

No. 751,112.

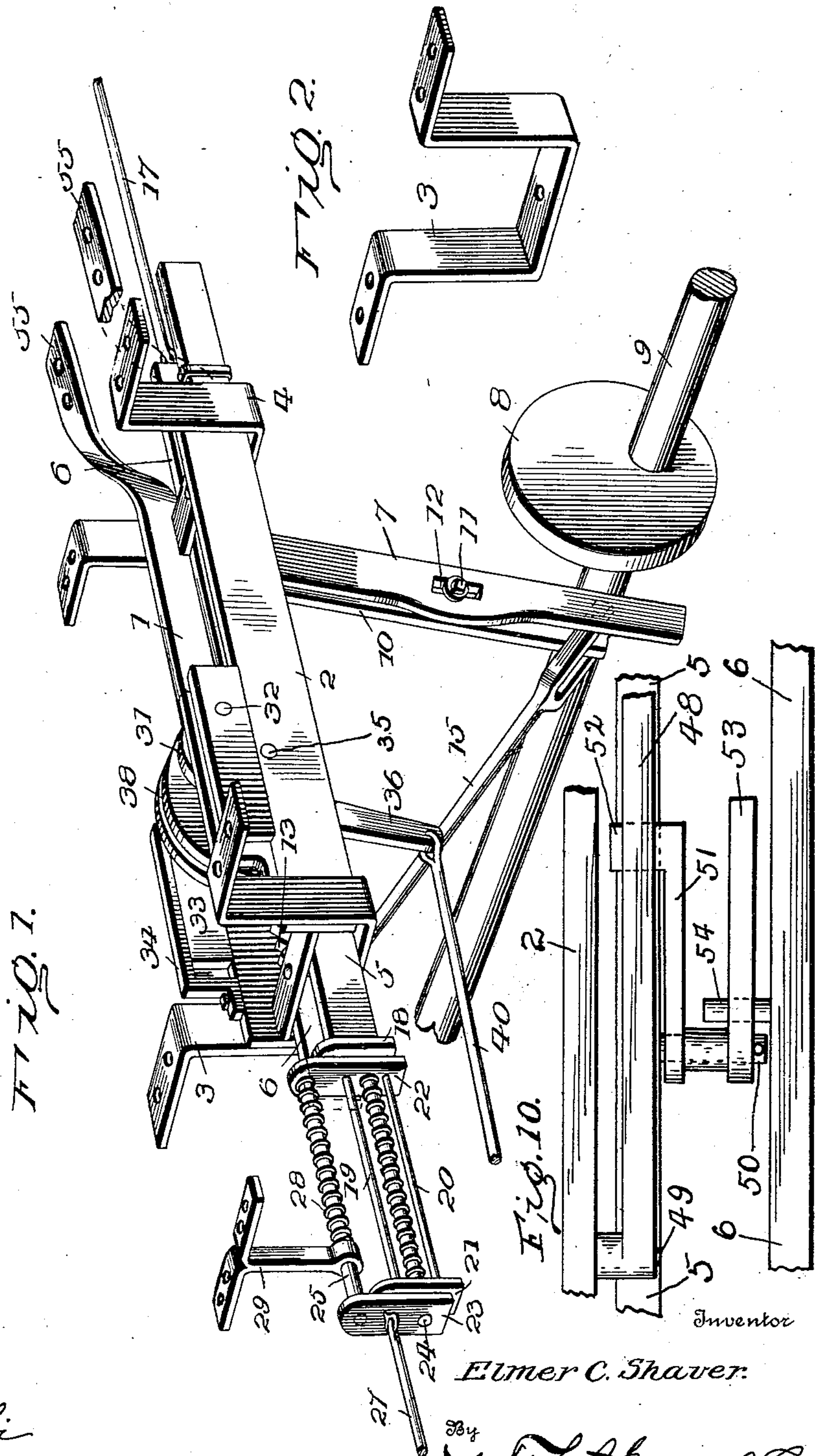
PATENTED FEB. 2, 1904.

