

Nov. 24, 1942.

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2,302,989

SCORING DEVICE FOR THE GAME OF BRIDGE

Filed May 13, 1940

3 Sheets-Sheet 1

FIG. 1.

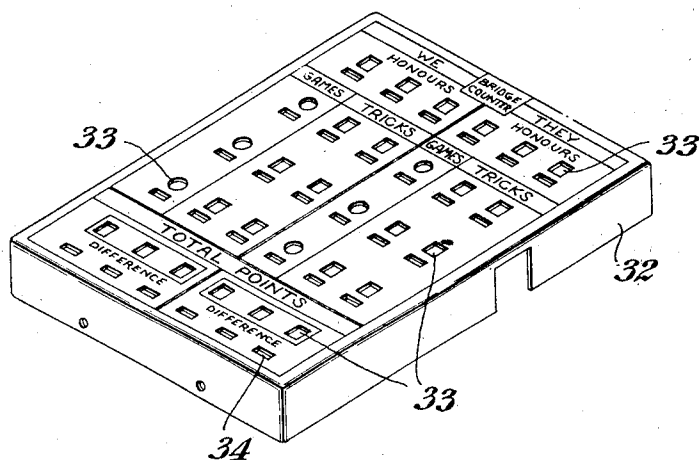


FIG. 2.

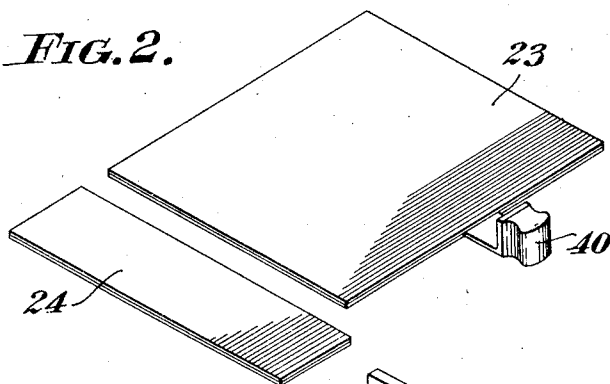
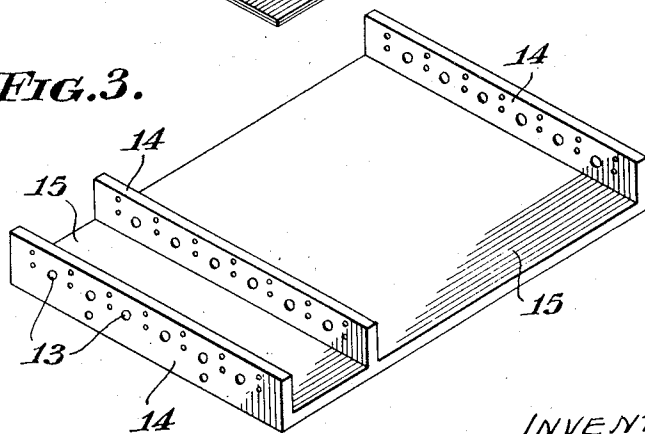


FIG. 3.



