

No. 779,448.

PATENTED JAN. 10, 1905.

W. A. & G. A. W. TURNER.

LIFE GUARD FOR ELECTRIC TRAM CARS OR OTHER ROAD VEHICLES.

APPLICATION FILED OCT. 7, 1904.

3 SHEETS—SHEET 1.

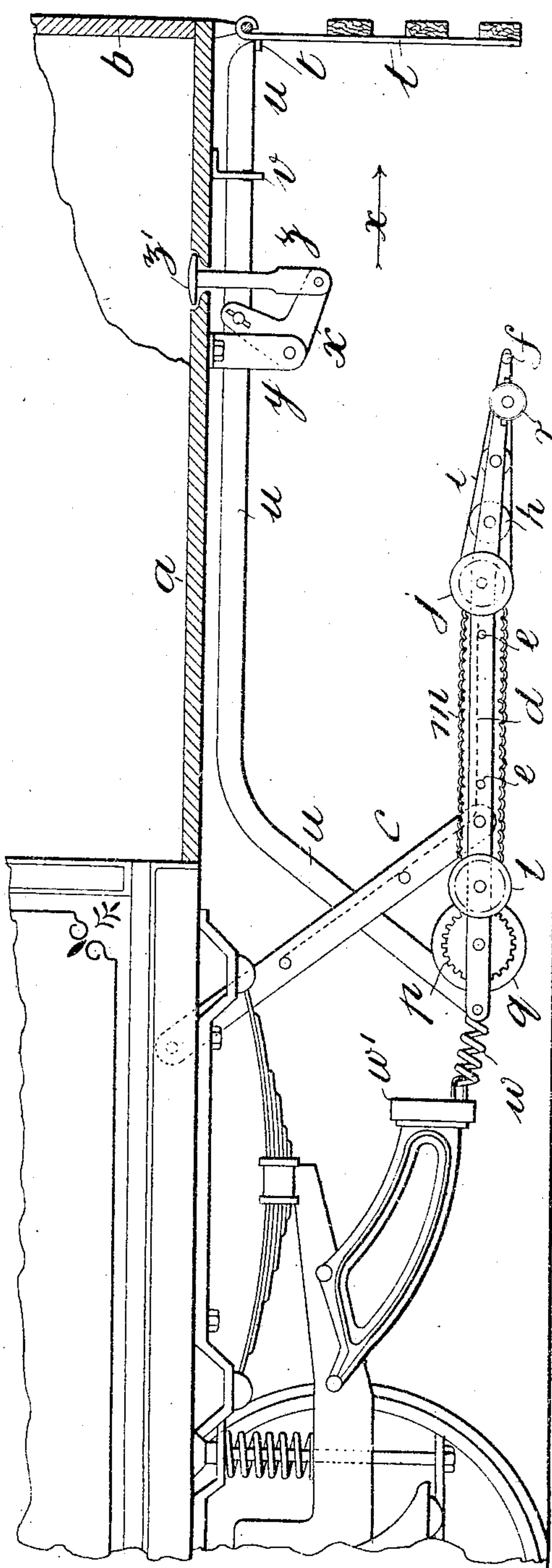


Fig. 1.

