Jan. 14, 1941. R. P. ROSS 2,228,403

CALCULATING OR DISPLAY DEVICE

Filed April 14, 1939 5 Sheets-Sheet 1

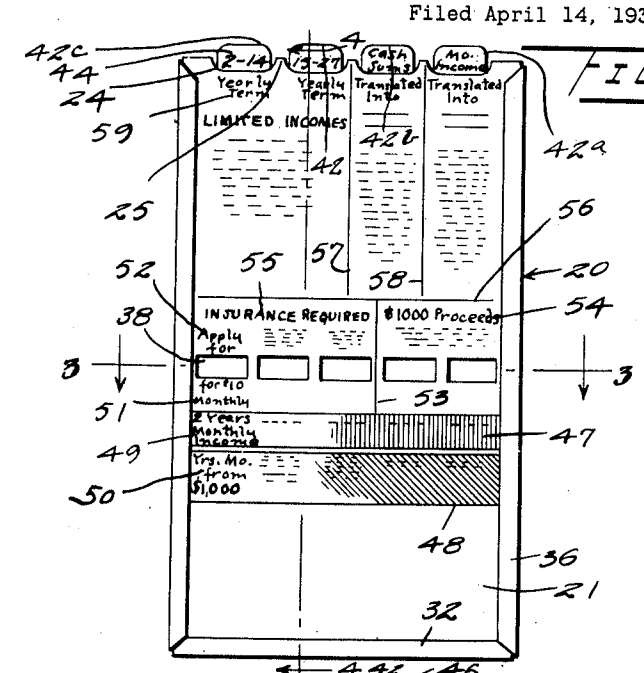


Fig. 1.

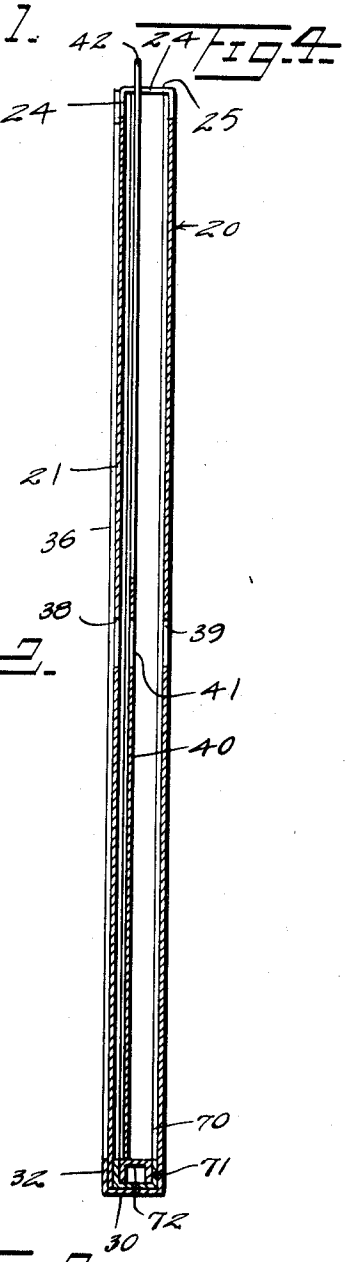


Fig. 4.

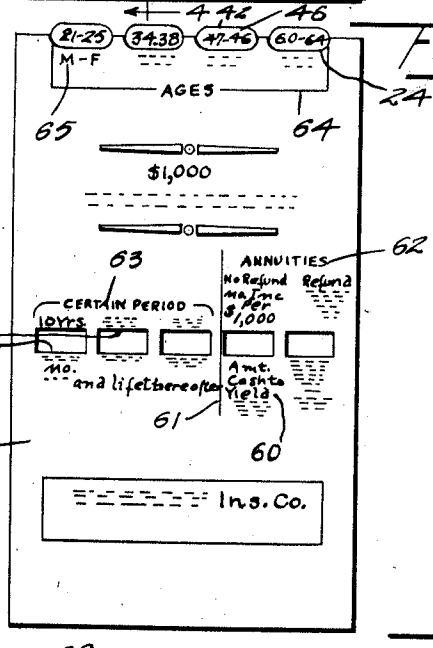


Fig. 2.

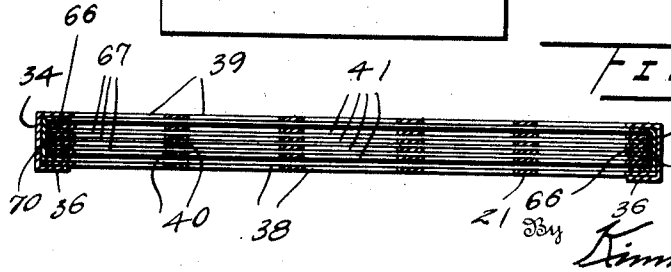


Fig. 3.

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Jan. 14, 1941. R. P. ROSS 2,228,403

CALCULATING OR DISPLAY DEVICE

Filed April 14, 1939 5 Sheets-Sheet 2

Fig. 6.