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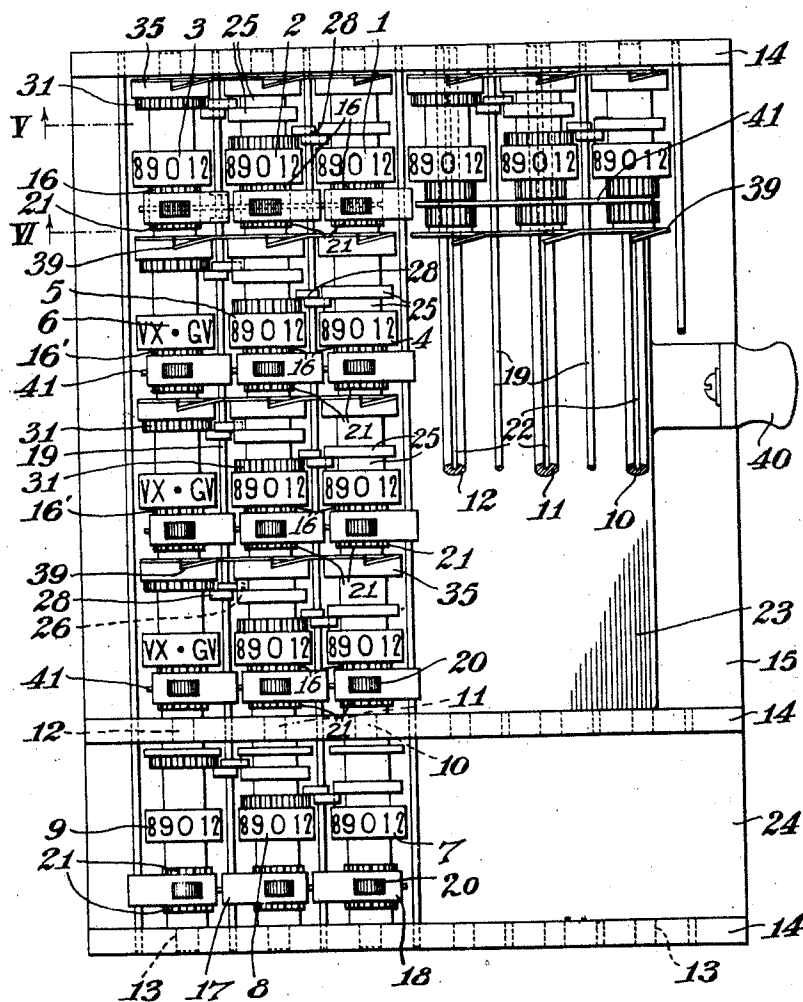
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FIG. 4.



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A circular diagram with 16 teeth, labeled 0 through 15 around the perimeter. The teeth are arranged in a circular pattern, with the number 0 at the top and 15 at the bottom. The diagram is labeled 16 in the top left corner.

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UNITED STATES PATENT OFFICE

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SCORING DEVICE FOR THE GAME OF
BRIDGE

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6 Claims. (Cl. 235-110)

This invention is concerned with an improved scoring device for the game of bridge, and is more particularly, although not exclusively, designed for use in computing the scores at contract bridge.

The object of the invention is to provide such scoring means which are compact, uniform, simple to make, easy to operate in identical manner throughout, and which will simplify the computation and registering of the individual as well as the gross scores and the difference total as between "We" and "They," whilst at the same time maintaining until the finish of a "rubber" an indication of the "honours" and "trick points" pertaining to each "game" as well as the scores in "games."

For the sake of clearness, the term "register" is used throughout the following description to define solely the devices on which individual scores are set up, whilst the term "totalisator" is employed to define solely the device which totals the score values of the different registers.

According to the invention, there is provided a scoring device for the game of bridge, comprising in combination a plurality of independent registers adapted to be used in progression in playing different games constituting a rubber or set, a totalisator for registering the total points applied to two or more of the said registers, identical setting means individual to said registers and means operating independently of the registers but adapted to co-act with each setting means thereof for simultaneously applying to the totalisator the scores set up on the registers whereby the totalisator shows the aggregate of the registers, the arrangement being such that any register of the totalisator can be individually manipulated otherwise than by the aforesaid setting means of the registers without affecting any other of the devices, thereby permitting, for example, the score value of a previously played game to remain registered during the playing of a subsequent game and the score values pertaining to all individual games to remain registered during independent manipulation of the totalisator, and, further, allowing the total score value to remain registered in the totalisator when the registers are re-set.

In a preferred manner of carrying out the invention, indicator wheels of the same denomination in the different registers and totalisator are carried upon a common shaft, those wheels belonging to the registers, e. g., honours and tricks points registers being loose on the said shafts, whilst the indicator wheels of the totalisator are

fixed to said shafts, setting of the register wheels being effected by manually operable pawls each of which co-operates with a ratchet wheel secured to the appropriate indicator wheel and also with a second ratchet wheel secured to the carrier shaft whereby a score entered in any of the registers is simultaneously transmitted to the totalisator.

