Jan. 25, 1938. R. H. PAUL 2,106,466

GAME SCORER

Filed Sept. 15, 1934 3 Sheets-Sheet 1

Fig.1.

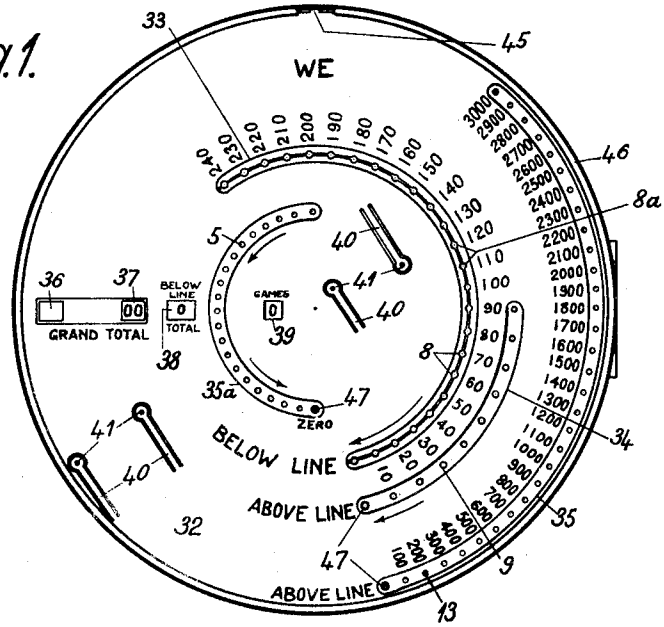
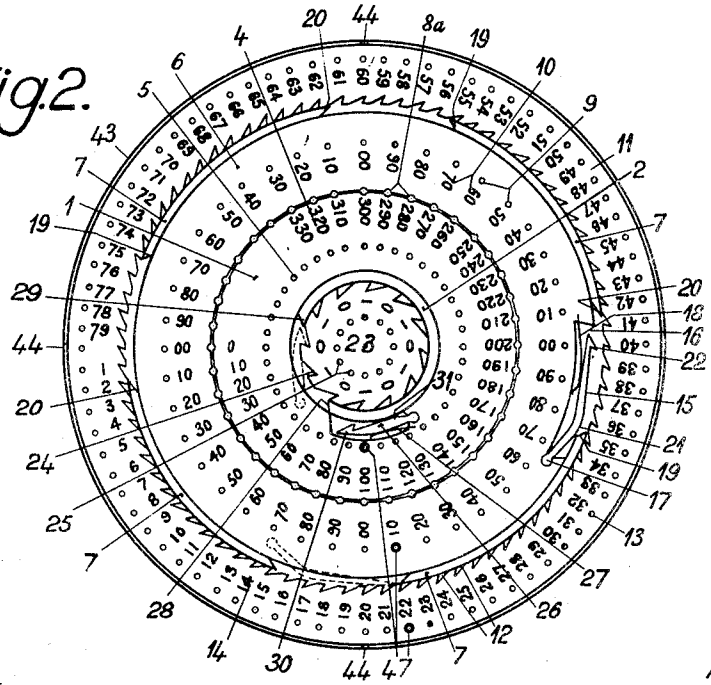


Fig.2.



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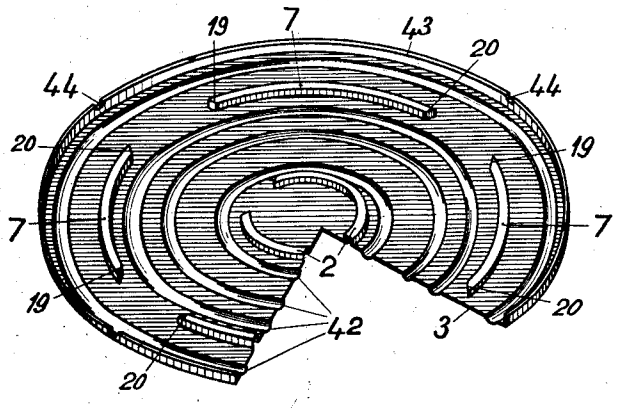


Fig.3.

