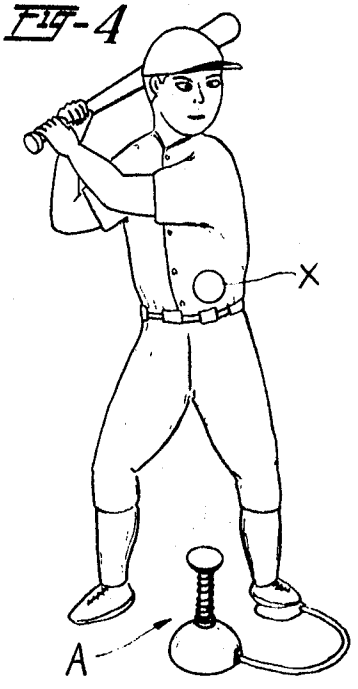



FIG-4




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FIG-6

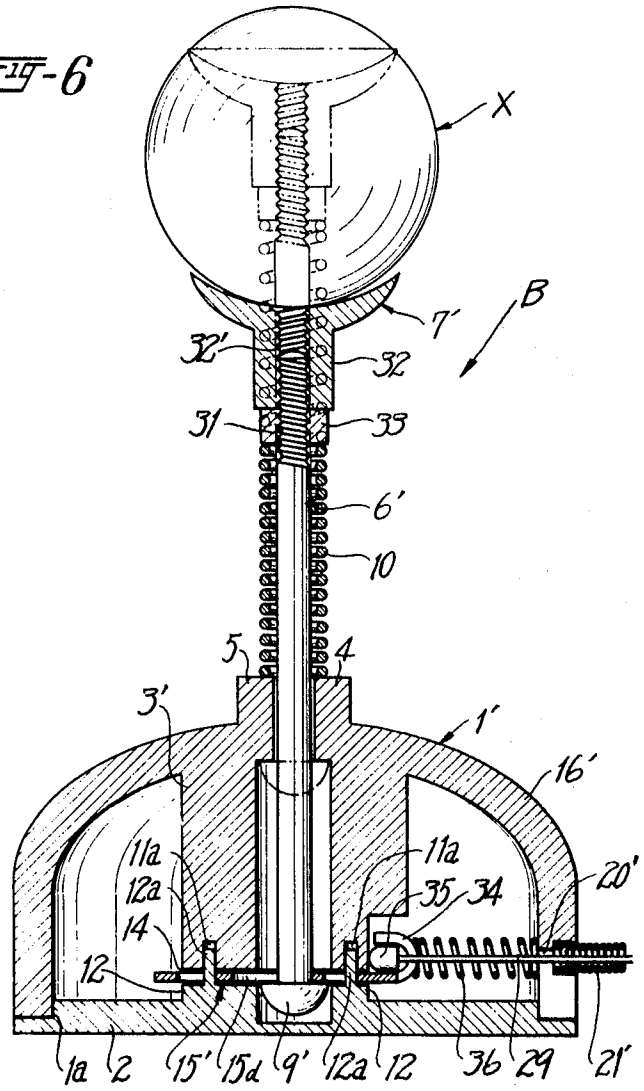
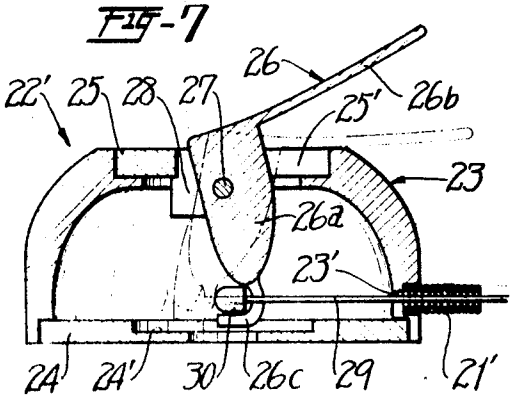



FIG-7




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# REMOTELY CONTROLLED SPRING-TYPE BALL PROJECTING DEVICE

## SUMMARY OF THE INVENTION

This invention relates to a device for practice batting, and more particularly to a new and useful remotely controllable device for practicing batting.

