

(No Model.)

2 Sheets—Sheet 1.

D. L. TOWER.
AUTOMATIC PASSENGER REGISTER.

No. 468,845.

Patented Feb. 16, 1892.

Fig. 1.

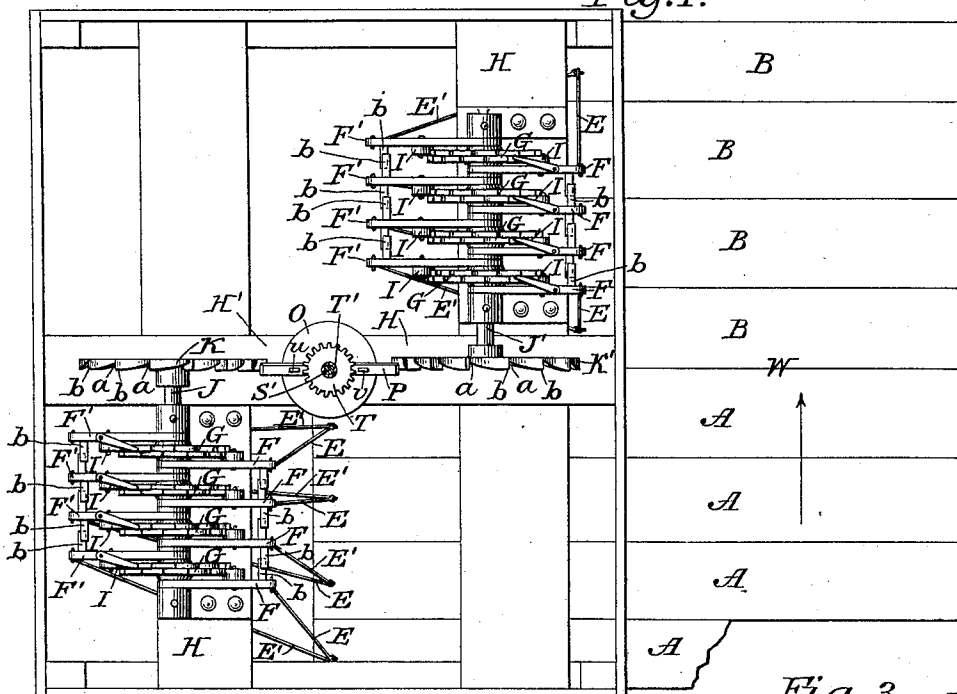


Fig. 2.

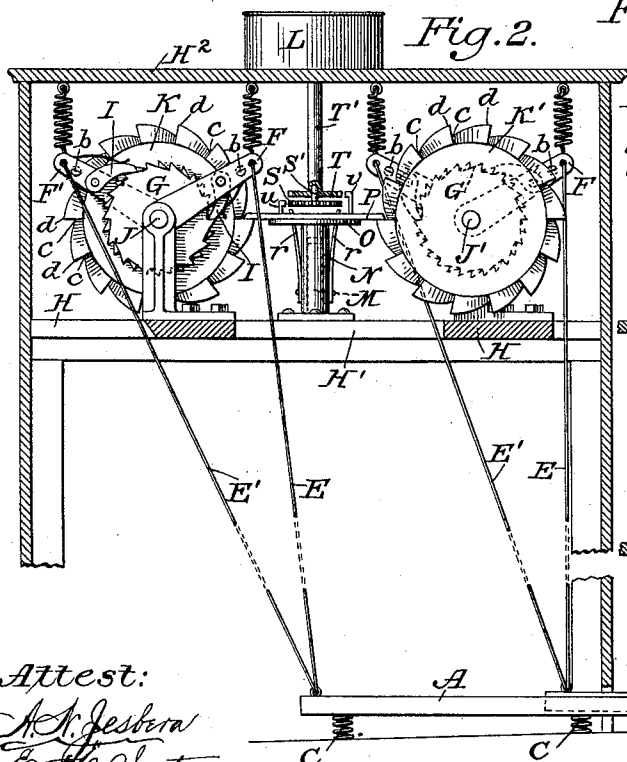


Fig. 4.

