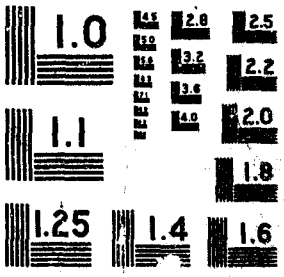
AUSTRALIA



MICROCOPY RESOLUTION TEST CHART
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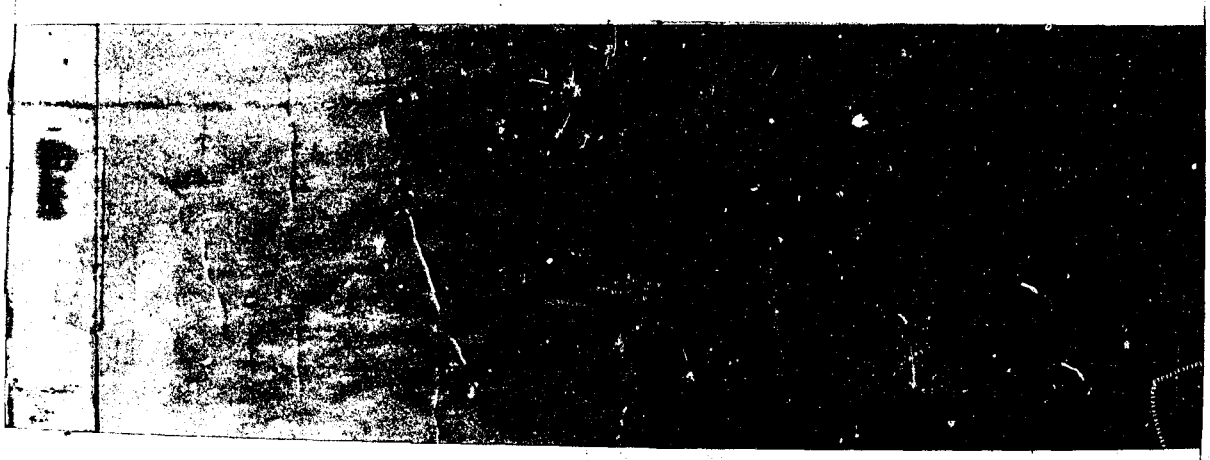

2711 51 AMENDED Form A4

COMMONWEALTH OF AUSTRALIA

The Patents Act 1903-1950

APPLICATION FOR A PATENT FOR AN INVENTION COMMUNICATED FROM ABROAD.

I, FREDERICK BERNHARD RICE, of Club Chambers, 96 Phillip Street, Sydney, in the State of New South Wales, Commonwealth of Australia, Patent Attorney, hereby apply that a Patent may be granted to me for an invention entitled:

"CALCULATING MACHINE"

And I declare that CURT HERZSTARK of Nendeln in the Principality of Liechtenstein, Engineer, is the actual inventor thereof and that the said invention has been communicated to me by CONTINA BUREAUX UND RECHENMASCHINENFABRIK AKTIEN-GESELLSCHAFT of Vaduz in the Principality of Liechtenstein, Manufacturers, the Assignees of the actual inventor,

And I declare that I am in possession of the said invention and that it is not in use within the Commonwealth of Australia by any other person or persons to the best of my knowledge and belief; and I further declare that the said CONTINA BUREAUX UND RECHENMASCHINENFABRIK AKTIEN-GESELLSCHAFT is not resident within the Commonwealth of Australia,

And I make this declaration conscientiously believing it to be true.

Dated this fifteenth day of June, A.D.1951.

F B Rice

Signed by the said
FREDERICK BERNHARD RICE
in the presence of :

J Waller

To the Commissioner of Patents,
Commonwealth of Australia

Form D

271151

COMMONWEALTH OF AUSTRALIA

The Patents Act, 1903-50

STATEMENT OF ADDRESS FOR SERVICE

S I R,

I hereby authorise and request you to send all notices, requisitions, and communications in connexion with my application for Letters Patent for my invention entitled:

"CALCULATING MACHINE"

to my address : -

Club Chambers,
96 Phillip Street,
Sydney. N.S.W.
Australia.

