

(19)



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(11)

EP 0 875 806 A1

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
04.11.1998 Bulletin 1998/45

(51) Int. Cl.⁶: **G04B 45/00**

(21) Application number: **97303026.5**

(22) Date of filing: **02.05.1997**

(84) Designated Contracting States:
DE FR IT

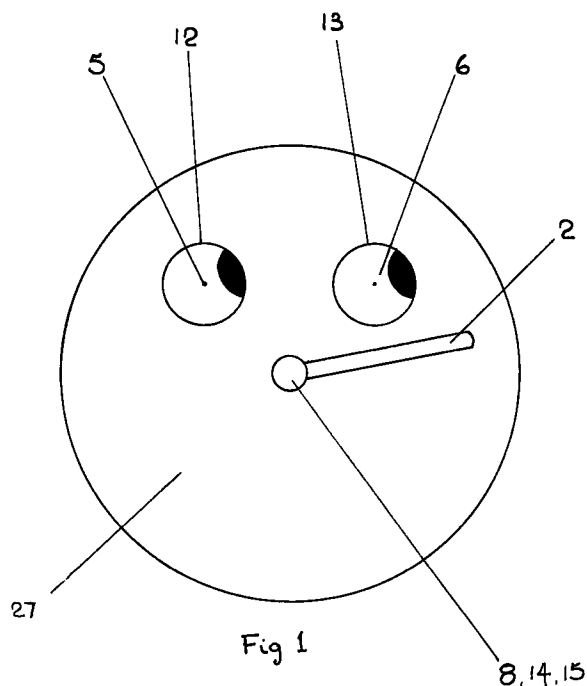
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(54) **Time-keeper**

(57) A time-keeper has two discs 5 and 6 at least partly visible from the front of the time-keeper. The discs are urged to rotate by the time-keeper drive mechanism in casing 10 such that each disc rotates in the same direction and angular velocity as time-keeper hand 2. Time-keeper hand 2 is a conventional clock and/or watch hand such as hour hand, minute hand or second hand.



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Description

This invention relates to a time-keeper, particularly to a time-keeper such as a clock or watch for children to encourage children to become more aware of the movement of the clock or watch hands such as the hour, minute and second hands, as time passes.

On conventional time-keepers, the hands are the only visible features which change position with time. However, many children when learning the time do not notice the change in the position of the hands. It would be valuable to provide features in addition to the time-keeper hands which change position as time passes and which relate to the time-keeper hands such that children become more aware of the change in position of the time-keeper hands with time.

According to the present invention, there is provided two or more discs positioned apart whereby one surface of each disc is at least partly visible from the front of the time-keeper and in the same or parallel plane as the front of the time-keeper. Each disc is urged to rotate by the time-keeper drive mechanism typically but not necessarily about the radial centre of each disc such that each disc rotates in the same direction and at the same angular velocity as the other disc or discs and also in the same direction and angular velocity as a conventional time-keeper hand such as the hour hand, minute hand or the second hand. The visible surface of each disc provides a valuable platform onto which graphic representations could be placed to indicate the change in position of each disc as time passes. The visible surface of the each disc can be flat or formed in three dimensions such as spherical, parabolic, conical or any other regular or irregular form. The periphery of the visible surface of each disc can be any regular or irregular shape and size.

Some embodiments of the invention will now be described by way of example with reference to the accompanying drawings, in which:

Figure 1 shows a front elevation of a time-keeper embodying the invention.

Figure 2 shows a front elevation of an arrangement for rotating the two discs through gears urged by movement typically of the hour hand bearing shaft.

Figure 3 shows a front elevation of an arrangement for rotating the two discs through one or more gears not directly urged by movement of one or more hand-bearing shafts.

Figure 4 shows in perspective an arrangement for rotating the two discs through gears urged by the minute hand-bearing shaft.

Figure 5 shows in perspective an alternative arrangement for rotating the two discs through

gears urged by movement of the minute hand-bearing shaft.

Figure 6 shows a front elevation of an arrangement for rotating the two discs through gears urged by the hour hand bearing shaft such that the discs rotate at the same angular velocity and direction as the minute hand bearing shaft.

Figure 7 shows a front elevation of an alternative arrangement for rotating the two discs through gears urged by the hour hand-bearing shaft such that the discs rotate at the same angular velocity and direction as the minute hand-bearing shaft.

Figure 8 shows a rear elevation of an arrangement for rotating the two discs such that the discs rotate at the same angular velocity and direction as the second hand bearing shaft.

Figure 9 shows a rear elevation of an arrangement for rotating four discs such that the discs rotate at the same angular velocity and direction as the second hand bearing shaft.

Figure 10 shows a front elevation of a time-keeper with two discs which are not geared.

Figure 11 shows a front elevation of a time-keeper with more than two discs.

As shown in Figures 1 to 11, a time-keeper has a substantially conventional mechanical drive mechanism, powered electrically or by clockwork. Thus there is a housing 10 from which two or three concentric hand-bearing shafts 8, 14 and 15 extend forward. The outer hand bearing shaft 8 carries the conventional hour hand, the intermediate hand bearing shaft 14 carries the conventional minute hand and the inner hand bearing shaft 15 carries the conventional second hand. The hand-bearing shafts are urged to rotate by the time-keeper drive mechanism shown in housing 10. Time-keeper hand 2 can be any conventional time-keeper hand such as the hour hand, minute hand or second hand or any other conventional time-keeper hand.

Geared discs 5 and 6 and which are at least partially visible from the front of the time-keeper have the same measured geared diameter and can each rotate. The periphery of their surfaces visible from the front of the time-keeper can extend beyond the outside diameter of the geared part of the discs.

In figure 2, geared disc 7 has the same diameter as the gear forms on both geared discs 5 and 6 and is fixed to the outer concentric hour hand-bearing shaft 8 carrying time-keeper hand 2. Geared disc 11 is engaged with geared discs 5, 6, and 7 such that when hand-bearing shaft 8 is urged to rotate by the time-keeper drive mechanism, then geared discs 5, 6 and 7 are constrained to

rotate in the same direction and at the same angular velocity such that geared discs 5 and 6 rotate in the same direction and at the same angular velocity as time-keeper hand 2.