E. C. SHAVER.
CAR BRAKE.

APPLICATION FILED OCT. 26, 1901.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses
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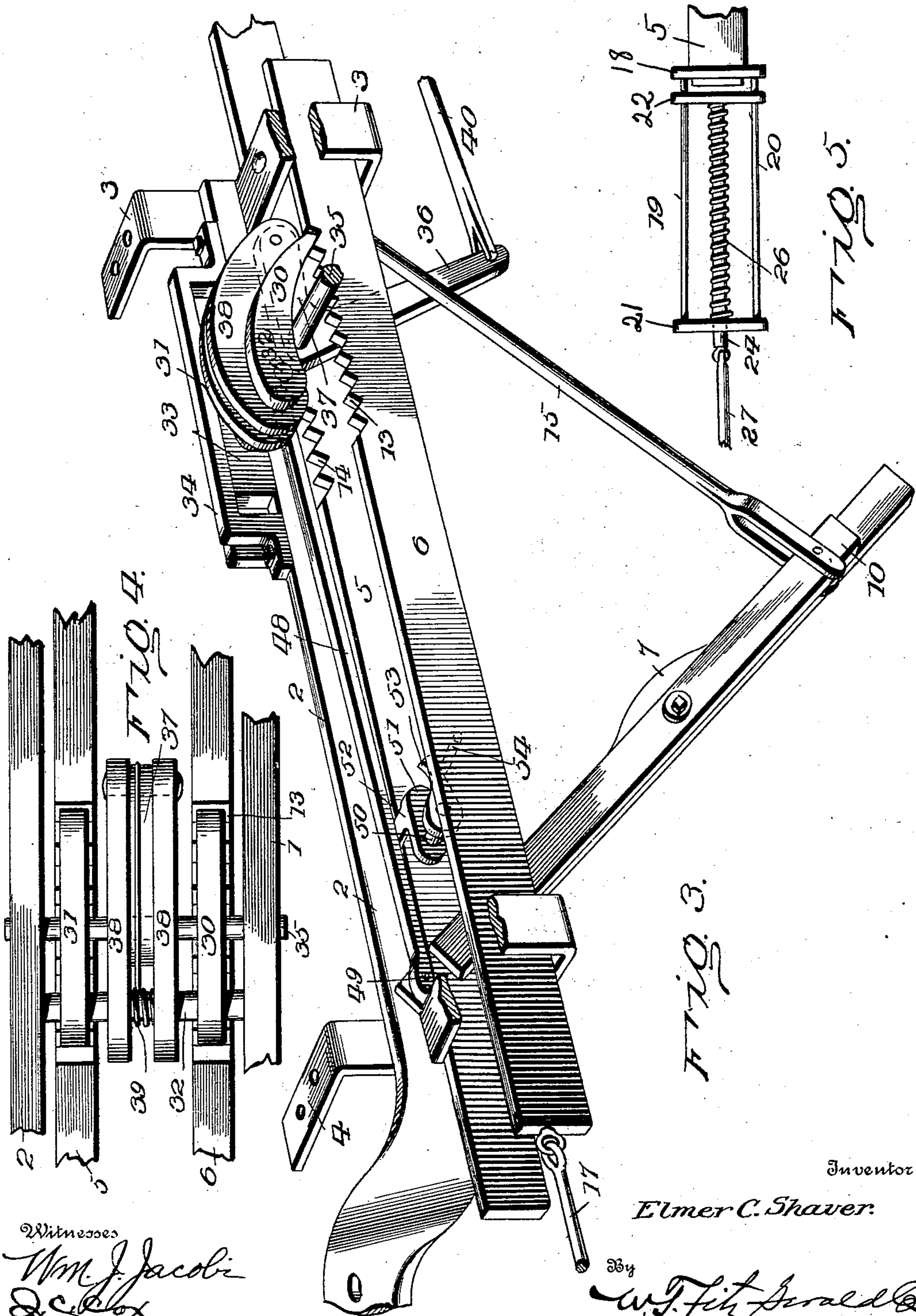
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3 SHEETS—SHEET 2.



