

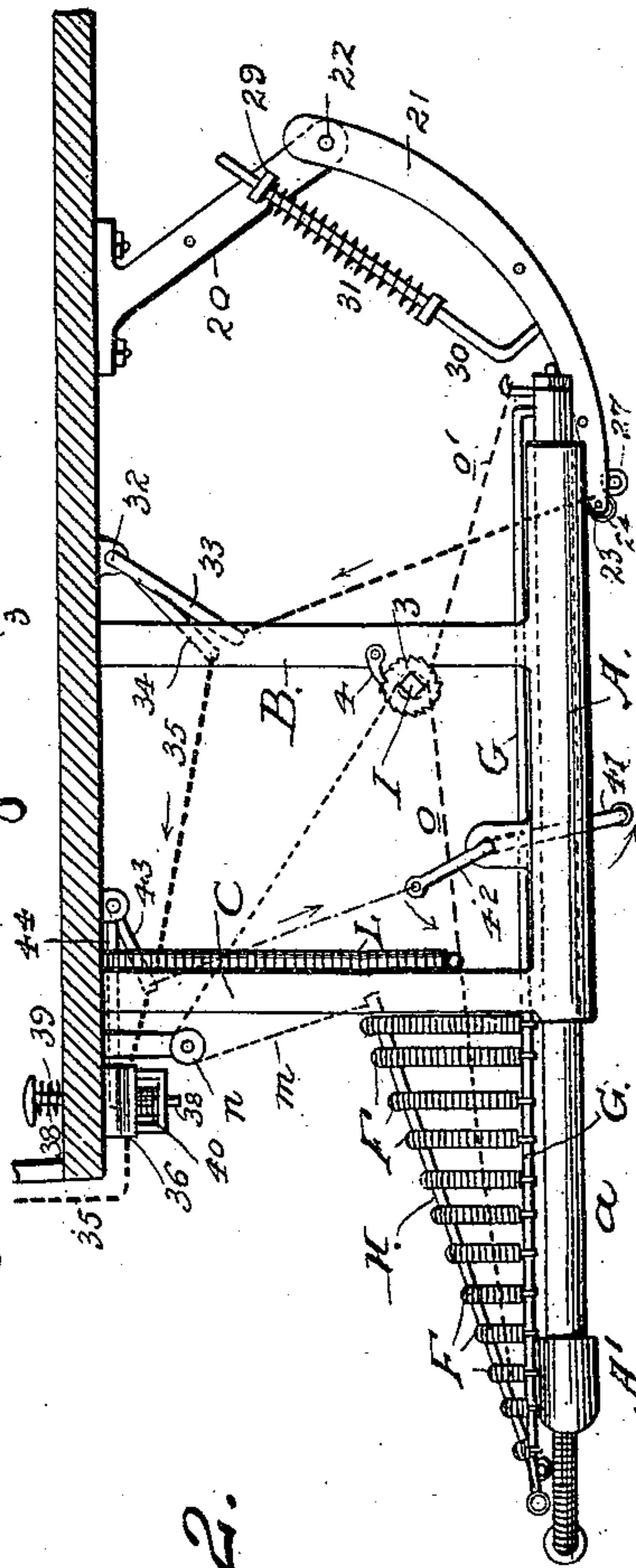
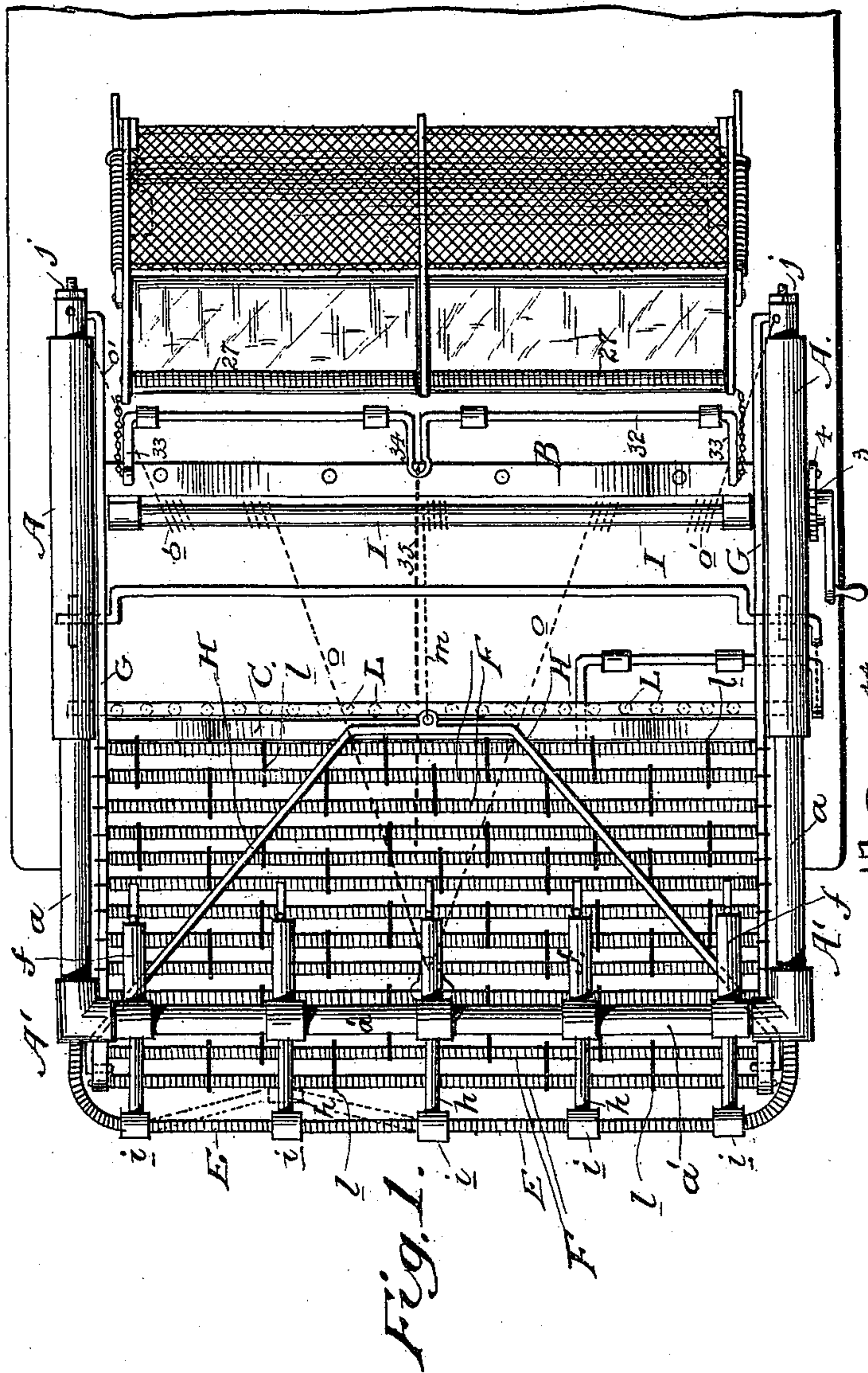
(No Model.)