In figure 3, geared disc 9 is engaged with a part of the time-keeper drive mechanism in casing 10 which is not necessarily engaged with hand-bearing shafts 8, 14 or 15 such that geared discs 5 and 6 rotate in the same direction and at the same velocity as time-keeper hand 2 whereby time-keeper hand 2 can be any conventional time-keeper hand.

In figure 4, minute hand-bearing shaft 14 carries time-keeper hand 2. Hour hand-bearing shaft 8 is shortened with gear teeth applied to its circumference such that it engages with gear 17. Gear 17 also engages with gear 19 such that hand-bearing shaft 8 and gear 19 rotate in the same direction and at the same angular velocity. In particular, gear 19 is configured such that it fits concentrically onto hand-bearing shaft 14 and is free to move radially about the outer surface of hand-bearing shaft 14. Gear 19 is also typically configured to carry the time-keeper hour hand. Gear 16 is fixed to hand-bearing shaft 14 and is the same diameter as the gear forms on geared discs 5 and 6. Gear 11 engages with gear 16 and geared discs 5 and 6 such that geared discs 5 and 6 rotate in the same direction and angular velocity as hand shaft 14 and time-keeper hand 2.

In figure 5, minute hand-bearing shaft 14 carries time-keeper hand 2. Hand-bearing shaft 8 has been removed such that minute hand bearing shaft 14 becomes the outer hand-bearing shaft. Gear 20 and gear 26 are fixed to hand-bearing shaft 14. Gear 18 is configured such that it fits concentrically onto hand-bearing shaft 14 and is free to move radially about the outer surface of hand-bearing shaft 14. Gear 18 is also configured to carry the time-keeper hour hand. Gear 21 is engaged with gear 26 and gear 18 such that when gear 26 has moved through exactly twelve complete revolutions gear 18 has been urged to move through one complete revolution. Gear 20 and has the same diameter as the gear forms on geared discs 5 and 6. Gear 11 engages gear 20 and geared discs 5 and 6 such that geared discs 5 and 6 rotate in the same direction and angular velocity as hand shaft 14 and time-keeper hand 2.

In figure 6, time-keeper hand 2 is carried by minute hand bearing shaft 14. Gear 23 is fixed to hour hand bearing shaft 8. Gear 25 is fixed to or is an integral part of gear 22 such that both gears can rotate together on the same axis and at the same angular velocity. Gear 23 engages with gear 25 and gear 22 engages with geared discs 5 and 6 such that when gear 23 has moved through exactly one complete revolution then geared discs 5 and 6 have both moved through exactly 12 revolutions such that geared discs 5 and 6 rotate in the same direction and angular velocity as time-keeper hand 2.

In figure 7, time-keeper hand 2 is carried by minute

hand bearing shaft 14. Gear 24 is fixed to the hour hand bearing shaft 8. Gear 24 engages with gear 11 which engages with geared discs 5 and 6 such that when gear 24 moves through exactly one complete revolution then geared discs 5 and 6 have moved through exactly 12 complete revolutions such that geared discs 5 and 6 rotate in the same direction and angular velocity as hand shaft 14 and time-keeper hand 2.

In figure 1, discs 5 and 6 are shown at least partly visible through two circular openings 12 and 13 concentric with discs 5 and 6 respectively. Discs 5 and 6 could also be completely visible with the visible surfaces being in the plane of time-keeper face 27 or in a parallel plane in front of time-keeper face 27. Time-keeper hand 2 is also visible in front of time-keeper face 27 such that when time-keeper hand 2 is urged to rotate by the time-keeper drive mechanism in casing 10, discs 5 and 6 rotate in the same direction and angular velocity as time-keeper hand 2.

In figure 8, geared disc 7 has the same diameter as the gear forms on both geared discs 28 and 30 which are arranged at the rear of the time-keeper drive mechanism in casing 10. Hand-bearing shaft 15 carrying time-keeper hand 2 is extended to the rear of casing 10 such that shaft 15 is fixed to geared disc 7. Geared disc 11 is engaged with geared discs 28, 30 and 7 such that when hand-bearing shaft 15 is urged to rotate by the time-keeper mechanism, then geared discs 28 and 30 rotate in the same direction and angular velocity as the time-keeper hand 2.

Discs 37 and 38 in figure 9 are at least partially visible from the front of the time-keeper and are fixed to shafts 29 and 31 respectively which are also fixed to geared discs 28 and 30 respectively such that discs 37 and 38 rotate in the same direction and angular velocity as the time-keeper hand 2.

In figure 10 geared disc 7 has the same diameter as the gear forms on geared discs 28, 30, 32 and 35 which are arranged at the rear of the time-keeper drive mechanism in casing 10. Hand-bearing shaft 15 carrying time-keeper hand 2 is extended to the rear of casing 10 such that shaft 15 is fixed to geared disc 7. Geared discs 11 and 34 are engaged with geared discs 28, 30, 32, 35 and 7 such that when hand-bearing shaft 15 is urged to rotate by the time-keeper mechanism, then geared discs 28, 30, 32, 35 and 7 rotate in the same direction and angular velocity as the time-keeper hand 2.