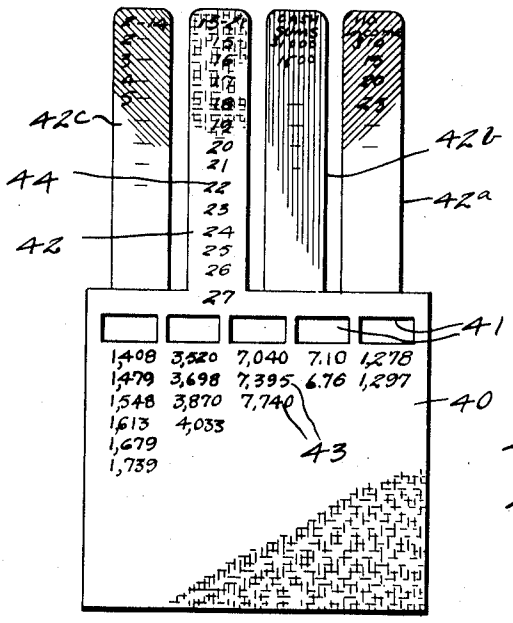


Fig. 5.

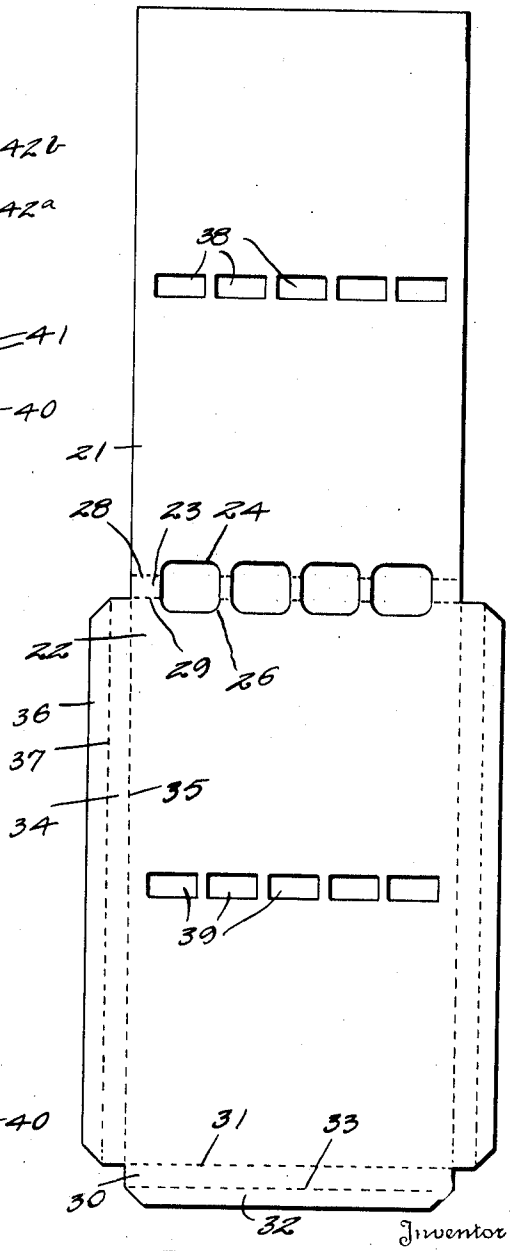
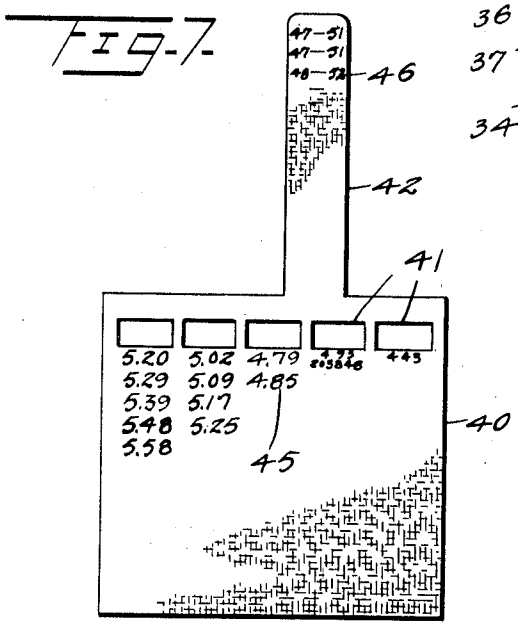


Fig. 7.



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Jan. 14, 1941. R. P. ROSS 2,228,403

CALCULATING OR DISPLAY DEVICE

Filed April 14, 1939 5 Sheets-Sheet 3

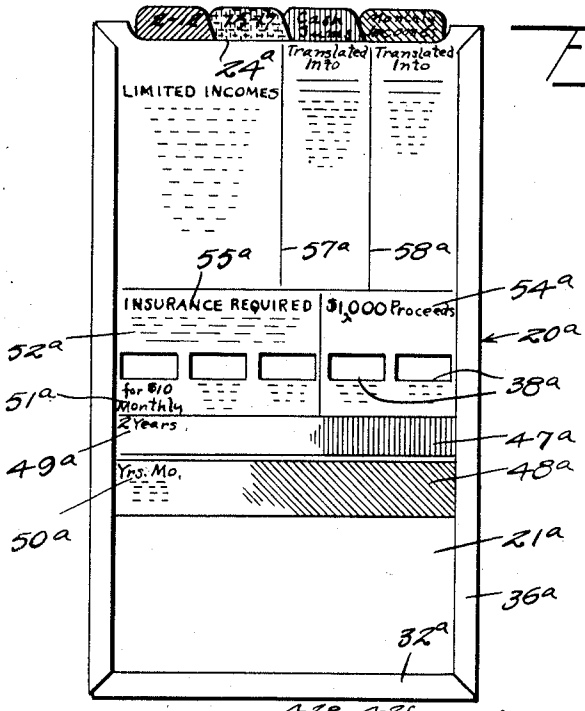


Fig. 9.

