

H. B. OHMER, W. L. CROUCH AND H. J. SIBLEY.

ZONE INDICATING AND RECORDING MACHINE.

APPLICATION FILED APR. 24, 1919.

1,316,175.

Patented Sept. 16, 1919.

3 SHEETS—SHEET 1.

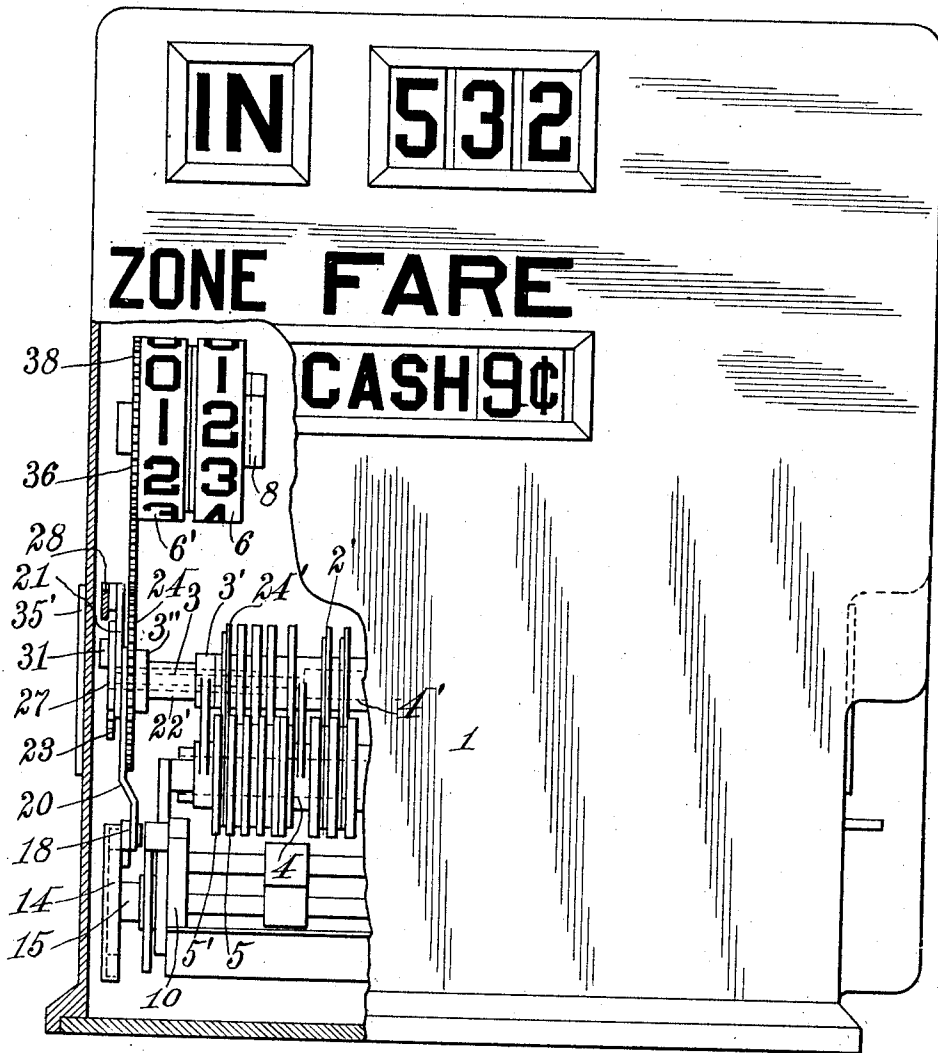


Fig. 1.