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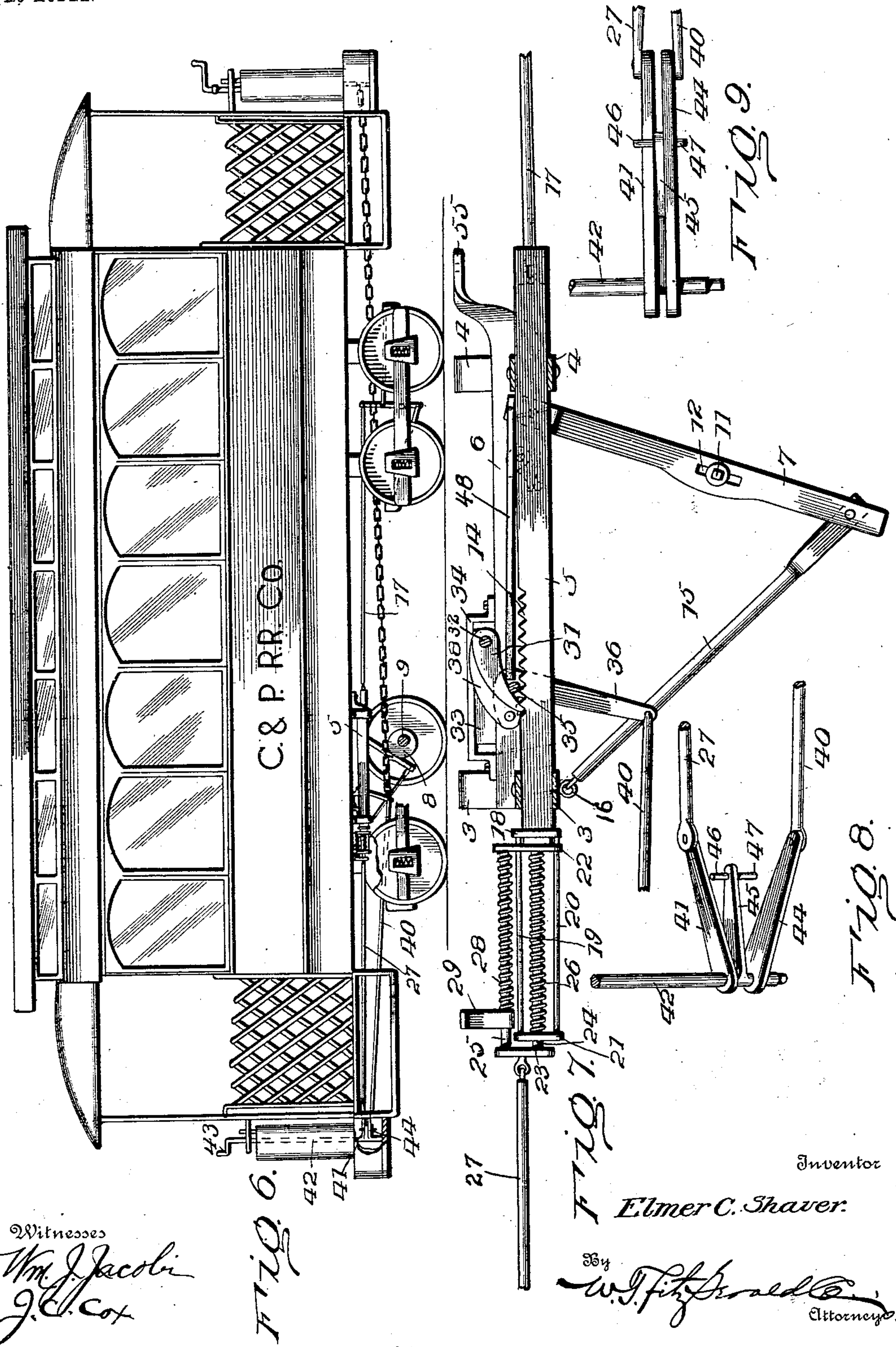
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3 SHEETS—SHEET 3.

NO MODEL.



UNITED STATES PATENT OFFICE.

ELMER CLIFTON SHAVER, OF NEW YORK, N. Y.

CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 751,112, dated February 2, 1904.

Application filed October 26, 1901. Serial No. 80,140. (No model.)

