July 2, 1940. J. F. OHMER, JR 2,206,116

RECORD TAKING APPARATUS

Filed June 13, 1938

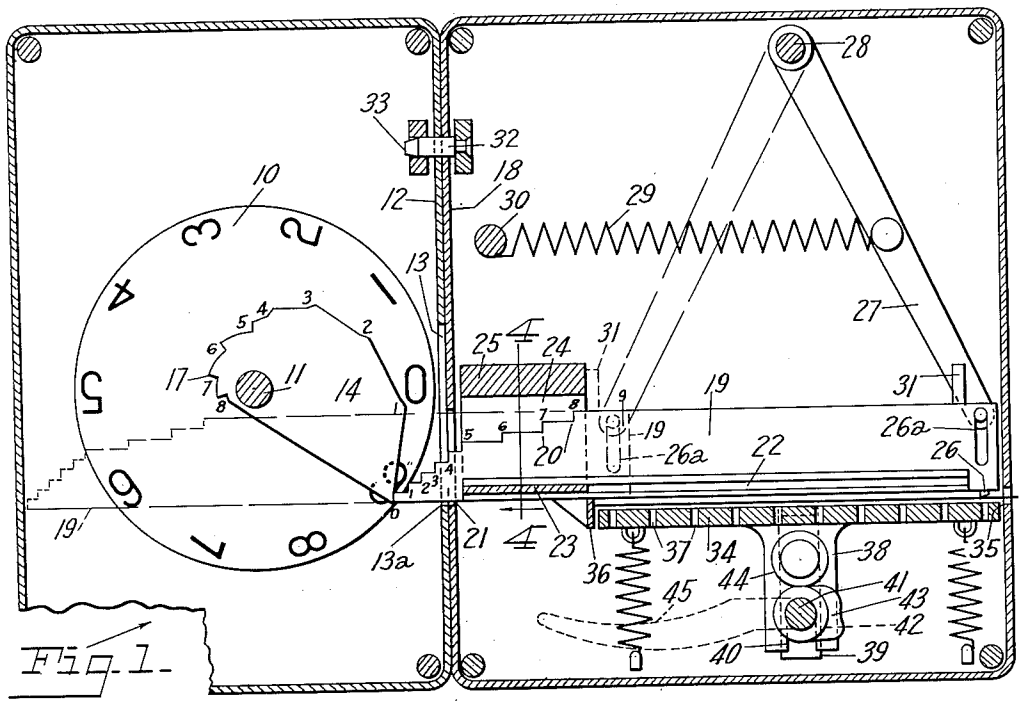


Fig. 1.

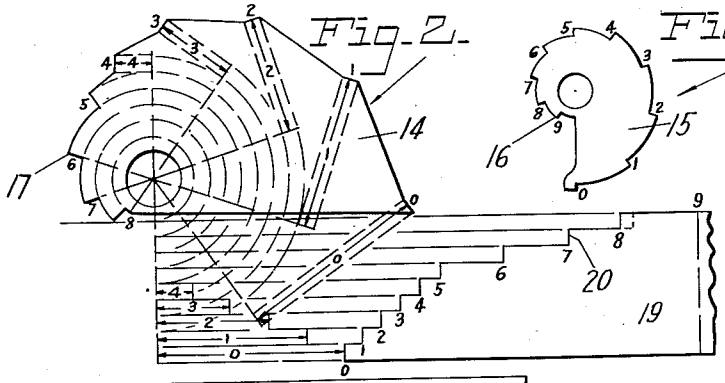


Fig. 2.

Fig. 3.

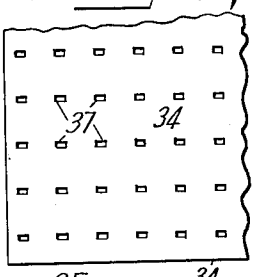


Fig. 5.

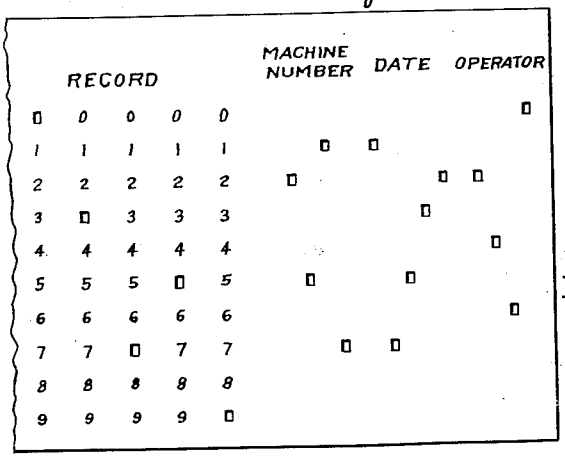


Fig. 6.