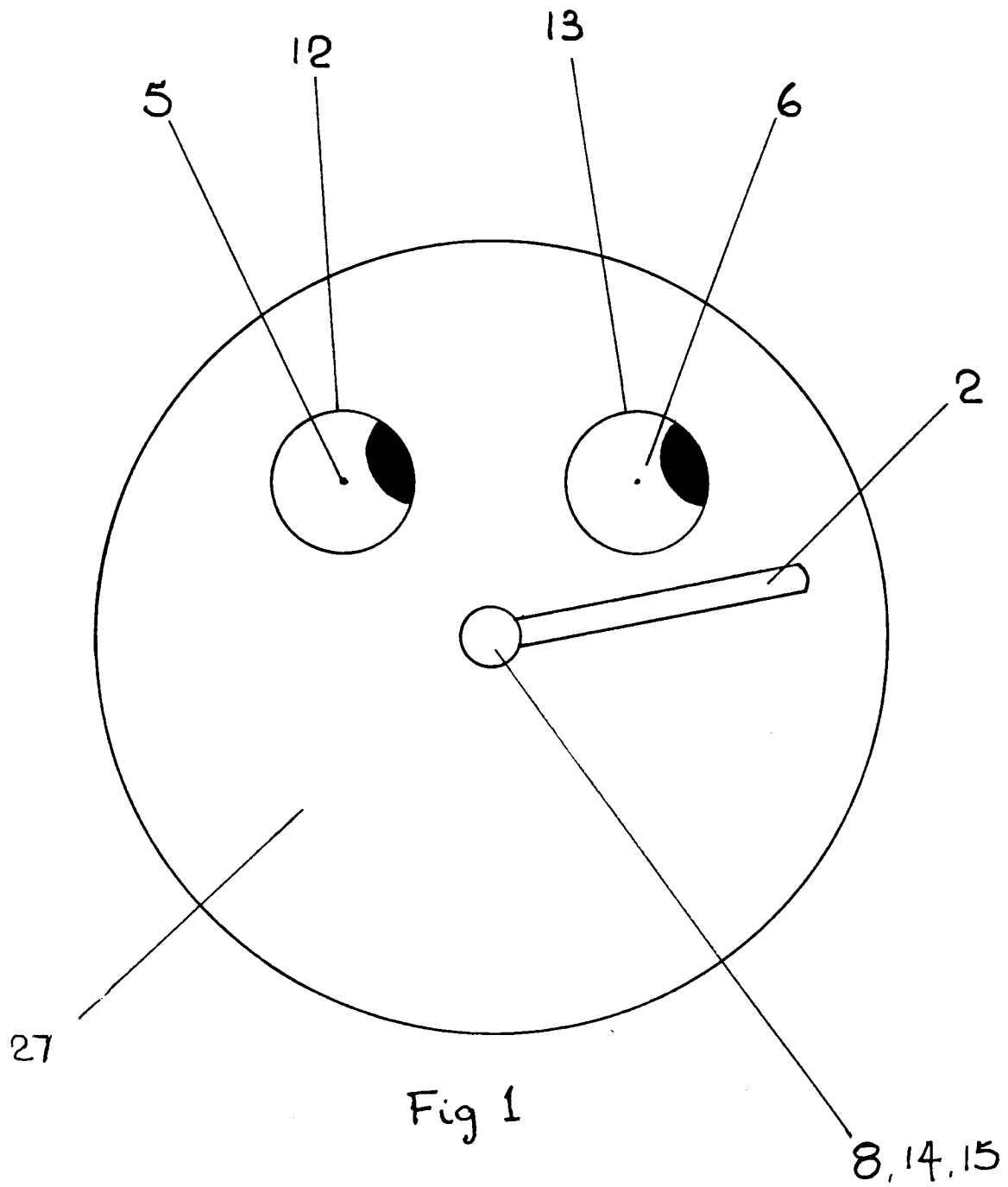
Discs 37, 38, 39 and 40 in figure 11 are at least partially visible from the front of the time-keeper and are fixed to shafts 29, 31, 36 and 33 respectively which are also fixed to geared discs 28, 30, 35 and 32 respectively such that discs 37, 38, 39 and 40 rotate in the same direction and angular velocity as the time-keeper hand 2.

