

Nov. 15, 1955

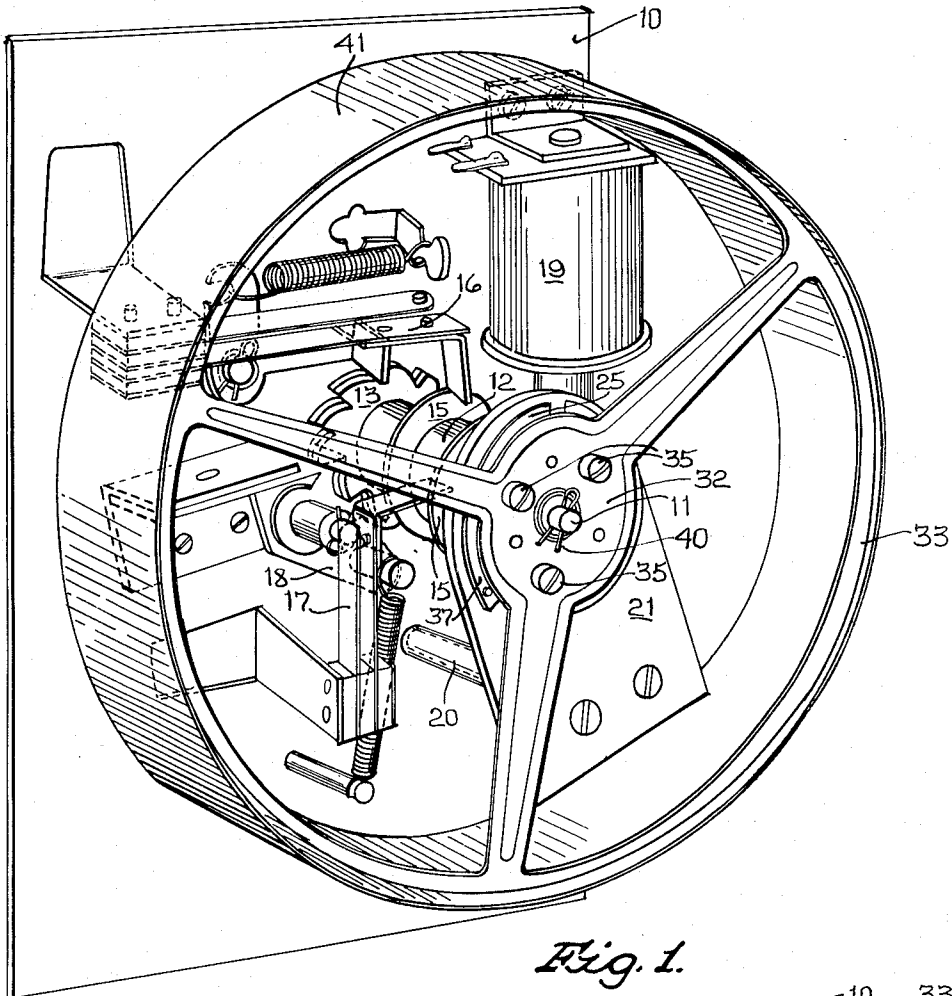
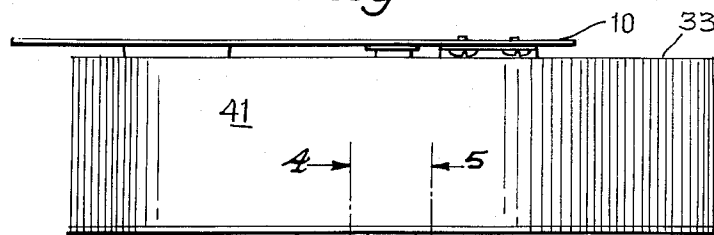
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2,724,024