To all whom it may concern:

Be it known that I, ELMER CLIFTON SHAVER, a citizen of the United States, residing at New York, in the county of New York and State
5 of New York, have invented certain new and useful Improvements in Car-Brakes; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as
10 appertains to make and use the same.

My invention relates to brakes for railway street-cars, heavy coaches, &c.; and it consists of certain novel features of combination and construction of parts, the preferred form or
15 materialization whereof will be fully set forth in the following specification and illustrated in the accompanying drawings.

The prime object of my invention is to provide a brake for street-cars which will be en-
20 tirely automatic and dependent upon a single initial act on the part of the motorman or engineer, as the case may be.

A further object of my invention is to provide a brake of the character specified which
25 will be so combined with the usual mechanism or carrying-trucks of a car that the momentum of the moving car will be applied to actuate the brake, and thus promptly stop the car with-
in any desired limit of space or trackage.

A further object of my invention is to provide a reliable device for promptly and auto-
30 matically stopping a car which will be very simple and inexpensive in character and which may be readily controlled or operated by any
35 one, whether especially skilled in the use of such an appliance or not.

Other objects and advantages will be made clearly apparent from the following specifica-
tion, and, referring to the drawings, made a
40 part of this application, Figure 1 is a perspective view of my improved automatic brake and showing a contiguous coöperating part of the axle of the car. Fig. 2 is one of the
45 supporting-brackets employed to hold the operating devices securely anchored to the under side of the car-body. Fig. 3 is a perspective detail view taken from the opposite side and end of that presented in Fig. 1 and showing
50 certain parts of the framework removed. Fig. 4 is a top plan view of a section of the frame-

work and contiguous coöperating parts, showing a pair of coöperating pawls or detents and mechanism designed to release the same from engagement with their respective rack-bars. Fig. 5 is a detail view showing a modified form
55 of construction for the springs illustrated in Fig. 1. Fig. 6 illustrates my invention applied to an ordinary street-car. Fig. 7 is a side elevation of my automatic brake appliance, showing a portion of the framework or outer cas-
60 ing removed. Figs. 8 and 9 illustrate in perspective and side elevation, respectively, the controlling device for my improved automatic brake, whereby the same is placed under the complete control of the operator; and Fig. 10
65 is a detail plan view showing the automatic trip mechanism for releasing one of the co-operating pawls or detents.

Briefly stated, my invention comprehends the utilization of the rotation of one of the
70 axles, or, in other words, I apply the momentum of the car to the work of setting of the brake-shoes and insure that the car will be checked within a minimum limit. By the use of the mechanism which I will hereinafter specifically
75 describe only a simple initial act of the motorman is all that is necessary to set certain coöperating devices in motion, the result being that the brake will be more reliably and promptly applied than would be possible if
80 the brakes were applied manually, as is common. This result, therefore, is a most valuable and important desideratum, inasmuch as the attention and labor of the motorman are conserved for the more active performance of
85 other duties devolving upon him.

In carrying out my invention in the present instance I provide the framework, comprising the side sections 1 and 2, properly secured to and supported by the brackets 3 and
90 4, which latter are bolted or otherwise secured directly to the under side of the floor or a cross-beam of the car-body. The said framework is preferably formed of bar-iron in order that the requisite amount of strength may
95 be attained to hold the working parts of my automatic brake appliance in their respective operative positions.

Referring to Figs. 1 and 7 and other views, it will be observed that I have disposed with-
100

in the framework thus or otherwise provided the longitudinal-movable controlling rack-bar 5 and the holding rack-bar 6, and to the former I pivotally connect near its inner end the depending lever 7, which latter is designed to contact at its lower inner edge with the cam-wheel 8, which is rigidly connected to the axle 9 of the car. Disposed substantially parallel with the lever 7 and pivotally connected thereto near its middle portion is the auxiliary lever 10, the pivotal union between said members being effected by the bolt 11, which is carried by the auxiliary lever 10 and is adapted to move loosely in the slot 12, formed in the lever 7, said slot being designed to compensate for the relative position of said levers incident to their operation.