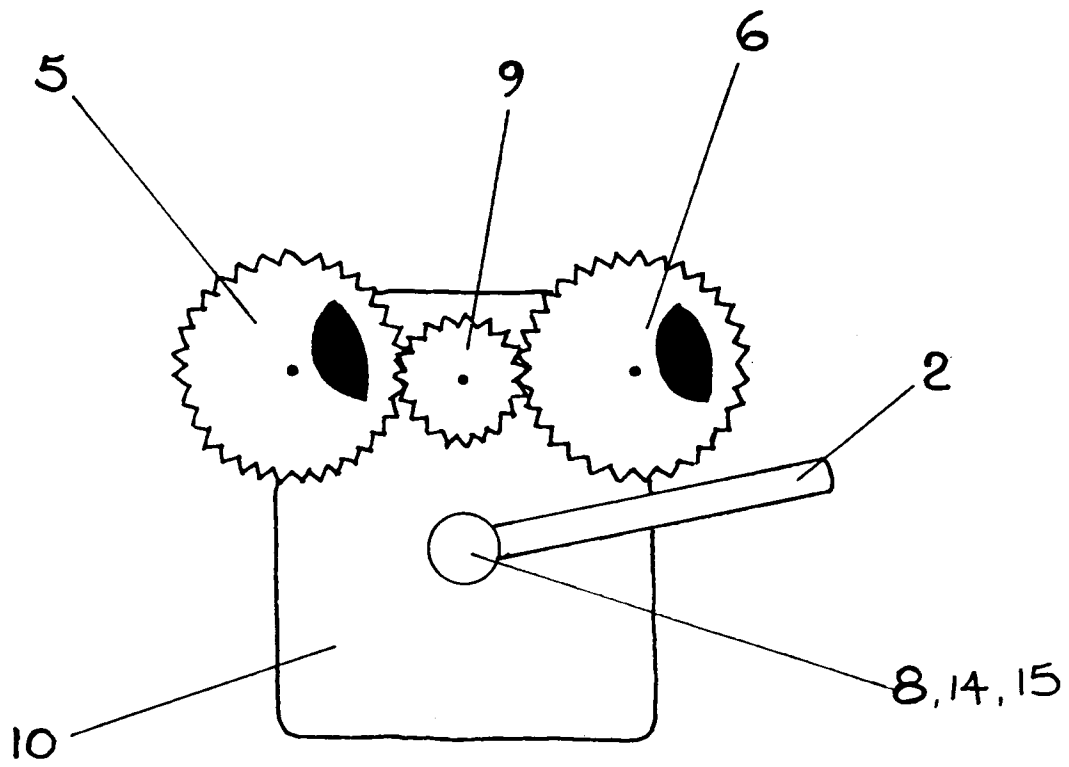
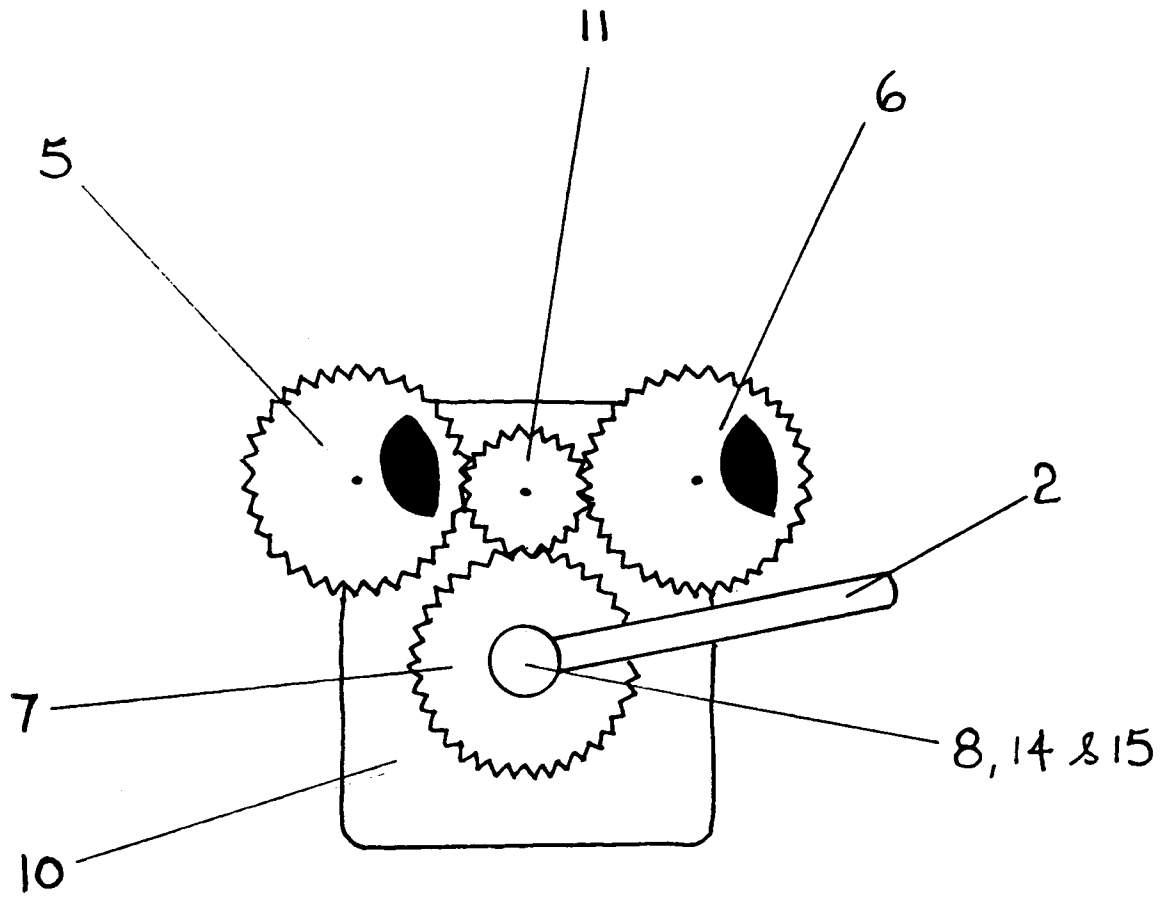
Claims

