

No. 649,701.

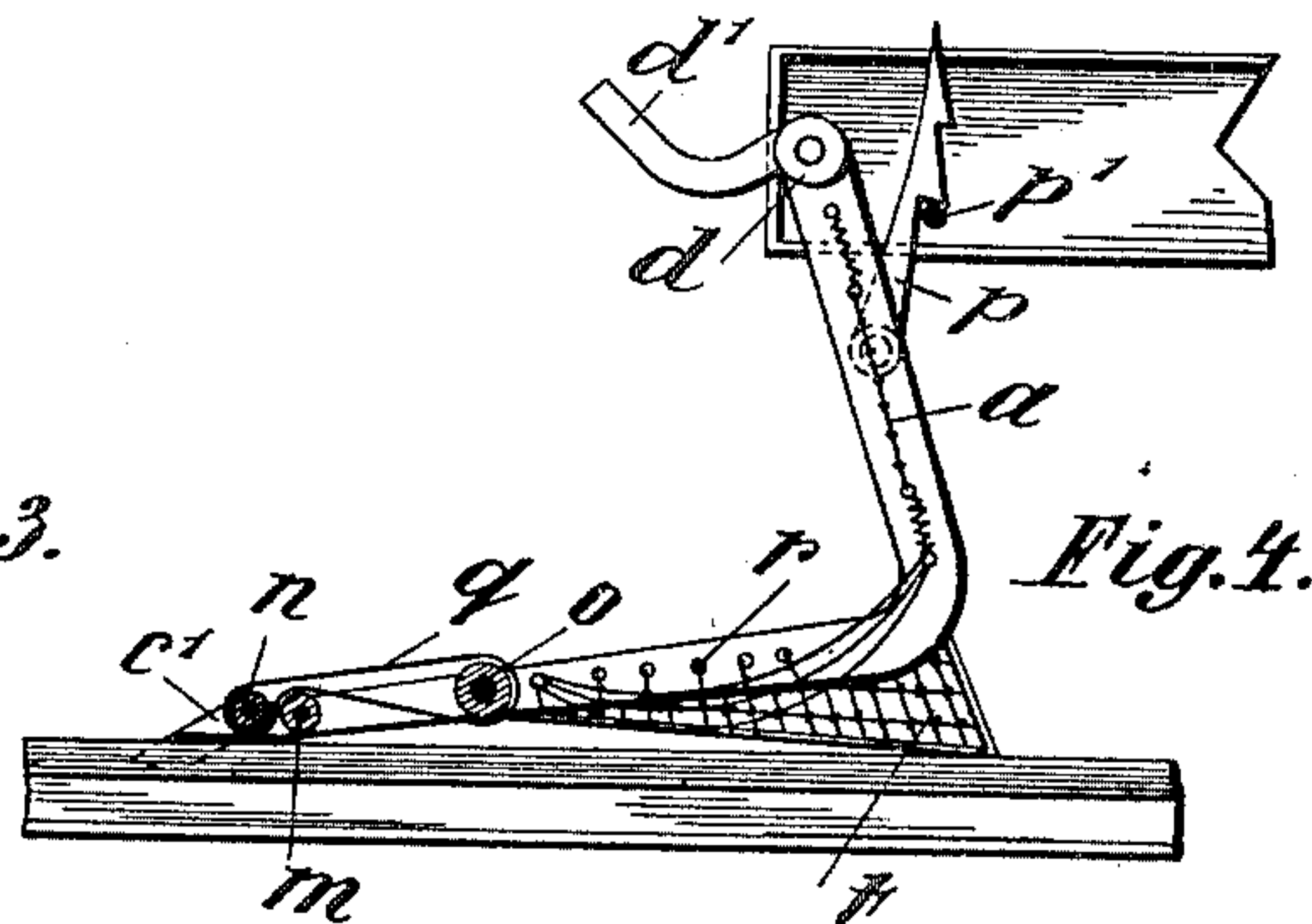
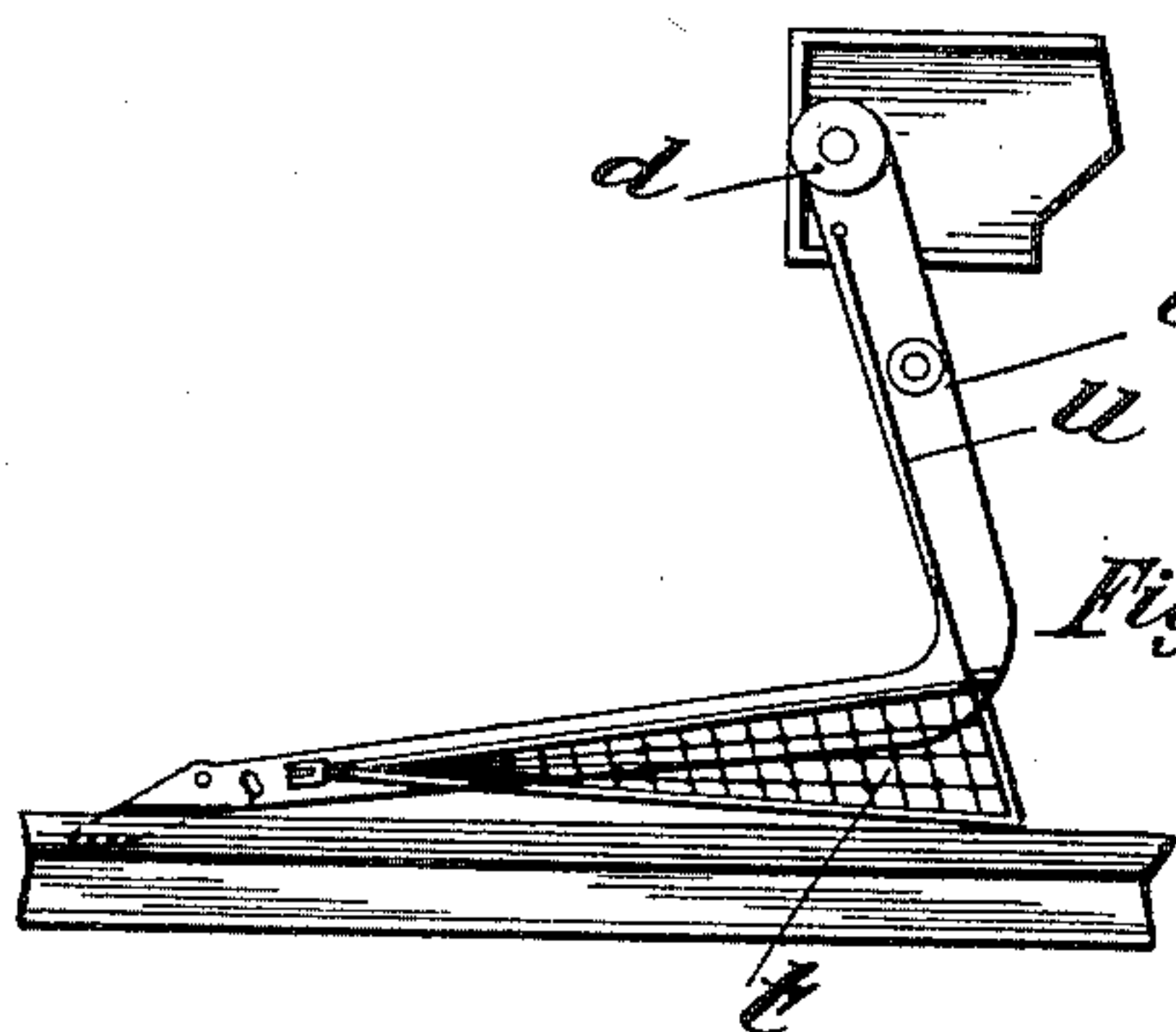
