Jan. 14, 1936. E. C. DEAN 2,027,474

DIVING APPARATUS

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Fig. 1.

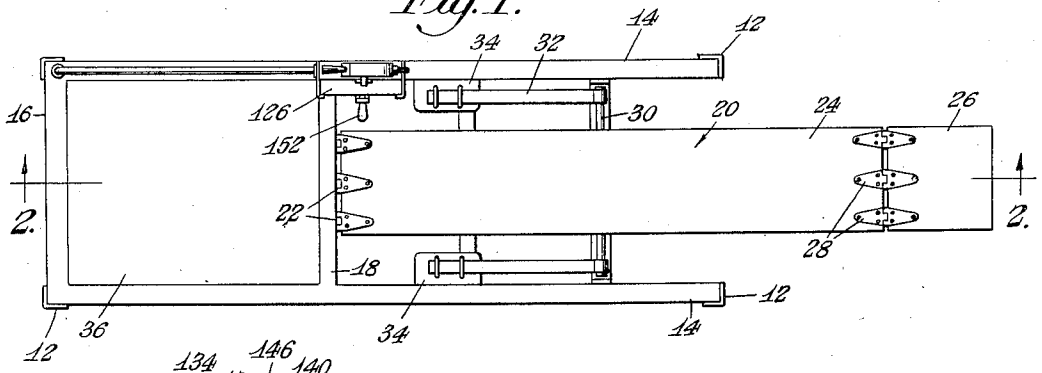
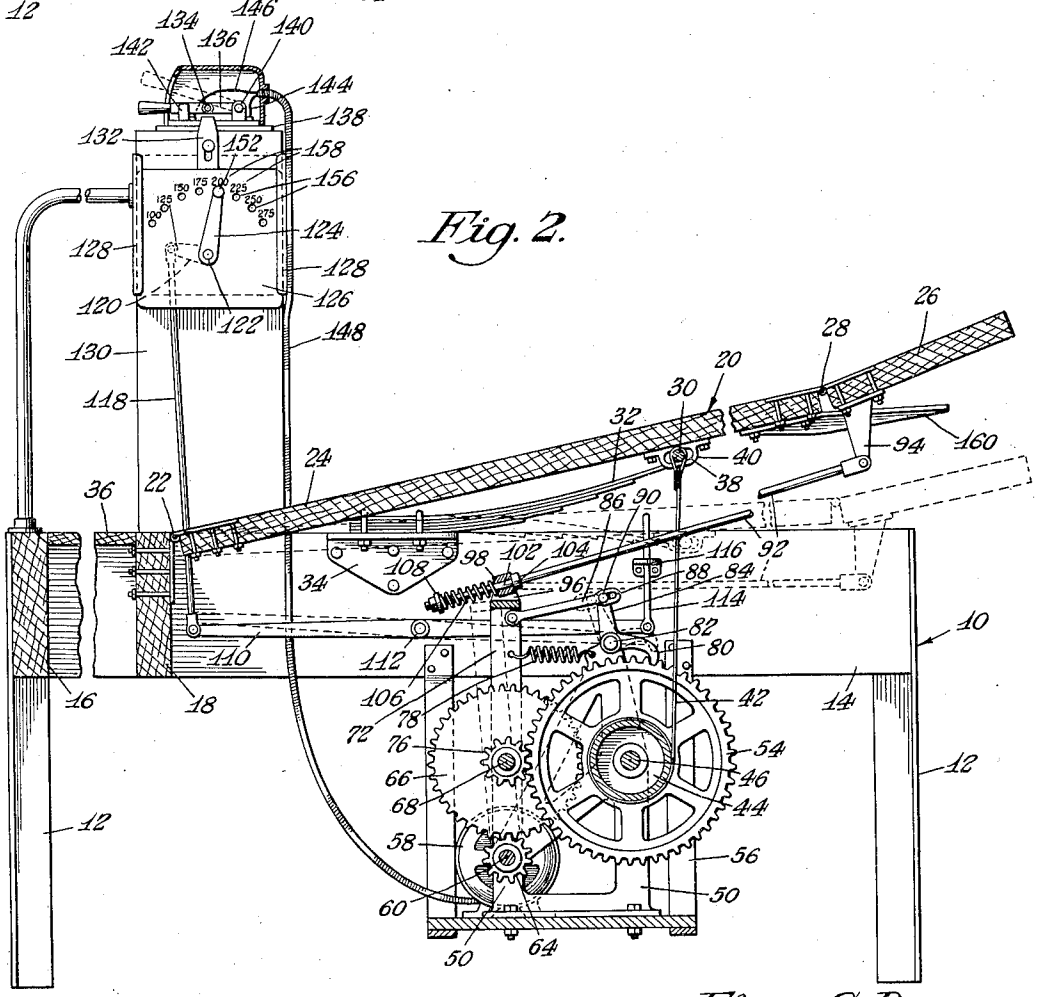


Fig. 2.