3 Sheets—Sheet 1.

F. B. CROOKER.
CAR FENDER.

No. 547,628.

Patented Oct. 8, 1895.



WITNESSES
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(No Model.)

3 Sheets—Sheet 2.

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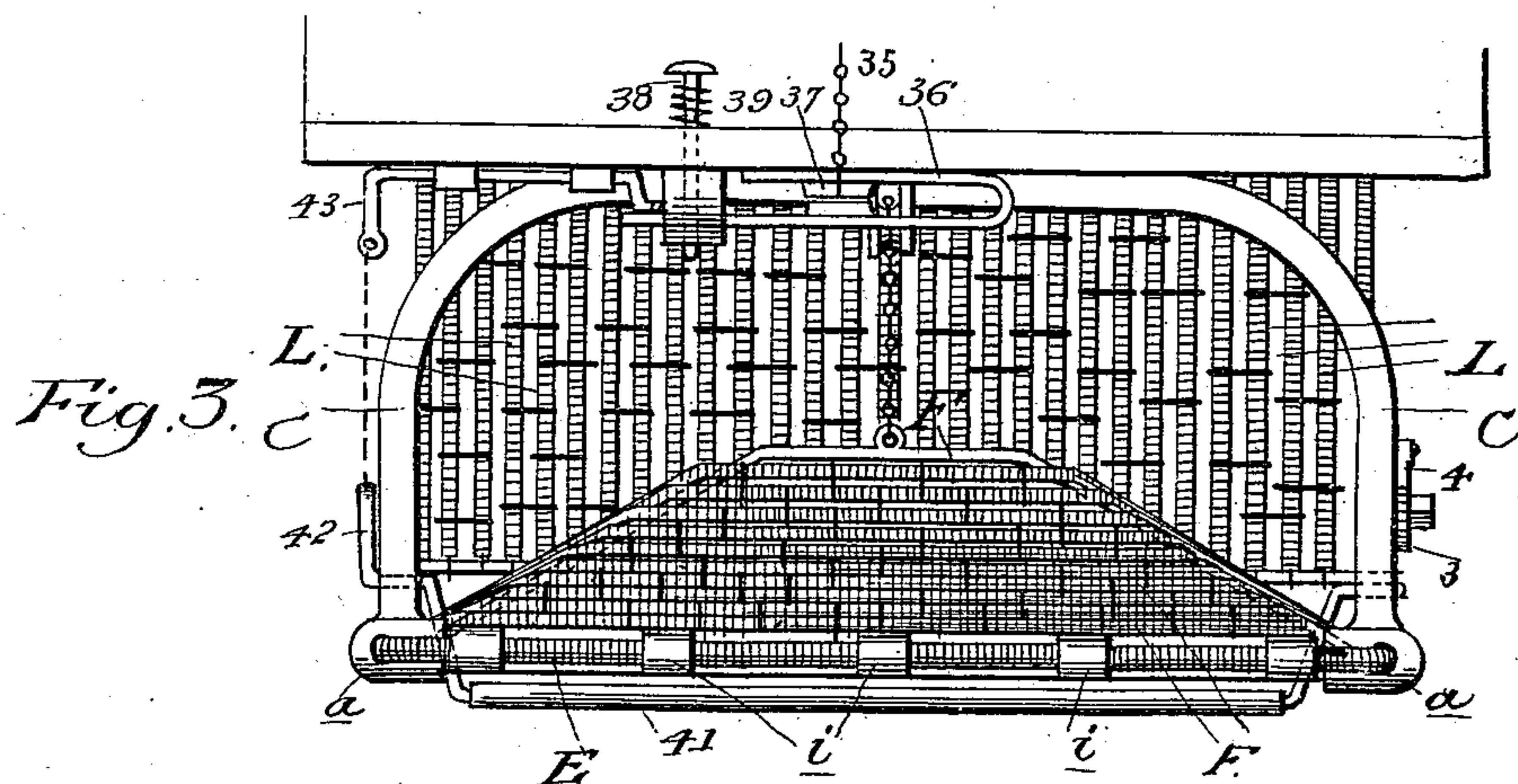


Fig. 8.

Fig. 9.