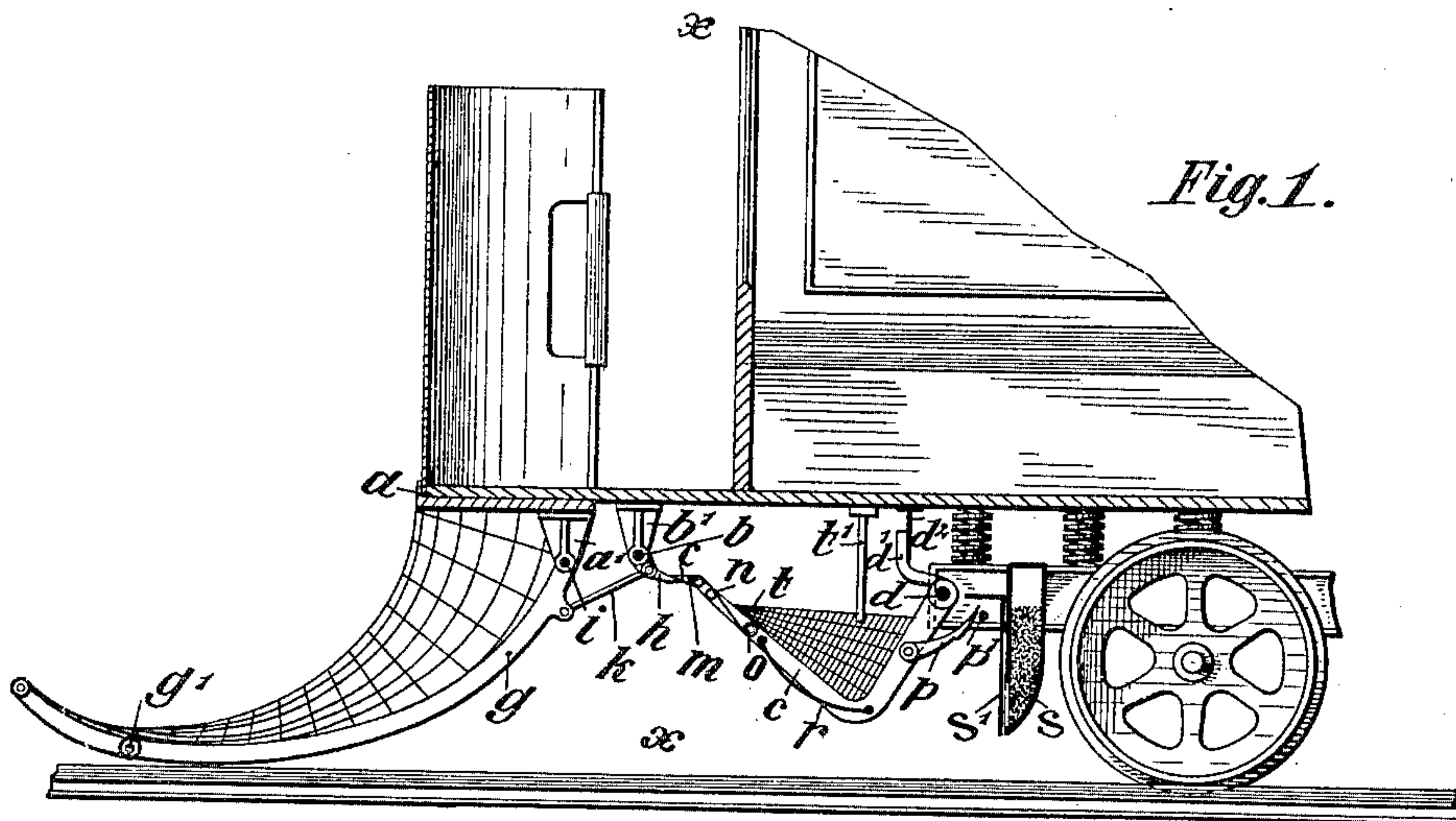
Patented May 15, 1900.