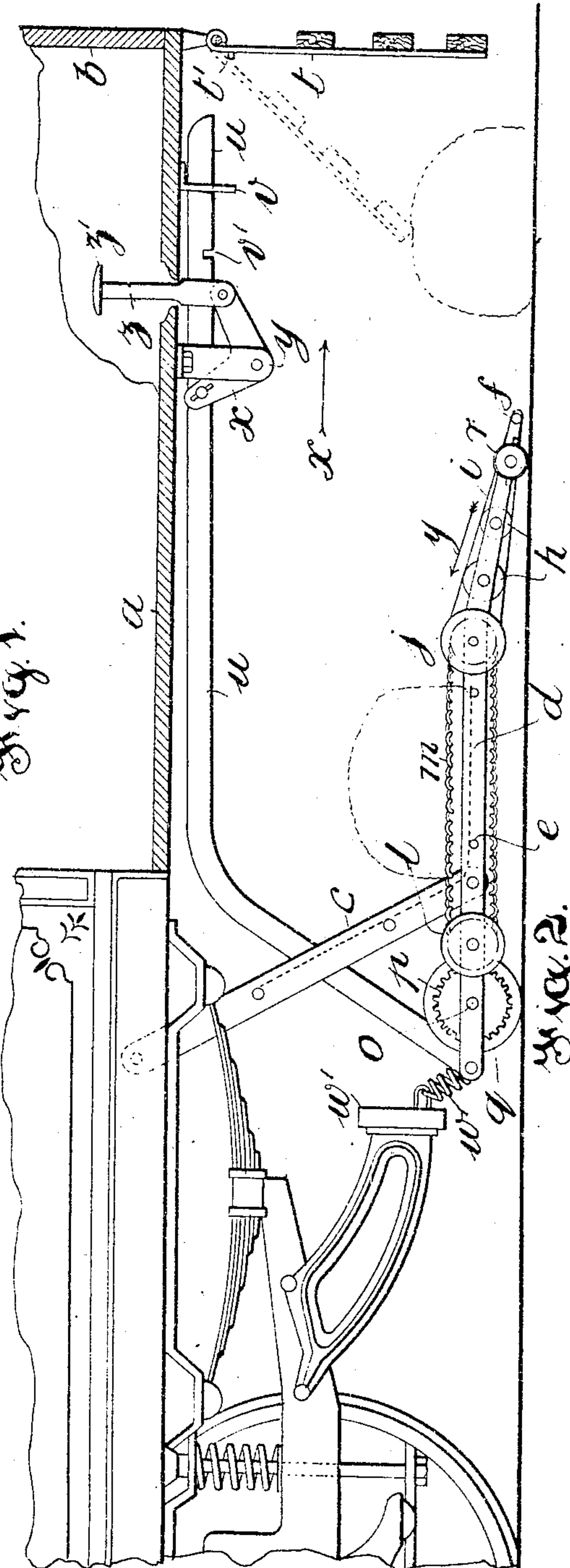


Fig. 2.

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Dickles D. Bailey

Inventors:
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By their Attorney: Walker Gurn.