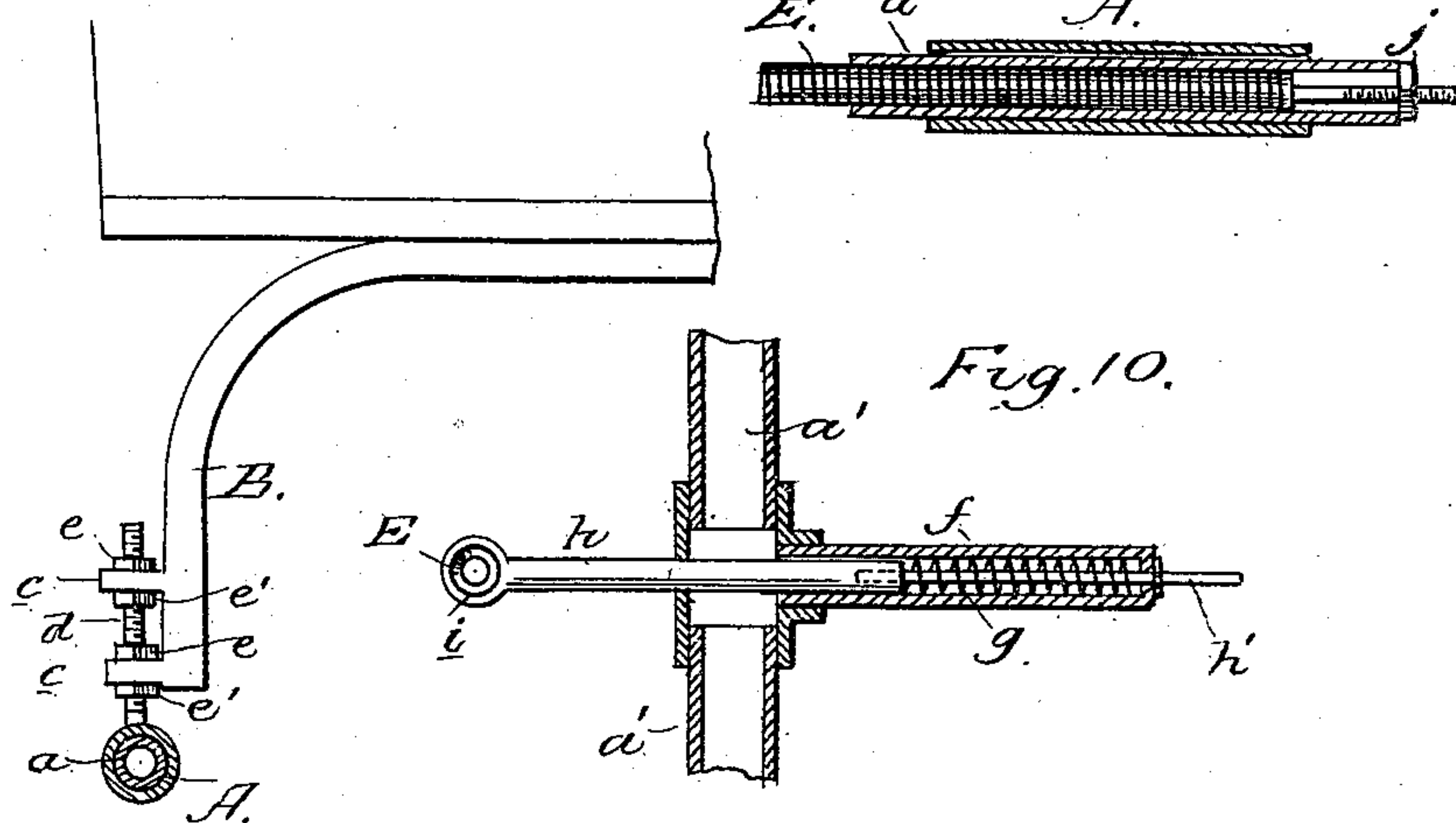


Fig. 10.

Fig. 11.

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3 Sheets—Sheet 3.

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Fig. 4.