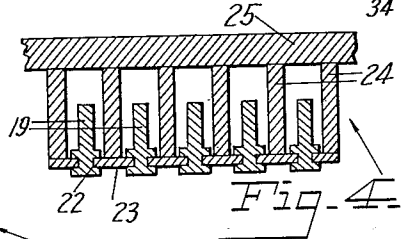


Fig. 4.

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UNITED STATES PATENT OFFICE

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RECORD TAKING APPARATUS

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15 Claims. (Cl. 234—58)

This invention relates to a record taking apparatus and more particularly to a portable device for transferring a record from a registering device to a record sheet.

Registering devices or counters such as are used in gas or water meters, for registering the number of operations of the machine, for counting articles, and for various similar purposes, are usually of the visual type and the record accumulated thereon must be transferred by hand to the record sheet or other permanent record. In many instances the record is first copied from the counter and then transferred to a tabulating card, by punching the card, such cards being thereafter passed through a tabulating machine to tabulate a plurality of such records. The taking of a record in such a manner is not only a slow and correspondingly expensive process but is subject to inaccuracies due to errors in reading the counters or transferring the count.

One object of the invention is to provide a mechanical device by means of which a permanent record may be taken directly from the registering elements of the counter.

A further object of the invention is to provide a portable device which may be applied successively to a plurality of separate registering devices and will transfer the record from each registering device to a record sheet or card.

A further object of the invention is to provide such a device which will accurately punch the tabulating card in accordance with the record on each registering device.

A further object of the invention is to provide such a device which will be simple in construction, accurate in operation and easily manipulated.

Other objects of the apparatus may appear as the same is described in detail.

In the accompanying drawing Fig. 1 is a vertical section taken through an apparatus embodying my invention and showing the same applied to a registering device; Fig. 2 is a detail view showing the development of one of the stop members of the registering elements; Fig. 3 is a detail view of a basic stop device from which the stop member of Fig. 2 was developed; Fig. 4 is a transverse section taken on the line 4—4 of Fig. 1; Fig. 5 is a plan view of a portion of the card supporting plate; and Fig. 6 is a plan view of a portion of a card which has been punched on the apparatus.

In the drawing I have illustrated one embodiment of the invention and have shown the same as comprising a record taking device which includes a plurality of movable elements adapted to be projected into engagement with adjustable stops carried by the corresponding registering elements of the registering device, each movable element of the record taking device being provided with a recording member which is thereby positioned in accordance with the registering position of the corresponding registering element.

In this particular embodiment the registering device comprises a series of counterwheels, one of which is shown at 10, mounted on a common shaft 11 and enclosed within a casing 12. The registering device is of a well known construction, such as the ordinary Veeder counter, and is operated in the usual manner to effect registration. In the present instance, however, each counterwheel is provided with a series of stops corresponding to the different registering positions of the counterwheel and adapted to be moved successively into an operative position, the arrangement being such that the stop which is in operative position will correspond to that numeral on the counterwheel which is in registering position. Usually the indicating numerals are on the peripheral face of the counterwheel but in the present drawing numerals are shown on the side of the counterwheel to more clearly show the positions of the stops with relation thereto, and the casing is provided with a sight opening 13 through which the peripheral numerals which are in registering position may be viewed and a visual reading taken therefrom. The stops may be of any suitable character and may, if desired, be formed integral with the respective counterwheels but, in the present instance, the stops are formed on the edge of a plate 14 which is secured to the countershaft 11. This stop member or plate 14 is of such a character that the stops are spaced circumferentially one from the other and are also spaced successively increasing radial distances from the axis of the shaft 11. The spacing is not the same as the spacing of the numerals on the counterwheel but the arrangement is such that the stop corresponding to each numeral will be in operative position when that numeral is in registering position, that is, is in line with the sight opening 13. In Fig. 2 the stop plate 14 is shown in the position it occupies when the counterwheel registers 9. In the present arrangement each stop when in operative position extends below the shaft, and the casing 12 of the register is provided with an opening in line with this stop position through which the movable members of the record taking

device may be moved into engagement with the operative stops of the respective counterwheels. In the arrangement shown this opening constitutes a downward extension of the sight opening 13, as shown at 13a in Fig. 1. No closure is shown for this opening but obviously the upper portion or sight opening may be provided with the usual transparent closure and the extension 13a may be provided with a movable closure or shutter of any suitable character.