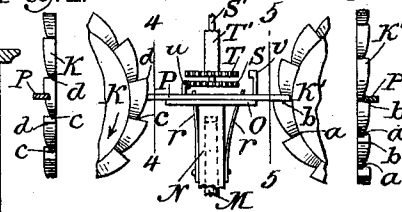


Fig. 3.

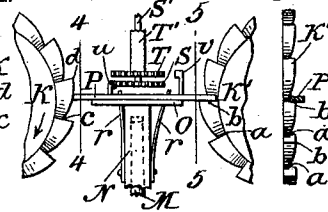


Fig.5.

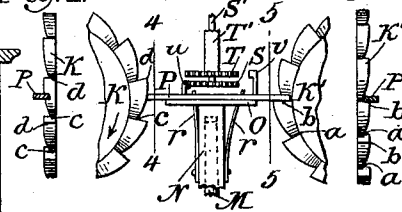


Fig. 6

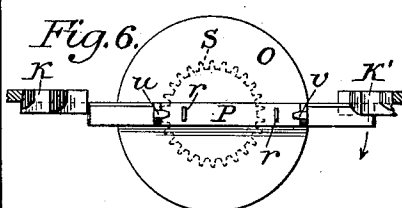
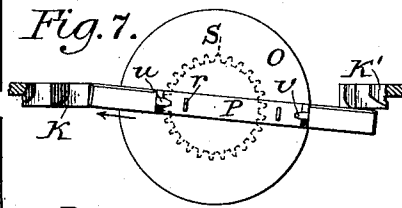


Fig. 7.



Attest:
A. N. Jesbera
E. W. Watson

Inventor:
Daniel L. Towser
By David A. Burr
Atty.

(No Model.)

2 Sheets—Sheet 2.

D. L. TOWER.

AUTOMATIC PASSENGER REGISTER.

No. 468,845.

Patented Feb. 16, 1892.

Fig. 8.

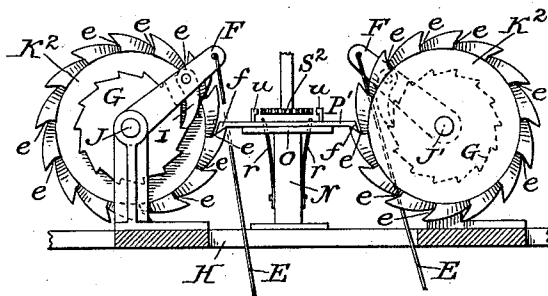


Fig. 9.

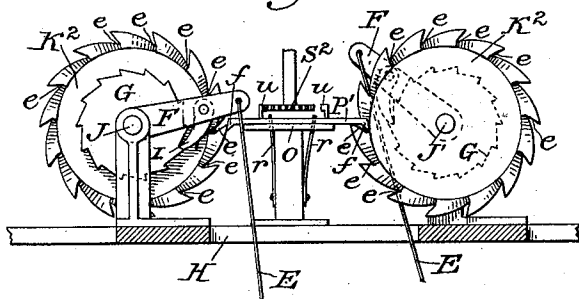


Fig. 10.

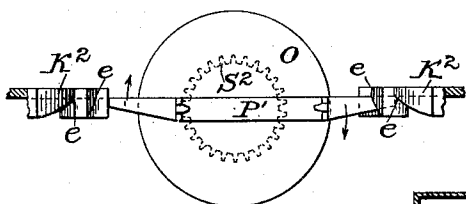


Fig. 11.

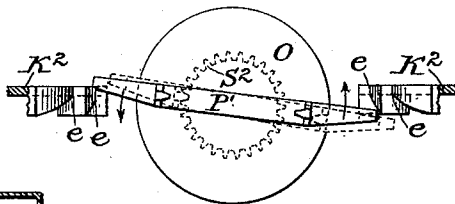
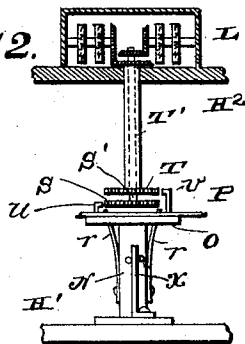


Fig. 12.