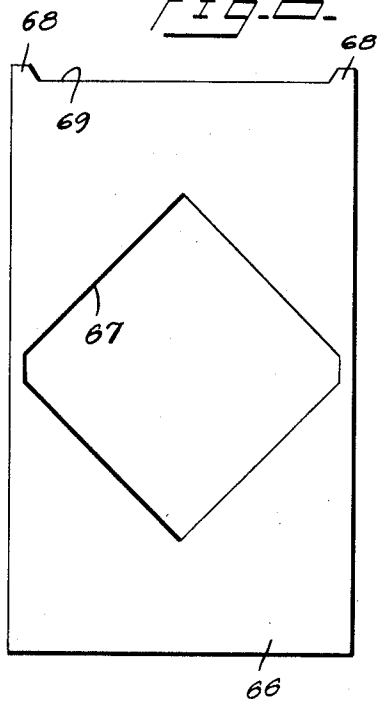


Fig. 8.

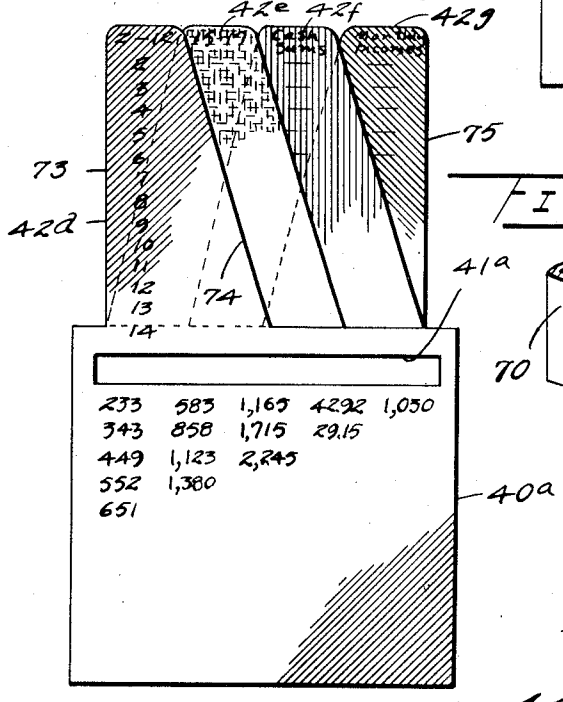


Fig. 10.

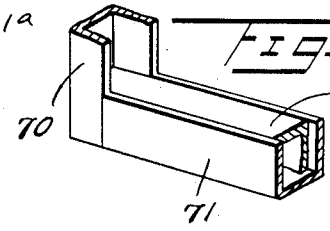


Fig. 11.

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Jan. 14, 1941. R. P. ROSS 2,228,403

CALCULATING OR DISPLAY DEVICE

Filed April 14, 1939 5 Sheets-Sheet 4

Fig. 11.

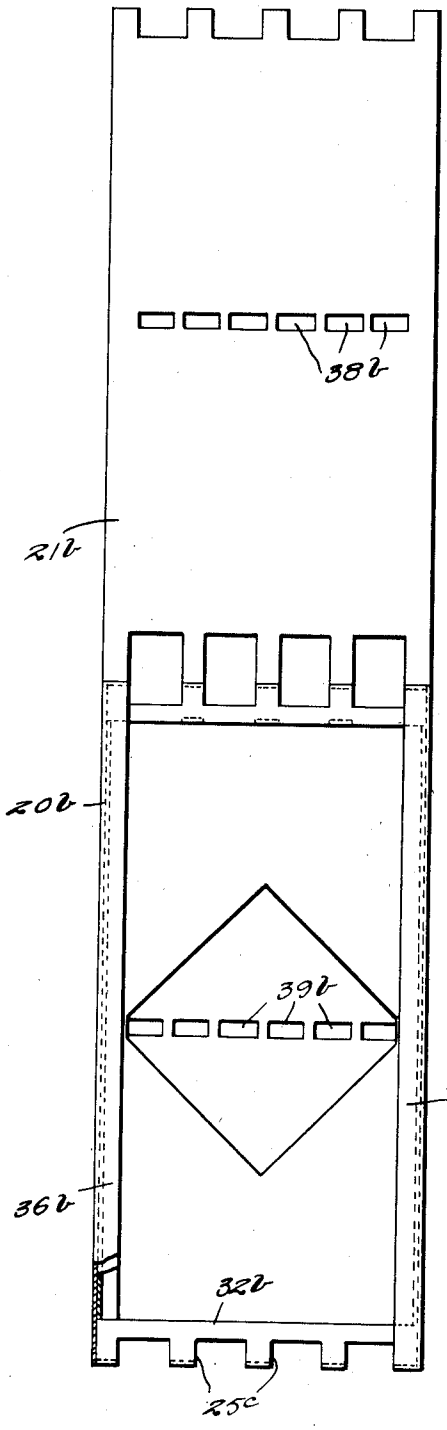


Fig. 12.