W. MATTES.  
FENDER, &c., FOR TRAM CARS.

(Application filed June 30, 1899.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:  
J. Green  
W. P. Hammond

Inventor:  
Wilhelm Mattes  
By                      atty

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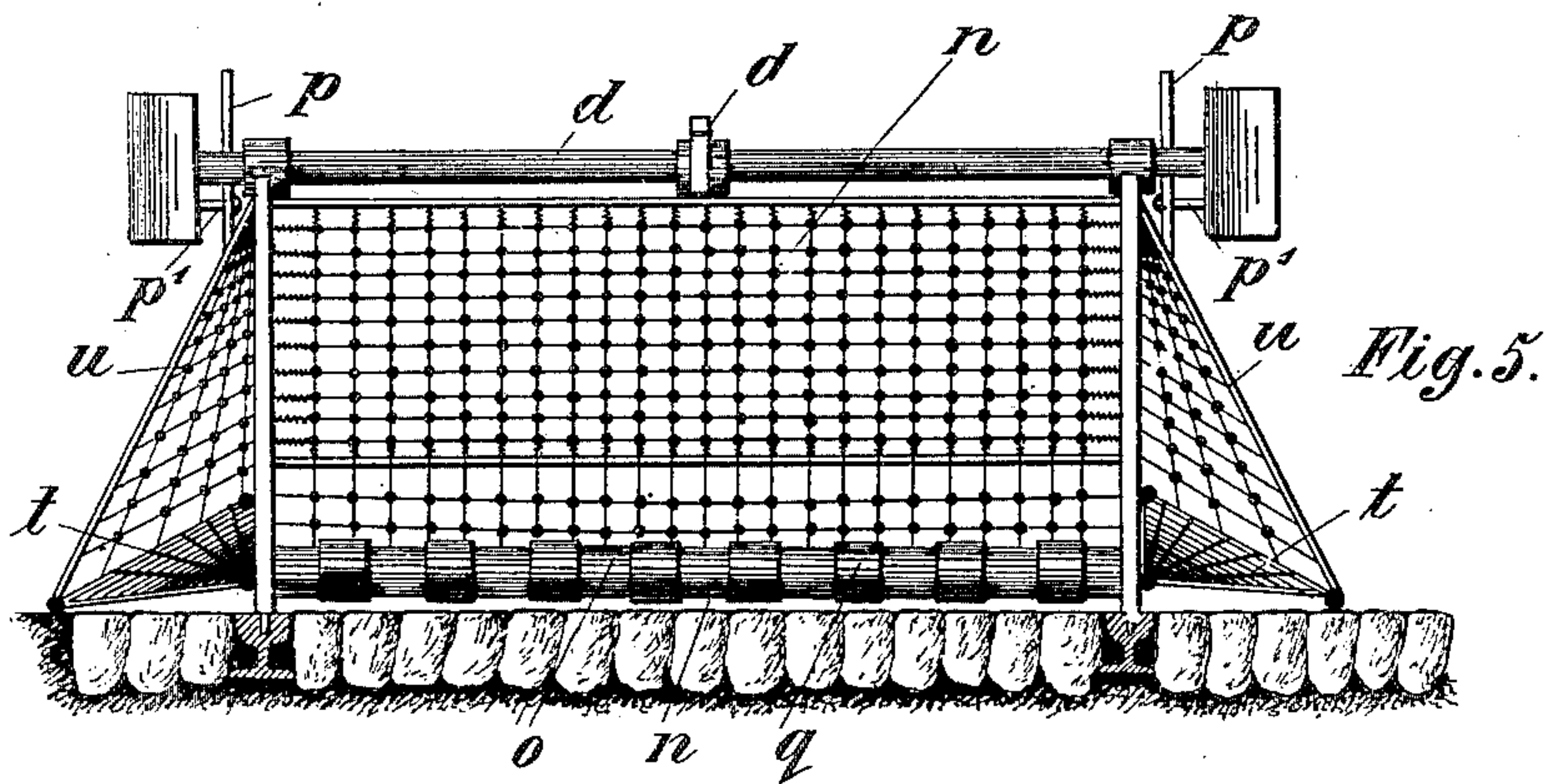
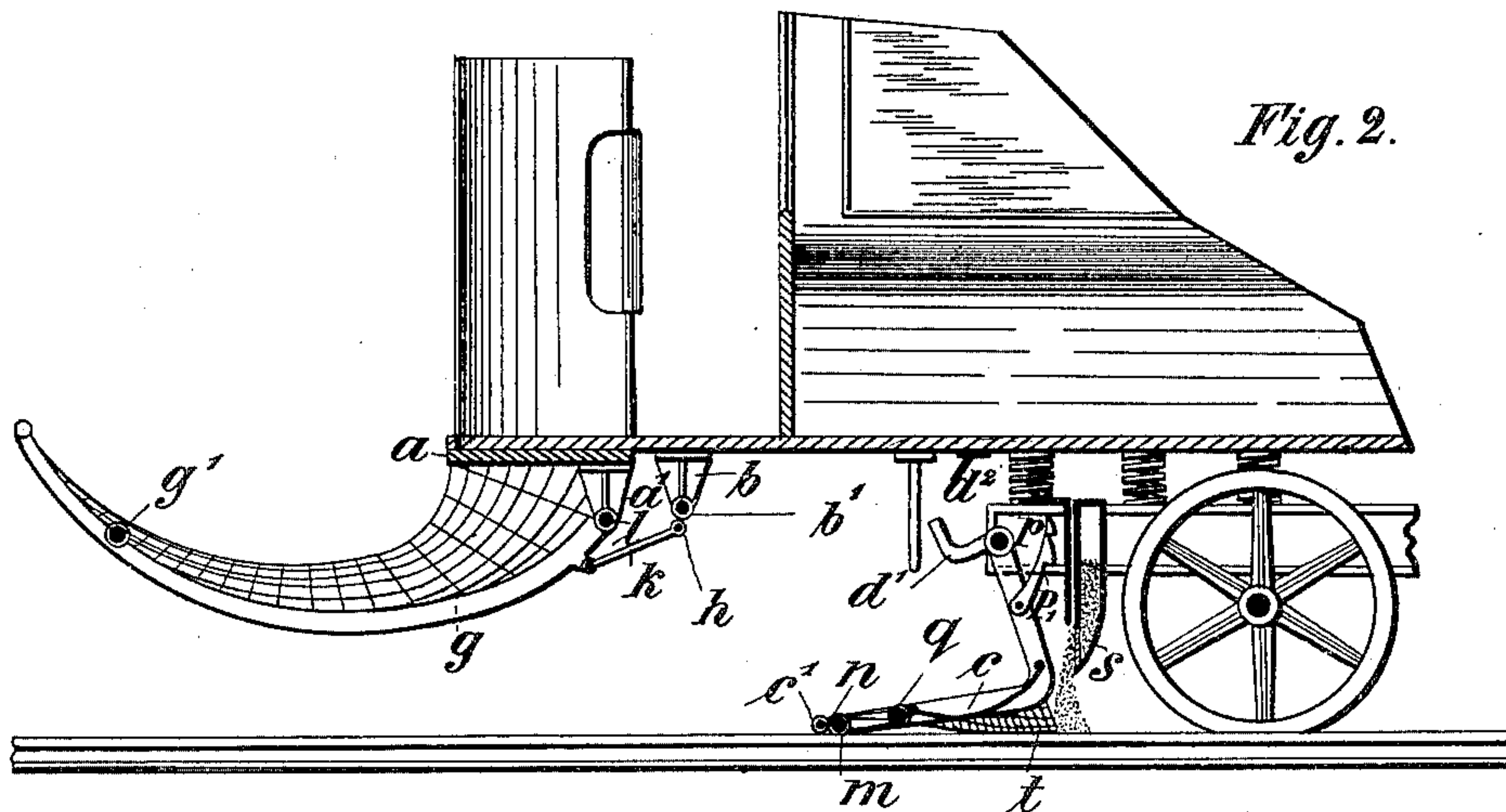
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3 Sheets—Sheet 2.