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Fig. 3.

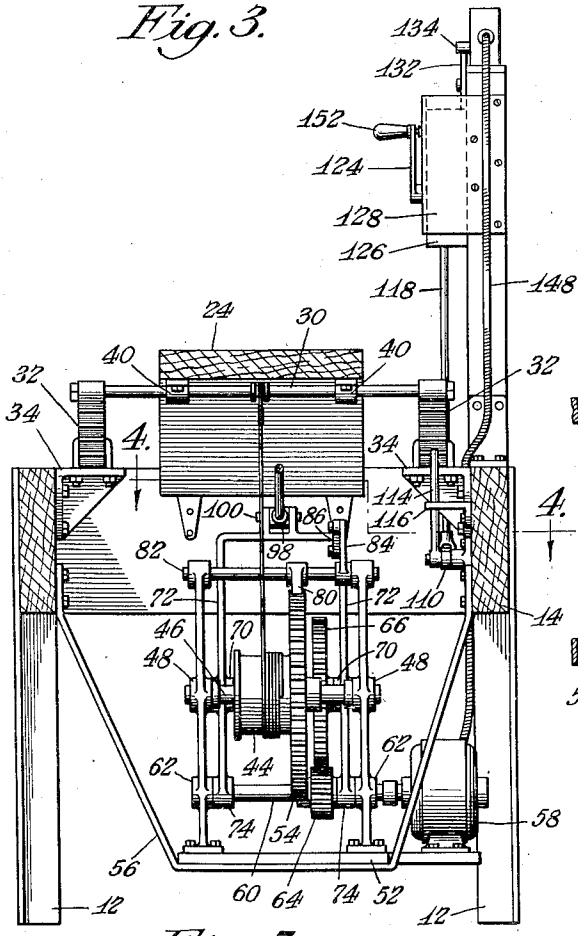


Fig. 4.

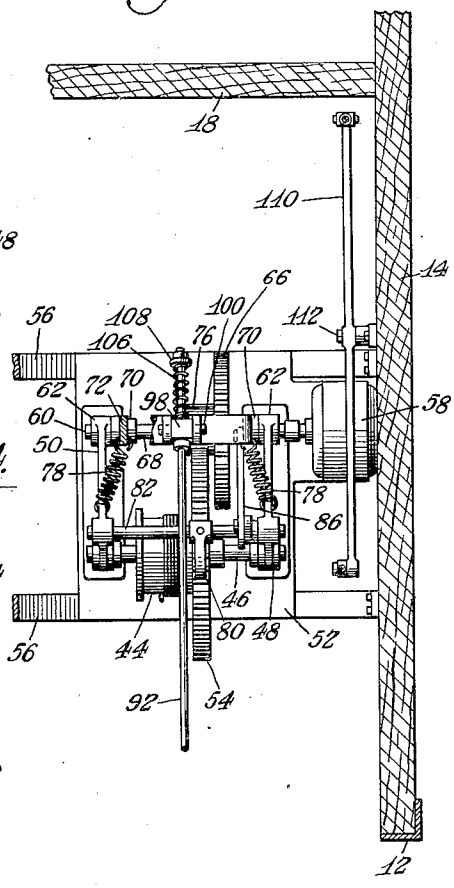


Fig. 5.

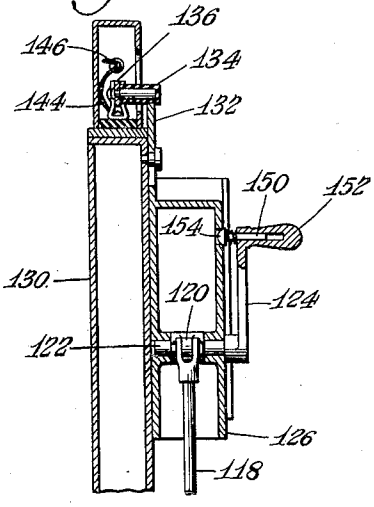
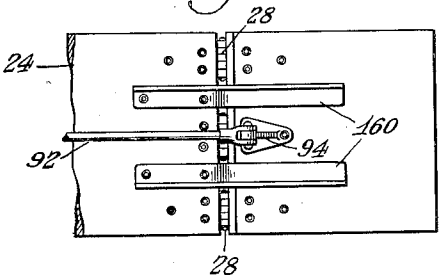


Fig. 6.