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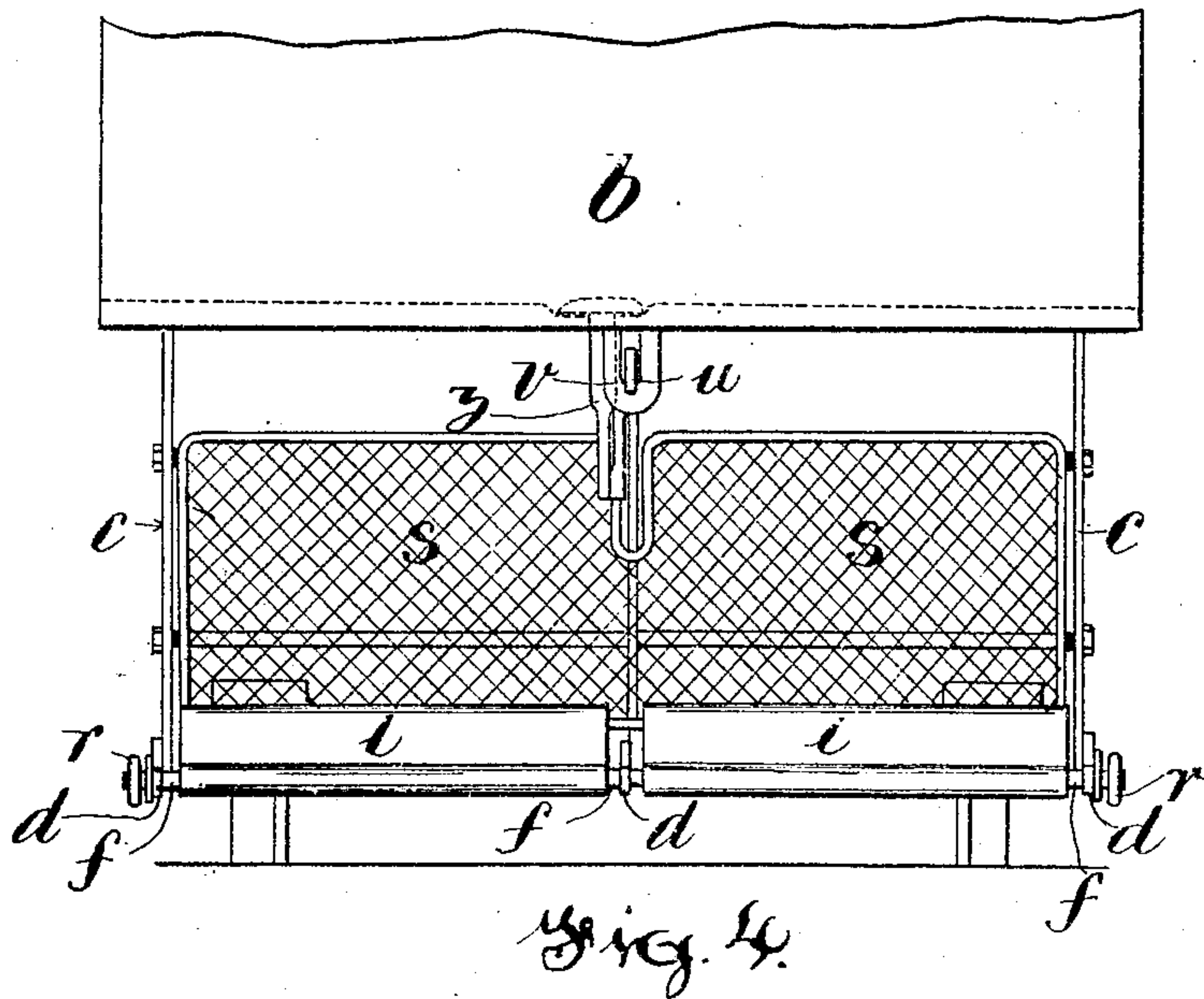
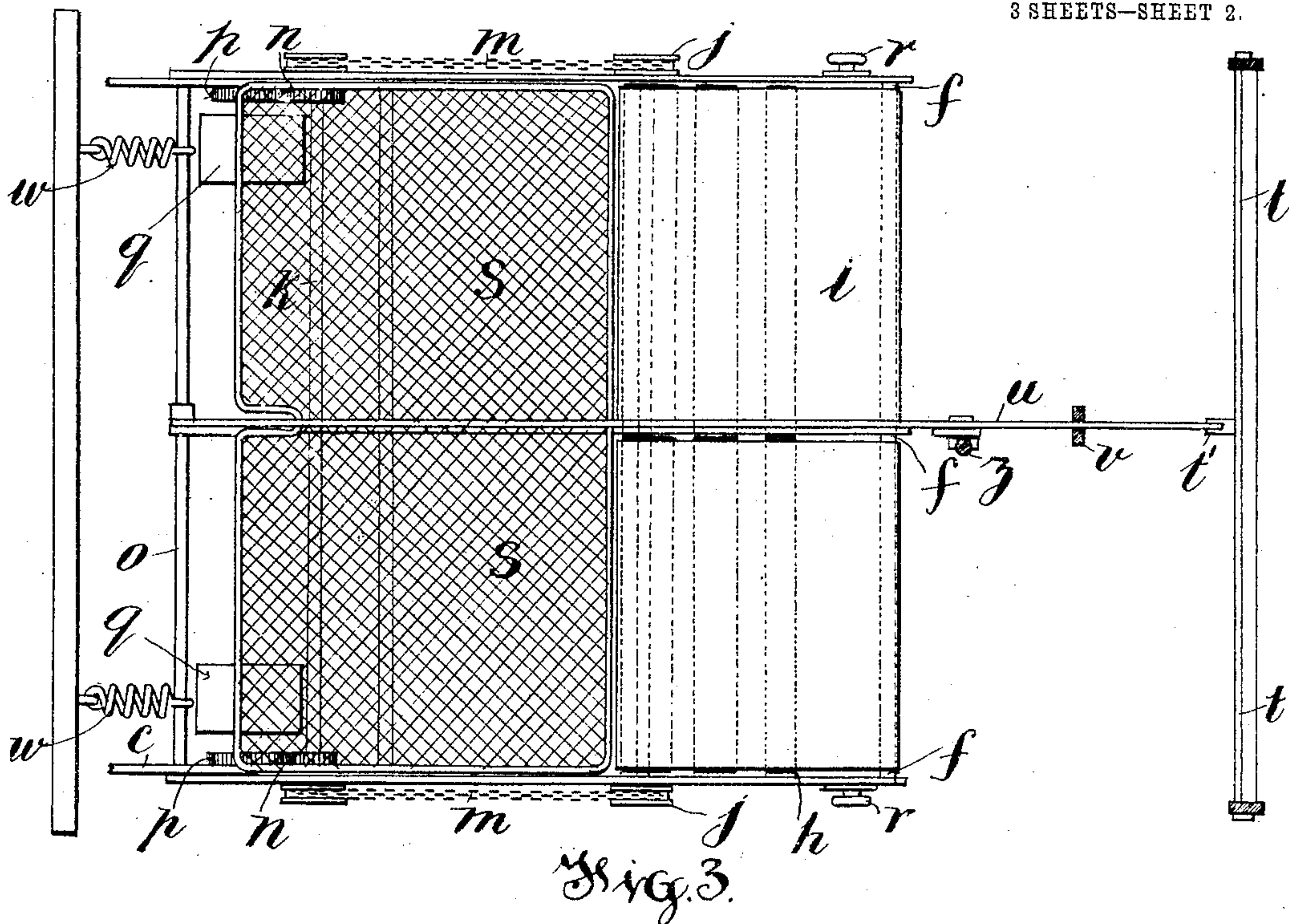
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3 SHEETS—SHEET 2.