In order that the invention may be readily understood, reference will now be made to the accompanying drawings which illustrate, by way of example, one embodiment as particularly designed for scoring at contract bridge. In the drawings—

Figure 1 is a perspective view of the outer casing of the device.

Figure 2 is a perspective view of the honours and trick points register zeroising plate and also of the plate which frictionally retains the setting of the totalisator.

Figure 3 is a perspective view of the base frame which supports the various elements which comprise the totalisating mechanism of the device.

Figure 4 is a plan of the totalisating mechanism.

Figure 5 is a cross-section on the line V—V of Figure 4 and shows in particular the means employed for transferring a digit from a lower denominational to the next higher wheel, or vice versa, when the former wheel changes from "9" to "0" or "0" to "9" in addition or subtraction as the case may be.

Figure 6 is a cross-section on the line VI—VI of Figure 4 and shows in particular the means employed for manually setting the register wheels.

Figure 7 is an elevation of a wheel associated with each denomination of each register and for zeroising the associated indicator wheel when the zeroising plate is actuated, such wheel being referred to herein as the zeroising wheel.

Figure 8 is an elevation of the ratchet wheel side of an indicator wheel; and,

Figures 9 and 10 are elevations of different positions of what is referred to herein as a primary transfer wheel.

The apparatus, in this case, is meant for the registration, totalisation or subtraction of numbers always ending in zero or, in other words, the digit 0, and ranging from 10 minimum to 9990 maximum normally, although this maximum range could be increased, if necessary, to double its value, namely 19,980, if the difference itself between the two gross totals is worked out, whenever necessary up to 9990 maximum. The ap-

paratus combines into a single assembly, two similar units (designated "We" and "They" respectively), and it consists, for each digit of a number, of a similar group of indicator wheels corresponding either to the tens and hundreds as in the sub-division "tricks," or to the tens, hundreds and thousands as in the sub-divisions "honours" and the "total points." The sub-division "total points" implies "totalisator reading." The groups, corresponding to the same digits of each denomination (tens, for instance) are mounted on a common axis and are parallel to the corresponding groups constituting the following denomination (hundreds, for instance). The "honours" register consists of three indicator wheels, 1, 2 and 3, arranged side-by-side and corresponding in denominations to "tens," "hundreds" and "thousands" respectively. The "trick points" register consists of three sets of three indicator wheels, 4, 5 and 6, arranged side-by-side and in denomination designated by "tens" and "hundreds" respectively, and the wheels 6, which are intended to register the "game" score or position being inscribed with the characters, such as "G" (game); "V" (vulnerable); "X" (null) according to the proceeding and rules of the play, although the totalising principle and method of transfer remain the same as for the other wheels.

The last device, namely the totalisator, which registers the gross total of "honours" and "trick points"—designated "Total points" in Figure 1 is composed of three indicator wheels 7, 8 and 9, arranged side-by-side and of denomination similar to the "honours" register.

The tens denominational indicator wheels 1, 4 and 7 are carried on a shaft 10, the hundreds units 2, 5 and 8, on a shaft 11 and the thousands units 3, 6 and 9 (in the case of the "trick points" register these are the character inscribed wheels 5), on a shaft 12, these three shafts of each scoring unit "We" and "They" being mounted side-by-side in parallel disposition and supported by bearing holes 13 formed in upstanding flanges 14 of a base plate 15.

Each indicator wheel unit consists of a numerically or character-inscribed wheel, as shown, provided on a one side face with a ratchet wheel 16 with which a manually operable pawl 17 co-operates. This pawl is a springy member which is carried by a plate 18, in turn supported by a pair of rods 19, the pawl having projecting upwardly therefrom a button 20 so that it can be depressed to engage and turn the ratchet one tooth, as will be readily understood from Figure 6. There is a pawl 17 for each indicator wheel so that each wheel can be set manually independently of any corresponding wheel in another register. In order that the setting of the "honours" and "trick points" registers may be transmitted to the totalisator, each of the wheels of the registers is loose on the appropriate shaft (10, 11 or 12) and (with the exception of the character-inscribed units 6 of the "trick points" register) is associated with a second ratchet wheel 21 which is secured to the appropriate shaft by a key 22 and which is disposed alongside the ratchet wheel 16 so as to be actuated by the associated pawl 17, the units 6 being associated with independent ratchet wheels 16' loose on the appropriate shaft 12.