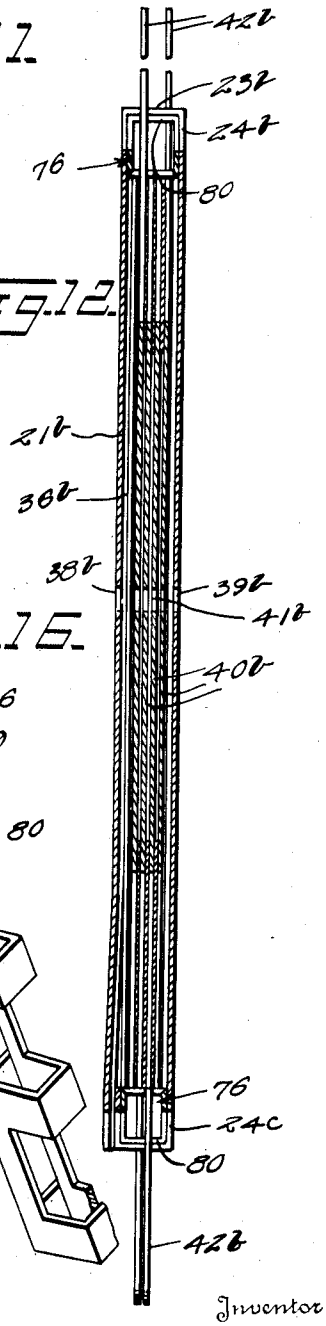
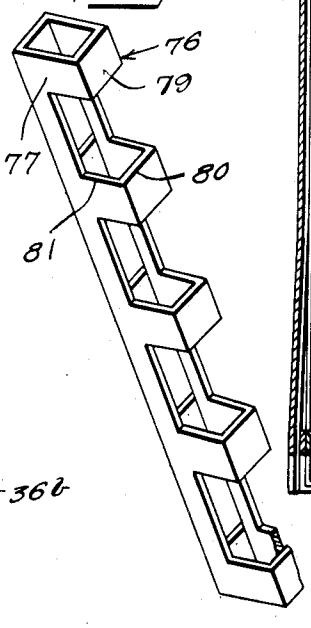


Fig. 16.



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Jan. 14, 1941. R. P. ROSS 2,228,403

CALCULATING OR DISPLAY DEVICE

Filed April 14, 1939 5 Sheets-Sheet 5

Fig. 15.

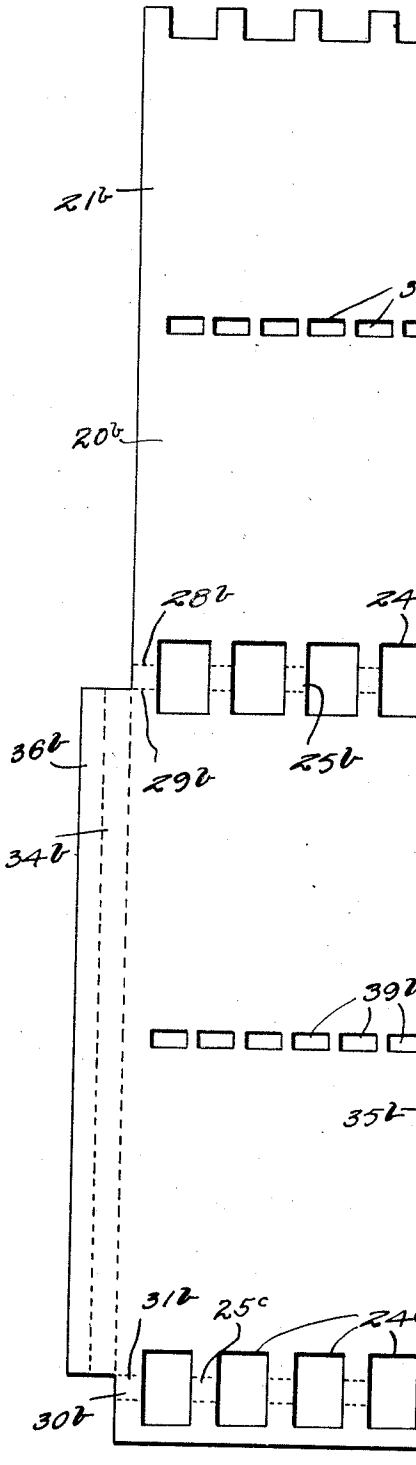
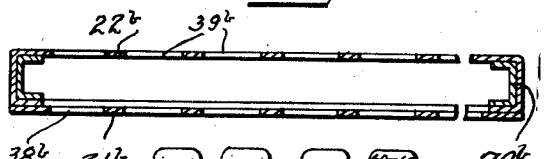


Fig. 14.



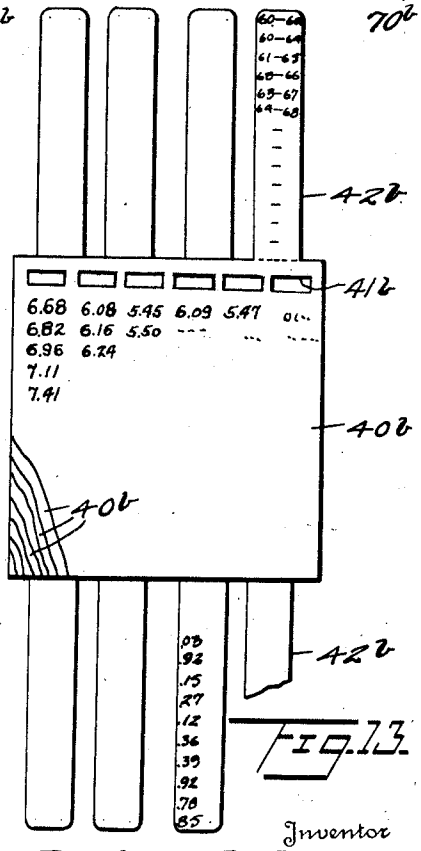


Fig. 13.

