(No Model.) 3 Sheets—Sheet 1.

J. BISSET, Jr.

RECORDER FOR CARS, &c., TO DENOTE THE NUMBER OF PASSENGERS AND THE DISTANCE AND TIME RIDDEN.

No. 347,153. Patented Aug. 10, 1886.

Fig. 7.

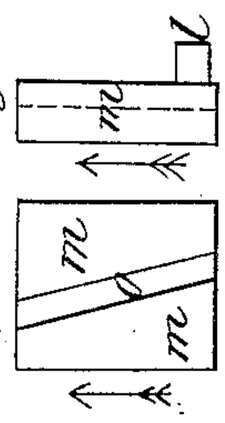

Fig. 6.

Fig. 2.

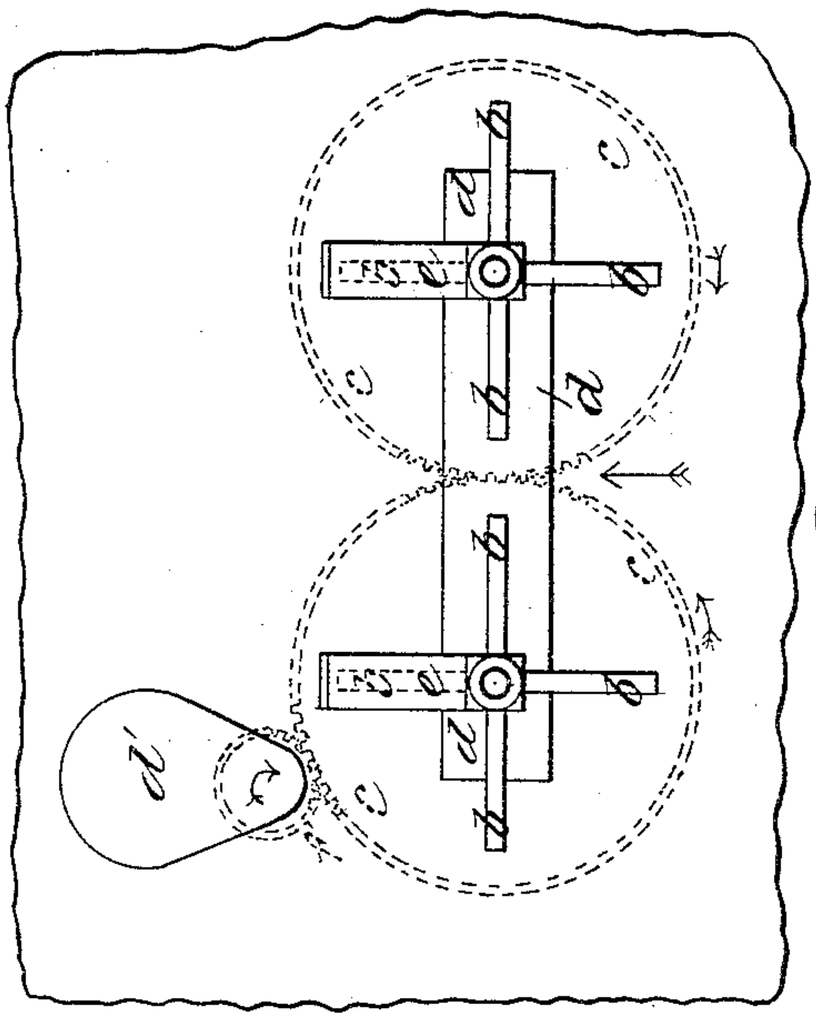

Fig. 5.

