

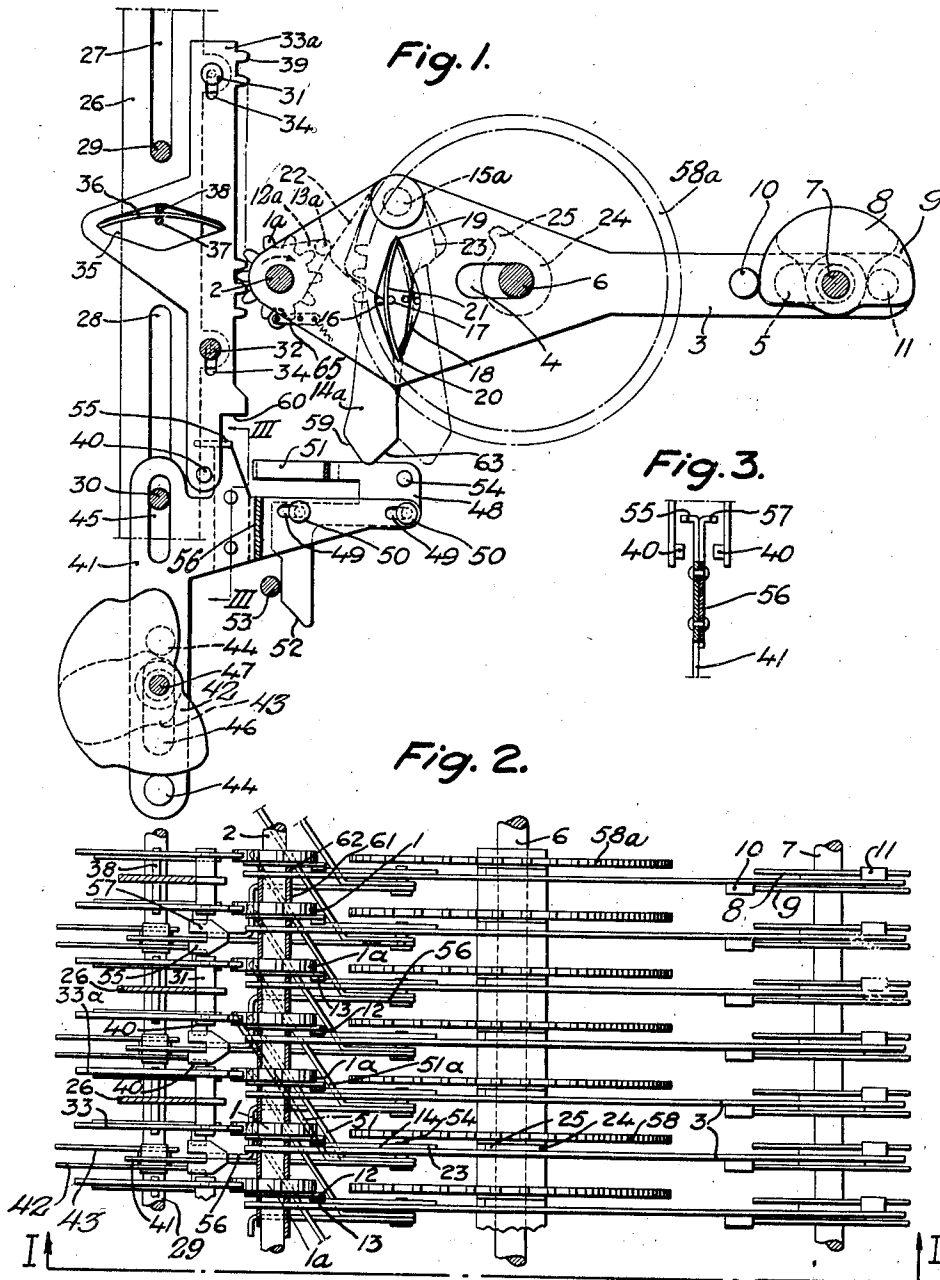
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TENS TRANSMITTING DEVICE FOR CALCULATING MACHINES AND THE LIKE

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TENS TRANSMITTING DEVICE FOR CALCULATING MACHINES AND THE LIKE

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The present invention relates to a tens transmitting device for adding machines and the like, having totalizer wheels, which are disconnectible relatively to differential setting members (setting racks) or the like, and the chief object of the invention is to provide for a positively operating tens transmitting device, which may be applied, without any difficulty, in most varying kinds of calculating machines, cash registers and the like, without necessitating the changing of the construction of the device to be able to correspond to the purposes the various machines are intended to serve.