The upper end of the auxiliary lever 10 is pivotally connected to the longitudinally-movable bar 6, hereinbefore denominated a "holding" rack-bar, inasmuch as the plurality of teeth 13 are formed upon the upper edge thereof near its outer end, a similar variety and number of teeth 14 being provided near the outer end of the controlling-bar 5, as clearly shown in Fig. 7, and designed for a purpose hereinafter particularly pointed out. The lower end of the auxiliary lever 10 is pivotally connected to the lower bifurcated end of the bracing-rod 15, the upper end of said brace being connected in any preferred way, as by means of the eye 16, with the under side of the bracket 3. The lower end of lever 7 is so normally disposed or when the brake is off the wheel that it will lie out of contact with the cam-wheel 8 during the rotation of the latter incident to the movement of the axle, and it therefore becomes desirable to provide means whereby the motorman or other attendant may change the relative position of said parts, so that the longest side of the cam-wheel will contact said lever and incidentally move the bar 6 through the medium of the auxiliary lever 10 forward or into position to operate the brake-rod 17 and set the brakes. In order, therefore, to place the mechanism under perfect control, I have connected to the forward or outer end of the bar 5 the member 18, disposed in a substantially vertical position and having rigidly connected thereto the guiding-rods 19 and 20, to the outer ends of which I rigidly connect the end section or head 21. Designed to move loosely upon the rods 19 and 20 is the member 22, having apertures to receive said rods, said member being rigidly connected to the bar 23 by means of the rods 24 and 25, and it is obvious that by disposing the spring 26 around the rod 24 an outward pull upon the controlling-rod 27 will compress said spring. If desired, a similar spring 28 may be disposed around the rod 25 between the upper end of the member 22 and the bracket 29, depending from the car-body at a proper point. By thus providing the two springs it will be seen that

after the controlling-rod 27 has been drawn outward and released it will be restored to its initial position, and thus similarly restore the bar 5 by the action of said springs.

In Fig. 5 of the drawings I have shown a device wherein the rod 25, spring 28, and bracket 29 are dispensed with and the rod 27 connected directly to the end of the rod 24, the spring 26 being relied upon entirely to return said parts to their normal positions. Inasmuch as an outward pull upon the rod 27 and the operation of the cam-wheel 8 upon the lever 7 results in a successive movement of the bars 5 and 6 it becomes necessary to provide securing devices whereby such forward movement of said bars will be utilized to more tightly set the brakes, and with this object in view I have provided the detents 30 and 31, both of which are pivotally mounted upon the rod 32, which is carried by the movable bearings 33, disposed in the bracket 34, said bracket being attached to the upper edge of a contiguous part of the frame-sections 1 and 2 or integrally cast or otherwise formed therewith. I also provide the cross bar or rod 35, disposed slightly above the corrugations or teeth in the bars 5 and 6, said rod being designed to cooperate with the free ends of the detents 30 and 31, said detents being caused to ride upon the rod 35 by reason of the movable bearings provided for the rod 32, as said bearings are controlled by the depending lever 36, which by reference to Fig. 3 is so formed as to have the substantially right-angled extensions 37 and a suitable aperture to receive the rod 35. The bar or rod 35, above referred to, is preferably seated at each end in a contiguous part of the frame-sections 1 and 2.

The outer end of the extension 37 is pivotally connected to the detent-controller 38, the inner end of which is pivotally connected to the rod 32, the outer end of the detent-controller 38 being held normally downward by the spring 39 or an equivalent device.

In the present instance I have shown the detent-controller 38 as formed of two separate pieces, though it is obvious that the inner end thereof may comprise a single part or body portion, while the outer end may be bifurcated to receive the extension 37 between the branches thereof. The lever 36 is placed under control of the operator by pivotally connecting the lower end thereof to the rod 40, which latter extends forward to the front of the car and is pivotally connected to the arm 44, secured to the shaft 42, which latter is mounted in suitable bearings and is provided at its upper end with any suitable form of controlling-handle, as indicated by the numeral 43, whereby the operator may have full control thereof. In like manner the rod 27 extends to the forward part of the car and is pivotally connected to the arm 41, which latter is also pivotally connected to the