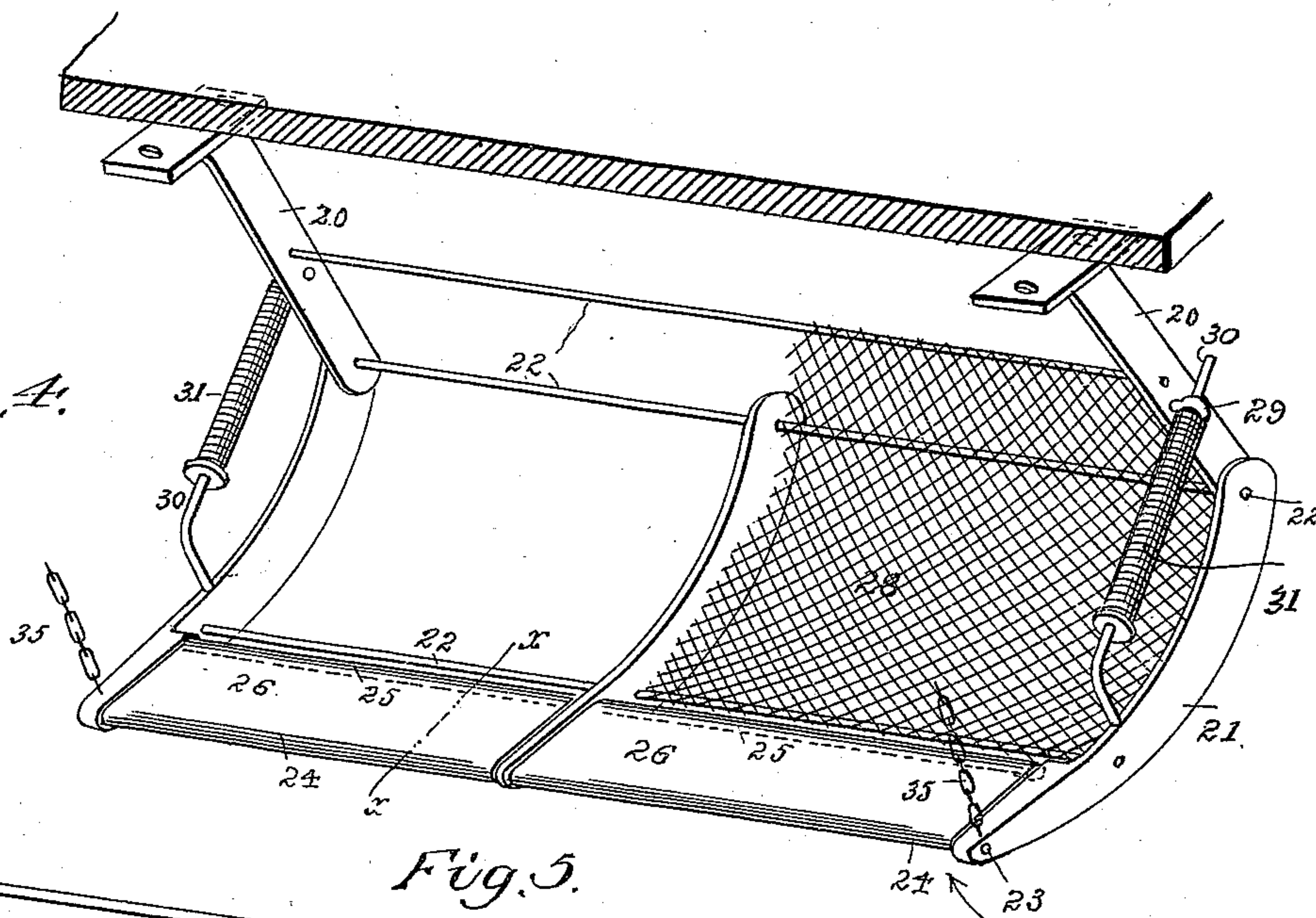


Fig. 5.

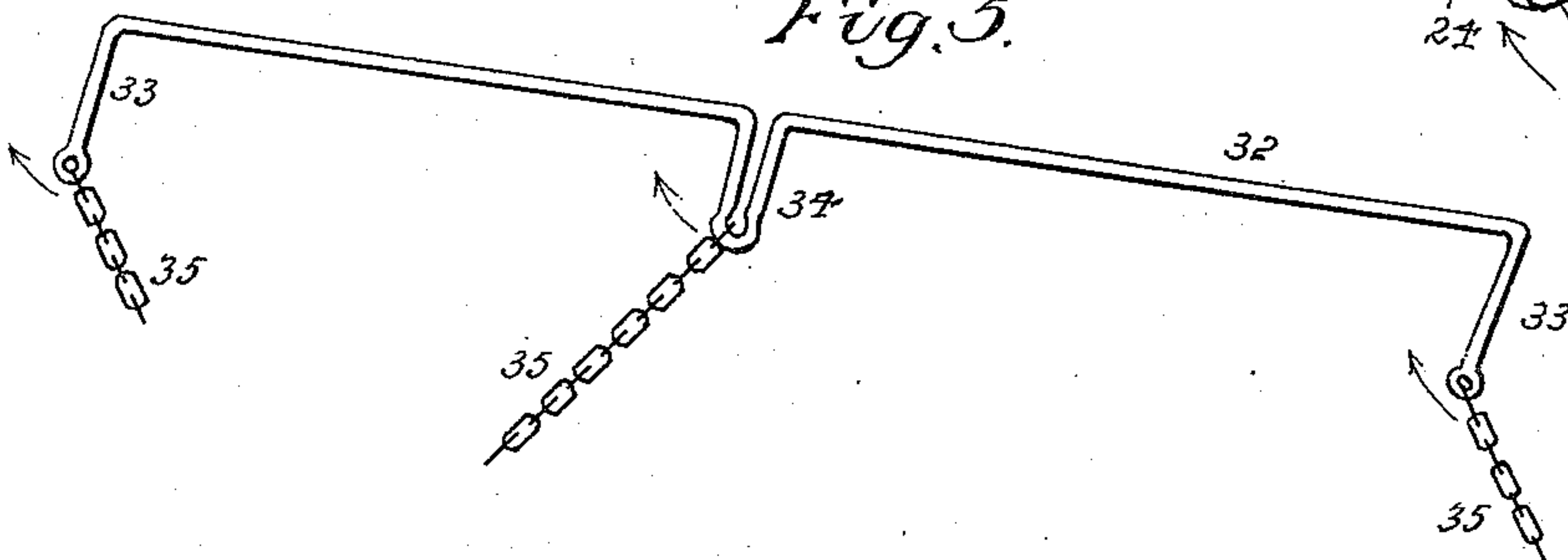


Fig. 6.