F B Rice

(FREDERICK B. RICE)

Dated: 17th May 1951

To The Commissioner of Patents,
Commonwealth of Australia

PATENT SPECIFICATION (21) 2711/51

Int. Cl. (51) G06G 3/02

Application Number (21) 2711/51
Lodged (22) 18.5.51

Complete Specification entitled (54) CALCULATING MACHINE

Lodged (23) 18.5.51
[redacted] (44) Abandoned
Published (41) 19.5.51

Convention Priority (30) NIL

Applicant (71) FREDERICK BERNARD RICE

The following statement is a full description of this invention, including the best method of performing it known to ME

Contina Obj 3

271151

Col 1
Fig 3

ORIGINAL.

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The Patents Act, 1903-1950.

COMPLETE SPECIFICATION

"CALCULATING MACHINE."

I, FREDERICK BERNHARD RICE, of Club Chambers, 96 Phillip Street, Sydney, in the State of New South Wales, Commonwealth of Australia, Patent Attorney, hereby declare this invention and the manner in which it is to be performed to be fully described and ascertained in and by the following statement : -

Continu Obj 3
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The invention relates to a calculating machine for all four species, having a minimum size, in which the figure drums and the associated transmission members of the result counting mechanism and of the revolution counting mechanism are arranged in a circle around a common driving member (for example an echelon drum).

It is an object of the invention to house the members of the result and revolution counting mechanisms in the machine space available in the minimum size (pocket size) of the present circular calculating machine in a manner to obtain completely separate figure patterns for both counting mechanisms with the use of structural components as simple as possible which are moreover space saving and permit an easy assembling of the calculating mechanism gears arranged on them.

In order to attain these objects, the figure drums and associated counting mechanism members of the result counting mechanism and of the revolution counting mechanism are arranged, according to the invention, on the same circle which should be as small as structurally possible, in two groups entirely separated from one another by an angular interval, and moreover off-set in angular pitch so that the two counting mechanisms yield figure patterns separated from one another, and the members of each counting mechanism group bridge the transmission members of the other group without engaging them as soon as they get into the zone of non-pertinent transmission members when performing a decade transfer of the total counting mechanism.

In the accompanying drawings a form of embodiment of the calculating machine according to the invention is shown on an enlarged scale by way of example, the figures showing only those components which are required for an understanding of the invention.

Fig. 1 shows a vertical section through a minimum size calculating machine, part of which only is represented, with the counting mechanisms engaged, whereas

Fig. 2 shows the same with the counting mechanisms disengaged.

Figs. 3 and 4 show diagrammatically the result and revolution counting mechanisms in plan view in their normal position, and in a position moved out of the normal position by several decades, respectively.

Fig. 5 shows a still more enlarged vertical section through the counting mechanism of a somewhat modified embodiment.

Fig. 6 shows the body of a counting mechanism according to Fig. 5 in plan view, and

Fig. 7 is a part view of the counting mechanism as seen from outside.

Figs. 8, 9, 10 and 11 diagrammatically represent some details of the minimum size calculating machine, relevant to the invention.

On a vertical shaft 2 journalled in the machine body 1 a driving element is arranged which consists of an echelon drum W having two groups of teeth Z_1, Z_2 on its circumference, off-set 180° with respect to one another (Fig. 11), of which the group Z_1 acts on the transmission members 3 of the result counting mechanism R, and the group Z_2 on the

transmission members 4 of the revolution counting mechanism U. Both counting mechanisms R and U are equipped with an ordinary number of places and a through-going decade transfer.

The revolution counting mechanism U as shown in Figs. 3 and 4 is arranged in the body 5 of the counting mechanism on the sector left free by the result counting mechanism U and on the same circle as the latter. The body 5 of the counting mechanism rests with a bush 5' on a central sleeve-shaped projection 6 of the machine body 1 so as to be capable both of being rotated and being shifted axially. It can be lifted against the bias of the compression spring 7 so far that the transmission pinions 8 for the figure drums 9 of the result counting mechanism and the transmission pinions 8' for the figure drums 9' of the revolution counting mechanism get out of engagement with the transmission pinions 10, 11 of the adjustment members 3,4. As will be seen from Figs. 1 and 2, the spring 7 bears with its one end against a flange 5" of the bush 5', and with its other end against a ring 27 held on the sleeve 6 by a circlip 26.