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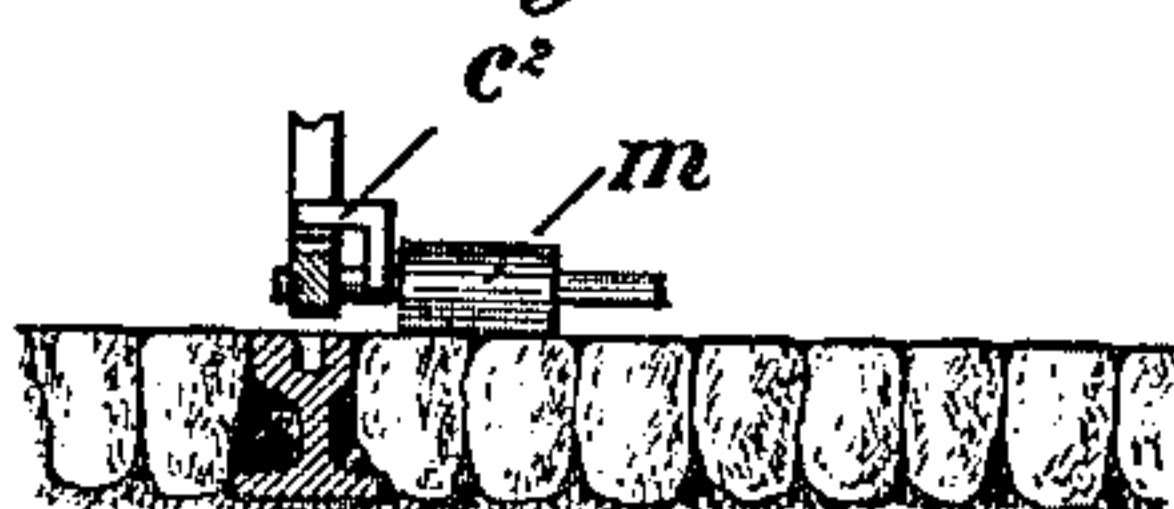
(No Model.)

