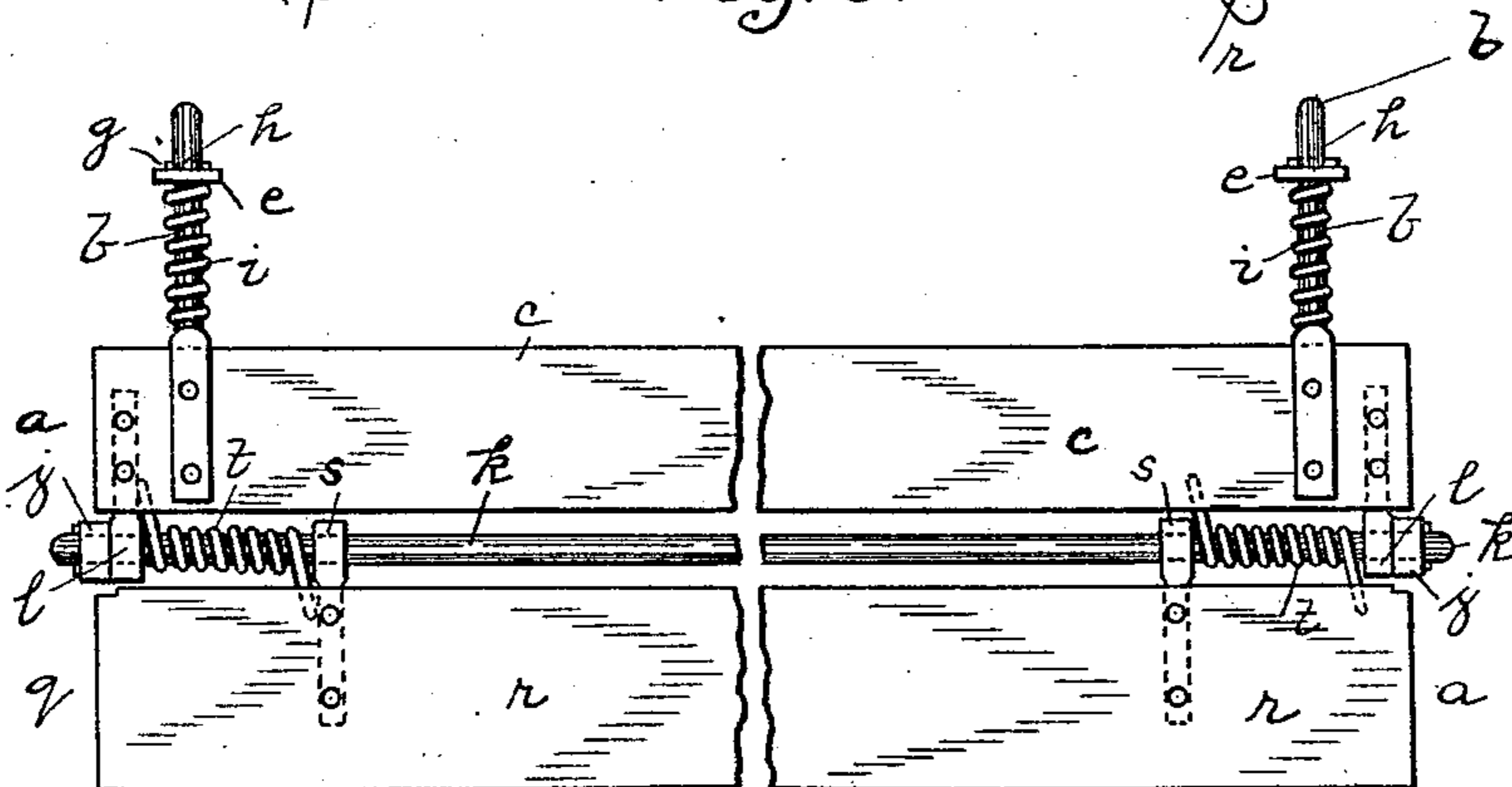