On the shaft 2 there is moreover the operating crank 29 secured for rotation by a pin 28. By turning said crank, the shaft 2 and the echelon drum W connected therewith for rotation are set in rotary motion. In the elevated position of the body 5 of the counting mechanism as shown in Fig. 2 of the drawings, the total counting mechanism can undergo a decade transfer. The arresting of the body 5 of the counting mechanism after each decade transfer is effected for example by a pin 12 inserted into the machine body 1 and engaging a

recess 13 of a rest rim 30 of the body 5 of the counting mechanism (Figs. 1, 2 and 10). The rest rim 30 has recesses 13 which serve for the housing of the axles 14 of the figure drums 9,9' and of the transmission pinions 8,8' of the result counting mechanism and of the revolution counting mechanism, respectively, and still leave a space free sufficient for the pin 17 to be capable to engage the recess for the purpose of arresting the body 5 of the counting mechanism. The radially projecting axles 14 may be screwed to the rest rim 30 by means of screws 31, as shown in Figs. 1 and 2, or alternatively cast into the body of the counting mechanism when the latter is made by injection moulding (Fig. 5).

The figure drums 9,9' and the transmission pinions 8,8' integral with them are pushed over the axles 14 from outside, and are loosely rotatable on them.

The body 5 of the counting mechanism shows, in the embodiment according to Figs. 5,6, a flange 15 projecting from the centre portion which flange terminates in an edge 16 directed upwards at a right angle. In the flange 15 there is provided a hole 17 over each axle 14 designed for housing a ball 18. The ball 18 is pressed into the interstices between the teeth of the transmission pinions 8,8' respectively, under the action of leaf springs 19. Thereby the figure drums 9,9' are always retained in a correct position when at rest. For the sake of simplicity, the springs 19 are combined into a spring spider punched out in one piece. The body 5 of the counting mechanism is covered by

a cup shaped ring 20 made for example of sheet metal which is provided with display openings 21 for the figure drums 9,9'. The display openings 21 are open towards the middle of the machine, and are covered in this region by the effacer 22 (not to be described in detail). The cover ring 20 is equipped at its upturned edge with an external thread and with recesses 23. With these recesses 23 the cover ring 20 embraces the free ends of the axles 14, and with the bases of these recesses 23 it rests on the ends of these axles.

The cover ring is screwed into a sleeve 24 having an internal thread 25 which sleeve serves as a grip for lifting the counting mechanism out of engagement when performing a decade transfer. When screwing the cover ring 20 and the sleeve 24 together, the former is centered by the recesses 23 according to the position of the axles 14 so that the axles 14 of the figure drums and the centre lines of the display openings 21 are in accurate juxtaposition. Moreover, the cover ring 20 and the axles 14 form together a mutually stiffened structure when tightening the sleeve 24. A further advantage of this device can be seen therein that after unscrewing the components 20,24, the figure drums 9,9' with the transmission pinions 8,8' can be easily removed sideways from the machine, and can be as easily refitted into the latter.

Because of the relatively very small diameter of the machine, very small intervals only remain between the result counting mechanism and the revolution counting mechanism, and moreover the angular distances between the members of

the counting mechanisms have to be dimensioned very small. Accordingly, when performing a decade transfer, the counting mechanism of the result mechanism gets into the range of the revolution counting mechanism. Lest the transmission pinions 8 of the result mechanism get into mesh with the transmission pinions 11 for the revolution counting mechanism when performing this transfer, the pinions 8 of the result mechanism R are off-set with respect to the corresponding pinions 8' of the revolution counting mechanism U by e.g. half an angular pitch "t" (Figs. 3, 4 and 6). The angular distance of the first figure of the result mechanism R from the last figure of the revolution counting mechanism U and, conversely, of the last figure of the result counting mechanism from the first figure of the revolution counting mechanism amounts to "1.5". In the same way the transmission pinions 11 (Fig. 4, group u) of the revolution counting mechanism are off-set with respect to the transmission pinions 10 (Fig. 4, group r) of the result mechanism R. In the position of the total counting mechanism as shown in Fig. 4, the latter is displaced for example by three decades from the normal position so that three of the toothed members 8, 9 and 8',9', respectively, of the result and revolution counting mechanisms are located between the transmission pinions 11 and 10, respectively, and are accordingly out of mesh with them (compare Fig. 9).

CLAIMS

Having now fully described and ascertained my said invention and the manner in which it is to be performed, I declare that what I claim is :-

1. A calculating machine in which the figure drums and counting mechanism members of the result counting mechanism and of the revolution counting mechanism are arranged around a common driving member on the same circle, divided into two groups entirely separated from one another by angular intervals, so that the two counting mechanisms yield two patterns of figures, the one separated from the other.