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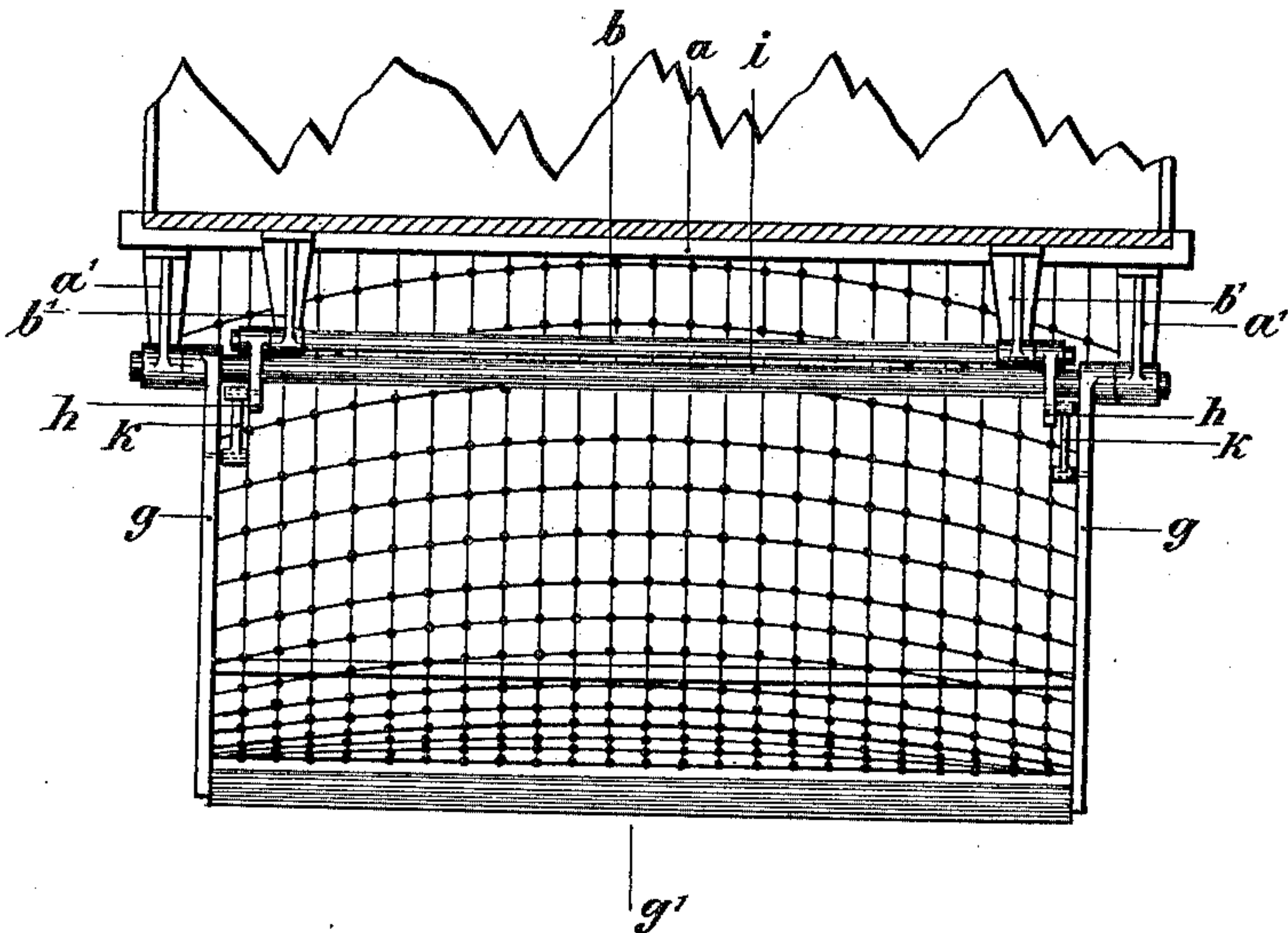
*Fig. 6.*



Fig. 7.



*Fig. 8.*



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Inventor

Wilhelm Matter

By John A. Adams

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# UNITED STATES PATENT OFFICE.

WILHELM MATTES, OF ALTONA, GERMANY.

## FENDER, &c., FOR TRAM-CARS.

SPECIFICATION forming part of Letters Patent No. 649,701, dated May 15, 1900.

Application filed June 30, 1899, Serial No. 722,380. (No model.)

*To all whom it may concern:*

Be it known that I, WILHELM MATTES, manager, a subject of the Emperor of Germany, residing at Gr. Rosenstrasse 23, Altona, in the  
5 Duchy of Holstein and Empire of Germany, have invented certain new and useful Improvements in Fenders or Obstruction-Removers for Attachment to Tram-Cars, of which the following is a full, clear, and exact description.  
10 tion.

