(No Model.) 2 Sheets—Sheet 1.

# E. SKAAR.

## AUTOMATIC WAGON BRAKE.

No. 589,512. Patented Sept. 7, 1897.

Fig. 1.

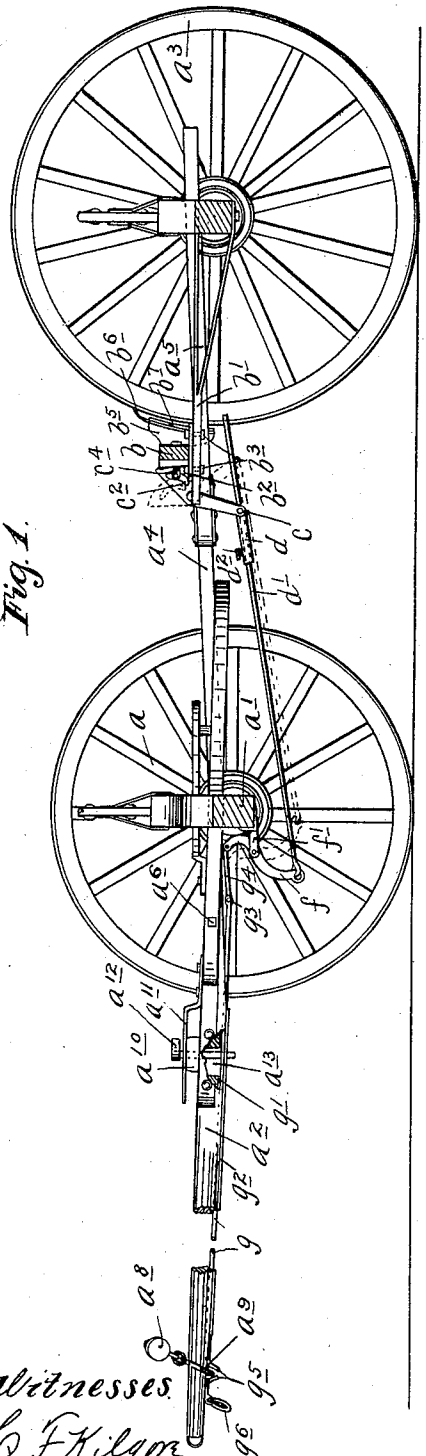
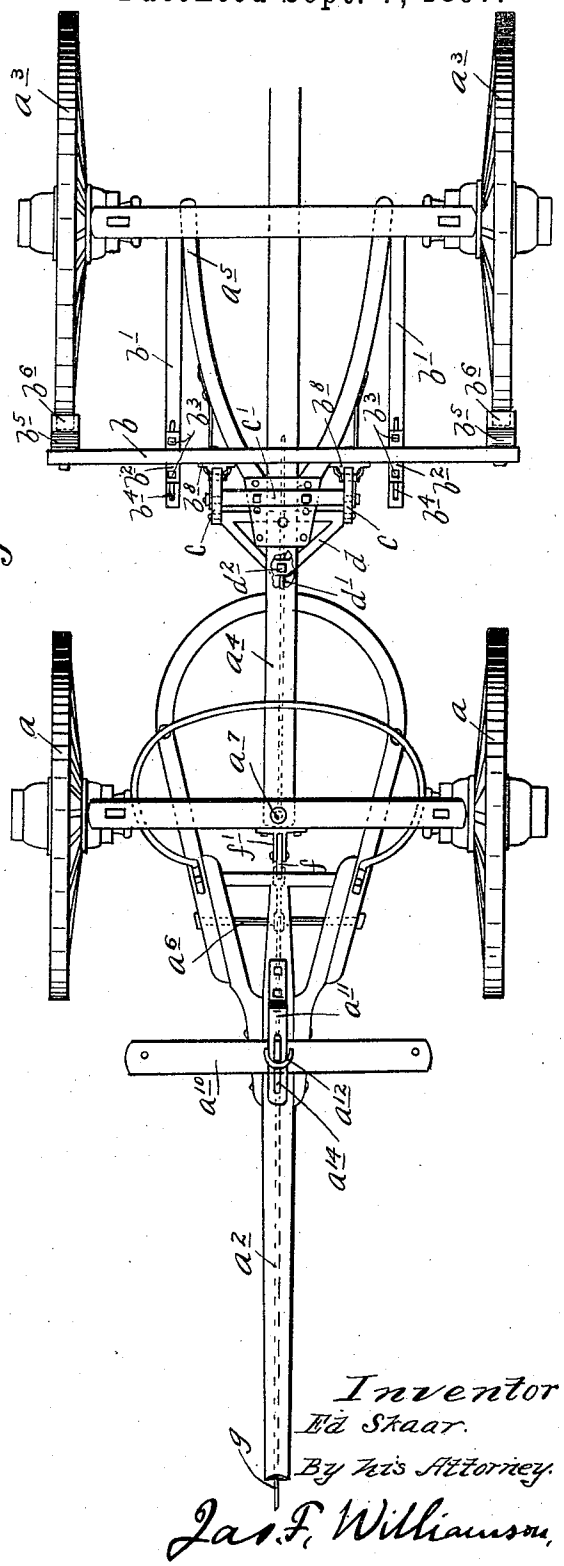


Fig. 2.