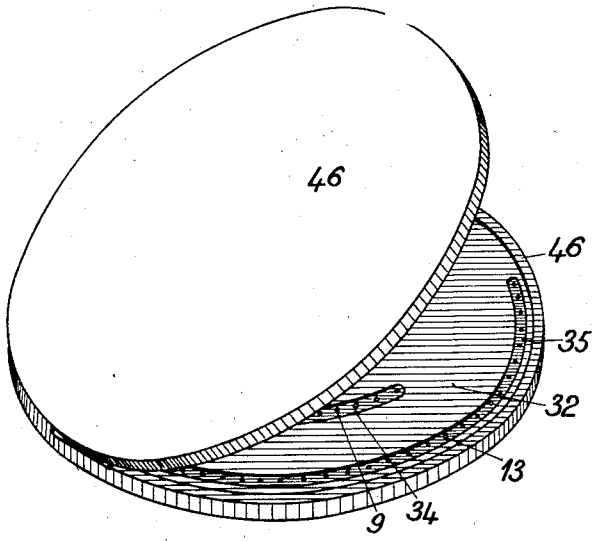


Fig.4.

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GAME SCORER

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Fig. 5.

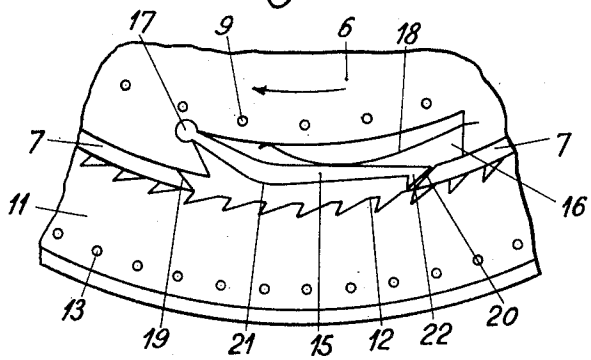


Fig. 6.

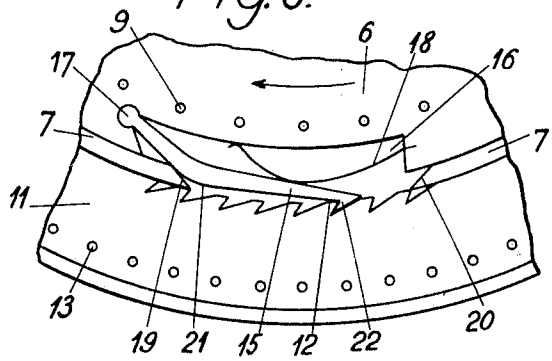
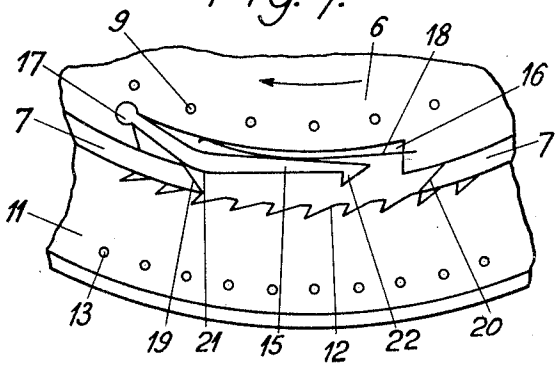


Fig. 7.



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2,106,466

GAME SCORER

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Application September 15, 1934, Serial No. 744,105
In Great Britain September 21, 1933

2 Claims. (Cl. 235—142)

The present invention relates to game scorers of the type in which concentric rotatable discs carrying scoring numbers and a series of holes are mounted on a base and encased by a cover having a slot registering with the holes on each disc and a window registering with the numbers on each disc, so that when one of the discs is moved forward a distance measured on the slot, a corresponding increase is produced in the number shown in the window.