Attest:

A. N. Jespersen.
J. M. Watson

Inventor:

Daniel L. Jover
By David A. Burr
Atty.

UNITED STATES PATENT OFFICE.

DANIEL L. TOWER, OF BROOKLYN, NEW YORK.

AUTOMATIC PASSENGER-REGISTER.

SPECIFICATION forming part of Letters Patent No. 468,845, dated February 16, 1892.

Application filed February 2, 1891. Serial No. 379,895. (No model.)

To all whom it may concern:

Be it known that I, DANIEL L. TOWER, of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Automatic Passenger-Registers; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

My invention relates to automatic registers for indicating the number of persons passing through a gateway or in a given pathway, and has for its object to produce automatically by the action of the weight of each individual walking over the apparatus in either direction a movement of an indicating and counting apparatus, which shall register the fact positively and with certainty.

It consists in the combination and arrangement, in connection with any suitable form of indicating mechanism, of a series of pedals and operative devices connected therewith, substantially as is hereinafter described and claimed.

In the accompanying drawings, Figure 1 is a plan view of my improved automatic passenger-register; Fig. 2, a side elevation thereof, partly in section; Fig. 3, a detached view in elevation of the coupling device for the indicating mechanism, Fig. 4 being a section in line 4 4, and Fig. 5 a section in line 5 5 of said Fig. 3. Figs. 6 and 7 are plan views of said coupling device, on an enlarged scale, illustrating the movements thereof. Figs. 8 and 9 are corresponding detached views in side elevation of the ratchet and cam wheels and coupling device for the indicating mechanism, showing a modification therein in two different positions thereof, thereby illustrating the movements of the parts, Figs. 10 and 11 being plan views, on an enlarged scale, of the coupling device in said modification and of portions of the cam-wheels operating the same, illustrating the movements more fully. Fig. 12 is a detail view illustrating adding mechanism which may be employed and the connections for actuating them.

Similar letters indicate like parts in all of the figures.

A A A and B B B are a series of parallel

pedals of any suitable widths placed closely side by side to form unitedly a continuous sectional platform to be placed in the way through which the persons to be counted are to pass, the pedals being disposed at right angles to the line of travel.

The two series of pedals A and B are disposed on either side of a central division-line W, (see Fig. 1,) and operate, respectively, as hereinafter described, to indicate the number of travelers crossing the line W in the one direction or the other.

An independent ratchet-wheel G is provided for each pedal. The ratchet-wheels connected with the pedals A A on one side of the division-line W are all fixed upon one horizontal shaft J, and those connected with the pedals B B, on the other side of the line, are fixed upon a corresponding shaft J', these shafts being mounted to rotate in suitable bearings upon a frame-work H at a suitable height above the pedals.

Each pedal is upheld at its inner end by a spring C placed under it, and this up-lifted end is coupled by means of two links E E' with independent pawl-arms F F', pivoted to oscillate upon the axis of the ratchet-wheel appropriate to the pedal, one on each side of the wheel.

Each ratchet-wheel is formed with a double set of teeth formed side by side upon its periphery, yet all inclining in the same direction. The intervals between the teeth in each set are equal, but the several teeth are so disposed as that those in the one set break joint with those in the other midway of each interval.

The two pawl-arms F F' for each pedal extend radially in opposite directions from their common axis on opposite sides and beyond the periphery of the interposed ratchet-wheel G. Each pawl-arm is fitted with a spring-actuated pawl I, (see Fig. 2,) adapted to engage the set of teeth nearest to it on the ratchet-wheel G, so that the intermittent movement of the pawls will operate to produce a corresponding revolution of the ratchet-wheel.