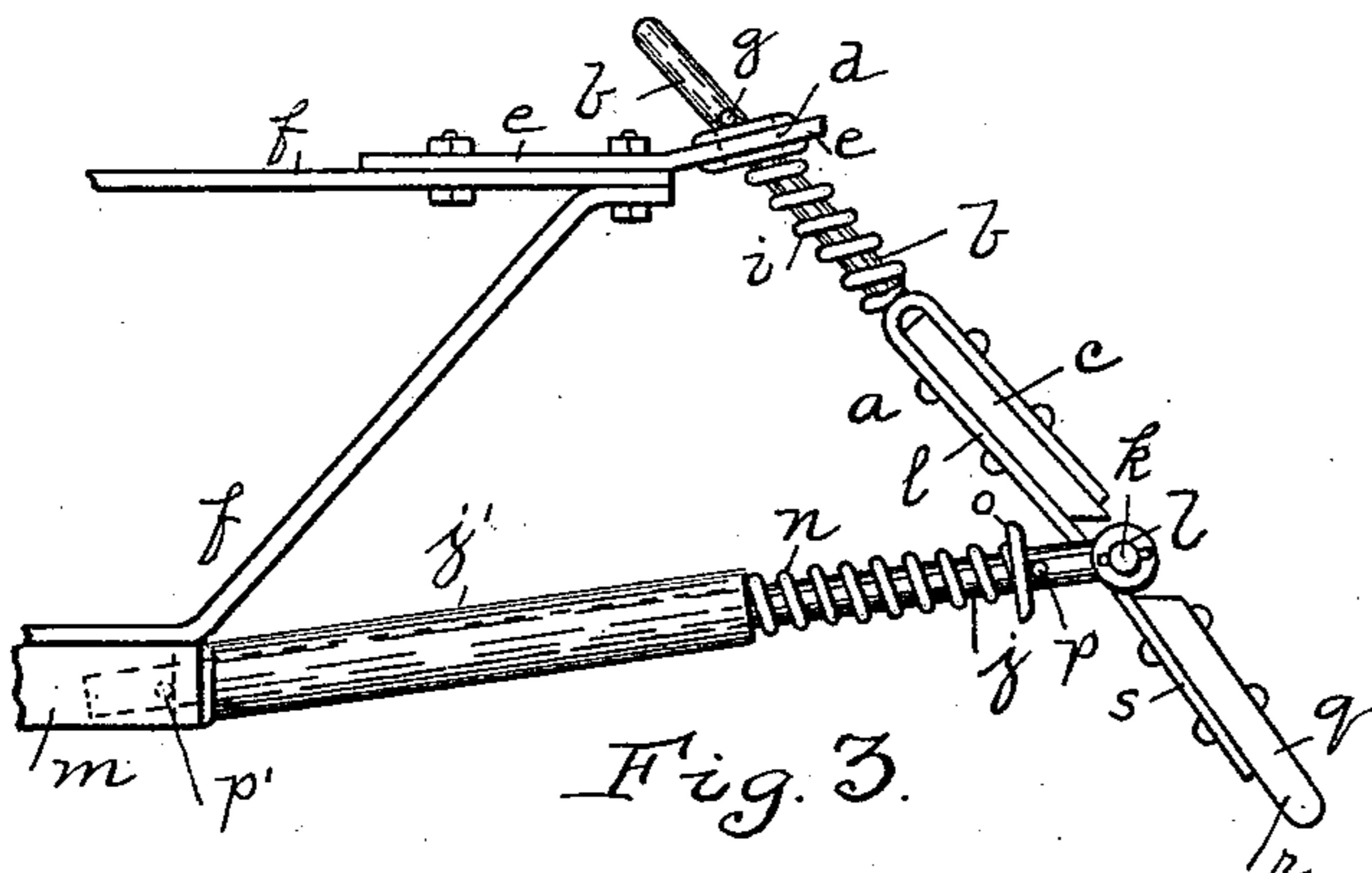
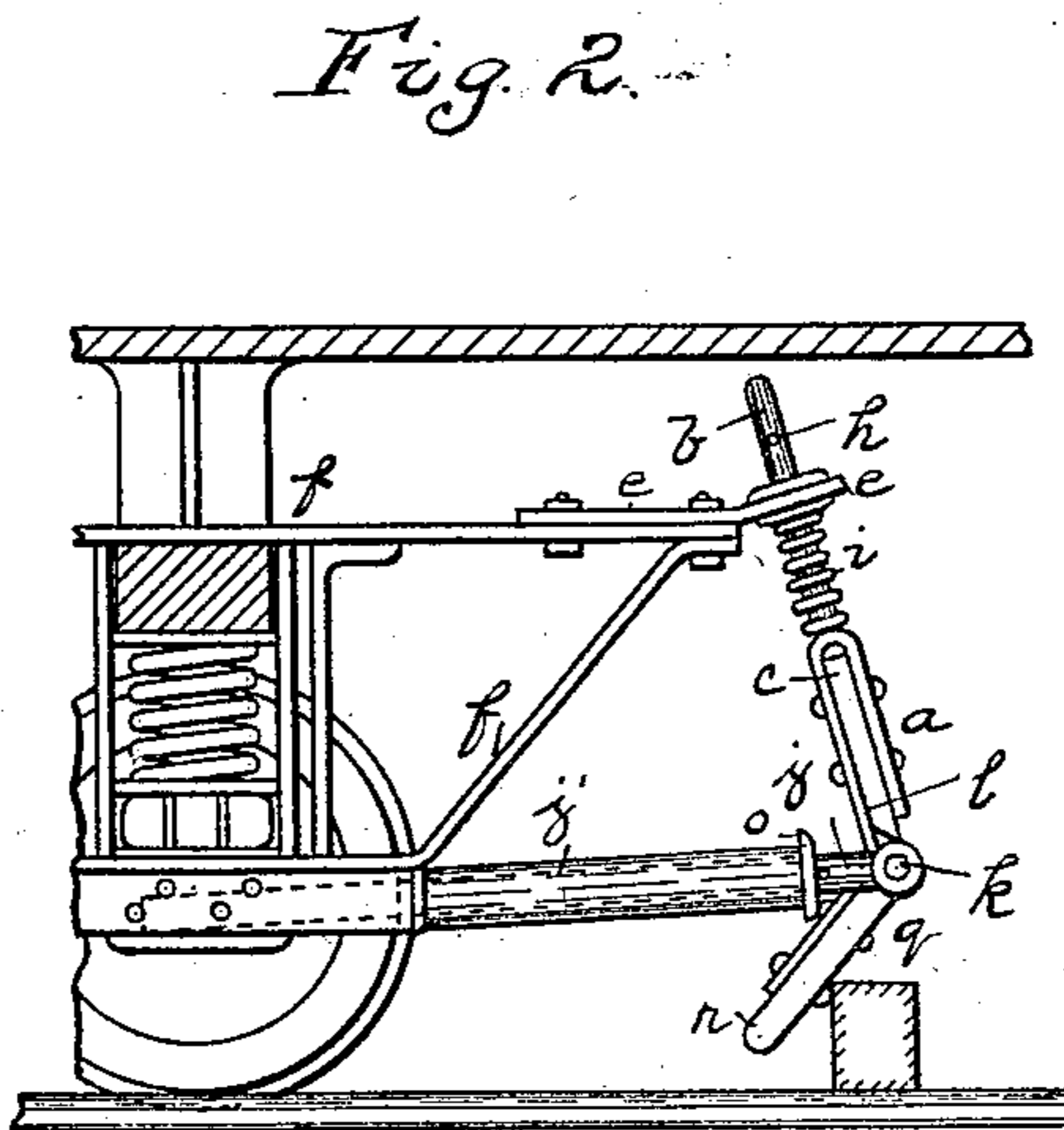