STEP-UP MECHANISMS

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2 Sheets-Sheet 1



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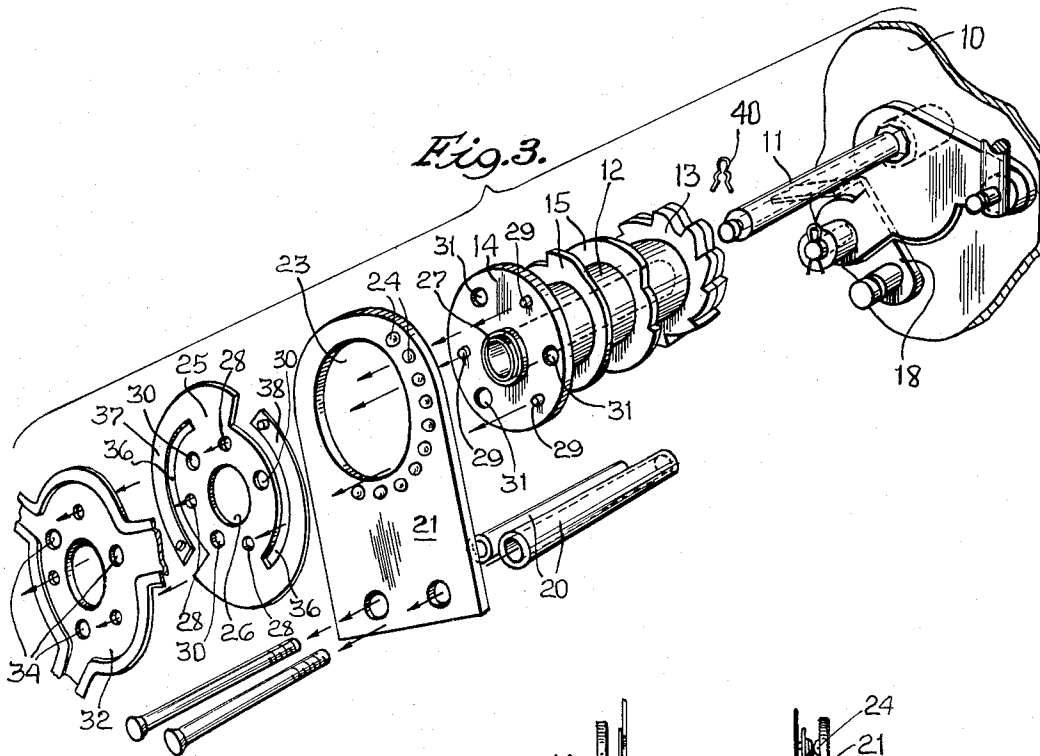
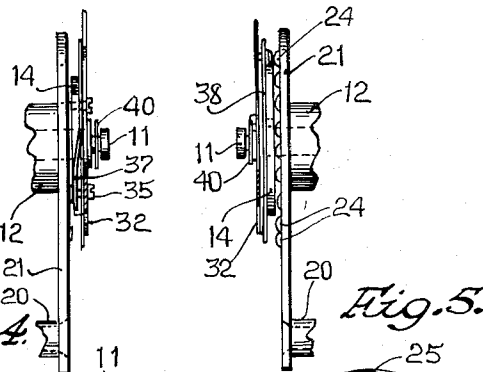
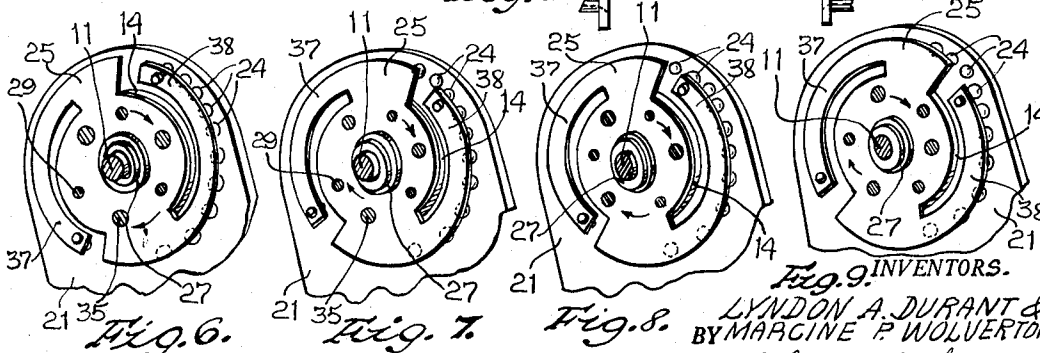
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STEP-UP MECHANISMS

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2 Sheets-Sheet 2



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2,724,024

STEP-UP MECHANISMS

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Application September 24, 1952, Serial No. 311,258

1 Claim. (Cl. 200—11)

This invention relates to certain new and useful improvements in step-up mechanisms especially adapted for use in connection with amusement game apparatuses for registering a score or other award.

The invention has for its principal object the provision of a simple, small, compact, and highly economical step-up mechanism especially designed for the above-stated purpose.

Another and important object of this invention is to provide in a step-up mechanism a drum moving means and a commutator, both of which are arranged within the confines of the drum to provide a compact and relatively small step-up mechanism.

Another and equally important object of the invention is the provision in a step-up mechanism of a commutator wherein there is provided a plurality of contact members arranged in a semicircle and in concentric relation, the first of the contact members and alternate contacts thereafter adapted to be successively engaged by a spring contact finger, before the second of the contact members and alternate contacts thereafter are successively engaged by another spring contact finger, thus resulting in a commutator having a maximum number of contacts within a relatively small field or area.

Other objects will appear hereinafter.

The invention consists in the novel combination and arrangement of parts to be hereinafter described and claimed.

The invention will be best understood by reference to the accompanying drawings showing the preferred form of construction, and in which:

Fig. 1 is a perspective view of the step-up mechanism embodying our invention;

Fig. 2 is a top elevational view thereof;

Fig. 3 is a perspective view of parts thereof showing the same in exploded relation with respect to each other;

Fig. 4 is a fragmentary sectional detail view taken substantially on line 4—4 of Fig. 2;

Fig. 5 is a fragmentary sectional detail view taken substantially on line 5—5 of Fig. 2;

Figs. 6 to 9 inclusive are perspective views of the commutator embodied in my invention, showing the parts thereof in different positions.