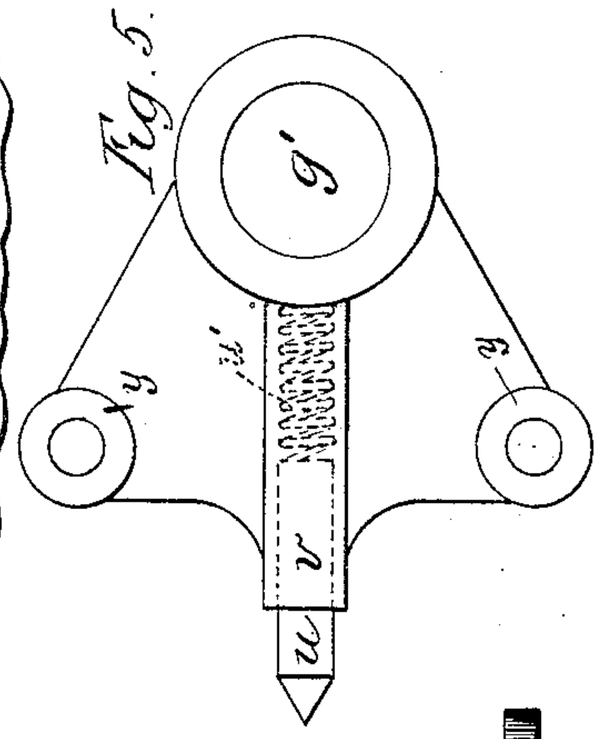

Fig. 1.