It is one object of the present invention to provide a remotely controlled device for practice batting, which can serve not only for improvement of batting technique, but also for physical training and amusement.

It is another object of the present invention to provide a device for the purpose stated, which is compact in size, light in weight and simple in operation and construction.

It is further object of the present invention to provide a device of the character stated, which is inexpensive and easy to manufacture.

It is a still further object of the present invention to provide a device of the character stated, which is provided with a pneumatic system for operation.

It is another object of the present invention to provide a device of the kind stated, which comprises a mechanical remote-control device for operation.

These and other objects and advantages of the invention will become apparent upon reading the following detailed description of the invention in conjunction with the accompanying drawings in which:

FIG. 1 is a perspective view of one embodiment of the present invention;

FIG. 2 is a vertical cross-sectional view of the embodiment shown in FIG. 1 from which air pump means for remote control has been cut away;

FIG. 3 is a bottom plan view of the embodiment shown in FIG. 2 from which the bottom plate has been removed;

FIG. 4 is a perspective view illustrating the state in which the user is practicing batting by the use of the embodiment according to the present invention;

FIG. 5 is a perspective view of another embodiment of the present invention;

FIG. 6 is a vertical cross-sectional view of the embodiment shown in FIG. 5 from which the mechanical remote-control device has been cut away; and

FIG. 7 is a vertical cross-sectional view of the mechanical remote-control device shown in FIG. 5.

In the drawings, like portions or parts are designated with like reference numerals.

Referring to FIGS. 1 to 4, there is shown a device A for practice batting as one embodiment of the present invention. The device A is provided with a hemispherical housing 1 with its lower end opened at 1*a*. The lower opening of the housing 1 is closed with a bottom plate 2. Within the housing 1 is provided a vertical cylinder 3 which depends from the central portion of hemispherical wall 1*b* of the housing 1. Immediately above the vertical cylinder 3, there is provided a boss 4 which extends upwardly from the central portion of the outer surface of said hemispherical wall. In the boss 4 and the wall 1*b* is formed a vertical bore 5 which is coaxial with and communicating with the vertical hollow cylinder 3. The diameter of the vertical bore 5 is made smaller than the inside diameter of the vertical cylinder 3.

An operation rod 6 of suitable length is vertically displaceably mounted in the vertical cylinder 3 at its lower portion through the vertical bore 5. The operating rod 6 is provided at its upper end with a traylike ball-receiving means 7 which has a concavity 7*a* in its upper surface. The operating rod 6 is provided with an axial bore 6*a* in which is inserted from above an elongated roundhead screw 8. The lower end of the screw 8 extends slightly downwardly of the lower end of said operating rod and is in threaded engagement with a round nut 9 within the vertical cylinder 3. The nut 9 is so constructed as to function both as a stopper and a guide for the operating rod 6.



Coaxially mounted on the operating rod 6 is a coil spring 10, the lower end of which abuts against the upper surface of the boss 4 of said hemispherical wall and the other end of which abuts against the underside of the ball-receiving means 7, so that the operating rod 6 is constantly biased upwardly by the action of the coil spring 10. In this case, as the round nut 9 fitted upon the lower end of the screw 8 is larger than the vertical bore 5 in diameter, it serves as a stopper to prevent the operating rod 6 from being released out of the vertical bore 5.

Within the housing 1 is also provided a pair of spaced-apart dependent supports 11 arranged outside and diametrically of the vertical cylinder 3. These supports 11 extend downwardly from the hemispherical wall 1*b* to the same level as the lower end of the vertical cylinder 3.