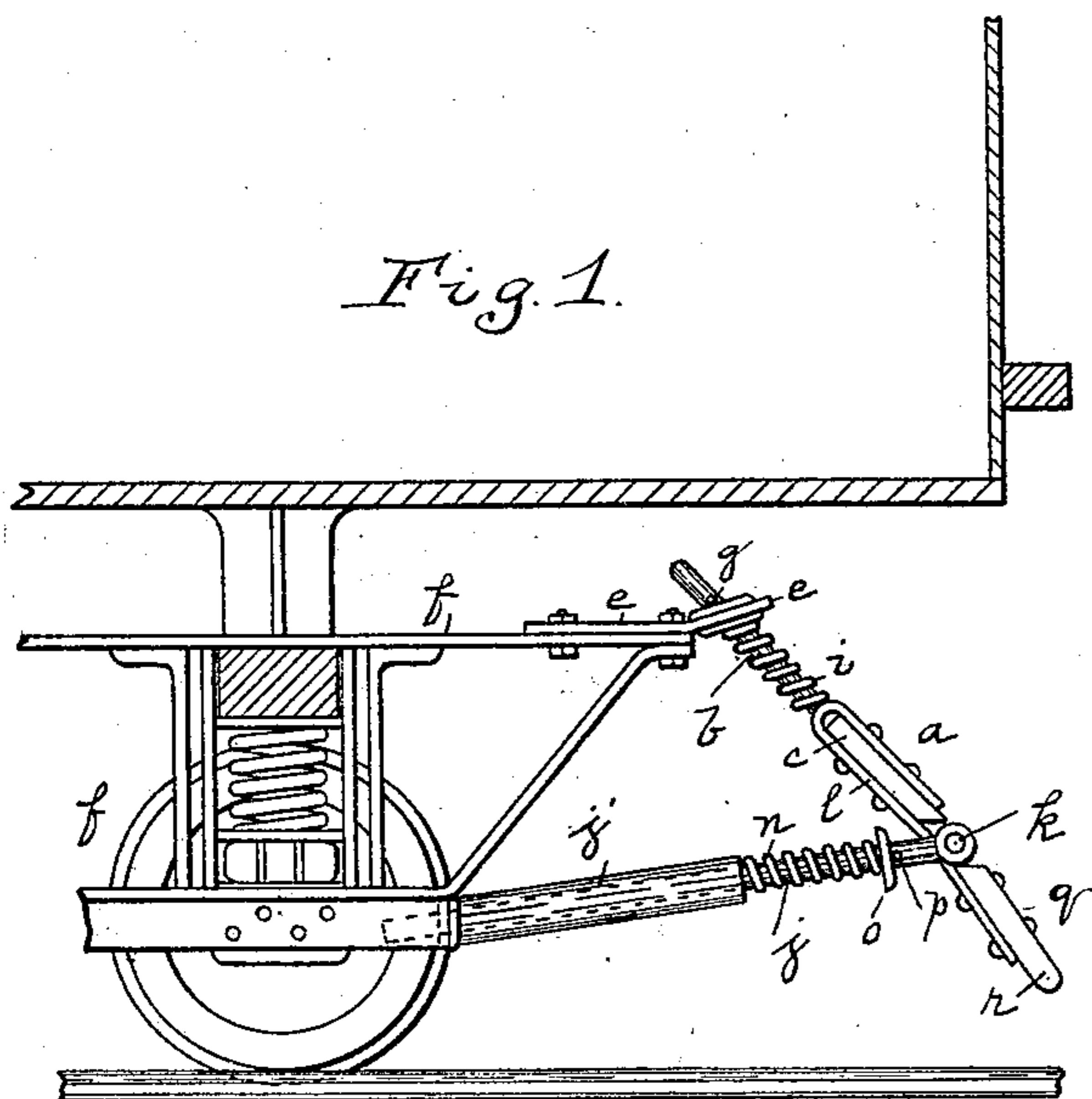