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No. 779,448.

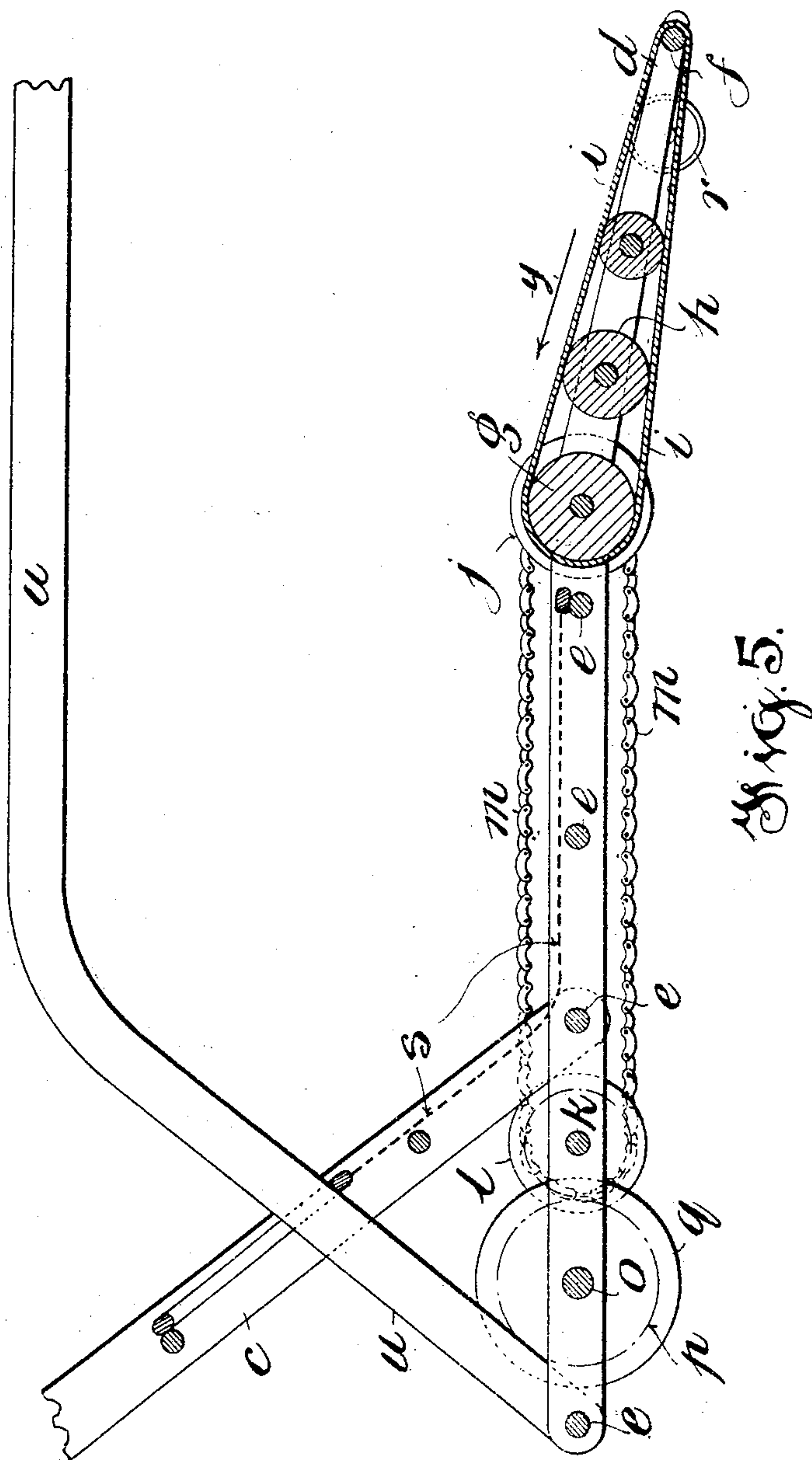
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