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(No Model.) 2 Sheets—Sheet 2.

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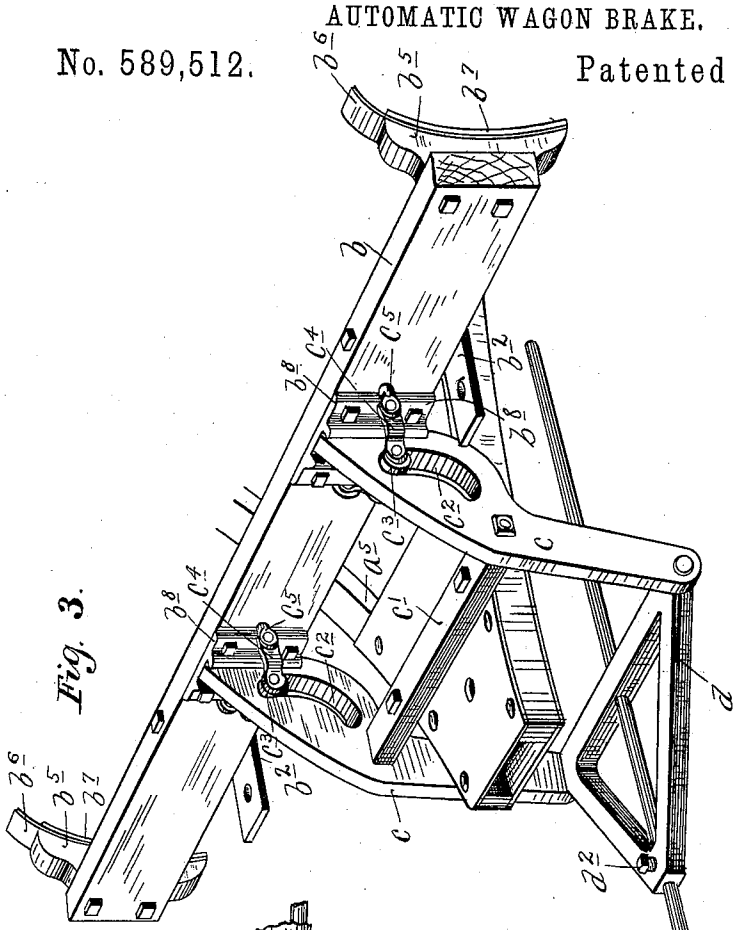


Fig. 3.

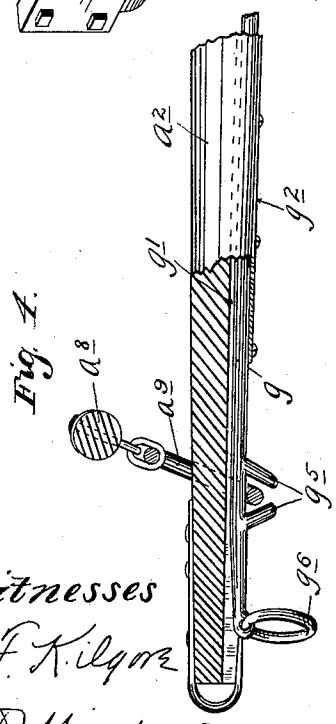
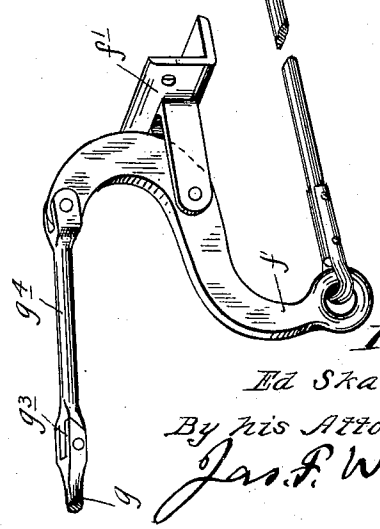


Fig. 4.



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# UNITED STATES PATENT OFFICE.

ED SKAAR, OF KENYON, MINNESOTA.

## AUTOMATIC WAGON-BRAKE.

SPECIFICATION forming part of Letters Patent No. 589,512, dated September 7, 1897.

Application filed December 7, 1896. Serial No. 614,746. (No model.)

*To all whom it may concern:*

Be it known that I, ED SKAAR, a citizen of the United States, residing at Kenyon, in the county of Goodhue and State of Minnesota, have invented certain new and useful Improvements in Automatic Wagon-Brakes; 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 brakes for wheeled vehicles, and has for its object to provide such a brake which will be automatically applied whenever in going downhill the vehicle is run forward by its own gravity, so that the draft-rigging or harness of the draft-animal is caused to hold back on the same.