The teeth of the ratchet are so proportioned with regard to the movement of the pedal actuating it as that when the pedal is depressed it will operate to carry the ratchet-wheel forward one step—viz., one-half the length of a

tooth—and by reason of the arrangement and connection of the two pawls *F* and *F'* with the one pedal *A* (or *B*) the depression of the pedal will thus operate to carry the ratchet-wheel forward one half the length and its elevation the other half of the length of a tooth in the same direction.

Since all the ratchet-wheels on each side of the division-line *W* are fixed upon the same axial shaft *J* or *J'*, it follows that when either of the ratchet-wheels *G* on the shaft is turned one step, or one-half the length of a tooth, by the depression of a pedal it will turn all the other wheels on the same shaft. Hence if after the wheels have thus been moved one step a second pedal under the same shaft be depressed before that which was first trodden upon and depressed has been allowed to rise, the depression of the second pedal will have no effect, since the tooth actuated upon by its pawl will have been already moved forward one step, or the half-length of the tooth, and the pawl will consequently simply move idly forward against it. Thus a second movement of the shaft *J* and the cam-wheel *K* carried by it can be effected only by the elevation of a pedal after the first movement of the shaft has been produced by the depression of a pedal, and the depression of a second pedal actuating the same shaft will have no effect thereon unless in the meantime the first pedal has been elevated. A false double movement of the cam-wheel operating the indicating mechanism is thus effectually prevented, and said mechanism will be operated only by the depression of a pedal on one side of the division-line after the depression of a pedal on the opposite side thereof.

Each pawl-arm, beginning with that in each set nearest to the division-line *W*, is formed with a lateral offset or projection *b*, (see Fig. 1,) adapted to overlap a similar projection *b* on the pawl-arm next to it in order, so that the depression of any one pedal in each set other than the first or outer one will operate to depress not only its own pawl-arm but also each of the pawl-arms between it and the outer end of the series without, however, influencing those in advance of it between it and the division-line *W*.

The two shafts *J* and *J'* are mounted in parallel lines with their inner ends terminating in the plane of the division-line *W* at such distances apart as to permit securing upon said inner ends cam-wheels *K K'* of greater diameter than the ratchet-wheels, a sufficient interval being also left between the peripheries of said wheels to allow of the intervention of the gear-wheels and coupling device for an indicating mechanism *L*, as hereinafter described.

The cam-wheels *K K'* are all alike peripherally notched to produce a succession of double or two-faced cams, one face of each double cam being on the periphery of the wheel, as at *c d*, Fig. 2, and the peripheral and the lat-

eral inclination for each cam being made to correspond exactly. The number of these cams on each cam-wheel corresponds with that of the teeth in each ratchet on the ratchet-wheels *G G*.

The cam-wheels *K K'* are preferably so mounted that the lateral cam-faces *a b* on both shall face in the same direction and revolve in a plane coincident with that of the division-line *W*, as shown in Fig. 1. Midway between said cam-wheels a vertical spindle *M* (see dotted lines, Fig. 2) is mounted upon a cross-bar *H'* of the frame *H*, and a sleeve *N* is fitted to revolve freely upon this spindle. A disk *O* is secured horizontally upon the upper end of the sleeve *N* to revolve with it, the spindle being so proportioned in height as to bring the disk *O* upon a level with the axes of the cam-wheels, as shown in Fig. 2. A coupling-bar *P* is mounted to slide longitudinally in suitable ways formed diametrically upon the disk *O* to project beyond its periphery far enough in each direction to admit of engagement at each end with the cams on the cam-wheels *K* and *K'*. This horizontally-sliding coupling-bar is automatically centered upon the disk by means of springs *r r*, secured to the sleeve *N*, and whose free ends project through slots in the disk *O* into engagement with the bar *P*.