WILLIAM ARTHUR TURNER, OF MARPLE, AND GEORGE ALFRED WEBSTER
TURNER, OF STOCKPORT, ENGLAND.

LIFE-GUARD FOR ELECTRIC TRAM-CARS OR OTHER ROAD-VEHICLES.

SPECIFICATION forming part of Letters Patent No. 779,448, dated January 10, 1905.

Application filed October 7, 1904. Serial No. 227,558.

To all whom it may concern:

Be it known that we, WILLIAM ARTHUR TURNER, a resident of Compstall, Marple, and GEORGE ALFRED WEBSTER TURNER, residing
5 at Warren Chambers, Warren Street, Stockport, England, subjects of the King of Great Britain and Ireland, have invented certain new and useful Improvements in or Relating to Life-Guards for Electric Tram-Cars or other
10 Road-Vehicles, of which the following is a specification.

These improvements refer to the type of life-guard for tram-cars in which a tray is employed to gather up and retain the obstruction. Heretofore the tray has usually been of the nature of a series of wooden battens secured to hinge-bars, with the front edge adapted to be lowered onto the roadway. Due to the unevenness of the roadway or the
20 formation of the tray it sometimes happens that a portion of the obstruction gets between the tray and the roadway and with the further travel of the tram-car causes greater evils than the tray is intended to prevent.

According to this invention the tray is so made as to be capable when lowered onto the roadway of presenting a surface to the obstacle which travels or moves in a direction opposite to that of the car and which thus not
30 only tends to prevent the obstruction getting beneath the tray, but helps it to mount the tray. The tray is preferably in the form of an endless belt or apron; but it may consist of rollers all driven in one direction, and the traveling
35 of the apron or rotation of the rollers is obtained by gearing and a roller or rollers or other suitable devices which come into operation on being lowered onto the roadway or on being moved into play with the vehicle-
40 wheels or their driving mechanism.

A further feature of the invention is a net or fixed receiver placed immediately behind the tray, into and by which the obstruction after traveling up the tray is delivered and
45 retained.