2. A calculating machine as set forth in claim 1, in which the members of the revolution counting mechanism are off-set with respect to the corresponding members of the result counting mechanism by such an angular interval, for example 1.5 t if t denotes the pitch, that when performing a decade transfer by turning the casing of the counting mechanism, those members of the one counting mechanism which get into the range of the members of the other counting mechanism remain out of mesh therewith.

3. A calculating machine as set forth in claim 1, in which two groups of teeth, the one separated from the other, are arranged on the echelon drum, the one group of teeth acting on the members of the result counting mechanism, and the other group of teeth acting on the members of the revolution counting mechanism.

4. A calculating machine as set forth in claim 1, in which the spaces provided in the body of the counting mechanism for the housing of the axles of the figure drums form at the same time locking rests for the locking members of the arresting device of the counting mechanism.

5. A calculating machine as set forth in claim 1, in which the axles of the figure drums freely project from the body of the counting mechanism in the fashion of the spokes of a wheel.

6. A calculating machine as set forth in claim 5, in which the body of the counting mechanism is designed as a cage for spring biased detent balls which hold the figure drums in the correct rest position.

7. A calculating machine as set forth in claim 6, in which a cover ring having lateral recesses is superimposed on freely projecting ends of the figure drum axles, which ring has display openings and is secured in its arresting position by a sleeve forming a grip for operating the counting mechanism, whereby the said axles and cover ring are mutually stiffened structurally without the use of special components, and moreover permit easy assembling and dismantling of the components of the counting mechanism.

8. A calculating machine as set forth in claim 6, in which a spring spider is arranged on the body of the counting mechanism, resiliently loading all the detent balls.

9. A calculating machine as claimed in claim 1, substantially as described with reference to Figs. 1 to 4 and 8 to 11 of the accompanying drawings.

10. A calculating machine as claimed in claim 1, substantially as described with reference to Figs. 5 to 7 of the accompanying drawings.

Dated this 17th day of May, A.D. 1951.

F B Rice

(FREDERICK B. RICE)