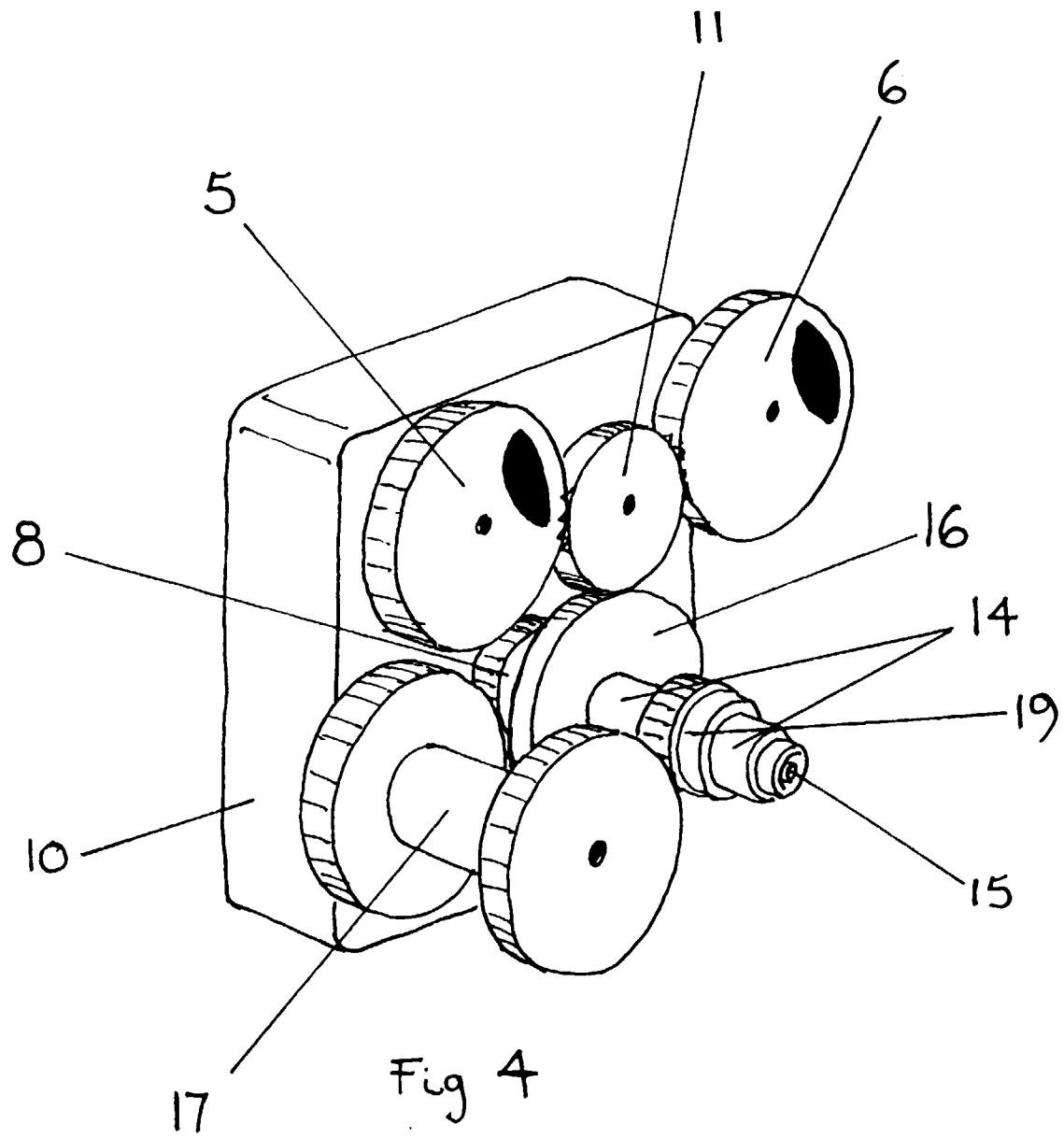
1. A time-keeper such as a clock or watch having two or more discs positioned apart whereby one surface of each disc is at least partly visible from the front of the time-keeper and in the same or substantially parallel plane as the front of the time-keeper; a mechanism such as a clock or watch mechanism powered electrically or by clockwork and at least one conventional time-keeping hand such as a second hand, minute hand or hour hand which is physically connected to the mechanism such that the mechanism urges it to rotate; a means of urging the discs to rotate about their respective axes which are substantially parallel to the axis of rotation of the time-keeping hands such that discs rotate at the same angular velocity and direction and at the same angular velocity and direction as one of the conventional time-keeper hands.