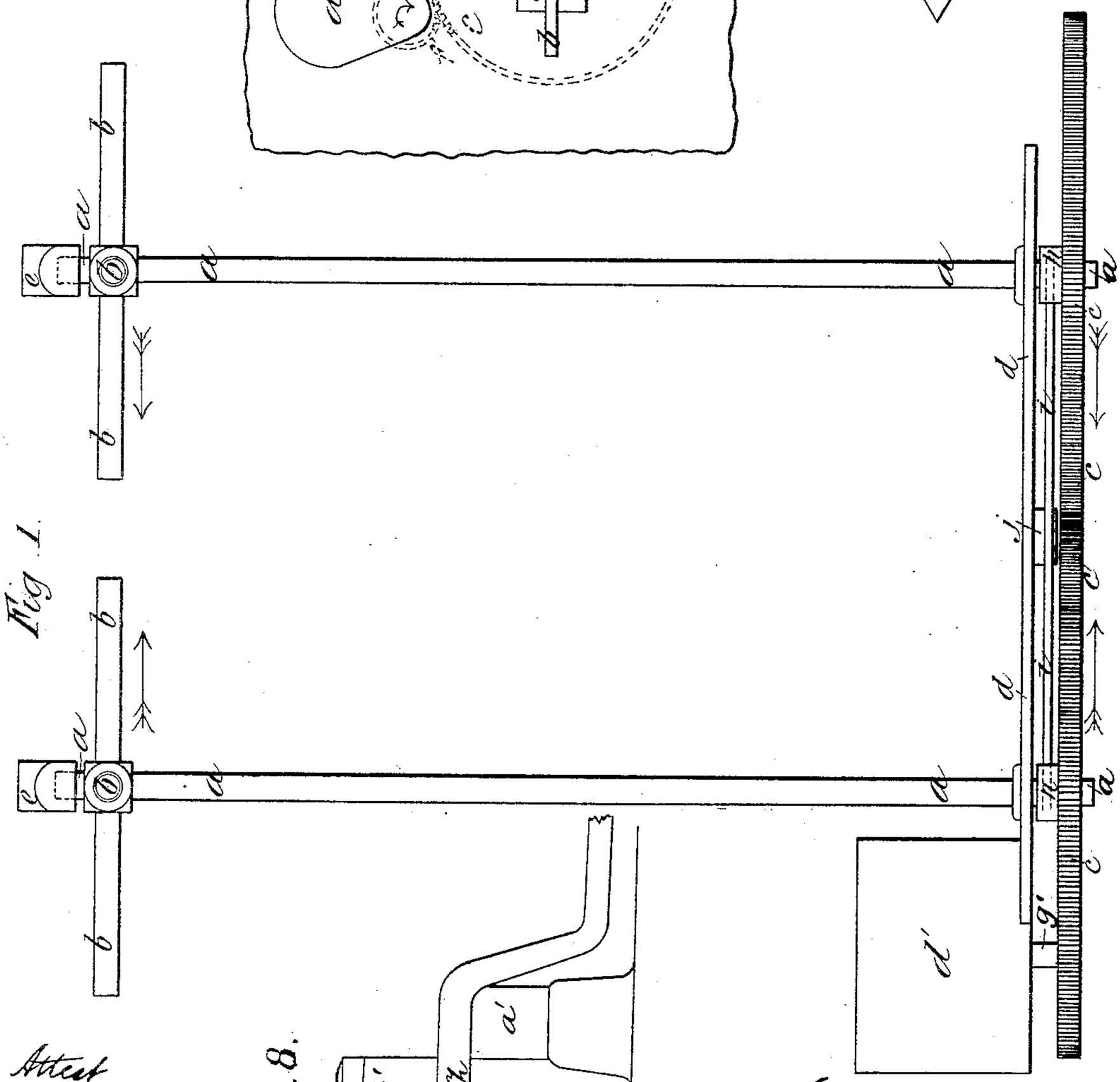

Fig. 8.

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(No Model.) 3 Sheets—Sheet 2.

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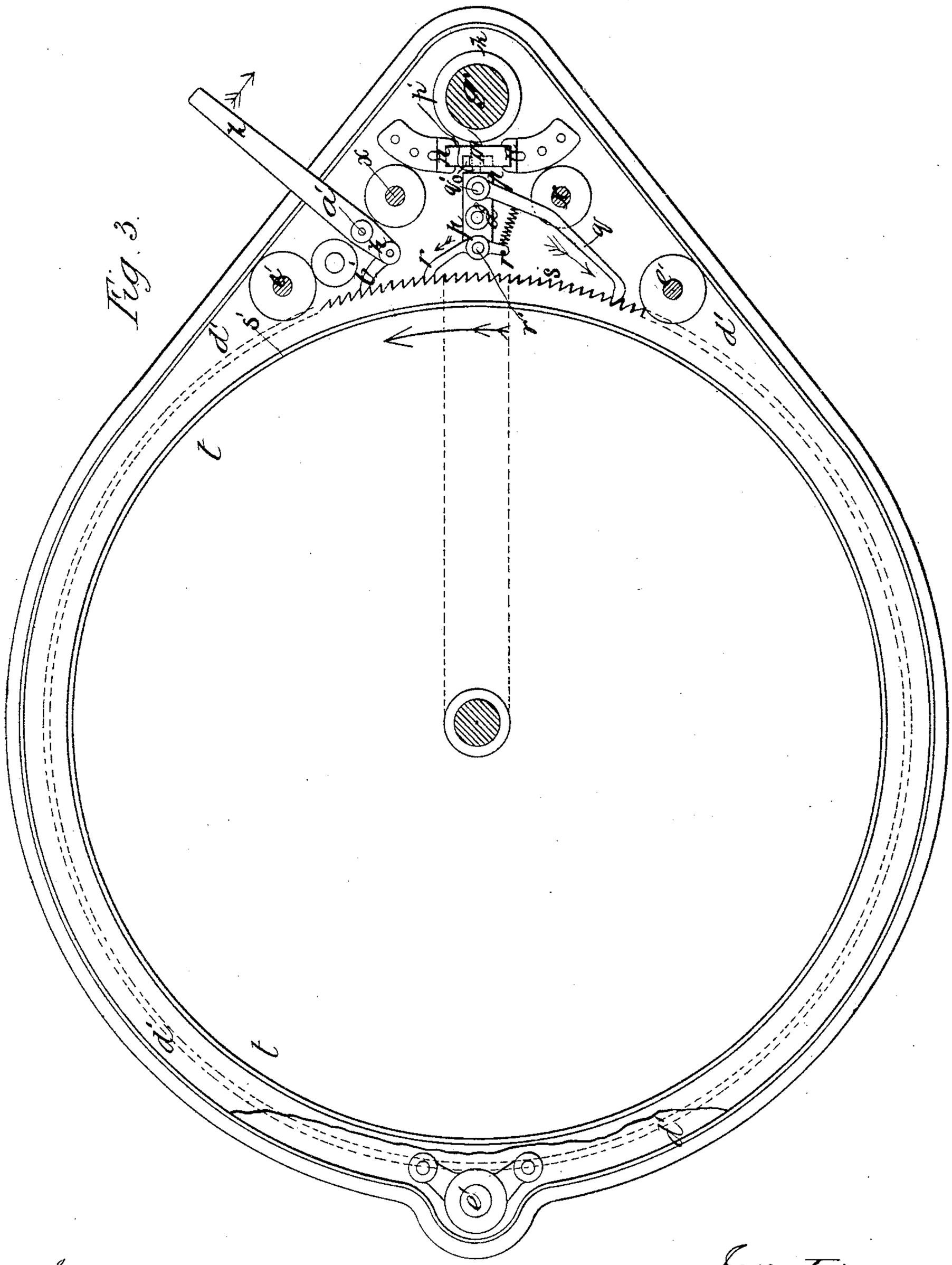