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Patented Jan. 14, 1941 2,228,403

UNITED STATES PATENT OFFICE

2,228,403

CALCULATING OR DISPLAY DEVICE

Ralph P. Ross, Dallas, Tex.

Application April 14, 1939, Serial No. 267,929

2 Claims. (Cl. 235—89)

This invention relates to calculating or display devices.

An object of this invention is to provide a relatively simple calculating or display device which includes a housing and a plurality of slide members mounted in the housing, the slide members and the housing having correlated indicia.

Another object of this invention is to provide a novel housing and means carried by the housing for slidably supporting a plurality of slide indicia bearing cards within the housing.

A further object of this invention is to provide a housing and a plurality of slidable indicia bearing cards in the housing and separators interposed between the confronting faces of adjacent cards so as to not only facilitate the sliding movement of one card but also to hold the remaining cards against movement when one card is moved longitudinally of the housing.

A still further object of this invention is to provide a device of this kind which may be constructed out of relatively stiff fibrous material, such as cardboard, stiff paper or even metal, the housing being of such a construction that it may be readily stamped out of a single sheet of material and then bent into proper configuration.

A further object of this invention is to provide a device of this kind wherein certain of the cards are provided not only with indicia which is correlated to certain indicia carried by the housing but certain of the cards are also provided with distinguishing colors which are correlated with similar colors carried by the housing and upon which correlated indicia is positioned.

To the foregoing objects and to others which may hereinafter appear, the invention consists of the novel construction, combination and arrangement of parts as will be more specifically referred to and illustrated in the accompanying drawings, but it is to be understood that changes, variations and modifications may be resorted to which fall within the scope of the invention as claimed.

In the drawings:

Figure 1 is a detail front elevation of a calculating or display device constructed according to an embodiment of this invention,

Figure 2 is a detail rear elevation of the device,

Figure 3 is an enlarged sectional view taken on the line 3—3 of Figure 1,

Figure 4 is a longitudinal section taken on the line 4—4 of Figure 1 with all but one of the sliding cards removed from the housing,

Figure 5 is a plan view of the housing in blank form,

Figure 6 is a detail front elevation of the slide cards removed from the housing,

Figure 7 is a detail rear elevation of one of the slide cards,

Figure 8 is a plan view of one of the spacer members between the slide cards,

Figure 9 is a detail front elevation of a modified form of this device,

Figure 10 is a detail front elevation of the slide cards associated with the device shown in Figure 9,

Figure 11 is a detail front elevation partly broken away and in section of a further modified form showing the housing in open position,

Figure 12 is a longitudinal section of the housing shown in Figure 11 with the slide cards mounted therein,

Figure 13 is a detail front elevation of the slide cards partly broken away associated with the device shown in Figures 11 and 12,

Figure 14 is a transverse sectional view of the housing shown in Figures 11 and 12 with the slide cards removed therefrom,

Figure 15 is a detail plan view of the housing shown in Figures 11 and 12 with the housing in blank form,

Figure 16 is a perspective view partly broken away of one of the end members associated with the housing shown in Figures 11 and 15, and

Figure 17 is a fragmentary perspective view of the housing reinforcing means for use with the housing shown in Figures 1, 2 and 9.

Referring to the drawings and first to Figures 1 to 8 inclusive, the numeral **20** designates generally a housing which as shown in Figure 5 is provided with a front wall **21**, a back wall **22** which is formed integral therewith, being connected together by an end wall **23**. The end wall **23** is provided with a plurality of notches **24** between which the end wall **23** is formed into relatively narrow divider strips **25**. When the housing is in blank form the notches **24** assume the configuration of substantially a rectangle with rounded corners **26**. The sheet from which the housing is formed is bent along scores **28** and **29** which are disposed in parallel relation to each other so that the end wall **23** will be disposed at right angles to the front and back walls **21** and **22** respectively.

The back wall **22** at the end thereof opposite from the end wall **23** or at the lower end is provided with an end wall **30** which projects beyond the back wall **22** and a score **31** extends between the back wall **22** and the end wall **30** so that the end wall **30** may be readily bent along the score **31** at a right angle to the back wall **22**. A securing flap **32** is formed integral with the end wall **30** and a second score **33** extends along the length of the end wall **30** so as to facilitate the bending upwardly of the flap **32** which is later adapted to be adhesively secured to the front or back face of the front wall **21** as shown in Figure 1.

The back wall **22** is provided on its longitudinal edges with extensions or side wall forming members **34** forming the opposite edges or sides of the housing **20** and a score **35** extends between the ad-

jacent edge of the back wall 22 and a member 34 so that the side member 34 may be readily bent at right angles to the back wall 22. A securing flap 36 is formed integral with each member 34 and a score 37 extends between the adjacent or inner edge of the flap 35 and the adjacent edge of the side wall member 34 so that the side flap 36 may be bent at right angles or inwardly to a position confronting the front or back face of the front wall 21 and then may be adhesively secured to the front wall 21. That portion of each member 34 between the scores 35, 37 forms a side wall of the housing.