The invention has particular application to game scorers of the type in which two distinct order of the points are scored, and more than one game constitutes winning, such as for instance in the game of bridge. In such games, points scored for tricks made, must be summed twice—first, individually, so that the players may know the total of points scored towards a game and also when each game has been completed, and secondly as a part of the grand total score which also includes points scored for bonuses, penalties and honours.

The objects of the present invention are to provide a scorer which may be made cheaply and easily assembled, and which is compact in size and is so thin that it may be conveniently carried in a pocket or in a lady's handbag, and also to provide other necessary features and improvements, comprising improved mechanical devices for moving the hundreds and thousands grand total score disc by progression of the units and tens grand total score disc and for automatically registering games won, when zeroizing the trick points score disc at the end of a game.

According to the present invention, a game scorer of the particular type described is provided in which there are at least three concentric rotatable discs mounted adjacent to one another and in the same plane, one for the hundreds and thousands grand total score, one for the units and tens grand total score and one for the trick points score commonly referred to as "below the line" and in which corresponding series of half holes equidistantly spaced are provided in the adjacent edges of the two last mentioned discs together with separate but corresponding series of holes in the grand total scoring discs and a separate but corresponding series of holes in the trick points scoring disc.

By means of the series of half holes the trick points disc and the minor grand total disc may be rotated together clockwise for registering trick scores and registering such trick scores in the grand total score by inserting a stylus or the like in one of the holes constituted by two of the said half holes in each disc thereby interlocking them. Alternatively the minor grand total scoring disc may be rotated alone, for registering bonuses, penalties and honours, by inserting the stylus in the separate series of holes in that disc and progressing it. The trick points scoring disc may be reversed to bring that score to zero at the end of a game by inserting a stylus in the separate series of holes in that disc and moving it anticlockwise.

The major grand total scoring disc may be rotated independently, for registering bonuses, penalties, and honours by inserting the stylus in the series of holes in that disc and progressing it.

Further features of the invention will appear hereafter in the following description of a preferred embodiment in which,

Figure 1 shows a plan view of the game scorer set in the zero position,

Figure 2 is a similar view to Figure 1 but with the cover removed,

Figure 3 is a perspective view, partly broken away of the base showing the ridges on which the concentric discs are guided and the corresponding series of stylus recesses.

Figure 4 is a perspective view of a double scorer in the half open position for showing both sides scores, the two scorers being hinged together, and

Figure 5 shows a detail view of the progressing pawl in the position just before it comes into engagement with a tooth on the adjacent disc ring (the minor grand total score at 90).

Figure 6 shows a detail view of the same parts shown in Figure 5 with the progressing pawl in engagement with the toothed ring and,

Figure 7 shows a detail view of the same part shown in Figures 5 and 6 with the progressing pawl in the neutral position.

In the embodiment shown in Figures 1 and 2 of the drawings, there are three scoring discs of ring shaped form illustrated. These comprise an inner ring-shaped disc **1** for registering trick scores (i. e. "below the line" score). The inner edge of this ring disc fits and bears on the circular ridge **2** provided about the centre of the base **3**, the disc thereby being able to rotate. A series of equidistantly spaced half holes **8** are arranged on its outer edge corresponding with which are the score indicating numbers **4**, printed adjacent to said half holes. A circular series of holes **5** is provided within these scoring numbers **4** corresponding with the series of half holes and provided for resetting the disc **1** to zero at the end of a game, and for the purpose of preventing unrequired movement of the disc by coacting with the holding spring **40**.