(No Model.)

R. A. CRAWFORD.
PILOT OR GUARD FOR CARS.

No. 521,307

Patented June 12, 1894.



Witnesses:
H. J. Martin,
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Fig. 4.

Inventor.

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UNITED STATES PATENT OFFICE.

ROBERT A. CRAWFORD, OF ALLEGHENY, PENNSYLVANIA.

PILOT OR GUARD FOR CARS.

SPECIFICATION forming part of Letters Patent No. 521,307, dated June 12, 1894.

Application filed September 27, 1893. Serial No. 486,587. (No model.)

To all whom it may concern:

Be it known that I, ROBERT A. CRAWFORD, a resident of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Pilots or Guards for Cars; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to pilots or guards for street cars, or like conveyances, whether electrically propelled or otherwise, its object being to provide a device which is simple in construction and manner of operation, and one which is capable of withstanding the severe strains and shocks which such devices necessarily have to encounter.

Many devices have been employed for the purpose of decreasing the liability to serious injury of persons overtaken by rapid transit cars and thrown down in the path thereof, but such devices have generally been impracticable, or soon rendered inoperative owing to the rough handling to which they were subjected. One of the severest shocks or strains which such pilots or guards encounter is when some permanent obstacle, such as a paving block, has in some way or another been raised sufficiently above the level of the street to form an obstruction against which the toe of the pilot or guard, necessarily moving in close proximity to the ground, impinges. I propose to relieve the shock or strain on the toe of the pilot or guard, as well as to improve the pilot or guard in other respects so as to provide devices which will withstand the severe usage to which such a pilot or guard is exposed.