When the housing 20 is in assembled form the housing is closed on all sides and the only access which may be had to the interior is through the slots or notches 24 in the upper end wall 23. The slots 24 have portions thereof arranged in the upper ends of the front and back walls 21, 22. The housing 20 is provided in the front wall 21 with a plurality of transversely aligned and spaced apart rectangular windows 38 and the housing is also provided in the back wall 22 with a plurality of transversely aligned rectangular square or circular windows 39 which are adapted to be positioned in substantial registry with the windows 38.

The housing 20 is adapted to have positioned therein a plurality of slidable calculating or indicia displaying cards 40 which are substantially rectangular in plan and the cards 40 are provided adjacent the inner ends thereof with a plurality of transversely aligned spaced apart rectangular, square or circular openings 41 which when each card 40 is in its innermost position are adapted to register with the openings 38 and 39 of the housing 20. Each card 40 is provided at its upper edge with an elongated tongue or strip which is adapted to permanently project slightly through a slot 24 at the upper end of the housing 20 when the card 40 is in its innermost position. The strips or tongues which extend from the cards 40 are indicated at 42, 42*a*, 42*b* and 42*c*. Each card 40 on one face thereof is provided with indicia 43 extending downwardly from each window or opening 41, which indicia is correlated with indicia 44 carried by the strip or tongue extended from the card. Each card 40 is also provided on the opposite face thereof with indicia 45 which is correlated with indicia 46 carried by the adjacent face of the tongue or elongated strip extended therefrom. As shown in the drawings, each card 40 is provided with a differentiating color from the remaining cards, and its tongue from which it extends is provided with a color similar to the card from which it extends. The tongues 42*a*, 42*b* and 42*c* have colors different from each other and from the color tongue 42.

The front wall 21 of the housing 20 is provided with at least two colored strips 47 and 48 which are colored similar to the colors carried by the tongues 42*b* and 42*c* and the cards associated therewith. The front wall 21 is also provided with indicia 49 in the colored strip 47 and indicia 50 in the colored strip 48 which is also associated with or correlated with the indicia carried by the cards 40 which are attached to the strips or tongues 42*b* and 42*c*, and are of corresponding colors to indicate correlation between these tongues and indicia.

The front wall 21 at a point below each opening or window 38 thereof is provided with indicia 51, as shown in Figure 1, and is also provided with indicia 52 positioned above each window opening 38. A dividing line 53 divides at least two of the windows 38 from the remaining windows and indicia 54 is positioned above the indicia 52 in the space at one side of the line 53 and indicia 55 is positioned on the opposite side of the line 53 above the indicia 52.

The front wall 21 above the indicia 54 and 55 is provided with a transversely disposed line 56 and a pair of parallel lines 57 and 58 which extend from the line 56 to the upper end of the front wall 21. The front wall 21 is also provided with indicia 59 positioned closely adjacent the lower edge of each notch or cut-out portion 24, which indicia is associated with or correlated with the indicia 44 carried by the tongues of the cards within the housing 20. As will be noted in Figure 1, the narrow strips 25 between the tongues 42, 42*a*, 42*b* and 42*c* hold the tongues against lateral movement and provide guide means for these tongues.

The back member 22 is provided with indicia 60 below at least one pair of the window openings 39 and a vertically disposed dividing line 61 extends longitudinally of the back 22 above and below the window openings 39. The back 22 is also provided with indicia 62 above the window associated with the indicia 60 and on the opposite side of the line 61, indicia 63 is provided which is associated with the indicia 45 on the card 40.

The back 22 may also be provided with a blocked area defined by the lines 64 below the cut-out portions 24, and indicia 65 is positioned in the blocked area 64 which is associated with each tongue member 42 and with the indicia 46 on these tongue members.

In order to provide a means whereby the cards 40 may readily be shifted longitudinally of the housing 20 and in order to prevent bending of the cards 40 and the tongues 42, I have provided a slip sheet 66 which is substantially rectangular in plan and is provided with a substantially diamond-shaped opening 67 in the central portion thereof. This opening 67 has a transverse width substantially equal to the distance from the outermost of the windows 38 and 39 and the opening 67 also extends above and below the upper and lower edges of the window openings 38 and 39. By providing the upwardly and downwardly convergent margins of the opening 67, the cards 40 will more readily slide longitudinally of the housing 20. This is accomplished by the novel configuration of the opening 67 which has a tendency to prevent transverse buckling of the cards 40 and if such cards do buckle or bend the slip sheets 66 will tend to straighten the cards out as the cards are moved longitudinally of the housing 20. Another important function of sheet 66 and opening 67 is to prevent any rough surface of a moving card from tending to move either adjoining card. Each slip sheet 66 is provided at the upper end thereof with a pair of spaced parallel oppositely disposed extensions of like form having their outer side edges flush with the side edges of the slip sheet. The extensions 68 are adapted to extend to the upper end wall 23 at the opposite ends of the end wall 23 thus providing a cut-out portion 69 between the extensions 68 so that the ends of the slip sheets 66 will not project above the lower edges of the slots 24 in the front and back walls 21 and 22 respectively. Another purpose of the extensions is to prevent any appreciable longitudinal movement of slip-sheet 66, thus keeping the opening 67 in proper register with windows 39, also pre-

venting movement of adjacent cards. There is a slip sheet **66** positioned between the confronting faces of each pair of cards **40**.