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(No Model.) 3 Sheets—Sheet 3.

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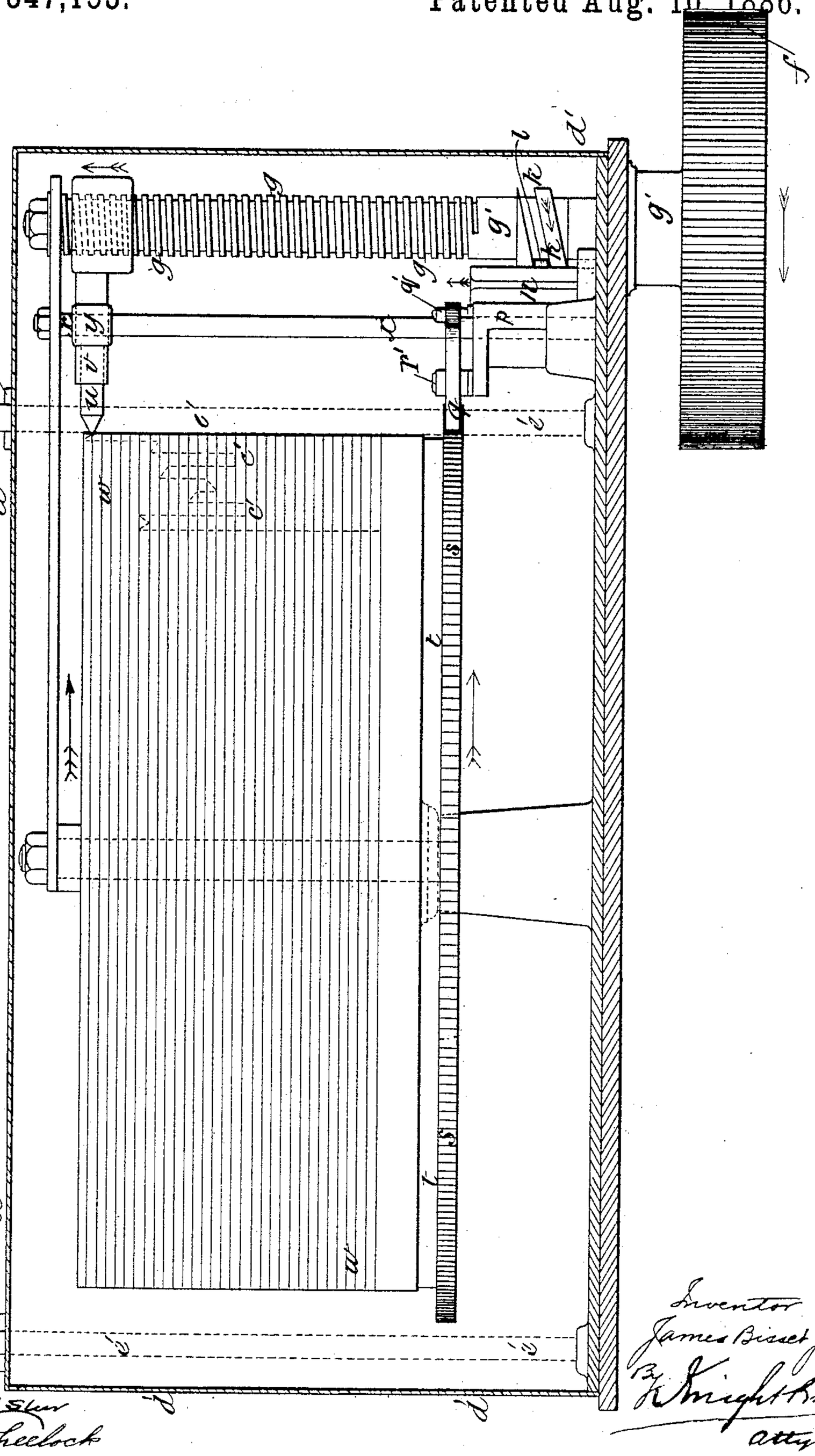
Fig. 1.