Each of the supports 11 is provided in its lower end with a bore 11*a* for the purpose which will be described later. The bottom plate 2 is provided with a pair of spaced-apart struts 12 projecting upwardly from the upper surface of said bottom plate and having projections 12*a* protruding upwardly from the top of said struts and adapted to be inserted in the bores 11*a* of supports 11, respectively. The bottom plate 2 is also provided with an annular flange 13 projecting upwardly from the upper surface of said bottom plate and arranged to be snugly inserted in the lower opening of the housing 1.

The height of the struts 12 is designed so that, when the lower opening of housing 1 is completely closed with the bottom plate 2, after insertion of the projections 12*a* of struts 12 in the bores 11*a* of supports 11, certain gaps 14 or clearances may be formed between the lower surfaces of the supports 11 and the upper surfaces of the struts 12, for the purpose which will be described later.

Indicated by numeral 15 is a horizontally slidable locking plate for releasably locking the operating rod 6. The locking plate 15 is of the thickness insertable in the gaps 14 between the supports 11 and the struts 12 and comprises an oval middle portion 15*a* and arm portions 15*b*, 15*c* extending from the both ends thereof in opposite directions, as shown in FIG. 3.

The oval middle portion 15*a* has in its central portion an oval aperture 15*d* which is formed lengthwise thereof. The transverse diameter of the oval aperture 15*d* is such that the round nut 9 fitted upon the lower end of the operating rod 6 can freely pass through the aperture 15*d*. The arm portions 15*b*, 15*c* are formed with longitudinally extending slots 15*b'*, 15*c'* in which are freely inserted the projections 12*a* of struts 12, respectively.

The locking plate 15 is attached at the base portion 15*b''* of its arm 15*b* to one end of a pneumatically inflatable hollow body 16, such as a bellows element of a pliable material, provided within the housing 1. The other arm 15*c* is provided at its end with a hook 15*c''* to which is secured one end of a spring 17 wound round a dependent support 18 adjacent the end of the arm 15*c* so as to constantly resiliently bias the locking plate 15, which is horizontally slidably supported by the struts 12 having projections 12*a* extending into the bores 11*a* of supports 11 through the slots 15*b'*, 15*c'* of the locking plate 15, toward the pneumatically inflatable hollow body 16 to thereby normally keep said hollow body compressed.

The inflatable hollow body 16 is carried by and communicates with an inlet pipe 19 horizontally mounted in a cutout 20 formed in the lower portion of hemispherical wall 1*b* in alignment with the supports 11. The outer end of the inlet pipe 19 projects outwardly of the housing 1 and is connected with one end of a pliable air tube 21 the other end of which is connected to air pump means 22.

The air pump 22 is of a substantially hemispherical hollow structure and is formed of elastic and pliable material such as rubber or plastics. However, the shape of the pump 22 may be other than that illustrated in FIG. 1, for example, a conventional bellowslike pump means may be substituted for the hemispherical pump 22.

When it is desired to practice batting with the device A, the operating rod 6 is depressed against the action of the coil spring 10 until the round nut 9 comes into locking engagement

with the locking plate 15. When the round nut 9 is lowered and slides into the oval aperture 15*d* by the depression of the operating rod 6, an annular recess 9*a* of the round nut 9 is brought into engagement with a portion of the inner peripheral edge defining the aperture 15*d* of the locking plate 15. In other words, when the round nut 9 is depressed and slides into the oval aperture 15*d*, the locking plate 15 is caused to slide in the direction away from the inflatable hollow body 16, against the action of the spring 17, by the round nut 9, and then as the round nut 9 is further lowered, the portion of said inner periphered edge opposed to the inflatable hollow body 16 is forced to fall into the annular recess 9*a* of the round nut by the biasing action of the spring 17, so that the nut 9 is kept retained by the locking engagement with the locking plate 15, together with the operating rod 6 under the action of the coil spring 10.

After the operating rod 6 has thus been locked by the locking plate 15 under the action of the coil spring 10, a ball X is placed on the ball-receiving means 7.