The housing **20** is provided at the longitudinal or side edges thereof with channel members **70** which may be formed of metal which is bent in U-form, and at the bottom end of the housing **20** a transversely disposed channel member **71** is positioned and may be adhesively secured to the lower end wall **30**. A U-shaped strip **72** is positioned within the bottom channel member **71** and at the ends thereof projects beyond the ends of the bottom channel member **71** and projects into the adjacent channel of a side channel member **70** as shown in Figure 17. In this manner, a metal reinforcing frame is provided for the housing **20** so that the housing **20** may be constructed out of cardboard which may be of relatively light weight construction and at the same time the housing will be firmly held against longitudinal and lateral bending by the metal frame of substantially U-shaped construction which extends along the side edges of the housing **20** and across the bottom thereof. The cards **40** and the slip sheets **66** engage within the channel members **70** so that these channel members **70** also constitute a guide means for guiding the sliding cards in their movement within the housing **20**.

In Figures 9 and 10 there is disclosed a slightly modified form of this invention wherein a housing **20***a* is provided which is substantially similar to the housing **20**. The housing **20***a* is provided with a front wall **21***a* similar to the front wall **21** and with a back wall similar to the back wall **22** of the housing **20**. The front wall **21***a* is provided with a plurality of transversely aligned spaced apart windows **38***a* and in like manner the back wall of the housing **20***a* is provided with openings similar to the openings **39** which register with the openings **38***a*. The upper end of the housing **20***a* is provided with an elongated cut-out portion **24***a* which extends from a point closely adjacent one side edge of the housing **20***a* to a point closely adjacent the opposite side edge and tongue members carried by cards **40***a* are adapted to project upwardly through the cut-out portion or slot **24***a*. In other respects the housing **20***a* is similar to the housing **20**. The housing **20***a* has a plurality of sliding cards **40***a* positioned therein which are each provided with an elongated transversely extending opening or window **41***a*. This opening **41***a* has a length substantially equal to the distance from the outer edge of one window **38***a* to the outer edge of an opposite window **38***a* carried by the front wall **21***a*. The card **40***a* is provided with indicia on the opposite sides thereof similar to the indicia on the cards **40** and the cards **40***a* may be moved longitudinally of the housing **20***a* by means of tongue members **42***d*, **42***e*, **42***f* and **42***g*.

In the present instance, there are four cards **40***a* with a card **40***a* associated with each of the tongue members. The tongue member **42***d* is provided with an outer edge **73** which is parallel with the outer edge of the card **40** and offset inwardly therefrom and the opposite edge of the tongue **42***d* is inclined or tapered as at **74** from the upper end to the lower or inner end. In this manner the lower end of the tongue **42***d* is wider than the upper end and provides a reinforcing means for the upper portion of the card **40***a*. The two tongues **42***e* and **42***f* are formed substantially as a truncated triangle and the tongue **42***g* is formed similar to the tongue **42***d* with the outer edge **75** thereof parallel and inwardly offset with respect to the adjacent edge of the card **40***a*.

In Figures 11 to 16 inclusive, there is disclosed a further modification of this invention wherein a housing **20***b* is provided. The housing **20***b* is provided with a front wall **21***b* and a back wall **22***b* which are substantially rectangular in configuration and these wall members are connected together by an end wall **23***b*. A plurality of cut-out portions **24***b* are provided in the end wall **23***b* and these cut-out portions **24***b* extend downwardly from the upper edges of the front wall **21***b* and **22***b* so as to thereby provide relatively narrow strips or extensions **25***b* between adjacent cut-out portions of the housing. The housing **20***b* is adapted to be cut out from a blank as shown in Figure 15 which is bent along the scores **28***b* and **29***b*, thus providing the end wall **23***b* at one end of the housing. The back wall **22***b* is provided on the opposite longitudinal edges thereof with laterally projecting side wall members **34***b* and a score **35***b* is positioned between the side walls **34***b* and the adjacent edge of the back wall **22***b* along which the end wall **34***b* may be bent at right angles to the back wall **22***b*. A flap **36***b* is formed integral with each side wall **34***b* and a score **37***b* extends longitudinally of the side wall **34***b* and the inner end of the flap **36***b* so as to facilitate bending of the flap **36***b*. When in applied position, the flap **36***b* as shown in Figure 11 is adapted to be positioned against the front wall **21***b*. The inner or outer surface of the flap **36***b* may be adhesively secured to the adjacent face of the front wall **21***b*.

At the opposite end of the back wall **22***b* a lower end wall **30***b* is provided and a score **31***b* defines the junction between the end wall **30***b* and the lower end of the back wall **22***b*. A flap **32***b* is formed integral with the bottom wall **30***b* and a score **33***b* is disposed between the adjacent edge of the lower end wall **30***b* and the inner edge of the flap **32***b* so that the flap **32***b* may be bent upwardly to lie flat against the front wall **21***b* where the flap is adhesively secured to the front wall. In the present instance the back wall **22***b*, the end wall **30***b* and the flap **32***b* are provided with rectangular openings **24***c* which are similar to the openings **24***b* so that when the end wall **30***b* and the flap **32***b* are bent to their normal position, the cut-out portion **24***c* will form guide strips **25***c* at the lower end of the housing **20***b*.