The "honours" and "trick points" indicator wheels are in contact with a plate 23 which is slidably mounted on the base plate 15 and has a displacement which is approximately equal to

three and one-half times the distance between the numbers inscribed on the indicator wheels, this plate being referred to herein as the "zeroising plate." The indicator wheels can be turned against the friction afforded by this plate and accordingly will be retained in their set positions until the plate is actuated, as will be hereinafter described. The setting of the totalisator is retained by reason of the fact that the indicator wheels hereof also contact with a plate 24 which is fixedly held on the base plate 15, it being understood that the plates 23 and 24 will have suitable friction surfaces which may be made of rubber, for example.

Transfer between two adjacent indicator wheels either in addition or subtraction is provided for by the means particularly shown in Figures 5, 9 and 10. Each unit requiring the transfer facility is provided with a primary transfer wheel having on its side a tooth 26 and in its periphery a recess 27. This wheel is fixed to rotate with the appropriate indicator wheel and it co-operates with a secondary transfer wheel 28 in the form of a star having three long teeth 29 adapted for engagement by the primary tooth 26 and three shorter teeth 30 which can engage in the recess 27. Normally the periphery of the primary transfer wheel 25 contacts with the arcuate portion between two short teeth 30 so as to hold the secondary transfer wheel in position. The long teeth of each secondary transfer wheel also co-operate with a toothed wheel 31 secured to rotate with the indicator wheel of next higher denomination and the transfer operation for addition is as follows: As the lower denominational indicator wheel unit turns from "9" to "0," the primary transfer tooth 26 thereof engages one of the longer teeth 29 of the adjacent secondary transfer wheel 28, and, as this latter turns, one of its shorter teeth 30 engages in the recess 27 of the primary wheel, whereupon the secondary transfer wheel continues to turn until the desired transfer unit is registered and at the same time another of the longer teeth 29 of the secondary transfer wheel meshes with the adjacent toothed wheel 31 of the next higher denomination, whereby the indicator wheel of the latter also is turned to register the transfer unit. At the conclusion of each transfer operation, the secondary wheel will have its teeth positioned as shown. Figure 9 shows the normal position of the primary transfer wheel 25 either at "0" or after transfer from "9" to "0," and Figure 10 the position before transfer in the indicator wheels corresponding to the tens, the normal position either at "0" or after transfer from "9" to "0" in the indicator wheels corresponding to the hundreds being shown in Figure 5.

The various secondary transfer wheels 28 are rotatably supported on the rods 19 which carry the setting pawl assemblies 17, 18 and 20.

In operation of the device, the scores, either for "honours" or "trick points," are registered in the appropriate registers by depression of the appropriate buttons 20, and at the same time such scores are registered by the totalisator. It will be understood that the scores will be entered under the "We" or "They" section of the device according to which side acquires them. For each "game," "trick points" are scored in one of the sets of registers provided, the unit 6 in the register in which the score has been entered will be turned from the neutral position corresponding to "0" to the "G" position corresponding to "1" as the hundreds indicator wheel changes from "0"

to "1" or more instead of from "9" to "0" upon the attainment of a hundred points which is a "game" score in contract bridge. Figure 5 shows, by way of example, the position of the primary wheel 25 after transfer from "0" to "1" in the indicator wheels corresponding to the hundreds, the normal position being at "0." The next game is scored in one of the two next lower sets of the "trick points" registers, whilst the units 6 of any section may be turned by means of the associated button 20 either to the "V" or to the "X" position which indicates that the side is either vulnerable or has lost its scoring points according to rules, these three sets thus forming a maximum combination for the clear realization of two "games." At the conclusion of the rubber, the "We" or "They" totalisators will be registering the respective total scores, and to ascertain the difference for obtaining the winning aggregate points, the lower total is entered either in the totalisator registering the higher total or in both totalisators by depressing the appropriate buttons 20. In this connection it will be observed that the pawls 17 of the totalisators operate in the reverse direction to those of the "honours" and "trick points" registers, so that the effect of depressing their associated buttons 20 is to rotate the totalisator in a direction opposite to the adding direction. Such rotation will not be transmitted to the "honours" and "trick points" registers since their units are loose on the shafts 10, 11 and 12.