Then, as the player compresses the pneumatic pump 22 with his foot as shown in FIG. 4, compressed air is transmitted to the inflatable hollow body 16 through the air tube 21 and the hollow body 16 is pneumatically operated and unfolded to push the locking plate 15, thereby disengaging or releasing the round nut 9 from the locking plate 15. The moment the nut 9 is released from the locking plate 15, the operating rod 6 is driven upwardly by the action of the coil spring 10 to cause the ball placed on the receiving means 7 to be discharged upwardly as shown in FIG. 4. Thus permitting the player to bat the ball X at this instant.

Referring now to FIGS. 5 to 7, there is shown another embodiment of the present invention. The device B for practice batting, according to the present invention, is provided with a mechanical remote-control unit 22' instead of the air pump 22 which is a pneumatical remote-control unit. The remote control unit 22' comprises a substantially inverted cup-shaped housing 23 having a bottom plate 24 and a cover plate 25, and a bell cranklike control lever 26.

The control lever 26 is rotatably mounted on a pivot pin 27 carried by a pair of brackets 28 depending from the cover plate 25 secured to the housing 23 by screws 29 and comprises an arm portion 26*a* pivotally supported by the pin 27 and projecting partially outwardly through a slot 25' formed in the cover plate 25, a pedal portion 26*b* extending from the arm portion 25*b* in a direction substantially perpendicular thereto, and a hook 26*c* fixed to the lower end of the arm portion 26*a* within the housing 23. To the hook 26*c* of said control lever 26 is connected one end of a remote-control connection 29 of steel wire by means of a stop 30. The other end of the remote-control connection 29 is mechanically connected to a horizontally slidable locking plate 15', which releasably locks an operating rod 6', for the purpose which will be described later.

As clearly shown in FIGS. 5 and 6, the device B for practice batting is provided with a hemispherical housing 1' within which is provided a vertical cylinder 3' corresponding to the vertical cylinder 3 of said first embodiment and vertically displaceably receiving the lower portion of the operating rod 6'.

The operating rod 6' is provided at its upper end portion with a screw thread 31 and at its lower end with a round head 9' which is integral with the operating rod 6' and which performs the same function as the round nut 9 of the operating rod 6 in the first mentioned device A. In the illustrated embodiment, the ball-receiving means 7', which corresponds to the ball-receiving means 7 in the first embodiment, is provided with a cylindrical skirt 32 which has an internally threaded bore 32' engageable with the external thread 31 of said operating rod.

The ball-receiving means 7' is mounted on the upper end of the operating rod 6' in such a way that after the coil spring 10 is mounted on the operating rod 6' a nut 33 is fitted upon the screw thread 31 of the operating rod 6' so as to keep the coil spring 10 suitably energized to thereby constantly bias the operating rod 6' upwardly, and then, the internal screw thread 32' of the ball-receiving means 7' is fitted upon the screw thread 31 of said operating rod.

In the second embodiment, the locking plate 15', which corresponds to the locking plate 15 in the first embodiment, is provided at one end with a hook 34 to which the other end of the remote-control connection 29, introduced into the housing 1' through a cutout 20' formed in the housing wall 1*b*', is secured by means of a stop 35. Different from the locking plate 15 of the first embodiment, the locking plate 15' of this embodiment is arranged to be constantly biased in the direction away from the cutout 20' of said housing wall 1*b*' by means of a coil spring 36 which is coaxial with the connection 29 and which abuts at one end against the hook 34 of said locking plate and at the other end against the inner surface of the housing wall 1*b*' at the portion adjacent said cutout 20'.

Indicated by reference numeral 21' is a flexible tube made of coiled steel wire and covering the remote-control connection 29. As shown in FIG. 5, the flexible tube 21' is secured at one end to the cutout 20' of the housing wall 1*b*' and at the other end to a cutout 23' formed in the lower portion of the housing wall 23 of said remote-control unit. As shown in FIG. 7, when the remote-control unit is not in use, that is, at rest, the pedal portion 26*b* of control lever 26 of said control unit is kept directed to the obliquely upward direction, because the hook 26*c* of the arm portion 26*a* of said lever is pulled by the action of the coil spring 36 within the housing 1' through the medium of the wire 29, and accordingly, the control lever 26 is urged to rotate counterclockwise. The bottom plate 24 of the control unit is provided in its upper surface with an elongated groove 24' extending parallel with the control wire 29 so as to permit the control lever 26 to rotate freely about the horizontal pin 27.