Hitherto fenders or obstruction-removers carried by tram-cars have possessed the disadvantage that a body falling in front of the car is either severely injured by violent contact with the fender or else gets underneath  
15 the fender or guard itself, so that there is little or no real protection against the danger of being run over. My improved fender or obstruction-remover when compared with already-known inventions of the same nature,  
20 some of which have had to be abandoned, possesses the great advantage that the appliance works quite automatically at the moment of impending danger and is completely independent of the attention and presence of mind  
25 of the driver. When my invention is in use, it is altogether impossible for a body falling in front of the tram-car to be drawn underneath the wheels, because the action of my improved  
30 fender is twofold in the following sense: The safety-guard provided in front, which I will hereinafter term the "fore" guard, offers a place of safety to a body falling direct thereon, the fore guard running on rollers and having  
35 joints easily manipulated and being provided with strong wire-gauze or cord-netting. If, however, the obstruction lies in the middle of the track, the fore guard, which has an upturned edge in front, is enabled to pass over  
40 the body or obstruction, rising in so doing and releasing a second fender or catcher, hereinafter termed the "second" catcher, situated underneath the car. This second catcher being thus automatically released when the fore  
45 guard is lifted by the obstruction falls with its twoside arms (which are controlled by springs) upon the rails and sets in motion a system of rollers situated between the two arms, the effect of this motion being to gently lift the obstruction—say the body of a person—and  
50 drop same into the net of the second catcher. The latter in its descent will automatically

stop the car, its lateral arms acting as a brake. The same descending motion also works the slide of a sand-box in such a manner that the  
55 contents of this box fall upon the rails, thus greatly assisting in stopping the car. The moment the second catcher is released other nets arranged laterally will be caused by springs to open out at the sides of the car and  
60 drop on the pavement, their normal positions being at the sides of the car, but turned upward when the car and the fore guard and second catcher are also in their normal positions. Thus a person falling sidewise upon the fender  
65 or guard is prevented from being dragged under the wheels of the car.

In order that my invention may be more clearly understood, I have attached hereto a sheet of drawings, on which—  
70

Figure 1 is a side view of the front part of a tram-car with my improved double-acting fender in its usual or non-working position. Fig. 2 shows the same when an obstruction has come underneath the fore guard. Figs.  
75 3 to 7 show, on an enlarged scale, the main parts of the arrangement, Fig. 3 being a view of the second catcher; Fig. 4, a section of the same, and Fig. 5 a front view thereof. Fig. 6 shows the spring-bearings of the india-rubber  
80 cylinder hereinafter described; Fig. 7, a side view of Fig. 6, and Fig. 8 is a vertical section of the front part of the car looking forward and showing in elevation the front fender and the supports of rear fender.  
85

Upon a plate *a*, which is preferably situated underneath the car, two levers *g* are mounted on a shaft *i*, which rotates freely in bearings  
90 *a'*. These levers *g* are bent in an upward direction at the front and carry an india-rubber roller *g'*. Between the said levers *g* and the plate *a* a wire-gauze or narrow net or any suitable material extends in such a manner as to afford plenty of room for the reception of a  
95 person falling upon this safety-catcher, the levers *g* extending for this purpose as far as convenient toward the front. If, however, a person or object should be lying already upon the track, this forward safety arrangement  
100 fulfils quite another purpose.

Underneath the bottom of the car and fixed to same at each side are bearings *b'*, which serve to support the shaft *b*, upon which are mounted small levers *h* in working connection



with the said shaft. These levers *h* are connected at certain points with the levers *g* by means of connecting-rods *k*. The levers *h*, which are arranged at a distance from each other equal to the width of the track, serve as supports to bent levers *c*, which belong to a protecting net or catcher placed underneath the car, only intended to be used when the fore guard has not removed the obstruction.