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DIVING APPARATUS

Elmer C. Dean, Frankfort, Ind.

Application June 26, 1934, Serial No. 732,533

9 Claims. (Cl. 272—66)

My invention relates to diving apparatus, and has among its objects and advantages the provision of an improved power operated diving board.

In the accompanying drawings:

Fig. 1 is a top plan view of the device;

Fig. 2 is a sectional view along the line 2—2 of Fig. 1;

Fig. 3 is a transverse sectional view;

Fig. 4 is a sectional view along the line 4—4 of Fig. 3;

Fig. 5 is a sectional view along the line 5—5 of Fig. 2; and

Fig. 6 is a detail view of a part of the diving board.

In the embodiment selected to illustrate my invention, I make use of a base structure 10 comprising four supporting legs 12 to which I connect two long frame members 14 and a cross member 16. A second cross member 18 is positioned between the member 16 and secured thereto for holding the members in spaced apart relation. Referring to Figs. 1 and 2, I connect a spring board 20 with the cross member 18 through the medium of a hinge 22. This board comprises a runway 24 and a trip member 26 hingedly connected with the runway at 28.

The normal position of the spring board 20 is illustrated in Fig. 2. In this position, the spring board rests upon a cross bar 30 having its ends connected with two springs 32 fastened to the frame members 14 through the medium of brackets 34 bolted to the members. My diving board is arranged to be shifted to the dotted line position of Fig. 2 against the tension of the springs 32 for hurling divers running out on the board 20 and jumping onto the trip member 26. In Figs. 1 and 2, I illustrate a floor 36 between the cross members 16 and 18. Referring to Fig. 2, the shaft 30 projects through a slot 38 in brackets 40 bolted to the bottom of the part 24. Thus, the board is operatively connected with the springs 32 in such a manner that the shaft 30 may shift longitudinally of the slots 38, but the part 24 is prevented from leaving the shaft.

I provide means for flexing the springs 32 various amounts to accommodate divers of different weights. To this end, a rope or cable 42 has one end connected with the shaft 30 and its opposite end wound upon a drum 44 mounted upon a shaft 46 having its ends supported in bearings 48 carried by upstanding frame members 50 bolted to a floor 52. I mount a large gear 54 upon the shaft 46 in fixed relation with the shaft in the same way as the drum 44, so that the three parts will rotate as a unit.

Loop members 56 are bolted to the member 14 for supporting the floor 52. Upon the floor 52 I mount a motor 58 having a shaft 60 journaled in bearings 62 carried by a part of the frame members 50, which shaft is provided with a gear 64 keyed thereto. I arrange the gear 64 in mesh with a large gear 66 keyed to a shaft 68 having its ends journaled in bearings 70 carried by an inverted U-shaped member 72 having its lower ends pivotally mounted upon the shaft 60 at 74. A small gear 76 is keyed to the shaft 68 and arranged in mesh with the large gear 58. In this way, rotation of the shaft 60 is transmitted to the gear 54, and the pivotally mounted member 52 is arranged to be shifted to throw the gear 76 out of mesh with the gear 44. Referring to Figs. 2 and 4, springs 78 are connected with the frame members 50 and the U-shaped member 72 for yieldingly holding the gear 76 in mesh with the gear 54.

In Figs. 2 and 3, a pawl 80 is mounted upon a shaft 82 carried by the frame members 50. This pawl is arranged to engage the teeth of the gear 54 for holding the gear in a fixed position against the tension of the springs 32 after the spring board 20 has been adjusted to its operative position. An arm 84 is fixed to the shaft 82 and is connected with the U-shaped member 72 through the medium of a link 86. This link is provided with a slot 88 for receiving a pin 90 carried by the arm 84. Thus, it will be seen that the U-shaped member 72 may be shifted sufficiently far to throw the gear 76 out of mesh with the gear 54 before the pawl 80 is pulled out of engagement with the gear 54.

The U-shaped member 72 is operatively connected with the trip member 26 through the medium of a rod 92 having one end pivotally connected with an arm 94 bolted to the trip member 26 and its opposite end pivotally connected between lugs 96 carried by the U-shaped member 72 (see Figs. 2 and 3). I provide a block 98 having trunnions 100 pivotally arranged within openings in the lugs 96. This block is provided with an opening 102 for slidably receiving the rod 92. This rod is provided with a flange 104 normally abutting the block 98 by reason of a coil spring 106 mounted upon the rod and abutting the block 98 and a washer 108 upon the rod.