When it is desired to practice batting with the second embodiment B, the operating rod 6' is depressed against the action of the coil spring 10 until the round head 9' of said operating rod comes into locking engagement with the locking plate 15' in the manner described with reference to the first embodiment A. As the round head 9' is caused to slide into the oval aperture 15*d*, the locking plate 15 is caused to slide toward the cutout 20' of the housing wall 1*b*' against the action of the coil spring 36. Immediately after the round head 9' has passed through the oval aperture 15*d*, the locking plate 15' is quickly returned to its original position by the action of the coil spring 36 thereby locking the operating rod 6' under the action of the coil spring 10 energized. Then, a ball 23 is placed on the ball-receiving means 7'.

As the player presses the pedal portion 26*b* with his foot, the control lever 26 is rotated clockwise and pulls the control wire 29, thereby causing the locking plate 15' to slide toward the cutout 20' against the action of the coil spring 36 to unlock the operating rod 6'. The moment the operating rod 6' is disengaged from the locking plate 15', it is driven upwardly by the action of the coil spring 10 to cause the ball X to be launched upwardly, thus permitting the player to bat the ball X at this instant.

What I claim is:

1. A device for practice batting comprising a housing adapted to be supported on a supporting surface, a vertical hollow cylinder provided within said housing, an operating rod vertically displaceably mounted in said cylinder and projecting upwardly of said housing, means for receiving a ball provided on the upper end of said operating rod, a coil spring coaxially mounted on said operating rod and arranged to constantly bias said operating rod upwardly and to be compressed for energization when said operating rod is depressed, slidable means slidably mounted within said housing for engaging releasably locking said operating rod in a cocked position, and a remote-control device connected to said housing through a remote-control connection and operative to slide said slidable means to disengage and release said operating rod while in locking engagement therewith, whereby when said remote-control device is operated, after said operating rod has been locked with said slidable means by depressing thereof against

the action of said coil spring, said operating rod is caused to be released and to be driven upwardly by the action of said coil spring to thereby launch a ball placed on said ball-receiving means upwardly the lowermost end of said operating rod having an enlarged shoulder engageable by the lock when the latter is in a cocked position, and said shoulder engaging the upper portion of the housing to provide a limit stop for the upward travel of the rod.

2. A device for practice batting as set forth in claim 1, wherein said remote-control device is an air pump device transmitting compressed air through a pliable air tube to an inflatable hollow body provided within said housing and operative to push said slidable means to thereby release and disengage said operating rod in locking engagement therewith.

3. A device for practice batting as set forth in claim 2, wherein said air pump device is a compressible hollow body made of an elastic and pliable material.

4. A device for practice batting as set forth in claim 1, wherein said remote-control device is a mechanical remote-control unit comprising a control lever having a pedal portion depressible with a foot, and operatively connected to said slidable means for releasably locking said operating rod through the medium of an axially displaceable control wire connecting said control lever and said slidable means.

5. A device for practice batting as set forth in claim 4, wherein said control lever is arranged to pull said slidable means through said control wire to release said operating rod in locking engagement with said slidable means.

6. A device for practice batting as set forth in claim 1, wherein said slidable means for releasably locking said operating rod is a relatively elongated plate having means for holding said operating rod against the action of said coil spring and arranged to slide in the direction substantially perpendicular to the longitudinal axis of said operating rod.

7. A device for practice batting as set forth in claim 1, wherein said housing is provided therewith with means for horizontally slidably supporting said slidable means for releasably locking said operating rod.

8. A device for practice batting as set forth in claim 1, wherein said means for receiving a ball is shaped substantially as a tray.