An embodiment of the invention is illustrated in the accompanying drawing, in which

Figure 1 shows a vertical section on line I—I of Fig. 2 through a tens transmitting device, when applied to a cash register having double totalizers.

Figure 2 shows the device in plan view, partly in section and

Figure 3 shows a section on line III—III of Figure 1.

Referring to the drawing numerals 1 and 1a indicate the totalizer wheels of two individual totalizer systems, the wheels indicated by 1 being the wheels of one totalizer system serving to add the figures entered on the counting racks to the totals previously obtained in this totalizer system and the wheels indicated by 1a being the wheels of the other system adding the same figures to the totals previously obtained in said second system. The totalizer wheels are mounted on the totalizer wheel shaft 2, which in its turn is mounted in frames or frame plates 3. The said plates are provided with guide grooves 4, 5, through which shafts 6, 7 extend. By means of cam or curve discs 8, 9, secured to the shaft 7, and adapted to cooperate with studs 10, 11 secured to the frames, it is possible, when turning the cam discs, to put the frames and with them also the totalizer wheels into a reciprocating motion. In the embodiment shown there are two cam discs 8, 9 for each frame 3. A plate 12 is rigidly connected with each totalizer wheel, the said plate being provided with a pin 13 serving as a cam. A swingable arm 14, which may be adjusted to two positions (shown in full and in broken lines, respectively, in Fig. 1), is connected by means of a pivot 15 to each of the frames 3, respectively. Each arm 14 is provided with two pins 16, 17, which, when the arm is swung, move to and fro in an aperture 18 provided in the frame, the side edges of the said groove forming stops for the pins 16, 17. In the groove 18 there

is, between its terminal points, 19, 20, provided a leaf spring 21, which is bent in its longitudinal direction and the middle portion of which is secured between the pins 16, 17 and the direction of force of which is reversible by the middle portion of the spring, by the swinging of the arm, being caused to be located at one side or the other of a line connecting the fixing points 19, 20. On two surfaces, which are opposite each other, each arm 14 is provided with cam surfaces 22, 23, one of which, 22, is adapted to cooperate with the cam or pin 13, the other cam surface 23 being adapted to cooperate with a cam 25, secured on the shaft 6

In the drawing numeral 26 indicates the setting racks, which are guided by means of shafts 29, 30 extending through guide slits 27, 28. The setting racks 26 are adjusted and driven, for example in the manner disclosed in the specification of U. S. Patent No. 1,839,138. On each setting rack there are, in their turns, provided two totalizer actuating racks 33, 33a, which are provided with teeth 39 and displaceable by means of guide slits 34 and guide pins 31, 32. Each of the said actuating racks is provided with a slit 35, in which there is placed a leaf spring 36 in a corresponding manner as in the slit 18 of the arm 14, the middle portion of the said spring being fixed between two pins 37, 38 secured on the setting rack 26. By means of the leaf spring 36 the actuating rack 33 may be locked in the position, which the said rack occupies after a tens transmitting operation has taken place. In order that it shall be possible to return the rack 33 to its initial position after such transmitting operation has been performed, the lower portion of the rack is provided with a pin 40, which serves as a stop and which is adapted to cooperate with the members described more particularly in the following.

41 indicates guide members located between the setting racks 26, each of which members, by turning cam or curve discs 42, 43, which are secured on a shaft 47 and which are adapted to cooperate with rolls 44 secured to the member 41, is adapted to be put into an up and down motion, during which motion the member is guided by guide grooves 45, 46, into which the shafts 30 and 47 extend. On each member 41 there is fixed an S-shaped plate 56, which thus takes part in the motion of the member 41. On each of the members 41 and the plates 56 there is, by means of guide grooves 49 and guide pins 50, displaceably disposed a tens transmitter 51 and 51a respectively. As will be seen from the