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Witness

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By

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His Attorney

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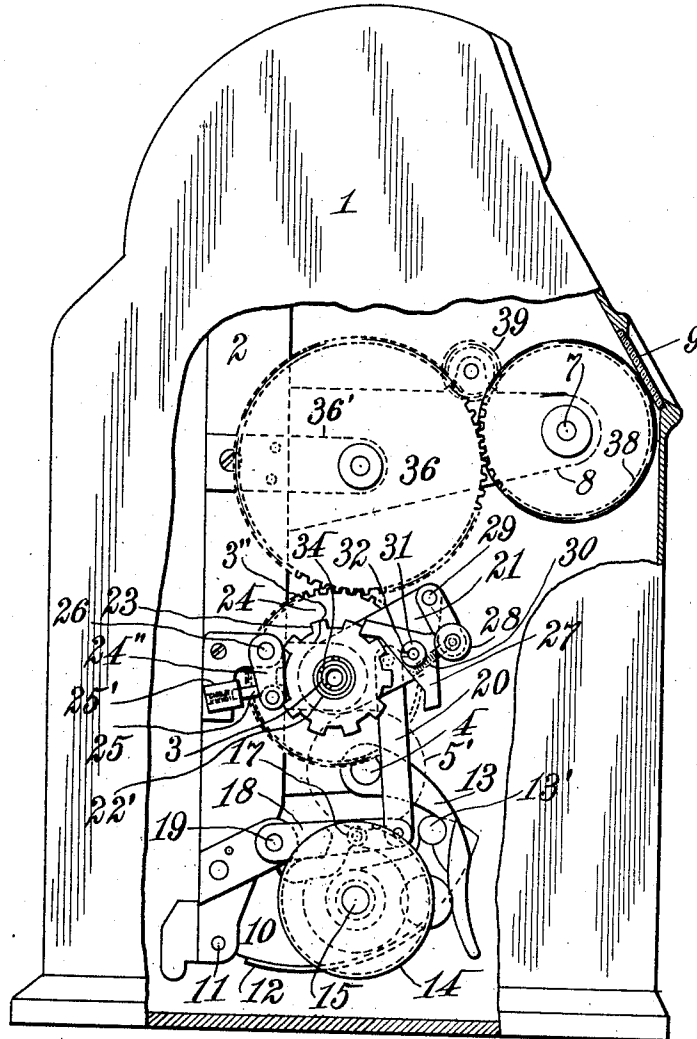


Fig. 2.

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3 SHEETS—SHEET 3.

ZONE	TRIP	DIRECTION	LINE NO.	PASSES	TICKETS	TRANSFERS	TOTAL CASH		MACHINE NUMBER	TOTAL PASSENGERS	DATE	IDENTIFICATION
01	*	1	18	000	000	000	032	7 6	100	1258	DEC 5	IN58
01	2	0	18	024	096	144	032	7 6	100	1258	DEC 5	14
02	2	0	18	022	093	140	030	5 4	100	1245	DEC 5	14
03	2	0	18	020	090	136	028	3 2	100	1232	DEC 5	14
04	2	0	18	018	087	132	026	1 0	100	1219	DEC 5	14
04	1	1	18	016	084	128	024	7 8	100	1206	DEC 5	14
03	1	1	18	014	081	124	022	5 6	100	1193	DEC 5	14
02	1	1	18	012	078	120	020	4 4	100	1180	DEC 5	14
01	1	1	18	010	075	116	018	3 2	100	1167	DEC 5	14
00	1	1	18	000	000	000	006	2 1	100	1057	DEC 5	14