As will hereinafter appear the recording device comprises a series of movable elements or bars each of which moves in a straight line extending below the shaft 11 of the registering device, and the stops on the counterwheel must be so arranged that each bar may engage any stop on the counterwheel with which it is associated. It has been proposed heretofore to provide a counterwheel with a controlling member having a plurality of shoulders or stops spaced successively increasing distances from the axis of the registering element, as shown in Fig. 3. Such an arrangement of stops would be inoperative in an apparatus of the kind here shown because the stop having the longest radius would prevent the slide bar from engaging the stop having the shortest radius. For example, if the stop plate of Fig. 3 was connected with the counterwheel in the manner shown in the drawing and the counterwheel moved to a position to register 8 or 9 the corresponding stop would be directly below the shaft 11, as shown in Fig. 2, and that portion of the stop plate having the longest radius, stop 0 to 1, would be between the operative stop and the bar so that the latter could not engage the operative stop. Therefore the stop plates 14 of the present apparatus have been developed to avoid this interference. As shown in Figs. 1 and 2 the stop structure is approximately semi-circular in shape and is provided on its peripheral edge with a series of shoulders or stops 17 corresponding respectively to the numerals 0 to 8 on the counterwheel, the stop 9 having been omitted for a reason which will hereinafter appear. With the counterwheel set to register 9 the stop plate will be in the position shown in full lines in Fig. 2 and that portion of the stop plate constituting the 0 stop and having the longest radius will lie above the path of the slide bar and the latter will be free to move to its 9 position. If the plate was provided with a 9 stop that stop would be directly below the shaft 11 and would be the only part of the stop plate in the path of the slide bar. When the 8 stop is moved to its operative position below the shaft the 0 stop will be spaced still further from the path of the slide bar and of course will not interfere with the movement of the latter into engagement with the 8 stop.

This plate is rigidly secured to the counterwheel for rotation therewith and, as here shown, is mounted at one end and near the base line thereof on the counter shaft 11. Thus the stop having the shortest radius, that is the "8" stop, is the only stop which projects beyond the base line of the stop plate and this stop is so arranged with relation to the zero stop, which is at the opposite end of the base line, that when the counterwheel is in its "9" position both the zero stop and the "8" stop will be out of the path of the movable element of the record taking device, as shown in Fig. 2. It will be apparent that the stop plate itself may constitute the registering element and the counterwheel may be omitted but when it is desired to provide for a visual reading of the accumulated count it is preferable to provide counterwheels to facilitate the reading of the count.

The record taking device comprises a main frame which in the present instance constitutes a casing 18 within which are supported the movable elements. Preferably these movable elements are in the form of elongate bars 19 slidably mounted in the frame and provided at their outer or forward ends with portions of successively decreasing width to provide the same with stops 20, spaced successively decreasing distances from the lower edge of the bar. These bars are adapted to be projected through an opening 21 in the front wall of the casing 18 and to be inserted through the opening 13a in the registering casing and caused to engage the operative stops of the corresponding counterwheels. The bars 19 may be supported and operated in any suitable manner. As here shown, each bar is provided near its lower edge with laterally facing grooves or guideways 22 into which project guide members or ribs 23 carried by supporting members 24 which are spaced laterally one from the other and are mounted at their upper ends on a transverse frame member 25. In this arrangement the recording members are shown as punches 26 and are rigidly secured to the lower edge of each bar adjacent the rear or inner end of that bar. Any suitable means may be provided for actuating the slide bars but this means is preferably yieldable so that each bar may be stopped in a position determined by the stop with which it engages. In the present instance each bar is actuated by a separate spring and in order that the springs may be of proper length each bar is connected, by a pin and slot connection 26a, with the lower end of a lever 27 which is pivotally mounted at its upper end on a shaft 28 in the upper part of the casing. A spring 29 is connected at one end with the lever 27 and at its other end with a rod 30 in the forward portion of the casing.