drawing the said tens transmitter is shaped from a plate 48 and according to the present embodiment, where the machine is provided with double totalizers, it forms an arm, which is directed obliquely outwards and which extends past the nearest actuating rack and to the following actuating rack, with which the arm is meant to cooperate. From the part 48 there is also formed a cam or guide surface 52, adapted to cooperate with a stationary shaft 53, and further, the part 48 is provided with a pin 54, with which the arm 14 is adapted to cooperate. The member 41 and the plate 56 are provided with an angularly bent portion 55 and 57 respectively, forming stops, adapted to cooperate with the pins 40 secured on the actuating racks. Finally, there are toothed wheels 58 rotatably mounted on the shaft 6, which are meant to serve as motion transmitting members between the totalizer wheels 1 and other members, which are not shown in the drawing, to which numeral values are to be supplied, as for example, storage sets. 61, 62 indicate tube sleeves, which serve to keep the totalizer wheels 1, 1a and the frames 3 in correct positions relatively to each other on the shaft 2.

The device functions as follows:

It is assumed that the frames 3 together with the totalizer wheels 1 either occupy their right terminal position, in which the totalizer wheels are in engagement with the wheels 58, or an intermediate position (not shown in the drawing), in which the totalizer wheels are out of engagement with the actuating racks and the wheels 58. In the intermediate position the totalizer wheels are blocked against free rotation by spring actuated ratchets 65. Relatively to the setting racks 26 the actuating racks occupy the position shown in the drawing. The setting racks are moved downwards a number of pitches corresponding to a numeral value entered on keys or the like. When turning the cam discs 8, 9 the totalizer wheels carried by the frames 3 are moved to their left terminal position, the said wheels meshing with the respective actuating racks. The setting racks are now moved back to the initial position, during which movement, a rotating movement, in the direction of the arrow shown in Figure 1, is imparted to the wheels 1, said rotating movement corresponding to the movement of the setting racks. If in such a case, the totalizer wheel shown in the last mentioned figure has accumulated the figure "nine" a tens transmitting operation thus is to take place. The initial position for the arm 14 is the position shown in full lines in Figure 1. During the continued rotation of the totalizer wheel 1 the cam 13 actuates the cam surface 22 of the arm 14 and, against the action of the leaf spring 21, swings the arm 14 so far that the central portion of the spring is forced across a line connecting the terminal points 19, 20. Having reached this position, the spring jumps into the position indicated in dot-dash lines in Fig. 1. The arm 14 through the intermediary of the pins 16, 17 is taken along and swung into the position indicated by dash-and-dot lines. In this new position the arm is retained by the spring 21. While the totalizer wheel is still in engagement with the actuating rack 33 the guide member 41 moves upwards, by which the pin 54 will cooperate with the guide surface 59 of the arm 14. Owing to the fact, that each arm 14 in its dot-dash position offers a stationary cam face 59 to the pin 54 on the corresponding member 51, 51a, each of the latter members which upon rising finds the corresponding arm 14

in its left-hand position is displaced towards the setting rack so as to occupy the position indicated by dash-and-dot lines in Figure 2. Each of the members 51, 51a, by being bent at an angle, projects past the adjacent actuating rack 33a, to the actuating rack 33, 33a representing the next higher denomination of the same totalizer system. Thus, the free end of each member 51, 51a, which has been displaced in the first stage of its upward movement by cooperation with an arm 14, upon continued upward movement of the guide member 41 encounters a stop 60 formed on said actuating rack 33, 33a of the next higher denomination and takes the latter along upwards. The movement of the member 41 is so adapted as to impart through member 51, 51a and actuating rack 33, 33a to the totalizer wheel in engagement with the said actuating rack a rotating motion corresponding to one pitch. When the said tens transmitting operation has been done the actuating rack is retained by the leaf spring 36 in the position it has assumed during the transmitting operation. The totalizer wheel 1 may now be again brought out of engagement with the actuating rack 33. Before the said movement takes place the guide member has again moved so far downwards that the arm 14 will not be actuated by the pin 54; this in order that the arms 14, which have not been adjusted by the respective totalizer wheels, during the movement to the right of the last-mentioned wheels, shall not strike against the pins 54. Also after the totalizer wheels 1 have gone out of engagement with the actuating racks 33 the guide member 41 continues its downward movement. During this operation the stops 55, 57 strike against the pins or stops 40 of the actuating racks and return the actuating racks to the initial positions, the said racks having just been adjusted at the tens transmitting operation. Further, the tens transmitting members, which have previously been active, are caused to re-occupy their initial positions, by the cam surface 52 being caused to cooperate with the shaft 53.