Fig. 5

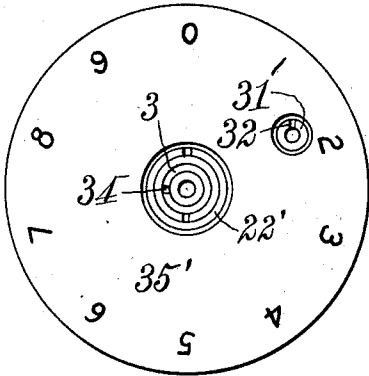


Fig. 3

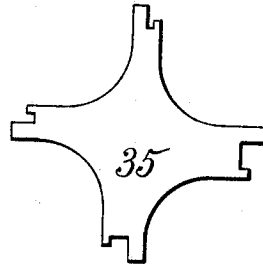


Fig. 4

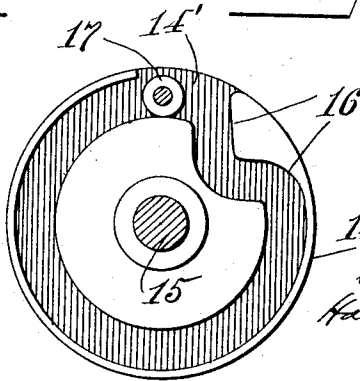


Fig. 6

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UNITED STATES PATENT OFFICE.

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ZONE INDICATING AND RECORDING MACHINE.

1,316,175.

Specification of Letters Patent. Patented Sept. 16, 1919.

Application filed April 24, 1919. Serial No. 292,516.

To all whom it may concern:

Be it known that we, HENRY B. OHMER, WALKER L. CROUCH, and HARRY J. SIBLEY, citizens of the United States, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Zone Indicating and Recording Machines, of which the following is a specification.

This invention comprises a universal zone indicating and recording machine.

An important object of the invention is to provide means by which fares may be collected, indicated and recorded throughout a system of zones into which the car line is divided.

Another object of the invention is to provide means whereby the zone indicating and zone printing mechanisms may be made universal so as to accommodate any car line or route divided into any number of zones, and without making any change or any adjustment in the mechanism. For example, a street car company may have two car lines or routes; the first line divided into six zones; the second line into eighteen zones. With this invention, a car having installed therein the fare register in combination with the universal zone indicating and printing mechanism, may be transferred from one line divided into six or any other number of zones to another line divided into eighteen or any other number of zones, and in making such transfer of the street car, the fare register, in combination with the universal indicating and printing mechanism, does not have to be changed or adjusted to meet the zone conditions of the new line, because the machine is constructed so as to meet the fare and zone conditions of any line by simply moving the operating means provided with such register.

While the drawings show a capacity or range of zones from one to ninety-nine, the invention is not such as to limit the number of zones to ninety-nine, because any desired number of zones above that number may be obtained by adding additional indicating and printing zone wheels with additional transfer mechanism.

A still further object of the invention is to provide setting means so that the zone indicating and printing wheels may be set forward or backward to any zone number without taking a print or impression. The pur-

pose of this is, for example, if a car finishes its last run for the day, in, say, zone 21, and the zone indicator and zone printing wheels in the machine are set at 21, and the next day it is desired to start the car from zone 1, a key is simply inserted in a slotted tubular shaft through an opening in the side of the casing of said machine, and by turning said key and therewith the said shaft, the zone indicating and zone printing wheels may be set to any desired zone number.

Another object of the invention is to provide means whereby the turning of the zone indicating wheels and the zone printing wheels, one digit, or one number or count every time a printing impression is taken, may be reversed at any time desired. For example, as the end of the last zone is reached on the line, the conductor may take his closing print or impression for the end of the zone and the end of the trip, and then by simply inserting a key through the side of the casing and turning a reversible ratchet pawl one way or the other, the machine may be thus set so that the next print or impression will reverse the turning of the zone indicator and printing wheels.

Having thus pointed out the underlying principles of the invention and indicated these to reside in the availability of a single type of machine to subserve lines regardless of the number of zones they may be divided into, the accompanying drawings illustrating the said invention will now be referred to.

Of these drawings, Figure 1 is a front elevation of a zone indicating and recording machine having the improved features embodied therein, a part of the inclosing case being broken away to disclose the parts of the mechanism necessary to be understood.

Fig. 2 is a side elevation of the machine with a part of the inclosing case broken away to facilitate illustration.

Fig. 3 is a detail elevation of the index or dial which is instrumental in guiding the setting of certain of the printing devices; to wit, the trip, line number, etc.