The front wall **21***b* is provided with a plurality of transversely aligned window openings **38***b* and the back wall **22***b* is provided with a plurality of transversely aligned windows **39***b* which are adapted to register with the windows **38***b*. The housing **20***b* is provided on the interior thereof with a plurality of sliding cards **40***b*, each of which is provided with an elongated narrow tongue **32***b* similar to the tongue **42** and each card **40***b* is provided with indicia on the opposite faces thereof adapted to be exposed through the windows **38***b* and **39***b* upon movement of a selected card **40***b* longitudinally of the housing **20***b*. The cards **40***b* are provided with openings **41***b* similar to the openings **41** which are adapted to register with the openings **39***b* when the cards **40***b* are in their innermost position. In the present instance, one series of cards **40***b* have the tongues thereof extending through the cut-out portions **24***b* and another series of cards **40***b* have the tongues **42***b* thereof projecting in the opposite direction and through the cut-out portions **24***c*. The outer

faces of the front and rear walls 21b and 22b respectively are adapted to have indicia thereon similar to the indicia carried by the front and rear walls 21 and 22 which latter indicia is associated with and correlated with the indicia carried by the opposite faces of the cards 40b and also the opposite sides of the tongues 42b.

The housing 20b is provided on the interior thereof with a pair of parallel U-shaped channel members 70b which may be formed of metal and the opposite ends of the channel members or guides 70b abut against the end members generally designated as 76. The end members 76 as shown in Figure 16 are constructed in substantially tubular form will parallel opposite side portions 77 and inner and outer walls 78 and 79. The inner and outer walls 78 and 79 are each provided with cut-out portions 80 and the side walls 77 are also provided with cut-out portions 81 which are adapted to register with the cut-out portions 24b or 24c respectively.

In the use of this device, the device may be used for computing insurance rates, premiums and other data connected with insurance policies particularly in cases where more numerous data is required than can be accommodated by housing constructed as 20 or 20a, so that when a selected tongue 42 is pulled outwardly, the tongue 42 will show on the desired face thereof the age of the prospect and the adjacent side or face of the card 40 will show the ages, premium rates, settlement options, annuities and the different periods for particular policies with the rates for such periods. The housing may then be turned over and the data on the opposite side of the card 40 exposed through the window of the housing will show the desired incomes and other data necessary to a complete and full understanding of the terms of the policy. With a device of this kind the agent can very quickly and easily show the customer the exact conditions which appertain to particular terms and particular amounts, whereas in the past, it has been necessary to obtain this information from different portions of a book.

It will, of course, be understood that I do not wish to be limited to the use of this device for insurance computations as the device may also be used for other purposes for which calculations correlated to each other are used.

I claim:

1. A device for the purpose set forth comprising a housing including top and bottom walls, front and back walls provided with indicia on their outer faces and a pair of side walls, a yoke shaped reinforcing member of channelled shaped cross section arranged within the housing having its sides bearing against the inner faces of the walls of the housing and its bight bearing against the inner faces of said front, back and bottom, said housing being formed with a row of spaced parallel slots in said top wall, a set of confronting independently shiftable indicia carrying cards arranged within the housing and each provided with a tongue projecting from its upper end, said tongues being free of connection to each other, each passing through and permanently extended from one of said slots and carrying indicia for selected exposure through said slots at the front and back of the housing, said cards extending into and being guided by the sides of said member, means arranged in the bight of said member forming a support for and common to the lower ends of the cards, said front and back wall being formed with aligned horizontal rows of spaced windows for exposing selected indicia on said cards, a slip sheet disposed between the confronting faces of said cards, seating at one end on said support and provided with extensions at its other end for bearing against the inner face of said top wall, each of said sheets being formed intermediate its ends and lengthwise thereof with an elongated substantially diamond shaped opening of greater dimensions than the dimensions of a row of windows, each of said cards being formed with a horizontal row of spaced openings for registry with said windows when the card engages said support, the indicia on said cards being arranged below the openings in the cards, the indicia on said front and back walls being arranged above and below said windows, and said slip sheets having their openings registering with said rows of windows.

2. In a calculating device a housing including front, back, upper, lower and a pair of side walls, said front and back walls each being formed with a row of aligned spaced windows below and parallel with its horizontal median and with indicia on its outer face disposed above and below its windows, the windows of one row being directly opposite the windows of the other row, a set of facewise opposed independently vertically shiftable cards within the housing carrying selectable indicia for exposure through said windows to correlate with indicia on the housing, each card having integral with its top edge an upwardly directed pulling tongue carrying selectable indicia for correlation with indicia on said housing, said housing being formed at its upper end with spaced openings for exposing selected indicia from a tongue on the upward pulling of the latter, said tongues extending upwardly through said openings and being free of each other, a yoke-shaped reinforcing member of inwardly opening channel-shaped form arranged within the housing, said member having its bight bearing against the inner face of the lower portion of the housing and constituting a holder for a support, its arms bearing against the inner faces of the front, back and side walls of the housing, overlapping said cards and forming guides for the latter and with the free ends of its arms bearing against spaced portions of the inner face of said upper wall, a support mounted in said bight common to and for limiting the extent of the downward shifting of said cards, each of said cards being formed with window forming means for registering with said rows of windows when the card is seated on said support, and a series of slip sheets arranged in said housing, alternately disposed in confronting relation with respect to all of the cards of said set and each formed centrally with an opening providing clearances for exposing selected indicia from said cards, said slip sheets corresponding in width to and being of greater length than said cards, seating at their lower ends against said support and having their upper end cutout to provide respectively clearances for the selected indicia on said tongues and forwardly directed spaced parallel projections for abutting other spaced portions of the inner face of said upper wall.

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