H. P. NORDMARK.

TRANSFER MECHANISM FOR REGISTERS.

APPLICATION FILED NOV. 30, 1920.

1,428,607. Patented Sept. 12, 1922.

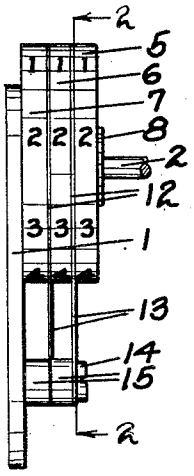


FIG. I.

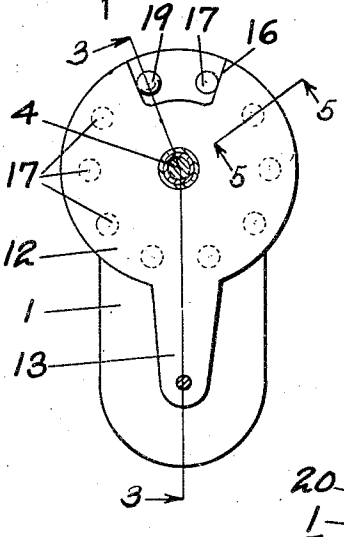


FIG. II.

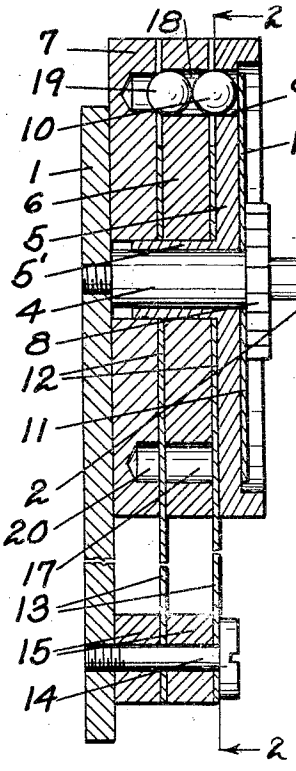


FIG. IV.

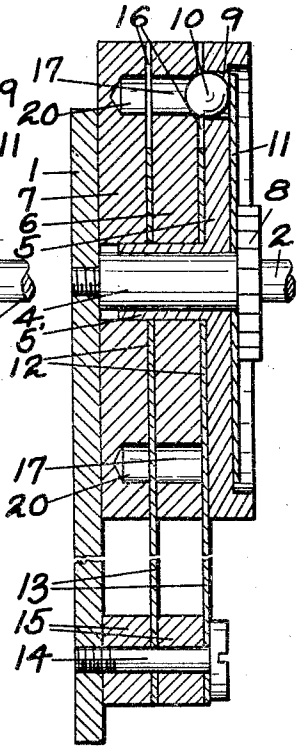


FIG. III.

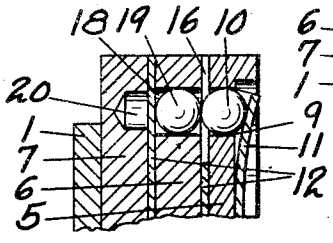


FIG. VI.

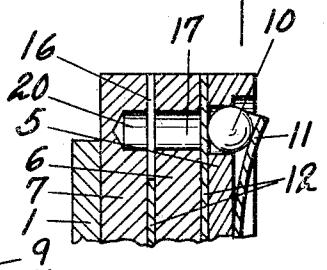


FIG. V.

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UNITED STATES PATENT OFFICE.

HENRY P. NORDMARK, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR OF ONE-HALF TO F. I. CHICHESTER, OF ALLEGAN, MICHIGAN.

TRANSFER MECHANISM FOR REGISTERS.

Application filed November 30, 1920. Serial No. 427,267.

To all whom it may concern:

Be it known that I, HENRY P. NORDMARK, a citizen of the United States, residing at Grand Rapids, Michigan, have invented certain new and useful Improvements in Transfer Mechanism for Registers, of which the following is a specification.

This invention relates to an improved transfer mechanism for number or counter wheels.

The objects of the invention are to provide a simple, effective and compact structure which is economical to manufacture and is certain in its operation.

Objects which pertain to mere details will definitely appear from the detailed description to follow.

I accomplish the objects of my invention by the mechanism described in the following specification. The invention is clearly defined and pointed out in the claims.

A structure which is a preferred embodiment of my invention is fully illustrated in the accompanying drawing, forming a part of this specification, in which:

Fig. I is a detail elevation view of a set of three number wheels to which my invention has been applied, the same here being such number wheels as are made use of in voting machines or in calculating machines generally.

Fig. II is a detail sectional elevation view taken on line 2—2 of Fig. I, showing details of construction and the form of one of the transfer plates.

Fig. III is an enlarged detail sectional view of the mechanism in position to transfer from the "unit" or lowest number wheel to the next higher number wheel, taken on line 3—3 of Fig. II.