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2. A time-keeper according to claim 1 with discs which are urged to rotate by the same time-keeping mechanism which urges the conventional time-keeping hands to rotate.
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3. A time-keeper according to claim 1 with discs which are urged to rotate by a means which is independent from the conventional time-keeping mechanism which urges the conventional time keeping hands to rotate such that the independent means urges the discs rotate at the same angular velocity and direction as one of the conventional time-keeping hands.
30
4. A time-keeper according to claim 1 with discs whereby at least one surface of one or more discs is formed in three dimensions such as spherical, parabolic, conical or any other regular or irregular form.
35
5. A time-keeper according to claim 1 with discs whereby the periphery of one or more discs is not round.
40
6. A time-keeper according to claim 1 with discs whereby one or more discs are of different size and/or surface form in three dimensions and/or peripheral shape other than round.
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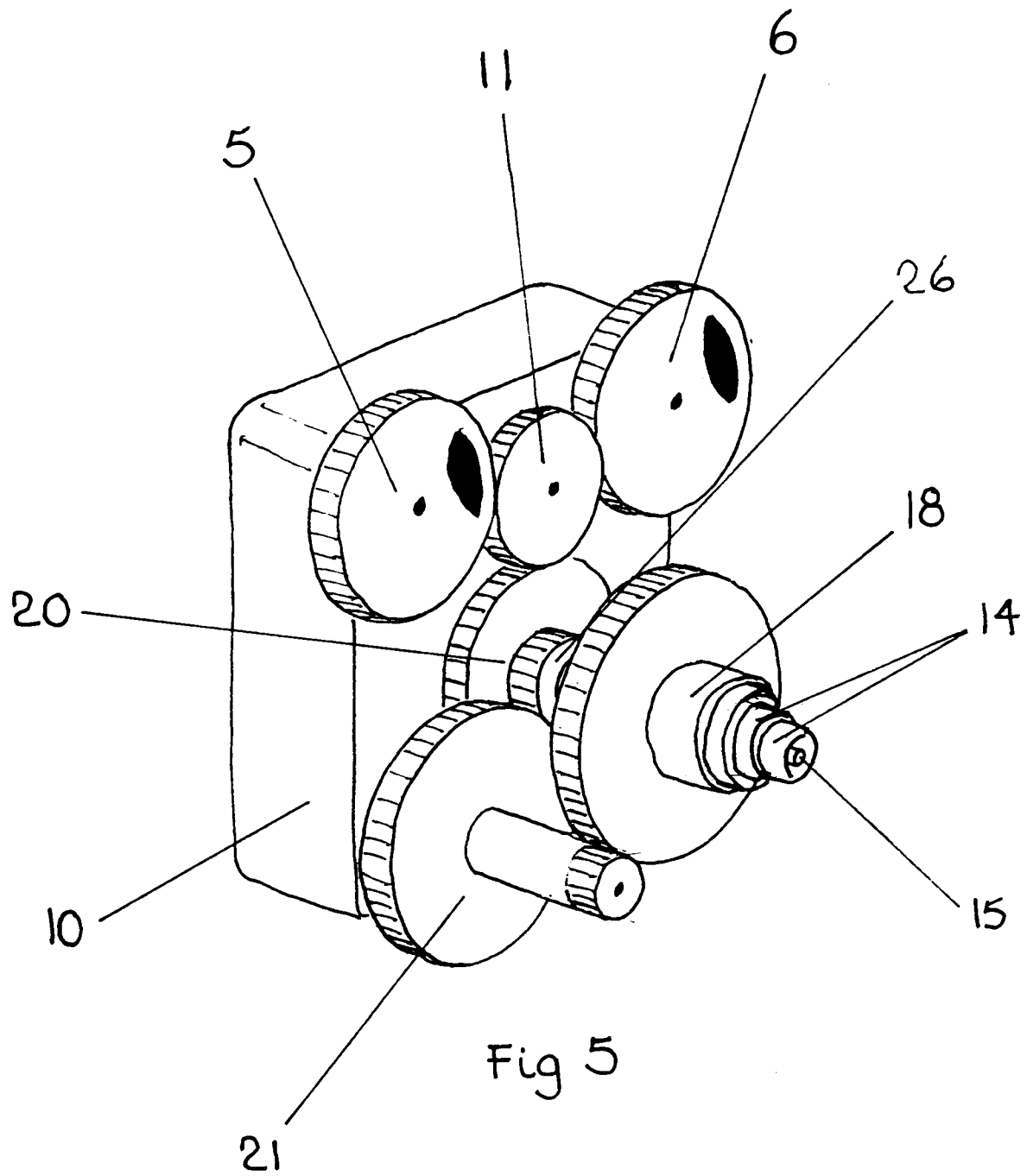
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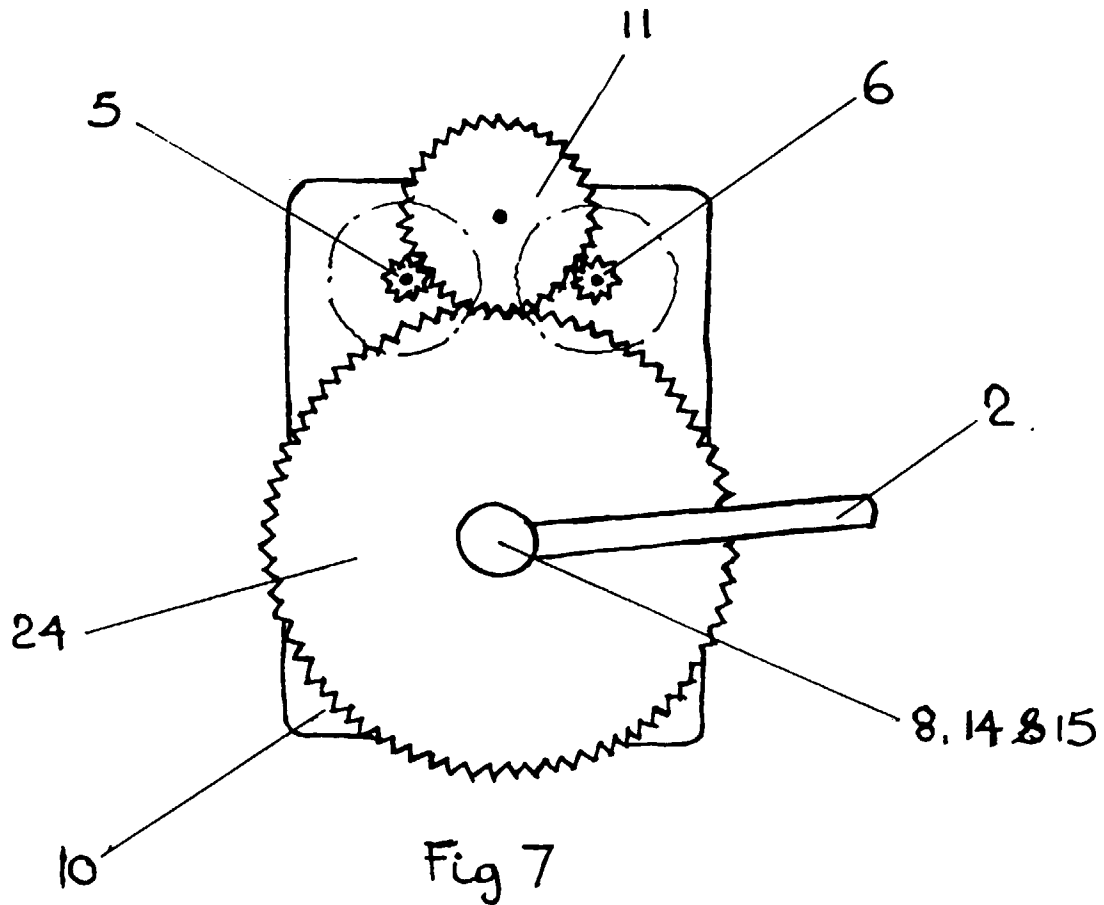
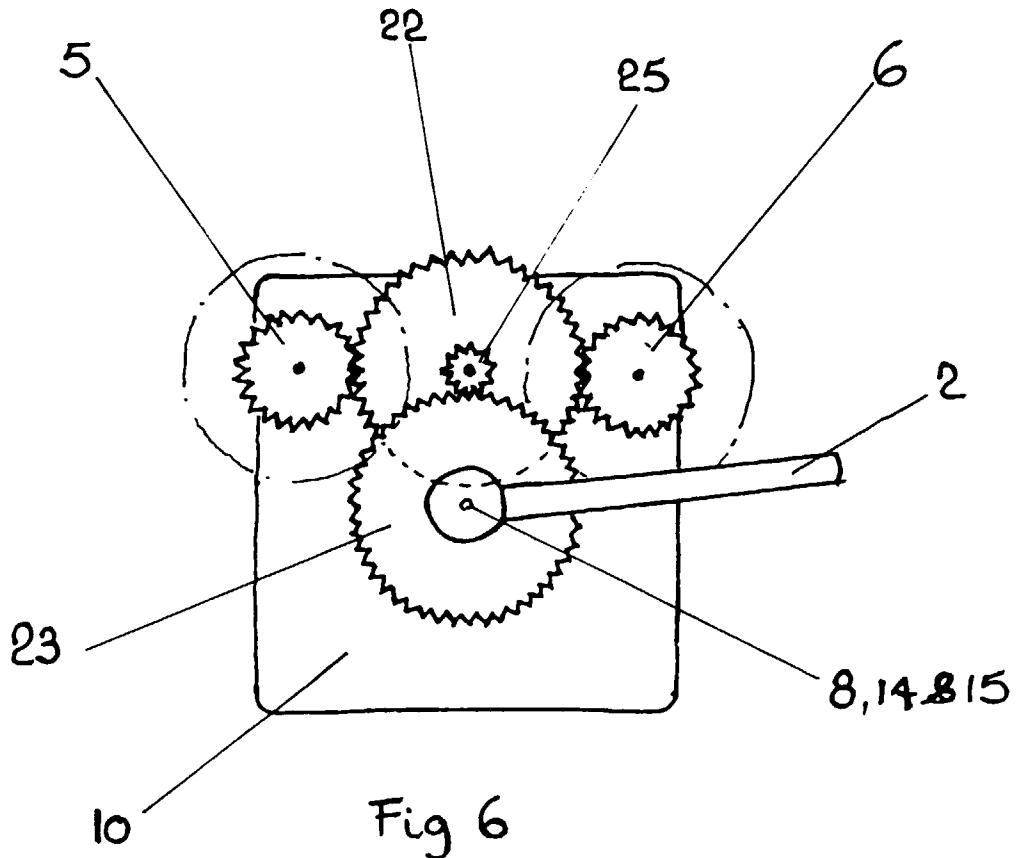
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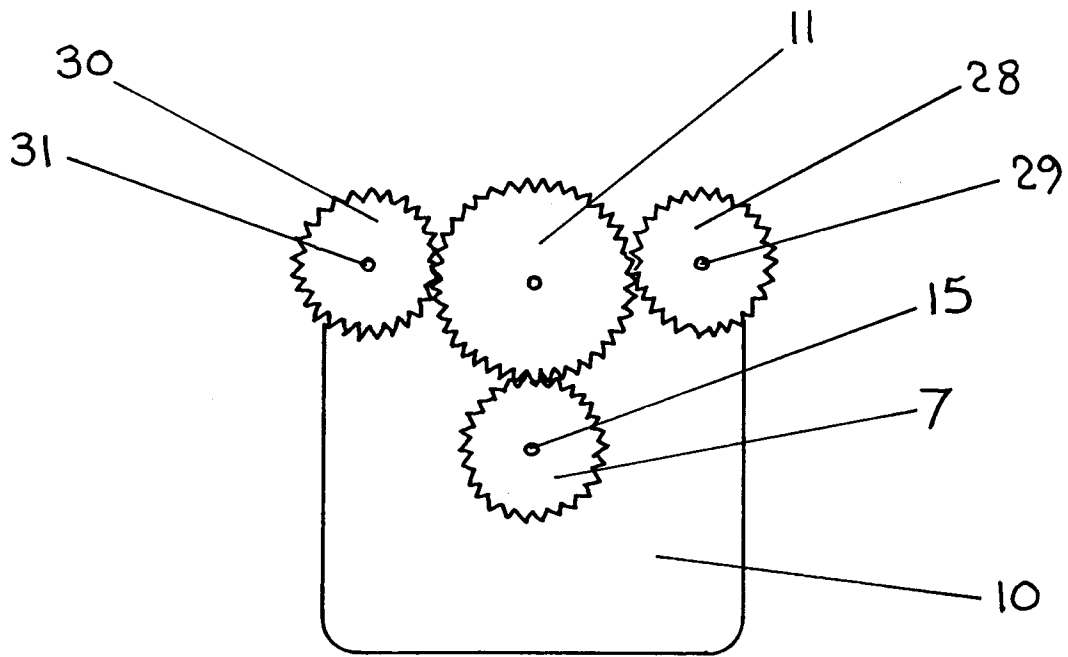