It will be noted that the springs 78 normally hold the trip member 26 in the position of Fig. 2, at which time the trip member is arranged at

a slightly steeper angle than the runway 24. When a diver runs out on the runway 24 and jumps upon the trip member 26, the latter is pivoted downwardly and shifts the member 72 sufficiently far to throw the gear 76 out of mesh with the gear 54 and the pawl 80 out of latching engagement with the gear 54, whereby the springs 32 are permitted to throw the spring board upwardly about its pivotal connection 22.

The throwing power of the springs 32 will depend upon the amount the springs 32 are flexed. The amount of spring flexure is adjusted to accommodate a diver of predetermined weight through the medium of a switch mechanism operating to open the circuit through the motor 58 when the springs have been flexed sufficiently far. Referring to Fig. 2, I illustrate a bar 110 pivotally mounted at 112 upon one of the frame members 14 and having an upstanding bar 114 pivotally connected with one of its ends and slidably associated with a guide bracket 116 mounted upon the member 14. The free end of the bar 114 projects beyond the bracket 116 and is arranged in the path of the spring board 20. The opposite end of the bar 110 is pivotally connected with a bar 118 connected with an arm 120 mounted upon a shaft 122 (see Fig. 5), which shaft is connected with a crank 124. The shaft 122 is carried by a slidable housing 126 arranged between guide flanges 128 carried by a standard 130. In Figs. 2 and 5, a finger 132 projects upwardly from the top of the housing 126 and is arranged to engage an insulated projection 134 fixed to a switch blade 136 mounted upon a block 138 of insulating material. I pivotally connect the blade 136 with the terminal 140 and provide a split terminal 142 for the reception of the blade in the position of Fig. 2. Conductors 144 and 146 are connected with the terminals 140 and 142, respectively, and are associated with a protective conduit 148. The conductors 144 and 146 connect with the motor 58 and comprise the circuit for the motor.

In operation, the bar 114 may be shifted through the medium of the crank 124 to make contact with the spring board 20 in various adjusted positions. I provide a spring pressed latch member 150 (see Fig. 5) in association with the grip 152 carried by the crank 124, to latch the crank in various shifted positions. The latch member is provided with a head 154 arranged to enter partly one of a plurality of openings 156 in the front wall of the housing 126. Each hole is provided with weight indicating indicia 158. In Fig. 2, I have illustrated a number of holes spaced to represent a number of adjusted positions representing differences of twenty-five pounds. Of course, more openings may be provided so that substantially correct adjustment may be attained for all weights. According to the illustration of Fig. 5, the latch pin will yield upon the application of a thrust in either direction on the grip 152, but is constructed to hold the adjusted parts firmly in shifted position.

In Fig. 2, the bar 114 is adjusted to accommodate a diver weighing two hundred pounds. After the arm 124 has been adjusted, the circuit through the motor is closed by arranging the blade 136 according to Fig. 2, at which time the drum 44 will be rotated in a clockwise direction when viewing Fig. 2, thereby flexing the springs 32. Continued movement of the spring board 120 after it has contacted with the bar 114, will cause the housing 126 to rise because of the latched connection between the arm 124 and the housing. Such upward movement of the housing 126 causes the blade 136 to be moved out of electrical contact with the terminal 142, thereby breaking the circuit through the motor. Thus, the spring board 20 will be shifted to a throwing position against the tension of the springs 32, which springs are flexed an amount providing an ideal throwing force for a diver of two hundred pounds.

The pawl 80 permits free rotation of the gear 54 in a clockwise direction when viewing Fig. 2, but prevents counterrotation. As previously stated, the gear 76 is thrown out of engagement with the gear 54 before the pawl 80 is moved out of latching relation, whereby the drum 44 in connection with the gear 54 is completely freed immediately upon disengagement of the pawl 80. My construction provides free and easy meshing of the gears and permits a quick release of the gear 54 after complete disengagement of the gears 76 and 54 which provides efficient action in addition to preventing stripping of the gears.

I provide stop members 160 for limiting the movement of the trip member 26 relatively to the runway 24. Thus, the trip is in contact with the supports 160 at the time the springs 32 are released so that an effective throwing action is attained.

Without further elaboration, the foregoing will so fully explain my invention that others may by applying current knowledge readily adapt the same for use under various conditions of service.