The tray is by preference mounted in a similar manner to the ordinary tray and provided with means—such as a cord, lever, or chain—extending to the driver's platform to raise and

lower the front edge or with a swing-gate to 50 lower it automatically. It may, however, be a fixture relatively to its supports, and in such connection the apron may always be traveling and the driving devices only may be adjusted (lowered) from the car. 55

Upon the accompanying drawings, Figure 1 illustrates a side elevation of one end of an electric tram-car in part with the improved construction and arrangement of life-guard or obstruction-remover applied thereto and 60 shown in its normal position or prior to an obstruction being met. Fig. 2 illustrates a like view, but with the life-guard lowered and in the position it occupies when picking up an obstruction. Fig. 3 illustrates a plan of the 65 improved life-guard, while Fig. 4 illustrates a front elevation. Fig. 5 illustrates a side elevation, to an enlarged scale, of the improved tray portion only.

As shown, *a* is the floor of the tram-car, and 70 *b* the front of the driver's platform. Pivotaly suspended from the car-underframe by links or bars *c* or the like is the improved tray, the frame of which consists, preferably, of three parallel bars *d*, joined and held apart 75 by cross-rods *e*. Axially supported by such frame at its front end, which is bent downward and made as narrow as possible, are two small rollers *f*, equal approximately to half the width of the car, and at another point to 80 the rear of such rollers and parallel thereto are two further rollers *g* of the same length, but of larger diameter. Intermediate of each of the said pairs of rollers are or may be one, two, or more rollers *h*, the diameters of which 85 diminish with their distance from the large roller *g*. Around each of the two sets of rollers passes an endless flexible belt or apron *i*, composed, preferably, of felt blanketing covered or treated with a waterproof material 90 and loosely fitting the rollers, so that when the rollers *g h* are rotated the apron is rotated. To insure the positive traverse of the apron, either of the rollers may be roughened or provided with a roughened sleeve. 95

As a modification there may be one set of rollers and one apron only extending the full width of the car, or there may be more than

two sets of rollers and aprons; but for various practical reasons we prefer two sets. The ends of the axles of the rollers *g* project beyond the sides of the frame and there carry chain or sprocket wheels *j*. To the rear of the frame is a shaft *k*, and upon the ends of such shaft are further chain or sprocket wheels *l*. Passing around such wheels *l* and the wheels *j* are endless chains *m*. As a modification there may be a single set of wheels centrally disposed and a single chain. Keyed upon shaft *k* are also two gear-wheels *n*. Between and parallel to the shaft *k* is a further shaft *o*, and keyed upon such shaft are two gear-wheels *p*, which mesh with those on the shaft *k*. Also fast upon the shaft *o* are two roller-blocks *q*, each near the frame side and each of a diameter which insures of a portion of their periphery lying slightly below or level with the lowermost part of the apron *i*. Each roller-block is by preference of wood and roughened on its periphery or provided with a sleeve of frictional material.

Due to the tray being hung from the car by links or bars *c* it is capable of occupying the position shown in Fig. 1 or of occupying the position shown in Fig. 2. When in the former position, it lies clear of the roadway and all its parts are at rest; but when in the latter position and resting with its full weight on the roadway and also with the tram-car moving forward in the direction of the arrow *x* the friction of the roadway serves to rotate the roller-blocks *q* and through them rotate the shaft *o*, the wheels *p* *n*, rollers *g*, and apron *i*, this latter traveling around its rollers in the direction of the arrow *y*. (See Figs. 2 and 5.) Should, therefore, an obstruction be in the way, it will be seen that the close proximity of the front edge of the tray to the roadway, together with the movement of the apron in the direction indicated, will insure its effectual removal, inasmuch as it will be caused to mount the apron, and so be carried onto the tray. So effective is the improved guard that upon fairly smooth ground it will pick up a small pocket-handkerchief.

To allow the apron to rotate freely, the forward end of the tray is fitted with small runners, skates, or wheels *r*, which when lowered take into the tram-rails or run on the roadway, and thus guide the tray, as well as hold the apron just clear of the roadway.

As a modification the blocks *q* may be dispensed with and wheels be used capable of running in the tram-rails or engaging the car-wheels, suitable variations being made in the gearing to suit the direction of rotation.

The space between the rollers *g* and the rear of the tray-frame, likewise the space between the links *c*, is fitted with netting *s*, by which the obstruction after passing up the apron *i* is caught and retained. (See Fig. 2.)