Secondly there is the middle ring-shaped disc **6**, which registers the units and tens digits of the grand total score. The outer edge of this disc fits and bears and rotates on the divided ridge **7** on the base **3**. The inner edge of the disc **6** is provided with a series of half holes **8a** which correspond with and are adjacent to the half holes **8** provided on the disc **1**. There is another separate series of holes **9** corresponding radially with the series of half holes also in this

disc for progressing the disc 6 independently and between this latter series and the series of half holes, the score indicating numbers 10, for registering the units and tens digits of the grand total score are embossed or printed on the disc. The score indicating numbers 10 consist of four sets of the numbers 0 to 90 in multiples of 10, so that one complete revolution of the disc 6 is equivalent to an addition of 400 to the grand total score.

Thirdly there is a ring-shaped disc 11, for registering the hundreds and thousands digits of the grand total score. This ring is provided on its inner edge with a series of equidistantly spaced blunted teeth 12 which fit and bear on the divided ridge 7 and so enables it to rotate. There is also provided a series of holes 13 for progressing the disc 11 independently, for the scoring of honours, penalties, and bonuses, and a corresponding series of score indicating numbers 14, each of the holes and numbers radially corresponding with one of the teeth 12.

The disc 6 carries a pawl 15 for progressing the disc 11 a distance of one tooth every time the former disc 6 is progressed a distance of ten holes (a score of 100) that is to say, for one complete revolution of the disc 6; the disc 11 must be progressed four times. The pawl 15 lies in an opening 16 cut away from the outer edge of the disc 6 (Figures 2, 5, 6, and 7) and is provided with a round end 17 which fits into a similar opening in the disc 6, thus enabling it to turn through a small angle. A spring 18 fitted to the disc 6 between it and the pawl keeps the latter thrust outwards. In order to allow of the operation of the pawl, the ridge 7 is divided into four parts, the openings between them being equidistantly spaced one from another; these ridge members have bevelled edges 19 and 20 as shown in Figures 2, 5, 6 and 7. In Figure 2 the pawl is shown in the zero position with its catch 22 well clear of the teeth 12 owing to shoulder 21 being in contact with one of the edges 19 of the said ridge members. If the middle disc 6 is now rotated through a distance of nine holes equivalent to a score of 90, that is to say through slightly less than a right angle, the pawl bears upon and passes along the ridge 7 on its shoulder 21 until the latter is released by the edge 20, the nose of the pawl coming to rest on the said edge 20. By a further rotation of the disc 6, the nose is released from this edge and the pawl under the action of the spring 18 will take up the position shown in dotted lines in Figure 2 and Figure 6, that is to say with its catch in a tooth of the disc 11 and the disc 6 will drag by means of the catch 22 of the pawl 15, the disc 11 until it has moved through a distance equal to one of its teeth 12, when the shoulder 21 of the pawl will come into contact with the edge 19 of the ridge 7 and the catch 22 thus be disconnected from the tooth.

The length of each opening in the ridge 7 between the edges 19 and 20 is such that after the catch 22 of the pawl 15 has engaged one of the teeth 12 on the ring-shaped disc 11 and progressed the disc a distance of one tooth, the shoulder 21 of the pawl comes into contact with the edge 19 (Figure 2).

The teeth 12 in the disc 11 are so positioned when idle, that the nose of the pawl 15 clears an edge 20 of the ridge 7 simultaneously with its catch 22 engaging the full face of a tooth. In every instance when the units and tens grand total disc 6 is in an idle position, the catch 22 of the pawl 15 is clear of the path of the teeth 12 in the hundreds and thousands grand total disc 11, allowing of an unimpeded direct movement of the latter.

It will be understood that every time the middle ring 6 progresses through a distance equal to a score of 100 the outer disc 11 is automatically progressed by one tooth and so increases the score of the grand total by 100.

As in the instrument shown on the drawings there are eighty teeth 12 in the disc 11 compared with forty holes in the series 9 of the units and tens grand total disc 6, and the distance also of the former from the centre of the instrument is greater than that of the latter, the distance between two radial lines drawn through two adjoining holes in the series of holes 9, is longer at the teeth than at the holes, consequently the progression of the disc 6 a distance of one hole, gives the pawl 15 sufficient travel to clear itself from its idle position on an edge 20 of the ridge 7 before engaging a tooth of the teeth 12 and dragging it forward a distance of one tooth, and then disengaging itself.