In the arrangement illustrated the springs 29 tend to move the respective slide bars 19 forwardly and when the bars are in their normal or idle positions they will be projected to the limit of their movement beyond the casing 18. With the bars in this position they are inserted through the opening 13a in the register casing and the casing 18 moved into operative relation with the casing 12, in the present instance in contact therewith. This movement of the casing causes the respective bars to engage the operative stops of the corresponding counterwheels, the stops 20 on each bar being arranged to engage a corresponding stop of the counterwheel when the latter stop is in its operative position and thereby interrupt the movement of the bar so that the continued movement of the casing 18 toward the casing 12 will cause the bar to be retracted with relation to the casing and the recording punch 26 positioned in accordance with the registering position of the corresponding counterwheel. The stops are so arranged that when a bar is in its fully retracted position, as shown in Fig. 1, the recording member 26 will be in its zero position. It will be noted that in this position the foremost stop on the bar is in engagement with the zero stop on the stop member 14, this being the stop having the longest radius. When the counterwheel has been moved to its "8" position, that is with the numeral 8 in line with the sight opening, the last stop, "8", on the bar will engage the "8" stop on the stop

member 14, thus positioning the recording member in its "8" position. When the counterwheel is moved to its "9" position, which is the position shown in Fig. 2, all the stops will be in inoperative positions and no part of the stop member will lie in the path of the bar. Thus the bar is permitted to move to the limit of its forward movement with relation to the casing and this limit is so determined that the bar will be stopped with the recording member in the "9" position. Any suitable means may be provided for so limiting the movement of the bar but, in the construction illustrated the bar is provided with a stop 31 arranged to engage the frame member 25 and thus positively interrupt the movement of the bar in the desired position. It is also preferable that some means be provided for so connecting the casing 18 with the casing 12 that the bars 19 will be properly positioned with relation to the stops of the counterwheels and this may be conveniently accomplished by providing the casing 18 with studs 32 adapted to be inserted in sockets 33 on the register casing. The connecting device may if desired be of such a character as to lock the casing 18 on the casing 12 but this is not essential as the operator may support the casing 18 against the casing 12 with one hand while he operates the record taking mechanism with the other hand.

Mounted within the casing 18 and beneath the slide bars is a card supporting member 34 which is normally spaced a slight distance below the recording members 26 and in line with a slot 35 in the rear wall of the casing 18 through which the cards may be inserted. The card is accurately positioned on the supporting member by fixed stops, one of which is shown at 36. The supporting member is in the form of a plate and is provided with a plurality of series of apertures 37, each series of apertures being arranged directly beneath and in line with one of the slide bars. The apertures of each series are so spaced one from the other that in any adjusted position of the corresponding bar the recording punch 26 of that bar will be in line with one of the apertures 37. When the card has been inserted and the several bars adjusted by contact with the corresponding counterwheel stops the supporting plate 34 is moved upwardly to cause each punch to pierce the card at a point designating that numeral, of the counterwheel with which the punch is associated, which is in registering position. As shown in Fig. 6, the record card is provided with a series of numbers in line with the respective apertures in the supporting plate so that when the plate is actuated one number in each series is punched out, thereby providing a card which is punched in accordance with the requirements of a standard tabulating machine and may be passed through that machine to tabulate the record on the card.

The supporting plate may be mounted and actuated in any suitable manner. In the construction shown it is provided with a downwardly extending rib 38 extending transversely to the slide bars and having at its ends parts slidably mounted in vertical guideways 39 carried by the end members of the main frame. The depending rib 38 is slotted, as shown at 40, and a shaft 41 extends through this slot and is mounted at its ends in bearings 42 carried by the end members of the main frame. Secured to this shaft are cams 43 arranged to engage rollers 44 carried by the respective ends of the depending rib 38 and thereby elevate the supporting plate when the cams are actuated. One end of the shaft 41 projects beyond the adjacent end wall of the casing and has secured thereto a lever 45 by means of which the shaft may be rotated to actuate the supporting plate.

While the apparatus is here shown as designed for punching record cards it will be obvious that the record may be taken in any manner on a record sheet of any kind and that the means for supporting the sheet and taking that record may take various forms.

While I have shown and described one embodiment of my invention I wish it to be understood that I do not desire to be limited to the details thereof as various modifications may occur to a person skilled in the art.

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

1. In an apparatus for taking a record from a registering device having a series of registering elements: a device adapted to be supported in operative relation to said registering elements and including a series of recording members and a movable element connected with each recording member to impart movement to the latter, said registering elements and the corresponding movable elements having parts cooperating to control the movement of said movable elements and to position said recording members in accordance with the positions of said registering elements, and means for taking a record from said recording members.