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UNITED STATES PATENT OFFICE.

JAMES BISSET, JR., OF ABERDEEN, COUNTY OF ABERDEEN, SCOTLAND.

RECORDER FOR CARS, &c., TO DENOTE THE NUMBER OF PASSENGERS AND THE DISTANCE AND TIME RIDDEN.

SPECIFICATION forming part of Letters Patent No. 347,153, dated August 10, 1886.

Application filed July 27, 1885. Serial No. 172,791. (No model.)

To all whom it may concern:

Be it known that I, JAMES BISSET, JR., of No. 10 North Broadford, Aberdeen, county of Aberdeen, Scotland, engineer, have invented Improvements in Apparatus for Recording the Number of Passengers and the Time or Distance Traveled on Tramway-Cars and other Conveyances, of which the following is a specification.

By the ingress and egress of passengers a screw is made to revolve, whereby a pencil is raised or lowered upon a suitable diagram-paper which is fixed to a revolving drum or cylinder, the result being an accurate diagram from which the number of passengers and the time or distance traveled can be readily ascertained.

The means by which the above result is obtained is as follows: The apparatus, as applied to a tramway-car, consists of two shafts vertically placed, one on each side of the entrance. These shafts are connected at the lower extremity, and under the floor of the car, by two wheels or pinions, so that they shall both revolve together. On these shafts, and at a distance of three feet or three feet six inches above the floor, are fixed four protruding arms at right angles to the shaft and at right angles to one another. Two of these arms, one from each side, protrude into the doorway, so that when a passenger enters the car the arms are caused to turn inward, and the following two arms, one from each side of the door, protrude into the doorway, there not being room within these arms to admit more than one person at a time, and in consequence the shafts on which the arms are fixed have to turn one-fourth of a revolution inward or outward as every individual passenger enters or leaves the car. On a counter-shaft connected by a pinion to one of the wheels a screw is cut of half-inch pitch. On this screw is fitted a nut or holder adapted to carry a pencil, so that when the shafts turn inward or outward the pencil is caused by the screw to rise or fall one-eighth of an inch with every fourth of a revolution of the shafts, the pencil-marks on a diagram-paper divided into as many parts as the number of passengers that can be carried on the car. These parts or divisions are one-eighth of an inch apart, so that every time a passenger enters or leaves the car the pencil moves up or down one of these divisions. The diagram-paper is fixed to a drum or cylinder eight inches in diameter, or any suitable size, which is made to revolve by clock-work, or by being in connection with the shaft on one of the sides of the doorway. At the end of the day the diagram-paper is taken off with the day's work on it and a clean diagram put on for next day, or as the arrangement may be.