To return the adjusted arms 14 to initial position the cams 25, by turning of the shaft 6, are caused to actuate the cam surfaces 23 of the arms 14.

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

1. In a calculating machine, the combination with setting members, a totalizing shaft, totalizing wheels rotatable on said shaft, and means for reciprocating said shaft and totalizer wheels substantially at right angles to the longitudinal axis of said shaft into operative and non-operative positions with respect to said setting members, of a reciprocating tens transporter for one denomination, a cam on the totalizer wheel of the next lower denomination to correspond with the highest denominational number on the wheel, and a guide member adjustable into operative position by said cam to guide said tens transporter of the next higher denominational order during its movement in one direction into a position for cooperative engagement with the corresponding setting member, said guide member being arranged to be adjustable by said totalizer wheel into operative and inoperative position of the latter with respect to the setting members.

2. A calculating machine, as claimed in claim 1, in which each of said setting members comprises a reciprocable setting rack and an actuating rack arranged on said setting rack to be en-

gaged and longitudinally displaced with respect to the setting rack by the corresponding tens transporter during the movement of the latter in one direction, said tens transporter in its non-operative position being disposed outside of the path of the reciprocating setting member.

3. A tens transmitting device, as claimed in claim 1, in which each of said setting members comprises a reciprocable setting rack and an actuating rack arranged on said setting rack to be engaged and longitudinally displaced with respect to the setting rack by the corresponding tens transporter during the movement of the latter in one direction, said device comprising further a detent mechanism for each of said actuating racks to lock the same in either position with respect to the corresponding setting rack, a stop on each actuating rack and a stop connected with each tens transporter, respectively, said stops being arranged for cooperation upon completion of the tens transporters return movement to restore the displaced actuating racks to their original position with respect to the setting racks.

4. In a calculating machine the combination with setting members, a totalizing shaft and totalizing wheels rotatable on said shaft of a frame carrying said totalizer shaft, means to reciprocate said frame at right angles to the longitudinal axis of said shaft to move said totalizer wheels alternately into operative and non-operative positions with respect to said setting members, a cam on one of the totalizer wheels, an arm pivoted to said frame and adjustable into operative position by said cam, a reciprocating tens transporter for the setting member of the next higher denomination, said transporter being adapted to cooperate during its movement in one direction with the arm of the next lower denominational order, and a detent mechanism to lock said arm in operative and non-operative position, said detent mechanism including a leaf spring bent in its longitudinal direction and fixed with its ends in said frame and means on said arm to hold the mid-portion of said spring in its position with respect to said arm.

5. A tens transmitting device, as claimed in claim 1, in which each of said setting members comprises a reciprocable setting rack, an actuat-

ing rack arranged on said setting rack to be engaged and longitudinally displaced with respect to the setting rack by the corresponding tens transporter, during the movement of the latter in one direction, and a detent mechanism to lock the actuating rack in either position with respect to the setting rack, said mechanism including a leaf spring bent in its longitudinal direction and fixed with its ends to the actuating rack and means on the setting rack to hold the middle portion of said spring in its position with respect to said setting rack.

6. A calculating machine, as claimed in claim 1, in which said means for reciprocating said shaft and totalizer wheels include a frame reciprocating towards and away from said setting members and carrying said totalizer shaft and guide member.

7. A calculating machine, as claimed in claim 1, in which said guide member comprises a swingable arm and a detent mechanism to lock said arm in operative and in non-operative position, respectively.

8. A calculating machine, as claimed in claim 1, comprising a reciprocating carrier for said tens transporter, the latter being displaceable on said carrier at approximately right angles to the direction of the carrier reciprocation, said guide member being adjustable by said cam to a position to cause displacement of said tens transporter with respect to said carrier during movement of the latter in one direction.

9. A calculating machine, as claimed in claim 1, comprising further guide means to restore said tens transporter to its non-operative position after cooperation with the setting members.

10. A calculating machine, as claimed in claim 1, which includes further a continually rotating cam, and in which said guide member comprises a swingable arm having on two opposite sides thereof cam surfaces, one of said surfaces being adapted to cooperate with the cam of the totalizer wheel to adjust the arm into operative position, the other surface being adapted to cooperate with said continually rotating cam to restore said arm to its non-operative position.

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