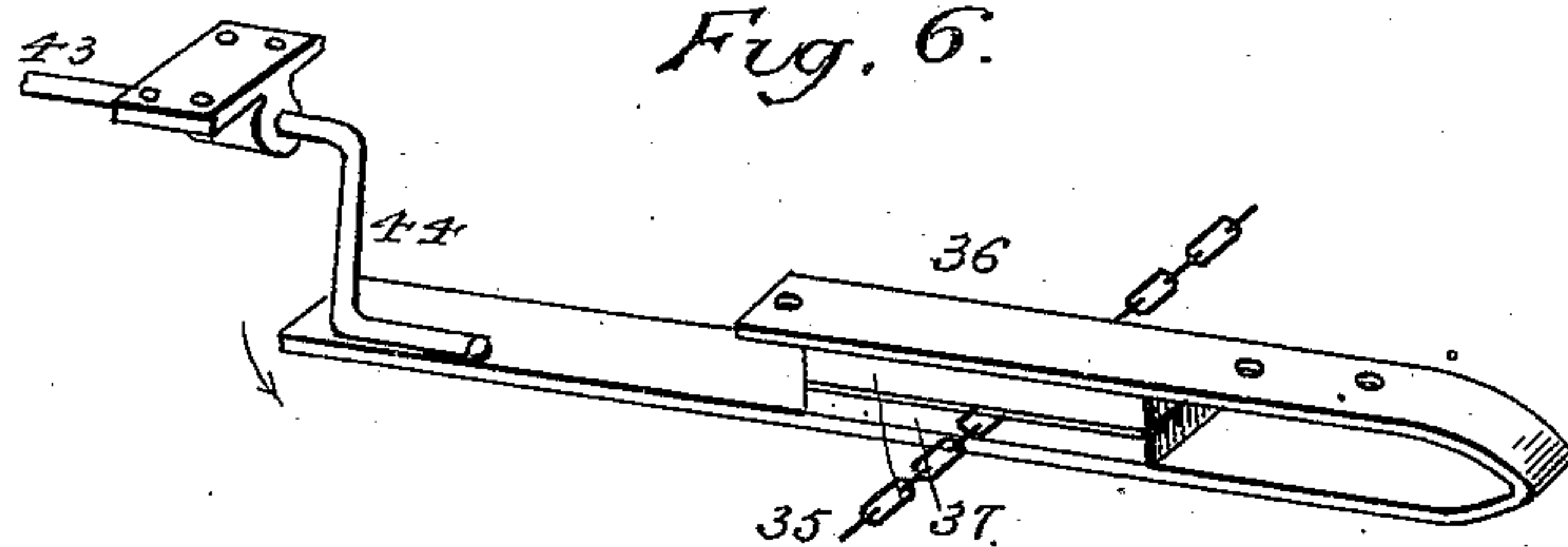
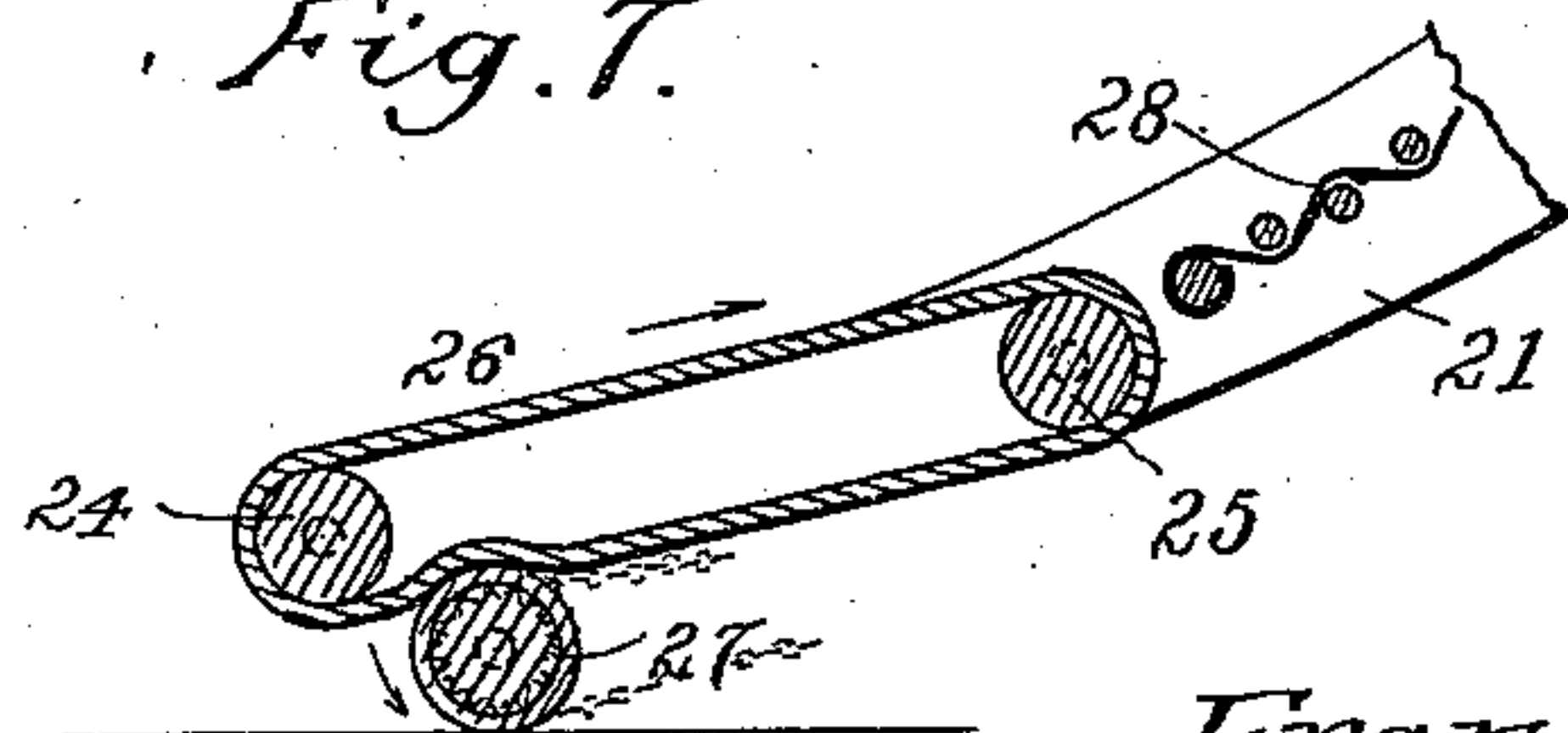


Fig. 7.



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UNITED STATES PATENT OFFICE.

FRANK B. CROOKER, OF FITCHBURG, MASSACHUSETTS.

CAR-FENDER.

SPECIFICATION forming part of Letters Patent No. 547,628, dated October 8, 1895.

Application filed April 3, 1895. Serial No. 544,333. (No model.)

To all whom it may concern:

Be it known that I, FRANK B. CROOKER, a citizen of the United States, residing at Fitchburg, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Car-Fenders; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to that class of safety appliances designed for the protection of human life and the reduction to the minimum of the chances of persons being permanently maimed in the event of their being struck by or falling in front of public vehicles, such as street-cars.