Immediately above the disk *O* are mounted two pinions *S* and *T* revolving upon a common axis coincident with the axis of the spindle *M*, the one *S* upon the lower end of a spindle *S'* geared to and depending from an indicating mechanism supported upon a cross-bar *H''* of the frame-work of the machine and the other *T* upon the lower end of a tubular shaft *T'* encircling the spindle and geared to a second indicating mechanism carried with the first upon said cross-bar *H''*, the two indicators being inclosed in a common case *L*. (See Figs. 2 and 12.)

The sliding bar *P* is fitted at one side of its central point with a short pin *u*, adapted to engage the notches in the pinion *S* when the bar is moved from its central position in the one direction, and on the opposite side with a second longer pin *v*, adapted to engage the notches in the pinion *T* when the bar is moved from its central position in the opposite direction. The pins *u* and *v* thus serve, respectively, to couple the bar with the one pinion or the other, according to the direction in which the bar is moved.

The sliding coupling-bar *P* is so proportioned in length that when in its central or balanced position its ends will be respectively in close proximity to the inner re-entrant portion of one of the peripheral cams *c d* on each of the cam-wheels, and consequently likewise opposite the lateral, inner, or re-entrant portion *a b* of the corresponding lateral cam. When in this position, the first move of either cam-wheel produced by the depression of either of the pedals coupled thereto, by operating to move a cam forward one-half

of its length, will carry the peripheral face of the cam against the end of the sliding coupling-bar P, and thereby move it lengthwise far enough to cause its pin *u* to engage the pinion S on the indicator-spindle, the increase in the width of the face of the cam as it moves forward being sufficient to enable it to obtain a bearing against the end of the bar directly after the movement of the cam-wheel begins.

When the first movement of a cam-wheel, as K, produced by the depression of a pedal, as A, is completed, the peripheral cam will remain in contact with the sliding bar in position to hold it in engagement with the pinion of the indicator, as shown at the left in Figs. 3 and 6, and when the pedal is elevated by the withdrawal therefrom of the traveler's foot the second movement of the cam will carry it beyond the end of the bar, as shown at the right in Figs. 3 and 6; but since the pedal A after it has been depressed cannot be elevated until the traveler has put one foot down upon a pedal B on the other side of the division-line W, and since this forward foot will bear down said pedal B before the hinder foot has been freed from the first pedal A, the pedal B, actuated by the forward foot, will operate to turn the opposite cam-wheel K' one move, during which the lateral face of the cam in contact with the proximate end of the coupling-bar P will force the bar laterally, (see Fig. 7,) and by causing it to turn upon its pivot will operate to turn the pinion S with which the bar is engaged and thereby move the indicating mechanism one step.

By the time this swinging movement of the coupling-bar P is completed the cam-wheel K at the opposite end of the bar will have completed its movement produced by the release of the first pedal A, so that the bar will be free to spring back to its normal central position. (See Figs. 1 and 2.) The disk and bar may be returned to their normal central position with respect to their oscillations by any suitable spring, such as that shown at *x* in Fig. 12. Thus the tread of the person approaching the division-line W from either direction will operate, first, to carry the coupling-bar into engagement or gear with the indicating mechanism, and as the person passes from one side of the line W to the other will operate to swing the coupling-bar around far enough to move the indicating mechanism one step, the automatic elevation of the pedals after their depression operating to restore the coupling-bar and the cams actuating it to a normal position for another move.

It will be noted that the indicating mechanism will only be moved when a person steps from one side of the division-line to the other, and that it will thus be moved each time a person crosses the line from a pedal on the one side to a pedal on the other irrespective of the number of persons in advance or in the rear of the division-line.