Fig. 4 is a detail view of a multiple form of key used for turning or setting the several devices, to wit the zone indicator and zone printing wheels, trip, line number, etc., and for reversing the means whereby the zone printing and zone indicating wheels may be reversed when operated.

Fig. 5 represents a record or impression taken from the various printing wheels and devices showing the fare collections in zones together with other data usually contained in such statements of records, and

Fig. 6 is a detail view of the cam which is operated from the printing mechanism and by means of which movement is imparted to the zone indicating wheels and the zone printing wheels.

In a more particular description of the invention reference characters of like import will denote corresponding parts as they appear in the drawings.

The invention, a description of which follows, is a carrying forward of the utility of the well known multiple fare indicating and recording machine now largely in use on street cars for collecting and accounting for fares. The type of machine in which the present improvements are utilized is shown and described in several patents that have been granted to John F. Ohmer, and John F. Ohmer jointly with others. The counters, counter-actuating mechanism, and the printing or impression mechanisms are fully described in several of the said patents, to wit, Patent No. 694,322, granted February 25th, 1902, and Patent No. 813,017, granted February 20th, 1906.

The statement or record shown in Fig. 5 of the drawings is obtainable from the instrumentalities shown and described in said patents with the exception of the print or impression which shows the different zones in which the fare charges were collected, and the total cash fare collections for passage through and in said zones. This feature comprises the present invention and by means thereof the fares or passenger charges as per the zones is made to appear as distinguished from the fares collected per trip or regardless of the distance.

As shown in the statement or record, Fig. 5, the first column to the extreme left shows the different zones while the other columns show the fares and other data according to the inscriptions appearing above the several columns. In starting a car out in the morning, say, an impression is taken from the printing devices including the zone printing wheels. This first impression is the lowermost line which shows zero in the zone column, and 6.21 in the first or lowermost line in the "total cash" column. The total cash counters are not reset to zero but count continuously and accumulate the cash fares for all the zones. The other data appearing on the sheet is substantially the same as is obtainable from the printing devices of the multiple fare recorders herein-before referred to, and the same is useful in furnishing a complete and full report from time to time of the service.

The mechanism is mounted within a cas-

ing —1— of suitable design and capacity on a frame —2—. Different sets or banks of printing or recording counters are mounted on a transverse shaft —4— supported by bearings —3—. These counters are of well known construction and operation and require no detail illustration or extended statement beyond the statement that the said printing counters are connected in the usual way to corresponding transfer and actuating wheels —2'— mounted on a cross shaft —4'—.

The functions of said printing counters are to furnish classified statements of the different classes of fares collected.

In the present case one bank totalizes the cash fares or passenger charges as appears under the caption "Total cash".

Coöperating therewith are two zone printing wheels —5— and —5'— which are in printing alinement with the other printing wheels and devices by being connected to telescopic shafts. In the present case these zone printing wheels —5—5'— have a capacity for printing zones from one to ninety-nine inclusive and this may be increased by adding additional printing wheels and their transfer mechanism. Corresponding zone indicating wheels —6—6'— coöperate with the said zone printing wheels by being connected therewith. The said wheels 6—6' in the present case are two in number corresponding to the two zone printing wheels and they indicate the same zones.

They are mounted in a suitable position upon a shaft —7— in bearings —8— in the frame of the machine and are exposed to view through a glass-enclosed-sight-opening —9— in the upper front of the machine. The zone printing wheels —5—5'— are actuated from the printing mechanism or an element thereof which printing mechanism is in all essentials the same as that disclosed in the prior patents herein-before referred to.