Witness: J Waller

DRAWINGS

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Fig. 1

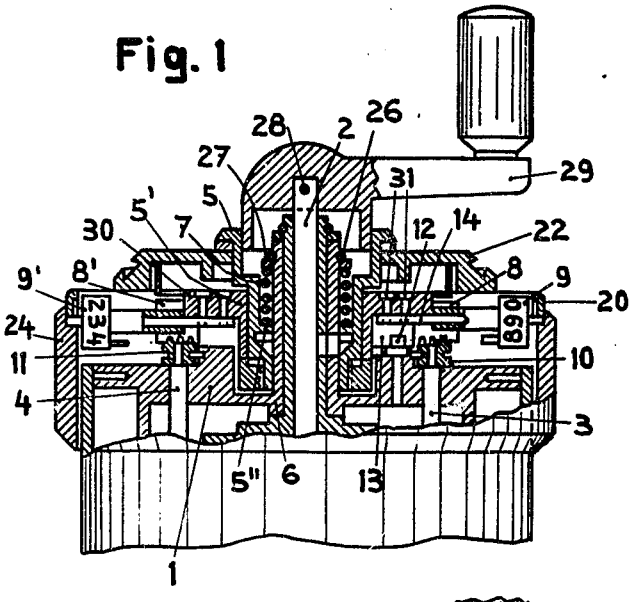


Fig. 2

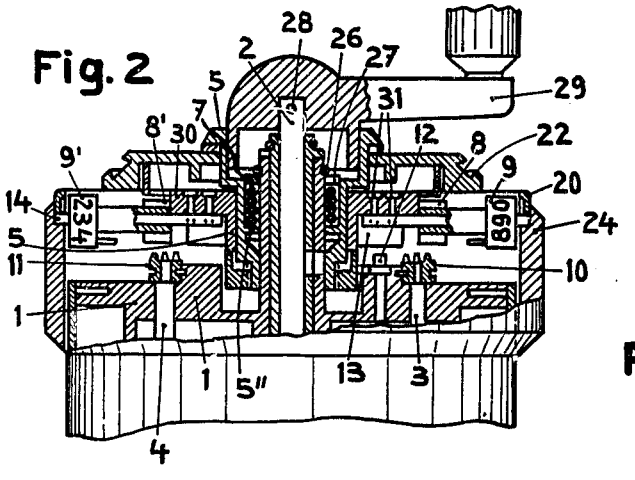


Fig. 10

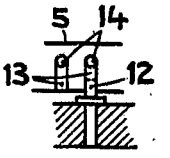


Fig. 11

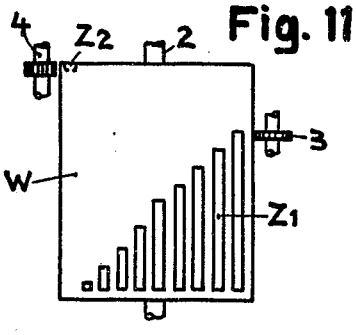


Fig. 8

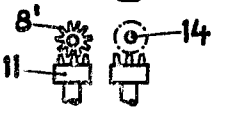


Fig. 9

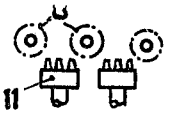


Fig. 3

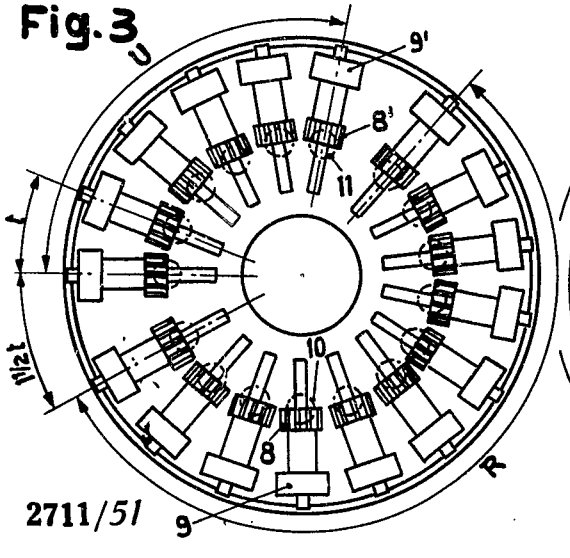
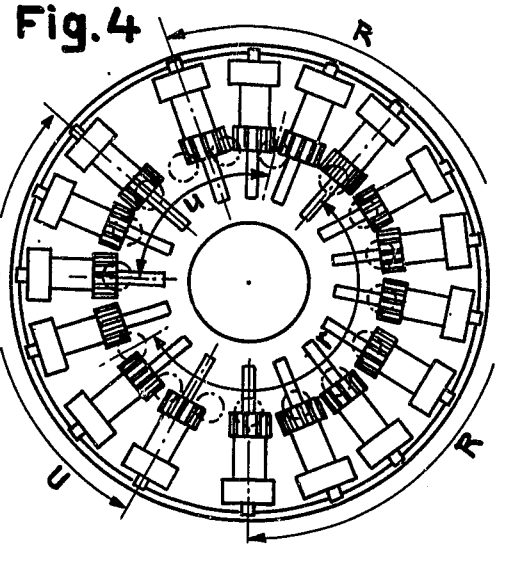


Fig. 4



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(FREDERICK B. RICE)

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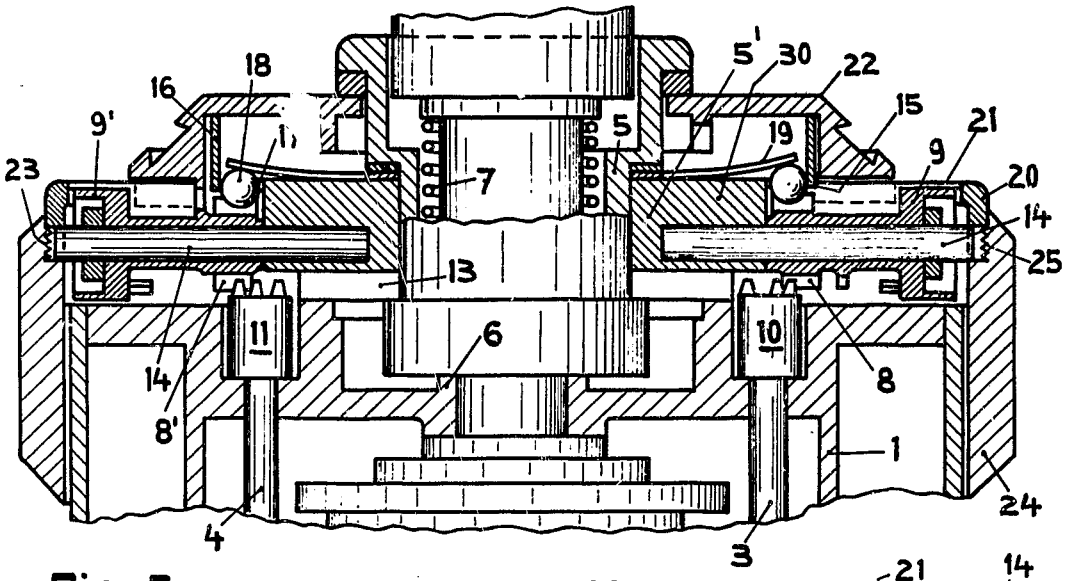