shaft 42, and in order that the operator may pull either of said rods forward, and thus operate the connecting mechanism, I provide the controlling-arm 45, rigidly connected to the shaft 42 and provided at its outer end with the upwardly and downwardly extending fingers 46 and 47, respectively, and since all of said arms lie closely in contact with each other it is clear that when the shaft 42 is turned so as to move the rigid arm 45 into engagement with the arm 44 the rod 40 will be moved forward, and thereby operate the lever 36, and through the medium of the extension 37, detent-controller 38, and movable bearings 33 the lower end of the detents 30 and 31 are brought into engagement with the rod 35, and thereby disengaged from the teeth in the bars 5 and 6, thus releasing the brake mechanism. When, however, the shaft 42 is reversely rotated, the rod 40 will be released and permitted to be restored to its normal position, while the finger 46 will engage the arm 41, and thereby draw the rod 27 outward and incidentally compress the spring 26 and move the bar 5 forwardly.

It will be observed that when the bar 5 is disposed inwardly its full extent the lever 7 will be out of the path of the eccentric or cam 8, and it therefore follows that when it is desired to set the brake, which may be of any preferred variety or construction and operatively connected to the brake-rod 17 in the usual manner, the operator will rotate the shaft 42, so as to cause the finger 46, carried by the rigid arm 45, to engage the arm 41 and incidentally draw the rod 27 and shaft 5 outward, which will result in disposing the lower end of the lever 7 in the path of the cam-wheel 8, which latter will engage said lever and force the lower end thereof forward, and the result will be that the lever 7 will act upon the auxiliary lever 10 through the mediation of the bolt 11 and force the bar 6 forward and incidentally draw the brake-rod 17 in such a manner as to partially or fully set the brakes. It is therefore obvious that the brake mechanism may be so manipulated as to apply the brake gradually, and thus slowly check the momentum of the car, in which case the rod 27 is pulled slightly forward through the medium of the shaft 42 and arms 41 and 45, thus throwing the lever 7 in the path of the cam-wheel 8 on the axle 9, when the lower end of said lever 7 will be thrown forward, and as the auxiliary lever 10 is pivotally secured to the lever 7 and the upper end thereof to the bar 6 said bar is driven slightly forward, thus partially setting the brakes. It is clear, therefore, that if it should be desirable to set the brakes still tighter a further rotation of the shaft 42 will draw the rod 27 still farther forward and incidentally move the bar 5 outward and again dispose the lower end of the lever 7 in the path of the cam-wheel 8, which latter will force said lever forward, and thus apply its full force through

the mediation of the auxiliary lever 10 upon the bar 6, it being understood that the detent 30 will in the meantime engage and secure said bar against reverse movement. This operation of the shaft 42, causing the outward movement of the bar 5, may be repeated until the brake is set to the fullest extent desired, thus gradually but reliably stopping the car. If, however, it is desired to suddenly stop the car, the shaft 42 is continuously rotated, thus holding the lever 7 in the path of the rapidly-revolving cam-wheel 8, when it will be seen that the bar 6 will be rapidly moved inwardly and the full power of the brakes at once applied to the wheels. In this connection it may be noted that the springs 26 and 28 will compensate for all undue strain placed upon said parts.

As the brake is usually applied slowly and the car stopped gradually, the use of the rod 27, bar 5, and lever 7 may be dispensed with after the bar 6 has been partially moved in, and it is therefore desirable to permit said parts to return to their initial positions independent of the bar 6; and to this end I provide the finger 48, which is pivotally connected, as indicated by the numeral 49, to a contiguous part of the inner surface of the member 2, while the free end of said finger extends under the detent 31. By this arrangement an upward movement of the free end of the finger 48 will elevate the free end of the detent 31 and release it from engagement with the teeth carried upon a contiguous part of the bar 5, and in order to accomplish this result I provide the lug 50, rigidly connected to the inner side of the bar 5. Loosely pivoted upon the lug 50 is the member 51, having the inwardly-extending ear 52 disposed between the bar 5 and finger 48. Rigidly secured to the member 51 and forming a part thereof is the lever 53, normally disposed downward in the path of the pin 54, secured to the bar 6, as illustrated more clearly in Fig. 10. By this construction it will be seen that when the bar 6 is moved forward through the medium of the levers 7 and 10 the pin 54, carried by said bar 6, will be moved into engagement with the depending lever 53, and thereby rotating the member 51 and raise the bar 48 through the medium of the ear 52. Thus it will be seen that the detent 31 will be released independently of the detent 30 and the bar 5 permitted to return to its initial point and the tension upon the springs 26 and 28 removed. If, however, it is found that the brake is not set sufficiently tight to stop the car at the desired point, the bar 5 may be again moved forward and the bar 7 again brought into the path of the cam 8, when through the medium of the auxiliary lever 10 the bar 6 is moved farther forward and the brake set more firmly.