As a modification of my invention, each ratchet-wheel G may be operated by a single

pawl, as shown in Figs. 8 and 9, instead of by double pawls, as shown in Figs. 1 and 2. Where but a single pawl is used, a depression alone of the pedal operates the ratchet-wheel and the cam-wheel connected thereto, and the wheels make a full stroke at each forward movement. In such case the ends of the peripheral cams on the cam-wheels K² are undercut, as shown at *e e*, Figs. 8 and 9, and the contacting end of the coupling-bar P' is enlarged at its outer end and beveled off inwardly to form a tooth *f*, adapted to pass laterally into the recess *e*, formed by the undercut portion of the cam. This enlargement of the outer end of the coupling-bar P' operates to prevent the bar from slipping off of the end of the cam when the cam-wheel has completed its stroke and thereby forced the bar longitudinally inward, as shown in Figs. 9 and 10; but after the bar has been swung over upon its pivot to clear the cam, as shown in dotted lines in Fig. 11, and carried outwardly longitudinally by the action of its spring *r*, as shown by positive lines in the same figure, the hook *f* will be in position as the bar is swung back to its first or normal position (shown in Fig. 8) to pass without interference into the under-cut *e* of the cam and against the face of the peripheral cam in readiness to be again forced outward by the next movement of the cam-wheel.

As a further modification, the coupling-bar P' may be provided with pins *u u* to engage severally the same toothed wheel S² from diametrically opposite directions, so that when the bar is carried longitudinally by the one cam-wheel or the other it will be brought thereby into engagement with the one toothed wheel S², as shown in Figs. 8 and 11, instead of with independent pinions S and T, as shown in Figs. 2 and 3. In such case the toothed wheel will be turned in opposite directions by the swinging of the coupling-bar upon its pivot in opposite directions, and may be made by suitable gearing, which need not herein be described, to actuate one indicator when it turns in one direction and another indicator when it turns in the opposite directions.

I claim as my invention—

1. The combination, in an automatic passenger-register, of a toothed wheel actuating the indicating or adding mechanism, oppositely-placed cam-wheels, each formed with peripheral and lateral cams on the rim thereof, a longitudinally-moving spring-actuated bar pivoted to swing on an axis at right angles to that of said wheels and whose ends are carried into contact with the cam-faces on the two cam-wheels to be alternately moved longitudinally by the one and then oscillated by the other, a tooth adapted to engage the toothed wheel of the indicating mechanism and oscillated with said bar, and mechanism, substantially as described, for moving the two wheels in succession, substantially in the manner and for the purpose herein set forth.

2. The combination, in an automatic pas-

senger-register, of a toothed wheel actuating the indicating or adding mechanism, oppositely-placed cam-wheels, each formed with peripheral and lateral cams on the rim thereof, a longitudinally-moving spring-actuated bar pivoted to swing on an axis at right angles to that of said wheels and whose ends are carried into contact with the cam-faces on the two cam-wheels to be alternately moved longitudinally by the one and then oscillated by the other, a tooth adapted to engage the toothed wheel of the indicating mechanism and oscillated with said bar, mechanism, substantially as described, for moving the two wheels in succession, a series of spring-actuated pedals arranged to form a pathway intersecting the plane in which the cam-wheels are mounted, and devices, substantially as described, coupling each pedal on one side of said plane with a device for actuating one of the cam-wheels and each pedal on the other side of the plane with a similar device for actuating the other cam-wheel, all substantially in the manner and for the purpose herein set forth.

3. In an automatic passenger-register, the combination of the wheels mounted upon horizontal shafts to revolve in the same vertical plane and having a series of double-faced cams formed peripherally upon the inner face of the one and the outer face of the other, a longitudinally-movable bar pivoted centrally upon a vertical axis midway between said wheels in the same vertical plane therewith and which is extended to contact with each to be alternately moved longitudinally by the one into position to be oscillated by the other, a toothed wheel mounted upon a spindle whose axis coincides with that of the pivoted bar, an indicating mechanism geared to said spindle, a tooth projecting from said bar, adapted to be carried by the longitudinal movement thereof into engagement with the toothed wheel, a series of pedals arranged at a right angle to the longitudinal shafts with their free ends under the shafts to form a pathway crossing the plane of the cam-wheels, springs upholding said free ends, and devices, substantially as described, for actuating each cam-wheel intermittently by the movement of the pedals located on the same side of the dividing-line as the cam-wheel, substantially in the manner and for the purpose herein set forth.