Fig 8

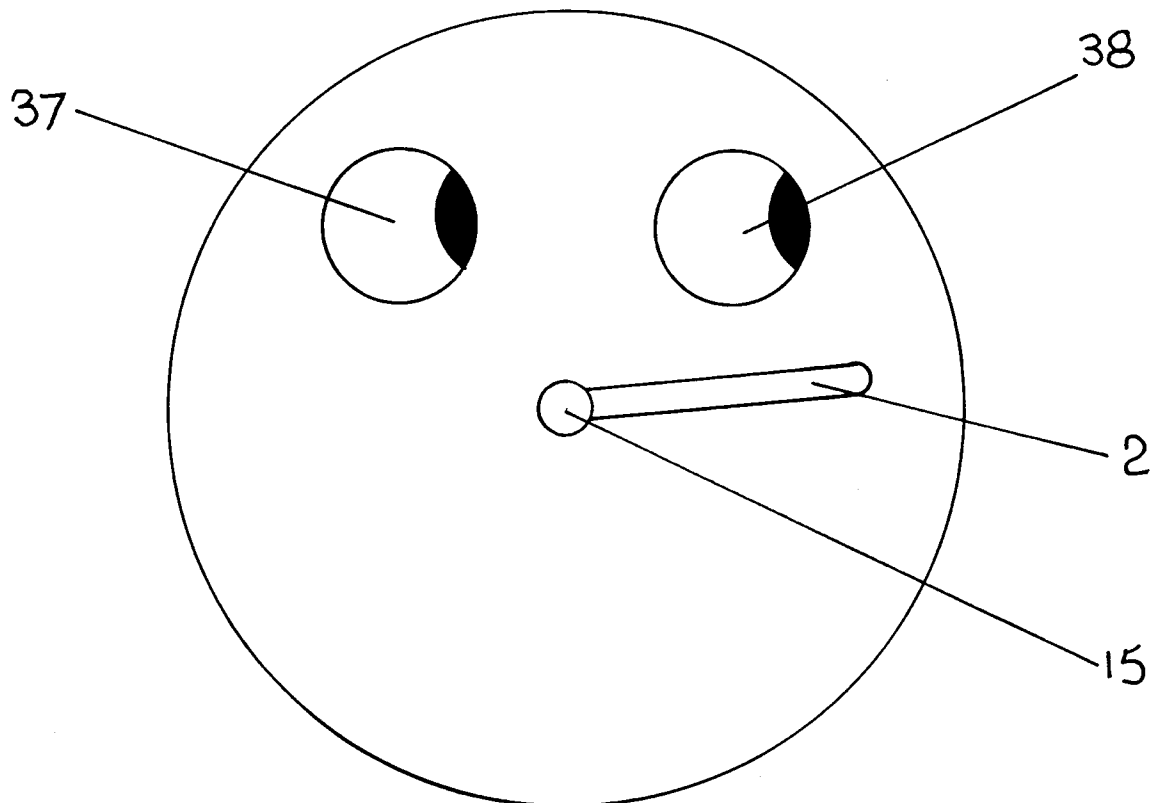
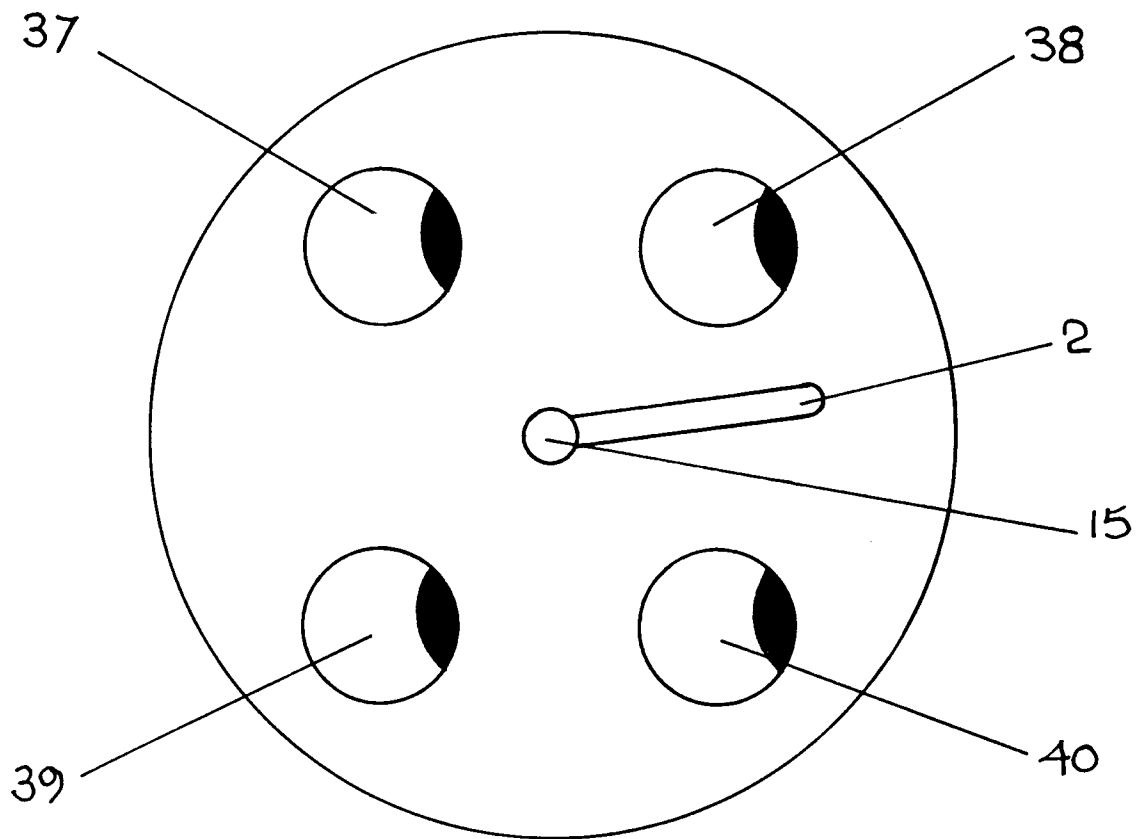
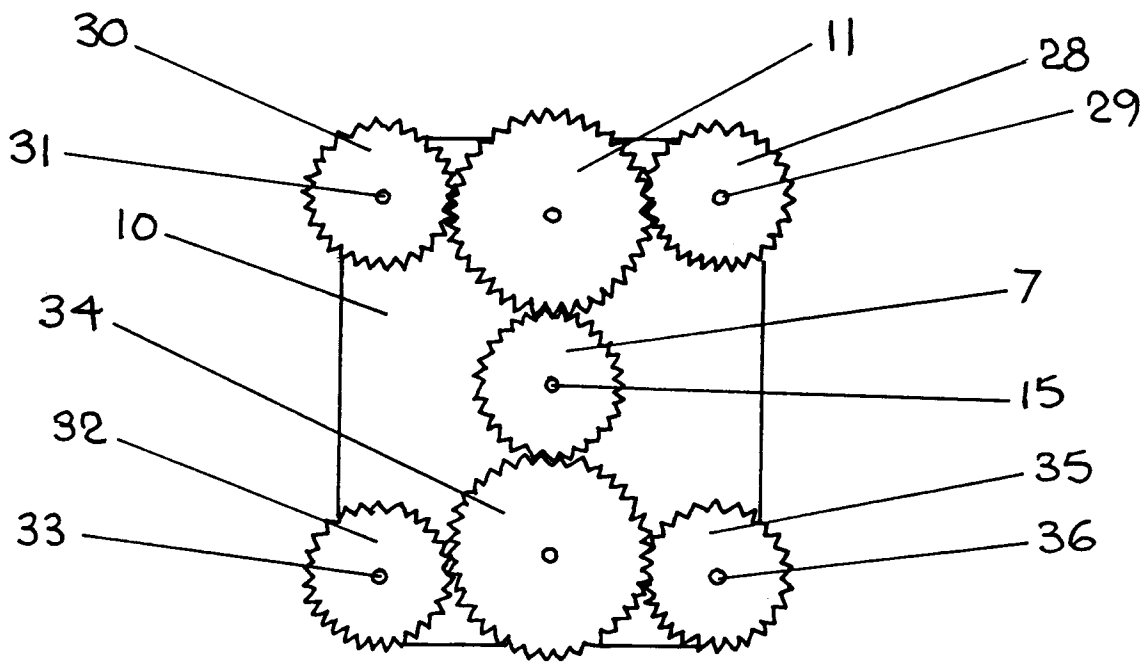


Fig 9





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EUROPEAN SEARCH REPORT

Application Number
EP 97 30 3026

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.6)
X	DE 66 00 118 U (REINBOLD) * the whole document * ---	1,2	G04B45/00
X	DE 92 17 623 U (LUTZ) * page 13, line 16 - line 24; claim 1; figures 1,6,20 * ---	1-3,5	
A	FR 66 784 E (BOREL & CIE, S.A.) * the whole document * ---	1,2,4,6	
A	US 2 791 853 A (COONS) * the whole document * -----	1,2,4,6	
			TECHNICAL FIELDS SEARCHED (Int.Cl.6)
			G04B
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 28 October 1997	Examiner Pineau, A
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