The several objects of our invention are accomplished by the preferred form of construction shown in the accompanying drawings. The step-up mechanism proper is substantially similar to that shown in application for United States Patent, Serial No. 293,395.

As in such application, the present mechanism includes a mounting plate 10 from which extends a shaft 11. On this shaft 11 is rotatably mounted a hub 12 having integral sections, one of which provides a ratchet wheel 13 at one end of the hub and at the opposite end a mounting disc 14. Intermediate the ratchet wheel 13 and the mounting disc 14 are cam elements 15 for actuating switches 16 and 17.

Like in the application hereinbefore mentioned, the

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ratchet wheel 13 is adapted to be engaged by a step-up pawl 18 actuated by an electromagnetic solenoid 19.

Extending from the mounting plate 10 are parallelly spaced posts 20 which support a plate 21 formed of insulating material and provided at its upper end portion with an opening 23 through which the mounting disc 14 projects when the hub 12 is mounted on the shaft 11. This plate 21 which constitutes a part of a commutator, comprises a plurality of contacts 24 arranged in a semicircle concentrically with respect to the opening 23 on one side of the long axis thereof.

The commutator further includes a conductor disc 25 having an opening 26 through which projects a ring 27 on the mounting disc 14. In this disc 25 are provided openings 28 which cooperate with pins 29 for properly locating the openings 30 in registration with openings 31, the latter formed in the mounting disc 14 and through which project suitable screws for attaching the hub 32 of a drum 33 to the mounting disc 14 over the conductor disc 25, the hub 32 being provided with suitable openings 34 which are adapted to register with the openings 30 and 31, the attaching screws 35 being threaded into the openings 31. When the hub 32 of the drum 33 is thus attached to the mounting disc 14, the conductor disc will be disposed between the hub 32 of the drum 33 and the plate 21. This conductor disc 25 has cut-out portions 36 thereby to provide spring fingers 37 and 38 arranged concentrically with respect to the disc 25 and extending in opposite directions and biased for engagement with the contacts 24.

The drum 33 is removably attached to the end of the shaft 11 by means of a spring clip 40, as shown in Fig. 1. This drum 32 has a relatively wide band or peripheral edge 41 on which is adapted to be printed or otherwise impressed indicia or other game scoring or awarding information.

When the several parts of our step-up mechanism are assembled in the manner shown in Fig. 1, the relationship of the contacts 24 with respect to the fingers 37 and 38 is such that the advancing finger, which in the present instance may be the finger 38, engages the first of the contacts 24 and successively engages alternate contacts thereafter, before the other finger 37 engages the second of the contacts 24 and successively engages alternate contacts thereafter. This feature we have illustrated in Figs. 6 to 9 inclusive. In Fig. 6, it will be noted that the contact of the finger 38 engages the first of the contacts 24 and thereafter successively engages alternate contacts (as shown in Figs. 6 and 7), before the contact of the finger 37 engages the second of the contacts 24 and thereafter successively engages alternate contacts (as shown in Figs. 8 and 9).

By this arrangement, a relatively large number of contacts may be provided within a minimum area and the life of the contacts of both the fingers and the contact plate are prolonged.

The construction illustrated in the drawings permits the commutator and hub to be bodily removed with and as a part of the drum 33. This greatly facilitates a saving in repair work as well as a saving in the assembly of the several elements constituting our improved step-up mechanism.

When the unit is assembled as shown in Fig. 1, the mechanism for stepping up the drum 33 step by step, and the commutator, are confined within the drum 33. This results in a small, compact unit, capable of occupying a relatively small space such as required in devices with which such step-up mechanism is contemplated to be associated.

While we have illustrated and described the preferred form of construction for carrying out our invention into effect, this is capable of variation and modification with-

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out departing from the spirit of the invention. We therefore do not wish to be limited to the precise details of construction set forth, but desire to avail ourselves of such variations and modifications as come within the scope of the appended claim.

Having thus described our invention, what we claim as new and desire to protect by Letters Patent is:

In combination, a mounting plate, a stationary shaft fixed to and extending laterally from one side of the plate, a hub mounted for rotation on the shaft, means for rotating said hub relative to said shaft, a wheel fixed to the hub for rotation therewith and having a laterally extending peripheral flange, an elongated plate fixedly supported by the mounting plate in spaced parallel relation with respect thereto and having an opening through which

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the hub projects, said plate having a plurality of contacts arranged concentrically with respect to the hub, and a conductor disc arranged between the hub and the wheel and fixed to the latter at the outer end thereof for removal from the hub with the wheel, said disc providing oppositely disposed contact fingers extending concentrically with respect to the disc with their free ends in the path of said contacts for successive engagement with the latter.

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