In the drawings, Figure 1 is an elevation of my improved apparatus as constructed for a conveyance carrying a number of passengers going different distances—such conveyances, for example, as tramway street-cars and omnibuses—and in which the said passengers are charged according to the distance so traveled. Fig. 2 is a plan of the same. Fig. 3 is a plan view of the recorder on a large scale. Fig. 4 is a side elevation of the same. Fig. 5 is a plan view of the pencil-holder. Fig. 6 is a rear view of the recorder-block. Fig. 7 is a side view of the same. Fig. 8 is a side view of the hand-lever.

In applying my present improvements to tramway-cars, omnibuses, and like vehicles, I arrange the two vertical shafts *a*, Fig. 1, one on each side of the entrance thereof, and provide each such shaft with four arms, *b*, which may be of any convenient length, and extending in such direction that upon any person's entering or leaving the said vehicle the two shafts *a*, by their then inwardly-projecting arms *b*, are caused to make one-fourth of a revolution. The two shafts *a* rotate in unison, by reason of their lower ends being connected by the gear-wheels *c*, which are necessarily of equal diameters. The shafts *a* revolve in and are supported upon the metal plate *d*, which is recessed or sunk into and is level with the surface of the floor of the conveyance, and the said shafts *a* are maintained in their vertical position by the cast-iron brackets *e*, which are secured to the wood-work of the conveyance, and in which the upper ends of the shafts *a* are free to rotate. The gear-wheels *c* are arranged beneath the floor, and one of these wheels is in gear

with the small toothed pinion *f*, as shown more particularly at Figs. 2 and 4 of the annexed drawings. This pinion-wheel *f*, which is preferably one-fourth the size of the wheels *c*, is secured to the lower end of the shaft *g'*, upon which the screw *g* of the recorder, Fig. 4, is formed, the said screw *g* having preferably eight threads per inch, so that when the arms *b* are moved through one-fourth of a revolution the pinion *f* is caused to make one complete revolution, and thereby a pencil-holder, which is hereinafter more particularly described, and which works on the said screw *g*, is moved vertically upward or downward to the extent of one-eighth of an inch.

In place of operating the pencil-holder of the recording mechanism in the manner herein last described, I may operate it by a screw formed, preferably, upon the upper part of one of the shafts *a*, and of half-inch pitch, so that the said pencil-holder is moved through a vertical distance of one-eighth of an inch at each quarter-revolution of the shafts *a;* but I prefer to operate the said recorder through the pinion *f*, as hereinbefore described, and arrange the recorder beneath the seat of, or other convenient position within, the conveyance.

The bosses *h* of the two toothed wheels *c* are made square, and a spring bar or rod, *i*, which is secured to the projection *j*, formed on the metal plate *d*, and which bears on the sides of these squared bosses *h*, checks the shafts *a* at every fourth part of their revolution.

The recorder, as hereinbefore described, is preferably arranged beneath one of the seats of the conveyance, and is there locked or otherwise secured against any outside interference. The vertical shafts *a* and the arms *b* are inclosed in the wood-work of the conveyance in such manner that the only parts exposed are the two then inwardly-projecting arms *b*, protruding from each side of the entrance.