2. In an apparatus for taking a record from a registering device comprising a series of registering elements having parts adjustable thereby and constituting fixed stops when said registering elements are stationary: a device movable into and out of operative relation to said registering elements and including a series of relatively adjustable elements having parts to engage the stops of the respective registering elements and to control the adjustment of said adjustable elements in accordance with the positions of said registering elements, a recording member carried by each adjustable element, and means for taking a record from said recording members.

3. In an apparatus for taking a record from a registering device comprising a series of registering elements having parts adjustable thereby and constituting fixed stops when said registering elements are stationary: a device movable into and out of operative relation to said registering elements and including a series of elongate elements supported for longitudinal movement with relation one to the other and having parts to cooperate with the stops of the registering elements to control the longitudinal movement of said elongate elements in accordance with the positions of said registering elements, means for actuating said elongate elements, a recording member connected with each elongate element for movement thereby to recording position, and means for taking a record from said recording members.

4. In an apparatus for taking a record from a registering device comprising a series of registering elements having parts adjustable thereby and constituting fixed stops when said registering elements are stationary: a device movable into and out of operative relation to said registering elements and including a series of elongate elements supported for longitudinal movement with relation one to the other and having parts to

cooperate with the stops of the registering elements to control the longitudinal movement of said elongate elements in accordance with the positions of said registering elements, yieldable means for retaining said parts of said elongate elements in cooperative relation to the respective stops, a recording member connected with each elongate element for movement thereby to recording position, and means for taking a record from said recording members.

5. In an apparatus for taking a record from a registering device having a series of rotatable registering elements each provided with a plurality of stops movable successively into operative positions by the rotation of the corresponding registering element: a device adapted to be supported in operative relation to said registering device and including a frame, a series of elongate elements mounted on said frame for longitudinal movement with relation thereto, spring means for projecting said elongate elements beyond said frame, a recording member connected with each elongate element, said elongate elements having parts to engage the operative stops of the respective registering elements and position said recording members in accordance with the positions of the respectve registering elements, and means carried by said frame for taking a record from said recording members.

6. In an apparatus for taking a record from a registering device having a series of rotatable registering elements each provided with a plurality of stops movable successively into operative positions by the rotation of the corresponding registering element: a device adapted to be supported in operative relation to said registering device and including a frame, a series of elongate elements mounted on said frame for longitudinal movement with relation thereto, spring means for projecting said elongate elements beyond said frame, a recording member connected with each elongate element, said elongate elements having parts to engage the operative stops of the respective registering elements and position said recording members in accordance with the positions of the respective registering elements, means carried by said frame for taking a record from said recording members, and means for detachably connecting said frame with said registering device with said elongate elements in line with the respective operative stops.

7. In an apparatus for taking a record from a registering device having a series of rotatable registering elements each provided with a plurality of stops movable successively into operative positions by the rotation of the corresponding registering element: a device adapted to be supported in operative relation to said registering device and including a frame, a series of elongate elements mounted on said frame for longitudinal movement with relation thereto, spring means for projectng said elongate elements beyond said frame, a recording member connected with each elongate element, each elongate element having a plurality of spaced stops arranged to engage the respective stops of the corresponding registering element when the last mentioned stops are in operative position and to thereby position said recording members in accordance with the positions of the respective registering elements, and means carried by said frame for taking a record from said recording device.

8. In an apparatus for taking a record from a registering device having a series of rotatable registering elements each provided with a plurality of stops movable successively into operative positions by the rotation of the corresponding registering element: a device adapted to be supported in operative relation to said registering device and including a frame, a series of elongate elements mounted on said frame for longitudinal movement with relation thereto, spring means for projecting said elongate elements beyond said frame, a recording member connected with each elongate element, each elongate element having a plurality of spaced stops arranged to engage the respective stops of the corresponding registering element when the last mentioned stops are in operative position and to thereby position said recording members in accordance with the positions of the respectve registering elements, a movable device arranged to support a record sheet in operative relation to said recording members, and means for actuating said movable device to cause said record sheet to engage said recording members.

9. In an apparatus for taking a record from a series of rotatable registering elements each having a plurality of stops spaced different distances from the axis thereof and movable successively into operative positions by the rotation of said registering element: a device adapted to be supported in operative relation to said registering elements and including a frame, a series of bars slidably supported on said frame and each having parts of successively decreasing width forming stops to cooperate with the respective stops of the corresponding registering elements, a recording member connected with each bar, springs acting on said bars to move the same to positions to engage the stops of said registering elements and position said recording members in accordance with the positions of said registering elements, and means for taking a record from said recording members.