The zone printing and zone indicating wheels are correspondingly actuated from said printing mechanism when the car reaches the end of each zone and an impression or print is taken from the several wheels and devices. The said printing mechanism is mounted in two side plates —10—, one being hinged or pivoted at —11— to the frame at each side thereof, said plate being united by cross plate —12—. The said printing mechanism is held in its operative or elevated position by two hooks —13— which are mounted on the main counter supporting shaft —4— and engage lugs —13'— on the side plates —10—. The said supporting hooks —13— may be moved to release the printing mechanism and permit it to drop on the hinges or pivots —11— when it becomes necessary to put a new roll

of paper in the machine upon which the records are taken. When this is done the transmission connections between the printing mechanism and the zone printing wheels and the zone indicating wheels —5—5'— and —6—6'— are broken. These connections consist of a cam wheel —14— which is pinned to an end of the printing shaft —15—. For a more particular description of the said printing shaft and the printing devices operated thereby, reference may be had to the prior patents hereinbefore mentioned.

The said cam wheel —14— is shown in Fig. 6 to have a facial cam groove the operative portion of which is indicated by —16—. When this part of said cam groove is in a certain position of its travel, the unit wheel —5— and the unit wheel —6— of the zone wheels are actuated through the movement of a spur gear —24— which is fixed to the shaft —22'— of the transmission wheel —24'— through which the unit printing wheel is moved each time a print or record is taken. The shaft —22'— is mounted in bearings —3''—. The unit indicating wheel —6— for the zones is at the same time operated through connections with the spur gear presently described. The cam groove in wheel —14— opens through the rim of the wheel at —14'— in order to allow the printing mechanism to be dropped out of operative position when necessary to put in a new roll of paper, by releasing the roller —17— from said groove. The said roller —17— is mounted on the lever arm —18— and travels in said groove as the printing shaft —15— and therewith the wheel —14— rotate. The arm —18— is pivoted at —19— to the frame of the machine, and it has pivoted to the other end thereof a link lever —20—. The said link or lever —20— is pivoted at its upper end to a pawl-carrying arm —21— which is loosely supported on the shaft —22'— of the transfer wheel —24'— of the unit zone printing wheel —5—. Also fixed to the shaft —22'— is a ratchet wheel —23— through which movement is imparted to the spur wheel —24—. The ratchet wheel 23 and therewith the spur wheel —24— are normally controlled by a brake arm —24''— which is pivotally mounted at —26— to the frame of the machine. This brake arm is pressed out by a spring-pressed plunger —25— supported in a boss —25'— and engaging said ratchet wheel —23—. By this means the zone printing and indicating wheels —5—5'— —6—6'— are controlled until they are operated each time. The ratchet wheel —23— is operated through a reversible pawl —27— either end of which may engage said ratchet wheel, and the zone wheels are thus operated according to the movement imparted from the

said ratchet pawl —27—. The direction of movement depends upon which end of the line the car starts from, whether in the first zone or in the last zone. The said reversible pawl is held in engagement with the ratchet wheel —23— by a detent —28— which is pivoted at —29— to the pawl arm —21—, said detent —28— being drawn against the pawl by a spring —30— connecting the detent with the pawl arm —21—. The said ratchet pawl —27— has a hub —31— with a slot —32— therein by means of which a suitable end of the multiple key —35—, shown in Fig. 4, may be inserted through an opening in a side of the casing, and the pawl be thus reversed. Other parts of the said key may be inserted through an opening in the casing and moved to engage similar slots —34— in the ends of the several telescopic shafts to which the printing counters are connected, and the said counters may be thus manually set. In Fig. 3, an escutcheon or plate —35'— is shown as attachable to the side of the casing over the openings therein through which the key is inserted.

The gear wheel —24— which concurrently moves with the unit printing zone wheel —5— and the unit indicating zone wheel —6—, is also geared to a transmission gear —36— which is mounted in a bearing —36'— extending out from a part of the general supporting frame —2—. The said transmission gear —36— engages a gear —38— fixed to the shaft —7— and upon which the unit wheel —6— is rigidly mounted. Any well known form of transfer mechanism to impart the necessary movement to the secondary zone indicating wheel —6'— and the secondary zone printing wheel —5'— may be employed, such for example, as a one tooth transfer wheel —39— which is a common means. As shown in the drawings, the said unit wheels —5— and —6— have a capacity for printing and indicating from one to nine zones inclusive. It may be apparent, however, that a greater number of zones may be indicated and printed through the cooperation of the secondary wheels —5'— and —6'— up to and including ninety-nine zones.