It may be noted here that the totalizing mechanism is enclosed by a box-like cover plate 32 (Figure 1), having windows 33 through which the inscribed indicator wheels can be seen, and slots 34 through which project the operating buttons 20.

Re-setting of the totalisators is effected merely by entering therein the score registered thereon, the entry being effected by depressing the appropriate push buttons 20. Re-setting of the "honours" and "trick points" registers in both "We" and "They" sections is effected by reciprocating the slide plate 23 from its normal left hand position to the right and then back, the maximum number of reciprocations in the present instance being three. For this purpose each of the "honours" and "trick points" indicator wheels is provided with a zeroising wheel 35 which is fixed to rotate with the appropriate indicator wheel and which has cut in its side three recesses, the first recess 36 standing at the "0" position of the wheel, the second recess 37 standing at the "4" position and the third recess 38 standing at the "7" position so that the angle subtended between recess 36 and 37 is greater than that between 37 and 38 or between 38 and 36 (see Figure 7). The recessed side of each zeroising wheel is engaged by a springy latch 39 which, as will be readily apparent from Figure 4, allows rotation of the zeroising wheel and thereby of the associated indicator wheel in the adding direction but prevents, when it is engaged in a recess, rotation of the indicator wheel in the opposite direction. It will be noted that the peripheral distance between recess 36 and recess 37 is greater than the maximum displacement allowed on the zeroising plate 23; accordingly it follows that all indicator wheels can be returned to zero in a minimum number of three reciprocations of the slide plate 23. Each time the slide plate is pulled to the right the indicator wheels will be rotated in the adding direction and during the movement of the plate to the left will be rotated back in the opposite direction the

same amount unless during the latter motion a recess of their zeroising wheels has engaged the associated latch 39. If this is the zero recess 36 the register will always come back to zero at the end of reciprocation of the zeroising slide, but if one of the other recesses 37 and 38, the next reciprocation of the slide will cause the zeroising wheel to be moved until the following recess engages the latch. Thus the zeroising wheel will be moved from recess to recess until it reaches zero position. This construction makes for compactness in the apparatus.

The zeroising slide is operated by a handle 40, and, if desired, it may be operated against the action of a suitable spring. In addition, the return of the buttons 20 may be facilitated by the provision of auxiliary springs.

Partitions 41 may be disposed between the ratchet wheels 15 and 21, the upper edge portions 42 of which are adapted to limit the downward movement of the pawls 17.

As will be readily understood, the scoring device for contract bridge, as above described, has the following advantages and characteristics:

1. It has the shape and volume of an ordinary small block-note.
2. It avoids the use of paper and pencil or pointer.
3. It is decorative in itself and interesting to use.
4. It separately totals the "honours" won by each group of players.
5. It separately totals the "tricks" of each "game" either for "We" or "They."
6. When tricks in each "game" to be won reach or exceed 100, it automatically indicates a "game."
7. It indicates if partners are "vulnerable" or not.
8. It indicates if tricks not reaching or exceeding 100 are annulled when opposing partners make a "game."
9. It simultaneously counts and totals all points, either "honours" or "tricks" as play is proceeding.
10. When rubber (two "games") is finished, it enables the difference between the two gross totals to be obtained and thus shows the winning points either for "We" or "They."
11. It enables the play of many rubbers to be registered independently and totals all points effectively, from start to finish. It can thus count the difference between the two gross collective totals and show the collective winning points either at the end of the play or after each rubber, or whenever desired.
12. It gives an exact and clear account of the play at any moment of its proceeding.