I claim:

1. A diver's apparatus comprising a runway movably connected with a fixed support, spring means yieldingly resisting movement of the runway in one direction, means for moving and holding the runway in various shifted positions against the tension of said spring means, and a mechanism operatively connected with said means and actuated by the weight of a diver stepping thereon for releasing said means and freeing the runway, to throw the diver.

2. A diver's apparatus comprising a runway movably connected with a fixed support, a spring yieldingly resisting movement of the runway in one direction, means for moving and latching the runway in various shifted positions against the tension of said spring, and a trip mechanism operatively connected with said means and actuated by the weight of a diver stepping thereon for releasing said means and freeing the runway, to throw the diver.

3. A diver's apparatus comprising a supporting structure, a runway movably connected therewith, a trip runway movably connected with the runway, a spring means yieldingly resisting movement of the runway in one direction, means for moving and latching the runway in various shifted positions against the tension of said spring means, means connecting said trip runway with said first-named means and actuated by the weight of a diver stepping on the trip runway for releasing said first-named means and freeing the runway and said trip runway to throw the diver.

4. A diving board comprising a supporting structure, a runway swingably connected with said supporting structure, a trip runway swingably connected with said runway, springs connected with said supporting structure and operatively connected with the runway for yieldingly resisting movement of the latter in one direction, a gear rotatably carried by said sup-

porting structure, a drum connected with the gear for rotation with the same, a rope connected with said springs and wound about the drum for moving the runway against the tension of said springs, a latch co-operating with the gear for latching the latter in various shifted positions of the runway, an operating connection between the trip runway and the latch, and power means for operating said gear.

5. A diving board comprising a supporting structure, a runway swingably connected with said supporting structure, a trip runway swingably connected with said runway, springs connected with said supporting structure and operatively connected with the runway for yieldingly resisting movement of the latter in one direction, a gear rotatably carried by said supporting structure, a drum connected with the gear for rotation with the same, a rope connected with said springs and wound about the drum for moving the runway against the tension of said springs, a latch co-operating with the gear for latching the latter in various shifted positions of the runway, a motor operatively connected with said gear, and an operating connection between the trip runway and the latch.

6. A diving board comprising a supporting structure, a runway swingably connected with said supporting structure, a trip runway swingably connected with said runway, springs connected with said supporting structure and operatively connected with the runway for yieldingly resisting movement of the latter in one direction, a gear rotatably supported by said supporting structure, a drum connected with the gear for rotation with the same, a rope connected with said springs and wound about the drum for moving the runway against the tension of said springs, a latch co-operating with the gear for latching the latter in various shifted positions of the runway, a motor, a train of gears connecting the motor with said first-named gear, a movable support for supporting said train of gears, a connection between said movable support and said trip runway and actuated by the weight of a diver stepping on the latter for throwing the train of gears out of mesh with said first-named gear, a connection between said movable support and said latch, said last-named connection operating to move the latch out of engagement with said first-named gear after disengagement of said train of gears with said first-named gear.

7. A diving board comprising a supporting structure, a runway swingably connected with said supporting structure, a trip runway swingably connected with said runway, spring means connected with said supporting structure and operatively connected with the runway for yieldingly resisting movement of the latter in one direction, a gear rotatably supported by said supporting structure, a drum connected with the gear for rotation with the same, a rope connected with said springs and wound about the drum for moving the runway against the tension of said spring means, a latch co-operating with the gear for latching the latter in various shifted positions of the runway, a motor, a train of gears connecting the motor with said first-named gear, a movable support for supporting said train of gears, a connection between said movable support and said trip runway and actuated by the weight of a diver stepping on the latter for throwing the train of gears out of mesh with said first-named gear, a connection between said movable support and said latch, said last-named connection operating to move the latch out of engagement with said first-named gear after disengagement of said train of gears with said first-named gear, a switch including a circuit for said motor, and means arranged in the path of said runway and operatively connected with said switch, to open the same when said runway has been shifted to a predetermined position by the motor.

8. In a diver's apparatus, a diving board, spring means for throwing the board, a motor operatively connected with the diving board for moving the same against the tension of the spring means, to shift the diving board to a predetermined position, and switch means comprising a part of a circuit for the motor actuated by the diving board to open the motor circuit when the diving board has been shifted to a predetermined position.

9. The combination of a runway movably connected with a fixed support, means for throwing the runway to hurl a diver therefrom, a motor operatively connected with said means for shifting the runway to a hurling position, a switch and a circuit for the motor, and adjustable means operatively connecting the switch with said motor and actuated by the runway when shifted to a predetermined position, to open the circuit through the motor.

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