My invention has particular reference to that class of such devices usually designated as "fenders," in which the fender is carried at one or both ends of the car and is so disposed that it projects a sufficient distance in front of the front platform of the car, whereby a person in falling upon the fender or being tripped by the fender striking him will have the shock modified by a cushion effect, produced by reason of the yielding nature of the device with which he contacts and upon which he falls.

My invention consists of the parts and the constructions, arrangements, and combinations of parts, which I shall hereinafter fully describe and claim.

Figure 1 is a bottom plan view of a car-fender embodying my invention. Fig. 2 is a side elevation of the same, showing the spring-platform elevated. Fig. 3 is a front view. Fig. 4 is a perspective view of the wheel-guard detached. Fig. 5 is a detail of the crank-shaft 32. Fig. 6 is a detail of the gripping-jaws. Fig. 7 is a sectional view on the line $x x$ of Fig. 4. Fig. 8 is a modification showing a means for vertically adjusting the stationary frame. Figs. 9 and 10 are enlarged details to be referred to. Fig. 11 is a modification of the swinging frame H.

In carrying out my invention I aim to construct the parts as strongly as possible, while at the same time reducing the weight of the fender to a minimum. With this idea in view I prefer to use metal tubing in the construction of many parts of the device, as being the

lightest and yet cheapest and strongest material for my purpose.

The fixed portion of my frame consists of horizontally-disposed metal tubes A, rigidly supported from the body of the car by means of arched or bent rods B C, one of which is arranged near each end of the tubes A, and said tubes being practically in a plane coincident with the plane of the sides of the car, although they may be located inside or outside of the plane of the sides of the car-body, as may be desired, without departing from the spirit of my invention, the said tubes being disposed at a suitable distance above the road-bed and the rails to hold the front of the fender low enough to prevent the possibility of any one falling in front of the fender from being forced under the same and thereby injured.

A' represents a frame, which is designed to slide in the fixed frame formed by the tubes A and their supports, the slidable frame consisting of sides a , connected at their front ends by means of T-couplings with a cross-piece a' , and the said sides and cross-piece, being of tubular material, possessing extreme lightness and strength and combining with the fixed tubes to produce a telescopic frame, one section of which is rigid, while the opposite section, which constitutes the fender proper, is adapted to be moved horizontally in and out to bring it into an operative position, to render it inoperative, or drawn in under the car-body, when desired, by means of a mechanism I will hereinafter describe. This telescopic frame may, if preferred, have a vertical adjustment, obtained by providing one or both of the supports B C with ears or bearings c , through which pass vertical screws or threaded rods d , secured to the side tubes in any suitable manner, as shown in Fig. 8. These screws or threaded rods are also provided with adjusting-nuts e and jam-nuts e' , whereby when any desired vertical adjustment of the fender is secured it may be maintained until a new adjustment is required. This adjustment regulates the height of the fender from the ground or road-bed, and this height may be modified at pleasure by the simple operation of the nuts before mentioned.

Projecting inwardly from the cross-tube a'

at the front of the slidable frame are tubular sleeves or sockets *f*, within which are placed springs *g*, and slidably mounted within these sleeves or sockets and projecting through the transverse tube at the front of the fender are a series of tubes or rods *h*, which are acted upon by the springs *g* to keep the rods normally projected outward beyond the front of the slidable frame proper. The forward ends of these slidable tubes or rods are provided with sleeves or guides *i*, through which pass a coiled wire or other flexible medium *E*, forming the front of the fender, the said flexible front having its ends passed through the tubular side portions of the slidable section of the telescopic main frame and having its terminals connected with any well-known form of tightening medium *j*, whereby the tension of the coiled wire front or elastic medium *E* may be regulated.

By reason of the foregoing construction the entire front of the fender is made elastic or yielding, and when an obstruction strikes any part of the coiled wire front of elastic medium *E* the latter immediately yields inwardly and communicates its movement to the contiguous slidable tube or rod *h*, with the result that the said tube or rod (or more than one) will be forced inward against the power of its own spring, as shown by the dotted line in Fig. 1, thereby producing a cushion effect, which greatly relieves the shock incident to a body contacting with a hard and unyielding surface.

In Fig. 10 the tube or rod *h* is shown as having a smaller tube or rod *h'*, screwed into its inner end to provide a shoulder against which one end of the internal spring bears, the outer end of this spring bearing against the closed end of the tube *f*, projecting from the transverse tube *a'*. This makes a simple and desirable construction of these parts.

The top or platform of my fender consists of tightly-coiled wire springs or other equivalent flexible material, forming a soft and yielding surface for any body falling upon it. These springs *F* have their ends connected with rods *G*, extending parallel with the sides of the telescopic frame and secured in any well-known manner to the slidable member thereof, and the springs *F* are kept from spreading apart and thereby allowing a body to fall through them by means of loops or links *l*, which connect adjacent springs, or by any other well-known method.

Either the forward ends of the rods *G* or some other portion of the slidable frame, preferably in advance of the cross-tube *a'*, is provided with bearings for the outer ends of the arms of the V-shaped bail or swinging frame *H*, which lies directly under and supports the springs of the top or platform of the fender, and also furnishes the medium by which these springs are drawn under tension and caused to assume their operative position, as shown in Fig. 3. The inner end of this swinging frame or bar occupies a central position un-

der the flexible top or platform, and it may be provided with an opening 2. (Shown in Fig. 11.) This opening will be found of advantage on those cars which employ a draw-bar that usually extends a short distance beyond the front of the car, and this opening is designed to receive said draw-bar.

The inner or movable end of the swinging frame or bar *H* is connected with a chain, rope, or equivalent device *m*, which extends upwardly and over a guide-pulley *n*, and thence to and around a shaft *I*, extending transversely across the fixed portion of the main frame and journaled in bearings in or on the arched bar or support *B* thereof, the said shaft having one end formed to receive a crank or other device by which the shaft is turned, and said shaft having a ratchet-wheel 3, secured to it and adapted to be engaged by a pawl 4, whereby the shaft is held against rotation.