The shape of the nose end of the pawl 15 is such that in the event of an error in scoring, the nose will mount an edge 20 of the ridge 7 when the disc 6 is reversed for rectification.

Within the trick points scoring disc 1 is a small disc 23 with blunted teeth 24 around its edge. These teeth bear against the ridge 2 and so enable the disc to be rotated. Opposite these teeth the figures 0.1, 0.1 . . . are printed on the disc and within these figures there is a series of holes 25 for the purpose of locating the disc by means of the holding spring 40. This disc 23 is operated by the disc 1 in such a way that when a game (100 "below line") has been scored and the disc 1 is returned to zero by means of a stylus in the hole 47 in the series of holes 5, the inner disc 23 is progressed anticlockwise a distance equal to one of its teeth 24. This is done by the pawl 26 which is similar in design to the pawl 15 and is similarly carried by said disc 1. The pawl 26 lies in a cut away opening on the inside edge of the ring 1, and is thrust inwards by a spring 27. There is an opening in the ridge 2 this latter at either end having bevelled edges 28 and 29. In Figure 2 the pawl 26 is shown in its zero position. When the disc 1 is rotated in a scoring or clockwise direction so also is the pawl 26, and if sufficiently rotated, the pawl will pass across the opening in the ridge 2, but its catch 30 will not rest against the teeth 24 until the shoulder 31 of the pawl has moved past the edge 28 of the ridge 2. The pawl will now bear against the teeth 24 under the action of the spring 27 and will ride over them until the disc 1 has been progressed a distance of 90 degrees, that is a distance equivalent to a score of 100, from its zero position, when the catch 30 will engage the registering tooth. This latter position is shown in dotted lines in Figure 2. If more than 100 is scored in any one game the catch 30 will ride up over the edge 29 and so become disengaged from the registering tooth of the teeth 24. However when the disc 1 is rotated backwards to zero at the end of a game, the catch 30 will again fall into its position as shown in dotted lines and will rotate with it the disc 23 the distance of one tooth when the catch 30 becomes disengaged through the shoulder 31 meeting the edge 28 of the ridge 2. Thus it will be understood that every time a score of 100 or more is registered by progression of the disc 1 and this disc is returned to zero, the disc 23 will

progress anticlockwise, and display through the window **39** of the cover the number indicating the rubber position. If, however less than 100 is scored on the disc **1** and it is zeroized, then there is no movement of the disc **23**, as the catch **30** of the pawl is prevented from engaging a tooth of the teeth **24**, by the shoulder **31** coming into contact with the edge **28**.

The scoring discs are enclosed by a cover **32** provided with slots **33**, **34**, **35**, and **35***a* for operating by a stylus the half holes **8** and **8***a*, the holes **9**, the holes **13**, and the holes **5** respectively. The cover is provided with a series of windows **36**, **37**, **38** and **39**. The hundreds and thousands grand total is shown in the window **36**, and the units and tens grand total in the window **37** and the trick score ("below line") in the window **38**; games are shown in the window **39**, the figures one and zero being alternately shown as games are registered. It is not necessary to show two games won, as the second game scored when one game is already showing in the window obviously constitutes a rubber (two games). Series of scoring figures are marked along the slots **33**, **34**, **35** to correspond with the holes showing through those slots and if the stylus is put in the hole opposite any desired number and the relevant disc rotated clockwise until the stylus reaches the end of the slot, that number will be added to the score showing in the relevant window.

Holding or locating springs are provided which engage the series of holes in each disc and prevent it from unwanted movement.

These locating springs **40** may be comprised, as shown in Figure 1, of flaps **40** integral with the cover plate **32** and formed by V-shaped cuts in the cover, the flaps having rounded ends with protuberances **41** therein, adapted to engage the holes in their relevant discs.