4. The combination, in an automatic passenger-register, of the concentric spindles S' T', separately geared each to a suitable indicating mechanism, a toothed wheel upon each spindle, a pivoted actuating-bar oscillating upon an axis coincident with that of the spindle and longitudinally-movable in the one direction into engagement with one toothed wheel and in the other with the other, a double-acting revoluble cam-wheel at each end of the bar operating to engage successively the extremity of the bar to produce its longitudinal movement and the side thereof to os-

cillate it, pedals arranged to serve as a footway extending across the vertical plane in which the cam-wheels revolve, and devices for transmitting the movement of the pedals on one side of said plane to one of the cam-wheels to revolve it and of those on the other side to the other of said cam-wheels to revolve it, all substantially in the manner and for the purpose herein set forth.

5. The combination of the concentric spindles S' T', the separate toothed wheels S T on said spindles, the parallel disk O, oscillating undersaid toothed wheels upon the same axis, the longitudinally-movable bar P, mounted diametrically upon said disk and having teeth *u v* to engage the toothed wheels, the springs *r r*, carrying the bar automatically to a central position out of engagement with either wheel, double-faced cams K, engaging the ends of said bar to move it longitudinally into engagement with one of the toothed wheels and then to oscillate it so that it will actuate said wheels, and two sets of pedals actuating said cams and arranged in a footway to be depressed by the weight of a person passing over them, the one set to operate the one set of cams and the other the other, all substantially in the manner and for the purpose herein set forth.

6. The combination, in an automatic passenger-register, of a series of spring-actuated pedals arranged as a footway on each side of a division-line, rotating shafts mounted transversely above the pedals, one on each side of said division-line, ratchet-wheels fixed upon said shafts corresponding in number with the pedals, oscillating pawl-arms pivoted upon each shaft on each side of each ratchet-wheel and severally coupled at their outer ends in pairs to the free ends of the pedals beneath the wheels, pawls carried by said pawl-arms into engagement with the intervening ratchet-wheel, a cam-wheel mounted on the inner end of each shaft in the plane of the division-line between the treadles, each cam-wheel having a succession of double-faced cams formed about its periphery, the lateral-inclined faces on the one wheel being made to face inward and on the other outward, a longitudinally-sliding spring-actuated bar pivoted upon a vertical axis on the division-line midway between the cam-wheels to extend into contact with both, a pinion upon a vertical spindle whose axis coincides with that of the pivoted sliding bar and which is geared to an indicating mechanism, and a tooth projecting from the sliding bar to be carried by its movement into and out of engagement with said pinion, all substantially in the manner and for the purpose herein set forth.

7. The combination of the cam-wheels mounted to revolve in the same vertical plane on independent parallel shafts extending in opposite directions, each wheel having double-faced cams on its rim, an intervening longitudinally-sliding bar swinging on a central pivot intermediate the peripheries of said

wheels to be brought into contact at its ends with their cam-faces, a toothed wheel mounted to revolve above the sliding bar on a pivotal axis coincident with that of the bar, indicating mechanism geared to the wheel, a tooth 5 upon the bar to be brought into engagement with the wheel by the longitudinal movement and to actuate it by the swinging movement of the bar, a series of ratchet-wheels fixed on 10 each cam-wheel shaft, each wheel having a double set of ratchet-teeth on its periphery, the one set breaking joint mid-length with the other, a series of spring-actuated pedals mounted beneath the shafts transversely the 15 length thereof, one for each ratchet-wheel, and arranged to form a continuous footway

parallel with said shafts, and vibrating pawls hung upon arms pivoted upon the axis of each ratchet-wheel on each side thereof in pairs to engage, respectively, the double set 20 of ratchet-teeth thereon, the two pawl-arms for each wheel being both coupled to the one pedal, substantially in the manner and for the purpose herein set forth.

In testimony whereof I have signed my 25 name to this specification in the presence of two subscribing witnesses.

DANL. L. TOWER.

Witnesses:

A. N. JESBERA,
E. M. WATSON.