To these ends my invention consists, generally stated, in the combination of a pilot or guard, a support therefor, a sensitive spring acting between the pilot and its support, a swinging toe at the lower end of said pilot, and a powerful spring controlling said toe.

It also consists in certain other details of construction and combination of parts, all of which will be more fully hereinafter set forth.

To enable others skilled in the art to make and use my invention, I will describe the same more fully, referring to the accompanying drawings, in which—

Figure 1 is a view of the front portion of a car with my improved pilot or guard applied

thereto. Fig. 2 is a like view showing the position of the same when it encounters an obstacle. Fig. 3 is an enlarged end view, and Fig. 4 is a front view.

Like letters here indicate like parts in each of the figures of the drawings.

My invention is applicable not only to what is commonly called the pilot and which is attached to the front end of the car, but also to a guard for the wheels and which is secured directly in front of the same.

I have illustrated my invention in connection with the wheel guard, and, referring to the drawings, the guard *a* consists of the rods *b* having secured thereto the fender *c* of wood or other suitable material. The rods *b* pass up through openings *d* in projecting supports *e* on the truck *f*, and are supported therein by means of the pins *g* which pass through holes *h* in said rods *b*. The said openings *d* are slightly elongated, as the rods *b* enter said openings at an angle, and accordingly said rods have a certain amount of play therein. The holes *h* may be formed at intervals in the rods *b* to provide for the adjustment of the said rods at different heights. Springs *i* encircle the rods *b*, said springs being interposed between the projecting supports *e* on the trucks and the fender *c*. To support the guard *a* at the proper angle with reference to the track, rods *j* are secured at their outer ends to the end of a shaft *k* journaled in rings *l* on the fender *c*, the inner ends of said rods *j* resting in suitable supports *m* on the truck *f* and adapted to slide to and fro therein, giving to said rods *j* a yielding action. In order that the rods *j* may support the guard *a* normally at the proper angle, the springs *n* encircle said rods, being interposed between the collars or rings *o* on said rods and the supports *m*. The collars or rings *o* may be held in position by means of the pins *p*, while pins *p'* prevent the withdrawal of said rods. In order to limit the yielding action of the rods *j*, tubular sections *j'* surround the said rods and the springs *n* so that upon the yielding of said rods the rings *o* thereon will come in contact with the forward ends of said tubular sections and prevent the further retreat of said rods, as the inner ends of said tubular sections abut against the supports *m*. Any other suitable

forms of stops may be employed instead of the tubular sections j' to regulate the distance to which the rods may recede. It is apparent, therefore, that the said rods j are capable of yielding when any compressive force is exerted at the forward ends thereof, and of moving back within the supports m , the springs n , however, acting to hold the said rods normally in their forward position.

By the above construction the guard a is supported at the proper angle with reference to the track, the springs i and n serving to give said guard the requisite rigidity to enable it to perform its work properly, while at the same time said springs are comparatively sensitive and are adapted to be compressed upon every slight shock or jar to which said pilot or guard is subjected.

Supported on the forward end of the guard a is the toe guard q . This toe guard q consists of the toe r , which may be formed of wood or any other suitable material, mounted loosely on the shaft k by means of the rings s on said toe. The toe r is thus free to swing upon the shaft k , but in order, however, to retain said toe normally at an inclined position with reference to the track and at the same time prevent said toe swinging back beneath said pilot or guard except in cases where said toe comes in contact with an immovable object, powerful springs t surround the shaft k , said springs engaging at one of their ends with the said toe r and at their opposite ends with the inner face of the fender c . In this manner the toe r is held at the proper angle, but upon sufficient force being exerted against said toe from in front to overcome the resistance of the springs t , the said toe is free to swing back in under the guard as shown in Fig. 2. I do not confine myself to the spiral springs shown in the drawings, as any other forms of springs may be employed with like effect.