Chains or ropes *o* have their forward ends connected with the front portion of the slidable frame *A'* at either the center or sides, and thence extend backwardly, preferably at an angle, and have their inner ends secured to the shaft *I* and adapted to be coiled around the same. In addition to these chains I employ other chains or ropes *o'*, having one end secured to the shaft and the opposite end secured to the rear of the slidable frame, these latter chains being wound upon the shaft in a reverse direction to the winding of the chains or ropes *o*, whereby they are unwound as the chains *o* are wound upon the shaft to draw the frame inward, and are in turn wound around said shaft to draw the slidable frame outward in the reverse movement of the parts.

The operation of this invention is substantially as follows: Each car will preferably be supplied with one of the fenders at each end, and when the car is about to be started on its trip the shaft *I* will be rotated to cause the chain or rope *o'* to pull the fender into its forward operative position in front of the car. In the first portion of the movement of the slidable frame the spring top or platform is horizontal throughout, and as the chain or rope *m* shortens because of its being wound upon the shaft as the latter is turned it pulls upon the free end of the swinging frame or bar *H* and draws it upward, thereby stretching the springs or flexible medium which forms the top or platform of the fender and causing them to assume the position shown in Fig. 3. The parts are held in this position by the pawl-and-ratchet mechanism of the shaft *I* and are in operative position to receive and form a safety appliance to prevent a person falling in front of the car being injured or killed by the car passing over him. A person on being struck by the car or falling in front of it would strike the fender, and the latter, being of yielding nature throughout, would safely hold that person against serious injury until the car could be stopped. At the end of the trip the shaft *I* is rotated to return the parts to their

original position under the car-body, and the fender at the opposite end will be drawn into operative position for the return trip in the same manner and by the same arrangement of devices as previously described. As a further protection to a person falling on or in front of the fender and to prevent such person rolling or being carried over the fender and under the wheels, I protect the space between the inner end of the spring top or platform and the front of the car-body and cover any projection on the car-body by means of vertically-disposed springs or elastic material L, as shown in Figs. 1 and 3, and connect them one with another to prevent their spreading apart in substantially the same manner as described for the springs of the top or platform of the fender. These springs L are secured at the top and bottom to the fixed frame or other part of the structure in any well-known manner.

This fender is light and secure and may be cheaply constructed. Its spring top or platform and spring front will reduce the blow or force of a person struck, so that if such a person is tripped by the spring front the blow would be of a yielding nature and he would fall without material shock upon the spring top or platform as the car advances.

A few turns of the shaft I will set the fender and elevate the spring top or platform to its operative position or return the parts to normal inoperative position. It may be readily attached to any form of car. It is closed from the floor of the car to the inner rear end of the fender, whereby it is impossible for a person to get under the wheels, and it is of few parts and readily repaired if broken.

To further offer a safeguard to any one who might by any possibility get under the fender, I employ a wheel-guard, whose construction is fully shown in Figs. 4 and 7. This guard is located just in front of the wheels of the car and between the same and the rear end of the fender, and it comprises the following construction: Depending from the car-body are arms or brackets 20, to the lower portions of which are pivotally suspended curved arms 21, suitably joined by rods or bars 22 at opposite ends and at one or more intermediate points to form a swinging frame. The upper rod serves as the pivotal connection for this frame, while upon the lower rod or shaft 23 are rolls 24, around which and a second set of rolls 25, also suitably mounted in the swinging frame, endless belts or aprons 26, of flexible material, are passed. Contiguous to the forward under side of these aprons or belts are rolls 27, whose upper surfaces are designed to press against the belts with sufficient power to cause them to travel and whose under surfaces are designed to be forced into contact with the ground, whereby the rolls are rotated by the travel of the car and the frictional contact of their surfaces with the ground, and whereby when the guard is dropped or depressed, as I will hereinafter in-

dicating, its rolls 27 will rest upon the ground and cause the belt to roll in an opposite direction, so that a person contacting with either of the aprons or belts will be rolled rearward along the belt and will be safely deposited in the wire-netting or other material 28, with which the curved swinging frame is covered. If desired, the roll 27 may be positively driven by belt or chain. (See Fig. 7.)

On or in the depending arms or brackets 20 are guides 29, and pivotally mounted on the side arms 21 of the swinging frame are rods 30, adapted to pass through said guides 29, while on the rods 30 are springs 31, which are designed to force the forward end of the swinging frame downward when the holding devices are released, as I will hereinafter indicate. A crank-shaft 32, suitably journaled on the car-body, has its end cranks 33 connected in any suitable manner with the free end of the swinging guard-frame, and it also has a crank-arm 34, to which a chain or connection 35 is attached.

At the forward under portion of the car-body is secured a return spring-plate 36, each of whose members has a coincident jaw 37, between which the free end of the chain or connection 35 is passed, and thence extends upwardly to within easy reach of the motorman in any suitable manner. The spring-plate 36 is operated by a rod 38, which passes through it and has a collar or shoulder adapted to press against the free member of the plate, whereby when the rod is depressed by the motorman this free end of the plate is forced downward to open or separate the jaws 37 and allow the chain or connection to run through them and the swinging guard-frame to drop to its lowered position. Springs 39 and 40 on the rod 38 assist in returning the parts to normal position after being once depressed, and when the motorman pulls the chain forward to again elevate the wheel-guard these springs close the jaws tightly upon the chain and hold it securely.

Under the car, just back of the rear or inner end of the fender, is a swinging bail or board 41, having a crank-arm 42, which is suitably connected with an arm on a crank-shaft 43, which said shaft has a second arm 44, whose free end lies in the plane of the free member of the spring-plate 36, whereby the body of a person or other obstruction striking this swinging bail or board 41 will cause the arm 44 to depress the free member of the spring-plate 36 and open the jaws, so that the swinging wheel-guard will be automatically dropped to operate as before described.