Fig. 5

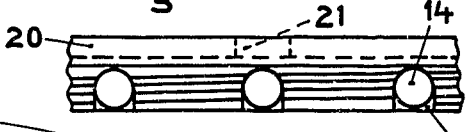

Fig. 7

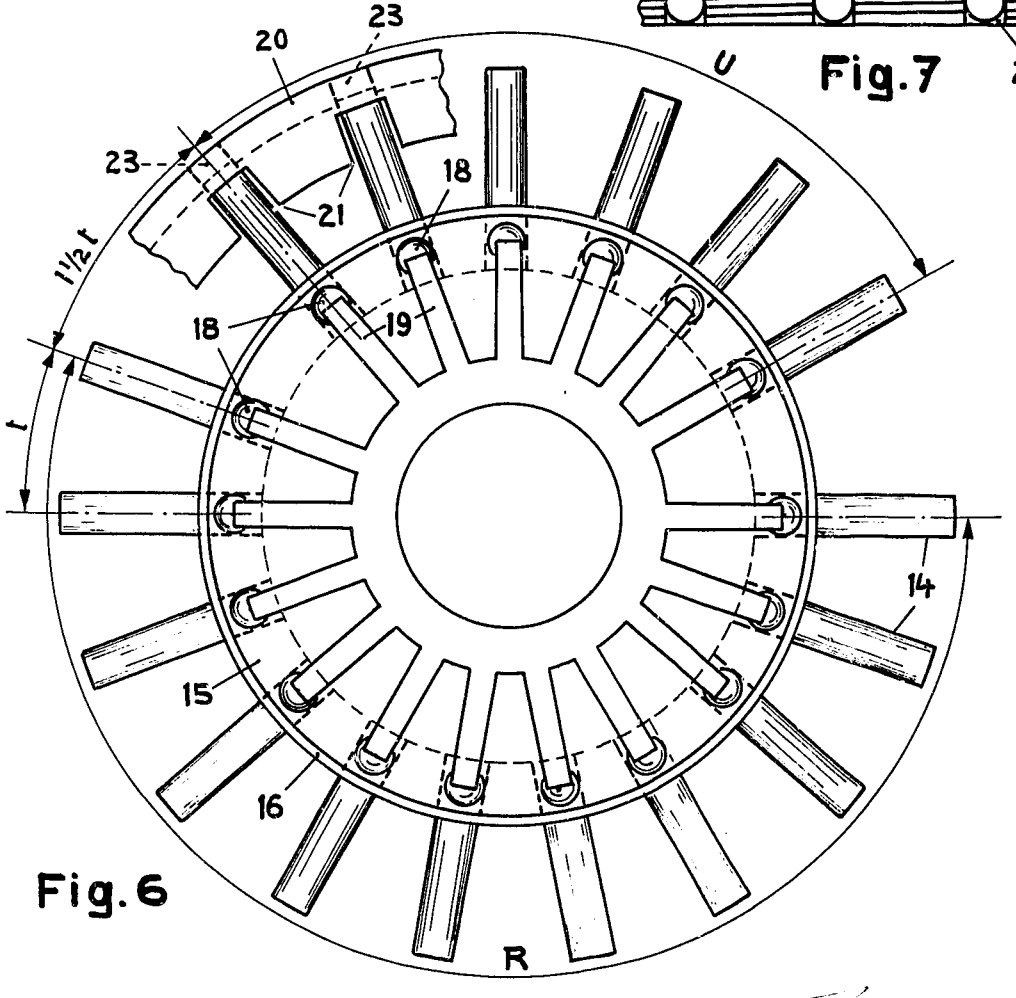

Fig. 6

F. B. Rice

(FREDERICK B. RICE)

END