When my invention is employed as a guard for the wheels, it is situated as illustrated directly in front thereof and is adjusted at the proper height above the level of the track. In case an individual is overtaken by the car and thrown down in front thereof, the guard a and toe guard q will prevent the individual from being crushed by the wheels passing over his body. The sensitive springs i on the rods b and the springs n on the yielding rods j , with an obstacle in front of the guard, will be compressed, said yielding rods retreating until the rings o thereon come in contact with the forward ends of the tubular sections j' , when further retreat is impossible. This action on the part of the yielding rods j has a tendency to bring the guard to approximately a vertical position, and consequently closer to the level of the track, as shown in Fig. 2. It is apparent that as the pilot or guard approaches a vertical position, or approximately so, the rods b will slide upwardly within the openings d in the supports

e and so aid to bring the forward or lower end of the pilot or guard closer to the track. In the meantime the toe guard q , through the action of the yielding rods j , is brought into contact with the track so that all liability of the wheels passing over the body of the individual on the track is removed, but as the springs t are sufficiently powerful to resist movable objects the toe guard q does not swing back farther, but simply moves in close proximity to the track in order to prevent any person falling in the path of the car from getting beneath the wheels. If, however, any immovable object is encountered the resistance of the powerful springs t is overcome and the toe guard swings back, as shown in Fig. 2, and having passed over said obstacle again resumes its normal position. The wear on the toe r of the toe guard q traveling in contact with the uneven track surface is obviated by the fact that said toe, being free to swing back under the guard, is permitted to pass readily over any fixed unevenness of surface. By having the rods b so arranged that they are free to move up and down within the openings d in the supports e , the strain on the guard is further relieved. It is apparent that the toe guard may be applied to any well-known pilots or guards. It affords also a convenient support for brushes or knives to clear the snow from the track, as they too will pass over immovable objects in their path, and so relieve the wear and tear on said brushes and knives.

My improved pilot or guard can be readily adjusted to any style of car or truck, and can be carried in close proximity to the track surface without liability of injury from any unevenness thereof. It requires no oiling and possesses the qualities of lightness, simplicity and durability.

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

1. The combination of a pilot or guard, a support therefor, a sensitive spring acting between the pilot and its support, a swinging toe at the lower end of said pilot, and a powerful spring controlling said toe, substantially as and for the purposes set forth.

2. A pilot or guard having spring-actuated rods sliding upwardly in suitable supports on the car-body or truck, and yielding rods secured to the lower end of said pilot or guard and adapted to support said pilot or guard at the proper angle, substantially as and for the purposes set forth.

3. A pilot or guard having rods sliding upwardly in suitable supports on the car-body or truck, springs interposed between said supports and the body of the pilot or guard, and yielding rods secured to the lower end of said pilot or guard and adapted to support said pilot or guard at the proper angle, substantially as and for the purposes set forth.

4. A pilot or guard having spring-actuated rods, sliding in suitable supports on the car-

body or truck, rods to support said pilot or guard at the proper angle, said rods being secured at their outer ends to said pilot or guard, the inner ends of said rods resting in
5 suitable supports, and springs interposed between rings on said rods and said supports, whereby said rods act to retain the pilot or guard at the proper angle, substantially as and for the purposes set forth.

10 5. A pilot or guard having rods sliding upwardly in suitable supports on the car-body or truck, springs interposed between said supports and the body of the pilot or guard, yielding rods secured to the lower end of said
15 pilot or guard and adapted to support the same at the proper angle, and means for regulating the distance to which said rods may recede, substantially as and for the purposes set forth.

20 6. A pilot or guard having yielding rods secured to the lower end of said pilot or guard to support said pilot or guard at the proper angle, sensitive springs interposed between shoulders on said rods and permanent abut-
25 ments, stops adapted to regulate the distance to which said rods may recede and with which said shoulders are adapted to contact, and a swinging toe at the lower end of said pilot or

guard operated by a powerful spring, substantially as and for the purposes set forth.

30 7. A pilot or guard having yielding rods secured to the lower end of said pilot or guard to support the same at the proper angle, sensitive springs interposed between shoulders on said rods and permanent abutments, tubu-
35 lar sections surrounding said rods, and a swinging toe at the lower end of said pilot or guard operated by a powerful spring, substantially as and for the purposes set forth.

8. A pilot or guard having rods sliding up-
40 wardly in suitable supports on the car-body or truck, sensitive springs interposed between said supports and the body of the pilot or guard, yielding rods and means for regulat-
45 ing the distance to which said yielding rods may recede, and a swinging toe at the lower end of said pilot or guard operated by a powerful spring, substantially as and for the purposes set forth.

In testimony whereof I, the said ROBERT A. CRAWFORD, have hereunto set my hand. 50

ROBERT A. CRAWFORD.

Witnesses:

JAMES A. WOOD,
JONATHAN W. CHAPIN.