With reference more particularly to Figs. 3 and 4 of the annexed drawings, it is seen that upon the counter-shaft, *g'*, on which the screw *g* is formed, there is a second screw, *k*, cut, preferably, of five-eighths of an inch pitch. Between the threads of this short screwed portion *k* the pin *l* (see more particularly Fig. 7) is held, the said pin *l* being formed in part with the block *m*, which is guided by and is free to move vertically between the guides *n*, and is provided at its front side with the inclined slot *o*. In this slot a pin, *p'*, is caused to work, the said pin being formed in part with the plate *p*, which is pivoted at a^2 to any convenient fixed part of the frame or case of the recorder. Upon pins *q'* and *r'*, respectively, mounted in this plate *p*, the pawls *q* and *r* are pivoted, and the swinging motion imparted to the plate *p* through the slot *o* and pin *p'* causes one of the said pawls to engage with the ratchet-teeth *s* of a toothed rim, *s'*, on the drum *t*, and to move the drum *t*, with which the rim is preferably formed in part, through a distance corresponding to the length of one of the said teeth. This motion is imparted to the drum *t* through one of the pawls—say the pawl marked *q*—when the shafts *a* are first turned inwardly—that is to say, when a passenger enters the conveyance—no further motion being imparted thereto by any passengers other than the first one entering; but upon any one leaving the conveyance the shafts *a* are turned in the opposite direction, and the pawl *r* moves the drum *t* forward to a similar distance. The pencil *u*, which may be of metal or other suitable substance, is carried in the pencil-holder *v*, Fig. 5, hereinbefore referred to, and by a spiral spring, *u'*, or equivalent spring, which is contained in the said holder *v*, is pressed upon the diagram-paper *w*. This diagram-paper is carried by the drum *t*, and is divided vertically, preferably, into as many eighths-of-an-inch parts as there can be passengers carried in the conveyance. The pencil-holder *v* engages with the screw *g*, and is otherwise guided by the vertical rods *x*, Figs. 3 and 4, upon which the eyes *y*, Fig. 5, slide.

Suppose one passenger to enter the conveyance after it has been emptied of all or any of its former passengers, this first-entering passenger causes the drum *t* to be moved forward, and at the same to raise the pencil *u* one-eighth of an inch, so that a short oblique pencil-line extending upward is formed upon the diagram-paper *w*. Should any more passengers follow this first without the intervention of any outgoing passengers, the pencil-line is only extended vertically upward to a length corresponding in eighths of an inch to the number of passengers so entering, the first movement of the shaft *g'* only operating by its screw-thread *k* and block *m* to advance the drum. One of the passengers leaving the conveyance moves the shaft *g'* in the opposite direction and lowers the block, and the drum *t* is moved forward and the pencil *u* downward, so that a short oblique pencil-line extending downward is the result. Should any more passengers leave the conveyance at the same time, the pencil-line is extended vertically downward to a length corresponding in eighths of an inch to the number of passengers so leaving. It will thus be seen that the drum is advanced one tooth only while the shaft *g'* is rotated in one direction, and is only advanced another tooth when the shaft is next rotated in the opposite direction, the drum being stationary while the shaft continues to move in the same direction. Should the passengers entering and leaving the conveyance do so alternately—that is to say, should one enter, a second leave, a third enter, a fourth leave, and so on—the result upon the diagram-paper *w* would be a horizontal zigzag line, because the block would be moved up and down with the alternate up-and-down movement of the holder, thus advancing the drum one tooth at each single alternate oscillating movement of the shaft *g'* forward and backward.

The lever *z*, Figs. 3 and 8, is in connection with the bell-pull, by which the tramway-car conductor, guard, or other attendant communicates with the driver at the stopping stations or stages to inform him to proceed on the next stage of the journey. This lever *z* is pivoted at *a'*, and at or near the end thereof the pawl *b'* is pivoted in such manner that when the lever *z* is pulled in the required direction it moves the drum *t* forward a distance equivalent to the length of one tooth, *s*. This movement of the drum produces a short horizontal pencil-line upon the diagram-paper *w*, as shown at *c'*, Fig. 4, and should any passenger enter or leave the conveyance at such a stage this is shown by vertical or oblique lines, as hereinbefore described, the said vertical or oblique lines being before or after the horizontal line, according as the passengers entered or left the conveyance before or after the lever *z* was pulled.