I claim:

1. A device of the character described comprising a plurality of parallel rotatable shafts, register wheels loose on said shafts and arranged in rows transversely with respect to said shafts for respectively registering different denominational digits of numbers, overcomable holding means cooperating with said register wheels to resist rotation thereof to an extent to prevent inadvertent rotation thereof, means individual to each of said register wheels operative to overcome the resistance to rotation imposed thereon by said holding means and to rotate the same step by step, means whereby a complete rotation of any lower denominational register wheel imparts a single step of rotation to the next higher denominational register wheel in any given row,

means whereby said register wheel rotating means when operated to rotate any given register wheel imparts corresponding rotation to the related shaft, and other registering wheels fixed on said shafts for registering the total of the numbers registered by said register wheels that are loose on said shafts.

2. A device of the character described comprising a plurality of parallel rotatable shafts, register wheels loose on said shafts and arranged in rows transversely with respect to said shafts for respectively registering different denominational digits of numbers, overcomable holding means cooperating with said register wheels to resist rotation thereof to an extent to prevent inadvertent rotation thereof, a ratchet wheel fixed with respect to each register wheel, a pawl individual to each ratchet wheel for cooperation therewith to overcome the resistance to rotation imposed on the related register wheel and to rotate the related register wheel step by step independently of all of the other of said register wheels, means whereby a complete rotation of each lower denominational register wheel imparts a single step of rotation to the next higher denominational register wheel in any given row, a second ratchet wheel related to each first mentioned ratchet wheel for actuation simultaneously with its related first mentioned ratchet wheel by the related pawl, said second mentioned ratchet wheels being fixed on said shafts whereby rotation of any register wheel by its related pawl results in corresponding rotation of the related shaft, and other registering wheels fixed to said shafts for registering the total of numbers that are registered by the register wheels that are loose on said shafts.

3. A device of the character described comprising a plurality of parallel rotatable shafts, register wheels loose on said shafts and arranged in rows transversely with respect to said shafts for respectively registering different denominational digits of numbers, overcomable holding means cooperating with said register wheels to resist rotation thereof to an extent to prevent inadvertent rotation thereof, means individual to each of said register wheels operative to overcome the resistance to rotation imposed thereon by said holding means and to rotate the same step by step, means whereby a complete rotation of any lower denominational register wheel imparts a single step of rotation to the next higher denominational register wheel in any given row, means whereby said register wheel rotating means when operated to rotate any given register wheel imparts corresponding rotation to the related shaft, other registering wheels fixed on said shafts for registering the total of the numbers

registered by said register wheels that are loose on said shafts, and means for effecting step by step rotation of the register wheels that are fixed on said shafts in directions counter to the directions in which they are rotated in response to rotation of said shafts by the register wheels that are loose thereon.

4. A device of the character described comprising a plurality of parallel rotatable shafts, register wheels loose on said shafts and arranged in rows transversely with respect to said shafts for respectively registering different denominational digits of numbers, overcomable holding means cooperating with said register wheels to resist rotation thereof to an extent to prevent inadvertent rotation thereof, means individual to each of said register wheels operative to overcome the resistance to rotation imposed thereon by said holding means and to rotate the same step by step, means whereby a complete rotation of any lower denominational register wheel imparts a single step of rotation to the next higher denominational register wheel in any given row, means whereby said register wheel rotating means when operated to rotate any given register wheel imparts corresponding rotation to the related shaft, means permitting rotation of said register wheels by their rotating means and acting to hold them stationary when said shafts are rotated, other registering wheels fixed on said shafts for registering the total of the numbers registered by said register wheels that are loose on said shafts, a ratchet wheel fixed with respect to each of the register wheels that is fixed to its related shaft, and pawls for cooperation with said ratchet wheels to rotate the related register wheels step by step in directions counter to the directions in which they are rotated in response to rotation of said shafts by the register wheels that are loose thereon.

5. A device as set forth in claim 3 in which the means whereby a complete rotation of any lower denominational register wheel imparts a single step of rotation to the next higher denominational register wheel in any given row is constructed and arranged to permit any register wheel that is fixed on its related shaft to be rotated in either direction without effecting rotation of the next lower denominational registering wheel that is fixed on its related shaft.

6. A device as set forth in claim 1 in which the means permitting rotation of the register wheels by their rotating means and acting to hold them against rotation when their shafts are rotated comprises a planar friction member engaging the peripheries of said register wheels.

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