Fig. IV is a similar detail sectional view showing the mechanism in position to transfer from the second or "tens" number wheel to the third or "hundreds," as the case may be, taken on line 3—3 of Fig. II.

Fig. V is a detail sectional view of the position of the parts taken on line 5—5 of Fig. II, when the lower or "unit" number wheel alone is being actuated.

Fig. VI is a similar detail sectional view showing the position of the parts, taken on said line 5—5, just after the transfer from the second to the third wheel.

In the drawing all of the sectional views are taken looking in the direction of the little arrows at the ends of the section lines, and similar numerals of reference refer to similar parts throughout the several views.

Considering the numbered parts of the drawing, 1 is the side plate or frame support for the number mechanism. 2 is the stud or shaft inserted into the frame and carrying the same. 4 is the shaft on which the initial number wheel 5 turns, the same being provided with a suitable sleeve or hub 5′ extending through the other wheels. 6 is the second number wheel and 7 is the third number wheel, supported upon the shaft or sleeve, as the case may be. 8 is the ratchet wheel secured to drive the first number wheel 5, which number wheel of course may be driven by any suitable means.

A hole 9 is provided parallel with the axis of the first number wheel, in which is disposed an actuating ball 10 which is yieldingly held in position by the spring disk 11, which is capable of being deflected somewhat, as indicated in Fig. V. Between the number wheels are interposed stationary transfer plates 12, held in fixed relation by projecting blades 13 engaged by the screw 14, the same being suitably spaced from each other by blocks 15, as clearly appears in Figs. III and IV.

A notch 16 is cut out of the upper portion of each transfer plate 12, as clearly appears in Fig. II. The wheel 6 has a series of ten holes, disposed at the same radial distance from the center as the hole 9 of the wheel 5. Nine of these holes 17 are considerably smaller in diameter than the hole 9, but the tenth hole 18 is of the same diameter, and in the tenth hole is disposed a ball 19 which is identical in size with the ball 10.

In the number wheel 7, or if there are more than three, in the last number wheel, are bored a series of ten holes 20, of smaller size to engage the last ball 19, the same as the holes 17 engage the side of the next succeeding ball to accomplish the transfer. The plates 12 are of very thin metal but of high quality of metal to withstand the action of the balls.

The operation of the device is as follows: As the ratchet wheel 8 is actuated step by step, the ball 10 is carried around on the smooth surface of the adjacent plate 12 until it comes to the notch 16. It is then urged axially to one side of the wheel by the spring disk 11 and drops partially into and engages

one of the holes 17. As it continues to move, the ball remains in engagement until it passes the opposite side of the notch 16, then the ball encounters the edge of the plate 12 and is lifted out of engagement with the wheel 6, thus accomplishing the transfer from the first to the second number wheel.

Continued movements and rotations of the predetermined number brings the ball 10 opposite the larger hole. It there drops into the hole and encounters the ball 19 which is forced axially partially into the hole 20 and consequently into engagement with the hole 20 on the third disk. The actuation of the ratchet now carries the first, second and third wheels forward, accomplishing the transfer to the third wheel, or wheel 7. By increasing the number of intermediate wheels 6, the capacity of the numbering machine is increased to any required or desired capacity within the limits of the structure.

The structure, it will be observed, is exceedingly compact, very strong, very easy of manufacture and very durable and lasting indefinitely for many purposes. Particularly is it of advantage in voting machines, although of course any numbering or calculating machines may be provided with the device and operate very effectively.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In a transfer mechanism, the combination of a series of disk-like number wheels, transfer division plates with a notch corresponding to the point of engagement for transfer, a series of perforations in all of said wheels except the first corresponding to the numerals to be transferred, one of which is slightly larger than the other and contains a ball of a diameter corresponding to the thickness of the said disk number wheels, a perforation in the first wheel of the series at an equal radial distance from the center, corresponding in size to the larger hole containing the ball, a ball in the initial number wheel hole or pocket, a disk spring pressing the said ball towards the higher number wheels adapted to coact and engage the perforations in the next higher number wheel and effect transfer by step-by-step action and to press the ball in the enlarged perforation of the higher number wheel to engage a still higher number wheel and effect transfer, all coacting substantially as described for the purpose specified.

2. In a transfer mechanism for numbering wheels, the combination of a series of disk-like number wheels containing perforations parallel with the axis thereof and radially equidistant from the center, an initial number wheel with a corresponding pocket, a ball in the pocket of said initial number wheel, a spring for pressing the ball yieldingly in position, an intermediate notched plate to permit the ball to engage the perforations of the higher wheel and to effect the transfer, as specified.

In witness whereof, I have hereunto set my hand and seal in the presence of two witnesses.

HENRY P. NORDMARK. [L. S.]

Witnesses:
L. S. CHICHESTER,
HAROLD H. ISAAC.