The mechanism of the recorder is contained within the casing *d'*, the interior of which is accessible, by reason of the upper part of the said casing *d'* being detachable therefrom, the said part being secured in position by means of pins or catches *e''* engaging with the upper ends of the tie-rods *e'*.

It is to be understood, in place of using two vertical shafts, *a*, and sets of arms *b*, as hereinbefore described, that I may use one such shaft with the arms *b*, of sufficient length to extend across the whole width of the entrance to the conveyance, this construction of mechanism being preferable when space is of small importance.

It will be observed that the pencil bears continually on the paper and produces a continuous line.

As shown in the drawings, the arrows indicate the movement of the parts on the entrance of another passenger, one having just withdrawn and placed the block in normal position, the parts having therefore just moved in the opposite direction to that indicated by the arrows.

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

1. The combination, with a conveyance, of a pair of vertical shafts, *a a*, having arms *b*, extending at right angles thereto, barring the entrance to the conveyance, gear-wheels *c c* on the shafts working in unison, a plate, *d*, in which the shafts are journaled at one end, brackets *e*, in which the shafts are journaled at the other end, a counter-shaft, *g'*, operated by the shafts, having screw-thread *g*, a drum, *t*, a vertically-sliding pencil-holder or marker operated by the counter-shaft, and means for rotating the drum, substantially as set forth.

2. The combination, with a conveyance, of a pair of vertical shafts, *a a*, having arms *b*, extending at right angles thereto, barring the entrance to the conveyance, wheels *c c*, working in unison on the ends of the shafts, having square bosses *h*, a plate, *d*, in which the lower ends of the shafts are journaled, formed with projection *j*, a spring-bar, *i*, bearing on the projection and bosses, a counter-shaft operated by the shafts, provided with a holder having a marker, and a drum, substantially as set forth.

3. The combination of a vertical shaft, *a*, having arms *b* at right angles thereto, and a recording device comprising a shaft, *g'*, having screw-thread *g*, pencil-holder moved on said screw-thread, and a rotating drum having a surface on which the pencil draws a continuous line, for indicating the entrance and exit of passengers to or from the conveyance by the direction of the line, substantially as set forth.

4. A recording device consisting of a shaft, *g'*, having screw-thread *g*, carrying a pencil-holder, short screw-thread *k*, and means for rotating the shaft in either direction, sliding block *m*, having pin *l*, pivoted plate *p*, pin-and-slot connection between the block and plate, pawls *q* and *r*, and a drum, *t*, having toothed rim *s*, substantially as set forth.

5. In a recording device, the combination of a pencil-holder or marker, means for imparting movements thereto in opposite directions, a drum, on which the pencil or point of the marker draws a continuous line, and means for moving the drum in one direction once for each change of direction of movement of the pencil-holder or marker, substantially as set forth.

6. In a recording device, the combination of a drum provided with a band having lines forming spaces corresponding to the number of passengers carried in the conveyance, a pencil-holder or marker having means by which it is moved in one direction to record the entrance of each passenger, and in the opposite direction to record the exit of each passenger, and means for shifting the drum at each change of direction of the pencil-holder or marker, substantially as set forth.

7. In a recording device, the combination of a drum moved periodically, provided with a band having lines forming spaces corresponding to the number of passengers carried in the conveyance, a pencil-holder or marker, and means for causing the pencil-holder or marker to move one space in one direction on the entrance of each passenger, and one space in the opposite direction on the exit of each passenger, means for shifting the drum the distance of one space at each change of direction of the pencil-holder or marker, and means for shifting the drum the extent of a space while the pencil-holder or marker is stationary, substantially as set forth.

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

JAMES BISSET, JR.

Witnesses:
ST. JOHN VINCENT DAY,
HENRY HART,
Both of 115 *St. Vincent St., Glasgow.*