For enabling the tray to be lowered and

raised automatically use is made of a swing-gate *t*, a notched rod *u*, and a catch *v*. This latter is fixed to the car and consists of a slotted bracket (see Fig. 4) through which the rod *u* freely passes, except when a notch *v'* in its lower edge engages the said bracket. (See Fig. 1.) The rod is pivotally connected to the rear of the tray, and when held by the catch it holds the tray in the elevated position, as shown in Fig. 1. The front end of the rod when locked comes immediately over a small plate *t'* on the gate *t*, so that with the gate free to swing rearwardly it serves, immediately an obstruction is met, to raise the end of the rod *u*, and thereby cause it to come out of engagement with the catch *v* and allow the tray to lower onto the roadway, as shown in Fig. 2. The lowering of the tray may be assisted by springs *w*, secured to the pilot-board *w'* at one end and the tray-frame at the other end. (See Fig. 3.) Due to such connections and to the balancing of the parts and also to the connection of the rod *u*, the tray always assumes a position parallel with the roadway. Suitable stops may, however, be used on the links *c* or the frame of the tray to limit the fall of the front edge of the tray. It will be noticed that in lowering the tray also moves bodily backward, and thus increases the distance between its front edge and the gate, and that, due to the friction of the roadway and the links *c*, the tray is always tending to increase the degree of contact, thereby rendering it extremely difficult for any object to get below the tray. For resetting of the tray after use the bell-crank lever *x* may be used, pivoted to a fixed bracket *y* and with one end engaging a pin on the rod *u* and the other end connected to a rod *z*, which passes through an opening in the car-floor and terminates in a foot-plate *z'*. When the tray is raised, the foot-plate is level with the car-floor, and when the tray is lowered the foot-plate is raised, as shown in Fig. 2, so that upon the driver of the car pressing down the foot-plate with his foot he causes the rod to be moved forward until its notch engages the catch and the tray is again locked in its elevated position. (See Fig. 1.)

While preferring the tray to be lowered automatically, means may be provided whereby it may be lowered by hand, the gate *t* in such case being dispensed with and the tray, if desired, brought farther forward and the links *c* adapted to lower the tray toward instead of away from the front of the car.

It will be obvious that the apron *i* may be of wood lags or netting or any suitable flexible material and that instead of the rolls *h* a fixed board or boards may be employed to receive the weight of the obstruction, also that the mechanism for imparting motion to the apron may be varied, without departing from the invention. The parts may also be other-

wise proportioned and simplified to suit the requirements of the tram-car. As is almost needless to add, there will be a life-guard at each end of the car.

5 What we claim is—

1. In life-guards or obstruction-removers for electric tram-cars and similar road-vehicles, a tray comprising an endless apron and rollers therefor, the tray and rollers being of the smallest possible diameter at the front end, and said tray also comprising an arrangement of chain-wheels and chains with certain of the wheels secured to the apron-rollers or their axes, and certain others secured to a shaft at or
15 near the rear of the tray, spur gear-wheels on this last-named shaft, and further gear-wheels meshing therewith on another shaft, on which latter are also friction wheels or blocks adapted to engage the roadway, or rails or vehicle-
20 wheels, substantially as and for the purposes set forth.

2. In life-guards or obstruction-removers for electric tram-cars and similar road-veh-

cles, a tray of the kind described pivotally suspended from the vehicle-underframe and
25 held elevated or clear of the roadway by a rod, chain or other suitable means and a catch or retaining device, and said tray lowered or released automatically or by hand, and means for resetting the same, substantially as here-
30 in set forth.

3. In life-guards or obstruction-removers for electric tram-cars and similar road-vehicles, the combination with the tray of a woven-wire or like part immediately to the rear of
35 the apron, and springs to help in lowering the tray, substantially as and for the purposes set forth.

In witness whereof we have hereunto set our hands in the presence of two witnesses.

WILLIAM ARTHUR TURNER.

GEORGE ALFRED WEBSTER TURNER.

Witnesses:

EDWIN W. HEWITT,

WILLIAM W. WADFIELD.