In its normal position the lower extremity of the wheel-guard will be a few inches above the track; but in the event of an emergency it is readily dropped to its lowermost position, as before described. The swinging bail or board should preferably be covered with rubber or flexible material, and the wheel-guard is located between the sliding frame of the

fender, while the swinging bail is best attached to the forward end of the stationary frame.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a fender, a telescopic frame consisting of a member fixedly supported from the car body, a second member slidable in the fixed member and provided at its front end with elastic cushions or springs, means for connecting the cushions or springs one with the other to prevent spreading, and means for operating the movable member of the frame to draw it beneath or project it from the car body.

2. In a fender the combination, of tubes supported from the sides on the car body, a frame having side members slidably mounted in said tubes, coiled springs or elastic medium traversing the front portion of the slidable frame, and forming a yielding top or platform, means for connecting one spring with another to prevent their spreading, and a coiled spring or elastic medium located in front of the slidable frame and supported therefrom by inwardly yielding connections, said connections being slidably mounted in the front portion of the outer movable frame, and connected at the outer ends with said front spring or elastic medium.

3. In a fender, the tubes fixedly supported from the car body, a slidable frame of tubular material consisting of side members slidable in said tubes, and a tube connecting the said side members at the forward portions, tubes or sleeves projecting inwardly from the transverse tube of the slidable frame, tubes or rods slidably mounted in said tubes or sleeves, springs within the sleeves acting upon said tubes or rods, a coiled spring or elastic medium passing across the front of the slidable frame and through bearings or guides in the spring-actuated tubes or rods, and other springs or elastic medium traversing the front portion of the slidable frame from side to side, and forming a cushioned top or platform.

4. In a fender, the combination, of tubes fixedly supported from the car body, a frame slidably mounted in said tubes, rods or tubes parallel with the side members of the slidable frame and connected therewith, springs traversing the front of the fender and connected with said rods, means for connecting the springs at points in their length to prevent spreading, and a coiled spring or elastic medium yieldingly supported from the slidable frame and extending across the front of said frame.

5. In a fender, the combination, of a fixed frame, a frame slidably mounted therein and having its forward portion provided with a spring or elastic medium which passes around the front of the fender, and rods or tubes yieldingly mounted in the front of the slidable frame and having their outer ends provided with sleeves or guides through which the spring or elastic medium at the front passes,

and is yieldingly supported, said front spring having its ends passing through the slidable frame, means whereby the tension of said spring is regulated and a spring or yielding top or platform carried by the slidable frame back of the front spring thereof.

6. In a fender, the fixed frame and a frame slidably mounted, in combination with means whereby the slidable frame is moved consisting of a shaft journaled on the fixed frame, chains or connections secured to said shaft and to the forward portion of the movable frame to move the latter in one direction, chains or connections from said shaft to the rearward portion of the slidable frame to move the latter in the opposite direction, said chains or connections being reversely wound upon the shaft whereby one pays out while the other is being wound, and a pawl and ratchet mechanism for holding the shaft after being turned.

7. In a fender, the fixed and movable members of a telescopic frame, said movable member having a spring or yielding top or platform, in combination with a swinging frame or V-shaped bar or rod pivotally mounted at its forward end to the movable member of the telescopic frame, a shaft and connections for effecting the movement of the movable member, and a connection from said shaft passing through or over a guide on the car body and connected with the free end of the swinging frame whereby said frame is raised and lowered simultaneously with the projection and retraction of the slidable member of the telescopic frame to raise and lower the spring top or platform of the fender.

8. In a fender having a yielding top or platform at its forward portion, a swinging frame beneath said top or platform and a means for raising the swinging frame to elevate the top or platform consisting of a turnable shaft and a connection therefrom to the free end of the frame.

9. In a fender, a fixed frame and slidable frame mounted therein, a spring or yielding top or platform carried by the movable frame, and vertically disposed springs or elastic medium connected with the movable frame and occupying the space between the inner portion of the spring top or platform and the car body, and forming a fender or shield at the back of the main portion of the spring top or platform the springs of the top or platform and the vertical springs being arranged in parallel series and the contiguous springs being connected by devices to prevent them spreading apart.

10. In a fender a guard for the wheels of the car consisting of a pivotally suspended frame covered with netting of flexible material, an endless traveling apron or belt at the lower extremity of the frame, and a roll under the apron adapted to contact with the roadway and with the belt for operating the latter.

11. In a fender, a guard for the wheels of a

car consisting of a pivotally mounted frame covered with flexible material, an endless traveling apron at the forward end of the frame and a roll beneath the apron and engaging and operating the same.

12. In a fender, a guard for the wheels thereof, consisting of a pivotally mounted frame provided with a flexible covering, endless aprons or belts at the forward end of the frame, and carried thereby, rolls beneath the aprons for operating them by contact of the rolls with the ground and aprons, means for holding the frame elevated, and means for releasing the frame and causing it to be depressed.

13. In a fender having a pivotally mounted frame provided with a flexible covering, a means for holding the same elevated comprising a crank shaft connected with the frame, a chain or connection from the shaft, gripping jaws by which the chain is held and

means for opening and separating the jaws to release the chain.

14. In a fender having a pivotally mounted frame provided with a flexible covering, a crank shaft and chain or connection whereby the frame is held in an elevated position, gripping jaws for securing the chain, a swinging bail or frame in advance of the pivoted fender frame adapted to contact with the ground, and a crank shaft connected with the bail or frame having an arm adapted to engage and separate the gripping jaws when the bail meets with an obstruction whereby the fender holding devices are automatically released.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK B. CROOKER.

Witnesses:

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HARRY W. WALLACE.