As the front catcher or fore guard is not always capable of catching the body lying between the rails, it may happen that the body remains on the ground, the fore guard simply passing over it, and thus being raised, whereupon the levers *c*, which rest upon the levers *h*, are caused to fall, the rods *k* having drawn the small levers *h* from their original positions, as shown in Fig. 2. The levers *c*, which pivot on shaft *d*, now fall directly onto the rails, the additional piece *c'* coming into contact with the latter, and thus substantially assisting in stopping the car. A small lever *d'* is mounted upon shaft *d* in such a manner as to press against a compressed spring *d''* when the arrangement is out of action. As soon as the levers *c* are released from their supports this spring substantially contributes to an increase in the speed at which the levers *c* descend. The second protector or catcher also offers a convenient resting-place for a person or body falling upon the line and is able to easily pick same up by means of an arrangement consisting of three rollers *m n o*, the india-rubber roller *m* of which touches the pavement as soon as the levers *c* drop down. As a result of this contact the roller *m* is set in rotation, whereby the endless bands *q*, which communicate with the rollers *n* and *o*, cause the body picked up to be slowly and gently carried to the protecting-net *r*, into which it falls on leaving the roller *o*. In order also to prevent the braking action of the levers *c* from being influenced by the roller lifting the levers in consequence of irregularities in the pavement, the shaft of the said roller *m*, as may be seen in Figs. 6 and 7, is made elastic at each side by means of springs *c''*, so that any jolting to which the roller might be exposed will have little or no influence on the levers *c*. Another safety arrangement is provided in case an obstructing body lies about the rails, but only in part underneath the car. This arrangement consists of a net or catcher *t*, attached to the levers *c* by hinges, which when not in use is turned up and engages with spring-clips *t'*, as may be seen in Fig. 1, so as to be supported laterally thereby, but falls down at the same time as the main fender in such a manner as to take up a slanting position across the pavement and beside the rails. This catcher *t* is provided at the side of the wheel with a wall of network *u*, made of flexible material, as the net *t* has to be turned upward.

In order to keep the levers *c* in position upon the rails after the fender has fallen down, a stop mechanism is attached to said

levers, consisting of a pawl-like hook *p*, the teeth of which engage with a stud *p'*, fixed to the car, whereby the levers *c* are prevented from leaving the rails.

An apparatus for spreading sand, which is coupled to the stop mechanism, serves materially to assist the stopping of the car under the influence of the brake-levers. The box *s* (see Figs. 1 and 2) is closed by a slide *s'*, which is lifted simultaneously with the fall of the levers *c* by means of the pawl-like hook *p*, thus causing the contents of the box to pour out upon the rails and producing a still more effective braking of the car. It will be understood that as the levers *c* fall the upper end of the pawl *p* engages the flange or arm projecting horizontally from the top of the slide *s'*, so as to lift the said slide, as clearly illustrated in Figs. 1 and 2.

Many small alterations may be made on the double-acting fender without materially altering the principle of this invention. Thus, for example, the releasing of the levers *c* from their normal position could be effected by electric means.

As may be understood from the drawings and description, my improved protecting apparatus offers an essential advantage when compared with existing arrangements of the same nature, because injuries to persons accidentally falling under the car are altogether impossible, the net *w* of the second fender or catcher, which affords support for the back of the person caught by same, being constructed in such a manner that should the body be carried lengthwise on the bands *q* and either the head or the feet strike against the said net *w* (which is made flexible and yielding by extending springs) there will still be spare room even in such a position of the body until the person is entirely raised from the pavement by the working bands on the rollers.

What I claim, and desire to secure by Letters Patent, is—

1. The combination of the forward safety-guard *g* hung on pivot-shaft *i* the hinged rear safety-catcher *c* the levers *h* on which the pivot of the catcher *c* rests when out of action, and the rods *k* connecting the guard *g* with the levers *h* so as to sustain the front part of the rear catcher *c* when the guard *g* is down in normal position and release it when the guard *g* is raised, as explained.

2. A duplex fender or obstruction-remover for attachment to tram-cars consisting of a forward safety-guard in combination with a rear safety-catcher, the latter being normally held up clear of the track by a trigger operated automatically from the forward guard, and having two pivoted side arms with short hinged extremities capable of dropping within the groove of the rail for the purpose of braking the car, and an endless band passing over two rollers and being rotated by the friction of one of said rollers against the ground, and the means of operating the side nets, the



stop mechanism, and the sand-box for the purpose and substantially in the manner hereinbefore described.

3. The combination of the rear safety-catcher *c*, means for supporting the same normally in elevated position and the side guards *t* hinged to the catcher *c* and when the latter is in elevated position supported by clips *t'* and when the catcher *c* falls dropping automatically outside the rails as explained.

4. The combination of the hinged catcher

*c* pawl *p* attached thereto, and sand-box *s* having a sliding shutter *s'* engaged by the pawl *p* so as to open the sand-box and discharge sand in front of the wheel when the catcher falls, as explained.

In witness whereof I subscribe my signature in presence of two witnesses.

WILHELM MATTES.

Witnesses:

E. H. L. MUMMENHOFF,

OTTO W. HELLENRICH.