The base plate **3** is stamped from a single piece of metal, and the guiding ridges **2** and **7** and the corrugations or recesses **42** are formed therein. The ridges **2** and **7** projecting from the floor of the base plate **3** are adapted to form a support for the cover. The recesses **42** are provided in the base plate beneath and coinciding with the series of holes in the scoring discs allowing depth for the stylus to pass right through the holes and grip these discs easily even though they are made of very thin material. The base plate **3** has also an upturned lip **43** (Fig. 3) at its edge and slots **44** are provided in this lip to accommodate lugs **45** provided on the outer edge of the cover **32**. The engagement of the lugs in the slots **44** ensure that there is no relative movement between the base and cover, which are firmly held together by an outer case **46** whose edge is rolled over the edge of the cover.

A certain hole in each series excepting in the series of half holes **8** and **8***a* and the series **25** is marked in a distinguishing manner as shown at **47**, so that when these holes are moved to the low number ends of their respective slots, the discs are automatically zeroized.

Two games scorers may be hinged together as shown in Figure 4 and adapted to be opened flat or shut together. One of these scorers will be used for the marker's own score whilst the other will be used for his opponent's score, each being suitably marked for identification purposes. A table of trick scores, penalties, honours and the like may be imprinted on the outer surface of the cover for reference purposes.

What I claim is:—

1. In a bridge scorer having a pair of rotatably mounted concentric discs, means for progressing one disc through a small angle consequent to rotation in one direction of an adjacent disc past a given position, comprising, a base with a raised circular ridge thereon having a short gap in it with its ends bevelled, the former disc rotatably mounted on said base with a peripheral edge having a series of equidistant undercut teeth therein adjacent one side of said ridge, the latter disc freely rotatably mounted on said base concentric and coplanar with the former disc so as to be capable of continuous rotation having a peripheral edge adjacent the other side of said ridge and a cut away opening in said peripheral edge, and a pawl pivoted to said latter disc so as to lie substantially tangentially to it within said opening and coplanar with the discs with its pivoted end in front when moved in said direction of rotation and having a bevelled end at the rear which pawl is spring pressed away from said latter disc so as to project through said gap when directly opposite it and engage said teeth and has a shoulder near to its pivot to abut against said ridge at the front end, with regard to said direction, of said gap and so quickly disengage said pawl each time the former disc is rotated through said small angle, the back end, with regard to said direction, of said ridge being so bevelled as to permit said pawl to ride over it when said latter disc is rotated in the direction opposite to the said direction without backward progression of said former disc.

2. In a bridge scorer having a pair of rotatably mounted concentric discs, means for progressing one disc having a circular series of equidistant numbers thereon through the angle between adjacent numbers consequent to rotation in a predetermined direction of an adjacent disc having a circular series of equidistant numbers thereon past a predetermined position, comprising a base with a raised circular ridge thereon having a short gap in it with its ends bevelled, the former disc rotatably mounted on said base with a peripheral edge having a series of equidistant undercut teeth therein adjacent one side of said ridge, the latter disc freely rotatably mounted on said base concentric and coplanar with the former disc so as to be capable of continuous rotation having a peripheral edge adjacent the other side of said ridge and a cut away opening in said peripheral edge, and a pawl pivoted to said latter disc so as to lie substantially tangentially to it within said opening and coplanar with the discs with its pivoted end in front when moved in said direction of rotation and having a bevelled end at the rear which pawl is spring pressed away from said latter disc so as to project through said gap when directly opposite it and engage said teeth and has a shoulder near to its pivot to abut against said ridge at the front end, with regard to said direction, of said gap and to quickly disengage said pawl each time the former disc is rotated through said angle between adjacent numbers, the back end, with regard to said direction, of said ridge being so bevelled as to permit said pawl to ride over it when said latter disc is rotated in the direction opposite to the said direction without backward progression of said former disc.

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