10. In an apparatus for taking a record from a series of rotatable registering elements each having a plurality of stops spaced different distances from the axis thereof and movable successively into operative positions by the rotation of said registering element: a device adapted to be supported in operative relation to said registering elements and including a frame, a series of bars slidably mounted on said frame and each having parts of successively decreasing width forming stops to cooperate with the respective stops of the corresponding registering elements, a recording member connected with said bar, springs acting on said bars to project the same beyond said frame, whereby the movement of said frame toward said registering elements will cause stops on said bars to engage the operative stops of the respective registering elements and retract said bars to position said recording members in accordance with the positions of said registering elements, and means to take a record from said recording members.

11. In an apparatus for taking a record from a counterwheel having a plate secured thereto for rotation therewith and provided with a series of peripheral shoulders spaced successively increasing distances from the axis of said counterwheel to form stops which are movable successively into operative position by the rotation of said counterwheel: a device including a bar having parts of successively decreasing width to form stops to cooperate with the respective stops on said plate, means for supporting said bar in line with said plate, a recording member connected with said bar, said bar being movable toward said plate to

cause one of the stops thereon to engage that stop on said plate which is in operative position and thus position said recording member in accordance with the position of said counterwheel, and means for taking a record from said recording member.

12. In an apparatus for taking a record from a series of rotatable registering elements each having a plurality of stops spaced different distances from the axis thereof and movable successively into operative positions by the rotation of said registering element: a device adapted to be supported in operative relation to said registering elements and including a frame, a series of bars slidably supported on said frame and each having parts of successively decreasing width forming stops to cooperate with the respective stops of the corresponding registering elements, a punch carried by each bar, yieldable means for imparting longitudinal movement to said bars, whereby the stops on said bars may be brought into engagement with the operative stops on said registering elements to position said punches in accordance with the positions of said registering elements, a card supporting member movably mounted adjacent to said bars and having series of apertures extending lengthwise of the respective bars and each adapted to receive a punch on the corresponding bar, and means to actuate said supporting member to cause said punches to pierce a card thereon at points determined by the positions of said bars.

13. In an apparatus for taking a record from a registering device including a casing, counterwheels within said casing each provided with a series of stops spaced different distances from the axis thereof and movable successively to an operative position by the rotation of said counterwheel, said casing having an opening in line with the stops which are in operative position: a second casing having an opening and adapted to be supported adjacent said register casing with said openings in alinement, a plurality of bars slidably mounted in said second casing and each having a series of stops spaced different distances from one edge thereof, a punch carried by each bar, springs acting on the respective bars to project the same through the opening in said second casing, said bars being adapted to be inserted through the opening in said register casing and to engage the operative stops of said counterwheels to position said punches in accordance with the positions of said counterwheels, a card supporting device, and means for actuating said supporting device to cause a card thereon to be pierced by said punches.

14. In an apparatus for taking a record from a series of registering elements rotatable about a common axis and each having a plurality of stops spaced different distances from said axis and movable successively into an operative position by the rotation of said registering element: a device adapted to be supported in operative relation to said registering elements and including a plurality of bars associated with the respective registering elements and movable longitudinally in fixed paths across the axis of said registering elements, each bar having a series of parts spaced one from the other and arranged to cooperate with the respective stops of the registering element with which that bar is associated, said stops being so arranged that when any stop is in operative position no other stop will be positioned between the same and said bar, a recording member connected with each bar for movement therewith, means for moving said bars into positions to engage the respective stops which are in operative position, thereby positioning said recording members in accordance with the positions of the respective registering elements, and means for taking a record from said recording members.

15. In an apparatus for taking a record from a registering device comprising a plurality of registering elements rotatable about a common axis, each registering element having a plurality of stops spaced apart circumferentially thereof and spaced successively increasing distances from said axis, said stops being movable successively into operative position by the rotation of said registering element: a record taking device adapted to be supported in operative relation to said registering device and including a plurality of longitudinally movable bars associated with the respective registering elements, each bar having a plurality of parts spaced one from the other lengthwise of said bar and spaced successively increasing distances from one edge of said bar, said parts of each bar and the stops of the registering element with which that bar is associated being so arranged that any of said stops which is in operative position will be engaged by a corresponding part of said bar when the latter is moved toward said registering element, thereby positioning said bar in accordance with the position of said registering element, means for actuating said bars, a recording member carried by each bar, and means for taking a record from said recording members.

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