The operation of the fare recording counters is understood by those familiar with the working of the well known fare indicators and recorders which are shown and described in several prior patents some of which are herein-before referred to.

In the present case one bank of counters is utilized for recording all cash fares collected in the several zones through which the car has traveled, the other counters being utilized for printing statements or records of passes, tickets, transfers, etc. As each fare is collected the proper counter is selected and operated to indicate it and

move the counter printing wheel to a position to record such fare when the statement or record is printed. As the car leaves each zone a print or statement or record is taken through the operation of the printing mechanism, which shows the zone or zones in which the fares so shown on said statement or record were collected.

Having described our invention, we claim:

1. In a machine of the character specified, the combination with fare printing counters and indicators, of zone printing devices and zone indicators associated therewith for furnishing service statements showing the different zones in which a car has traveled and the fare collections covering said zones, printing or impression devices cooperating with said counters and indicators and by means of which the zone printing devices and indicators are advanced through each printing operation to positions to indicate and print the next zone in which the car enters, and means for reversing the operation of said zone printing devices and indicators whereby the zones are successively printed and indicated when the car starts from either end of the line.

2. In a machine of the character specified, the combination with fare printing counters and indicators, of zone printing devices and corresponding zone indicators, means for taking statements from said fare printing counters and said zone printing devices showing the fares collected and the zones covered by said fares, connections between said statement-taking means and said zone printing devices and said zone indicators whereby they are concurrently and uniformly advanced upon each operation of said statement-taking means, and means for reversing the operation of said zone printing devices and indicators whereby the zones are successively printed and indicated when the car starts from either end of the line.

3. In a machine of the character specified, the combination with fare printing counters, and printing devices cooperating therewith to take impressions therefrom, of zone printing wheels alined with said fare printing counters, a cam connected with an element of said printing devices and adapted to be actuated thereby, connections between said cam and said zone printing wheels whereby said zone printing wheels are advanced to a position to record the next ap-

proaching zone upon each operation of the said printing devices, and means for reversing the operation of said zone printing devices and indicators whereby the zones are successively printed and indicated when the car starts from either end of the line.

4. In a machine of the character specified, the combination with fare printing counters, and printing devices cooperating therewith to take impressions therefrom, including a rotatable shaft, a cam mounted on said shaft, zone printing wheels, connections between said cam and said zone printing wheels for advancing said wheels upon each operation of the printing devices, and means for reversing the operation of said zone printing wheels so that they may record the zones from either end of the car line.

5. In a machine of the character specified, the combination with fare printing counters, and impression devices for taking prints therefrom, of zone printing wheels alined with said counters, a cam mounted upon a rotating element of said impression devices, a gear wheel connected with the zone printing wheels, a gear connected with said first named gear wheel, connections between said first named gear and said cam for actuating the last named gear, said connections including a reversible pawl, and means for reversing the position of said pawl whereby the zone printing wheels may be actuated to positions to record the zones from either end of the car line.

6. In a machine of the character specified, the combination with fare printing counters, of printing devices for taking impressions therefrom including a rotatable shaft, a zone printing wheel, a zone indicator, a cam on said rotatable shaft, a lever actuated from said cam, a gear wheel connected with said zone printing wheel, a gear connected to said first named gear wheel, a reversible pawl and ratchet connected to said gear, a cam-actuated lever upon which said pawl is mounted, and a zone indicator connected to said last named gear, whereby the zone printing wheel and the zone indicator are concurrently advanced upon each operation of the printing devices.

In testimony whereof we affix our signatures.

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HARRY J. SIBLEY.