It will of course be understood that the depending lever 53 will be of sufficient length to remain in cooperation with the pin 54 at

whatever relative position the bars 5 and 6 may be to each other, thus insuring that the detent 31 will be held out of engagement with the notches in the bar 5 after the bar 6 has been moved inwardly sufficiently to bring the pin 54 into engagement with the depending lever 53. As soon as the bar 6 is released and returns to its initial position and the pin 54 freed from the lever 53, or when the bar 5 is pulled forward sufficiently to carry said lever 53 entirely beyond the pin 54, as when the brake is not sufficiently set and the bar 5 is again moved forward, the member 51 returns to its normal position by gravity, thus permitting the finger 48 to move out of engagement with the detent 31, when said detent again engages the notches upon the bar 5 and operates, as previously described.

If preferred, the rear ends of the casing 1 and 2 may be extended and properly shaped, as indicated by the numeral 55, so as to fit against the floor or a contiguous cross-beam, thereby insuring that the great strain placed upon the casing will be reliably met and sustained.

While I have described the preferred combination and construction of parts, I desire to comprehend in this application all substantial equivalents and substitutes that may be considered as fairly falling within the scope and purview of my invention, inasmuch as various modifications and changes may be made without departing from the spirit thereof.

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

1. The herein-described automatic brake for railway-cars, &c., comprising a suitable frame, a pair of cooperating levers, a cam, a rack-bar cooperating with each of said levers provided with detents, means connected with each end of the car for setting and releasing each of said detents whereby the brake cooperating with the wheel and connected with said rack-bars may be rapidly set to any desired extent and as quickly released, all combined substantially in the manner specified and for the purpose set forth.

2. The combination with a car-truck provided with an eccentric and brakes, of a depending lever and an auxiliary lever pivoted thereto and normally resting parallel there-

with, devices connecting said levers with the brakes actuated by said eccentric and means for setting and retaining said brakes in operative condition as set forth.

3. The combination with a car-truck provided with brakes, of a depending lever, an auxiliary lever pivoted midway thereto, devices connecting said depending lever with the brakes and means for operating said devices, as set forth.

4. The combination with a vehicle provided with brakes, means for setting the brakes, a pawl-and-ratchet mechanism connected with said means for holding them set, comprising in part a horizontally-disposed shaft mounted in movable bearings, said pawl-and-ratchet mechanism being mounted upon and carried by said shaft, all combined as set forth.

5. The combination with a truck provided with brakes, means for setting the brakes, pawl-and-ratchet devices for holding them set comprising toothed bars and a sliding frame carrying said pawl-and-ratchet devices and a controller therefor, all arranged as set forth.

6. The combination with a car-truck provided with brakes, of an eccentric carried thereby, means actuated by said eccentric for setting the brakes, suitable controlling mechanism comprising in part a shaft 42 having an arm at its lower end and a handle at its upper end, an arm 41 and rod 27 adapted to move said means into engagement with said eccentric, duplicate pawl-and-ratchet mechanisms alternately cooperating with said means whereby, if desired, every revolution of the wheels may be utilized to successively actuate the brakes until the car is stopped, as set forth.

7. The combination of a car-truck provided with brakes, means for setting said brakes comprising in part a controlling rack-bar and a holding rack-bar, said bars having cooperating means for releasing the controlling-bar whereby said controlling-bar may return to its initial position independently of the holding-bar as set forth.

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

ELMER CLIFTON SHAVER.

Witnesses:

CHAS. T. KISSOM,
H. A. KIDDER.