To this end my invention consists of the novel devices and combination of devices hereinafter described, and defined in the claims.

The preferred form of my invention is illustrated in the accompanying drawings, wherein, like letters referring to like parts throughout the several views—

Figure 1 is a view in longitudinal vertical section taken through a wagon shown as equipped with my improved brake. Fig. 2 is a plan view of the wagon and brake shown in Fig. 1. Fig. 3 is a perspective view showing the brake device and a portion of the wagon running-gear, to which the same is secured, the other portions of the wagon being removed and some parts of said brake-beam being broken away; and Fig. 4 is a view, partly in side elevation, but principally in longitudinal vertical section, of the end of the wagon-tongue and neck-yoke.

Referring to the parts of the wagon, $a$ $a'$ $a^2$ indicate, respectively, the wheels, the axle, and the pole of the front truck, and $a^3$ $a^4$ $a^5$ indicate, respectively, the wheels, the reach-rod, and the reach-rod guide-yoke of the rear truck. As shown, the wagon tongue or pole $a^2$ is pivoted on a rod $a^6$, and the forward end of the reach-rod $a^4$ is pivoted to the front truck on a coupling-pin $a^7$.

$a^8$ indicates an ordinary neck-yoke provided with an ordinary pole-ring $a^9$, which works on the end of the pole, and $a^{10}$ indicates an ordinary two-horse equalizer to which the whiffletrees (not shown) are attached. This equalizer $a^{10}$ is for the purpose of applying my invention secured to the pole $a^2$ and to the pole-strap $a^{11}$ by means of a pole-pin $a^{12}$, which works through a perforation in said equalizer $a^{10}$ and through longitudinal slots $a^{13}$ and $a^{14}$, respectively, in said pole $a^2$ and said strap $a^{11}$. These slots $a^{13}$ and $a^{14}$ allow the equalizer a limited to-and-fro movement on the tongue, and the lower end of the pin $a^{12}$ projects below the pole. The purpose of this construction will later appear.

$b$ indicates the brake-beam, which extends transversely across the wagon just in front of the rear wheels, and it is supported on the forwardly-projecting ends of a pair of supporting-arms $b'$, the rear ends of which are rigidly secured to the rear axle. The brake-beam $b$ is thus supported with freedom for a limited movement to and from the working faces of the rear wheels by means of bearing-irons $b^2$, secured to said beam $b$, and guide-bolts $b^3$, passed through said irons $b^2$ and working in slots $b^4$ in the ends of said supporting-arms $b'$. At its ends and coöperating one with each of the rear-wheel faces the brake-beam $b$ is provided with a pair of brake-shoes, each of which in the preferred construction shown consists of a shoe-block $b^5$, a scraper-spring $b^6$, secured to the face of said block $b^5$, and a wearing-strip $b^7$, secured to and forming a lining to the concave of the scraper-spring $b^6$. It will be noted that the upper ends of the scraper-springs $b^6$ project above the parts $b^5$ and $b^7$ and are turned rearward, so that they will engage the running faces of the wheels $a^3$ before the wearing-strips $b^7$ are thrown into contact therewith, thus acting as scrapers and serving to clean the running faces of the wheels before the brakes are applied. To operate this brake-beam, a pair of cam-levers $c$ are pivotally mounted at their intermediate portions on a pivot-bar $c'$, secured to the forward end of the reach-rod guide-yoke $a^5$. The upper ends of these levers $c$ are provided with cam-surfaces which work in the grooves of bearing-plates $b^8$, secured on the front face of the brake-beam $b$. In order to hold the cam end of these levers $c$ in working position against the bearing-plates $b^8$ and also to cause the said levers to withdraw the brake-shoes from working position,

slots $c^2$ are cut in said levers concentric to their cam-faces, and in these slots work anti-friction-rollers $c^3$, pivoted on the free ends of coöperating links $c^4$, the rear ends of which links are pivotally connected to the brake $b$ by means of short studs or lugs $c^5$, rigidly secured to said brake-beam. This permits the proper adjustment of the brake-shoes.

The lower ends of the cam-lever $c$ are connected for simultaneous and parallel movement by means of a triangular bracket $d$, pivotally connected thereto at its opposite corners. The rear end of a draw-rod $d'$ is passed through the apex and base of the bracket $d$ and is adjustably secured thereto by means of a set-screw $d^2$.

The forward end of the rod $d'$ is pivotally connected to the lower end of a lever $f$, the intermediate portion of which is pivoted to the forwardly-projecting lugs of a fulcrum-bracket $f'$, which is rigidly secured to the forward central portion of the front axle $a'$.

A push-rod or thrust-bar $g$ is mounted to work with freedom for a limited longitudinal movement in a groove $g'$ cut in the under side of the pole $a^2$. The rod $g$ is held upward within the groove $g'$ by means of a long keeper-plate $g^2$, which is removably secured to the botton face of the pole and runs almost the entire length of the same, but terminates a short distance from its free end. The rear end of the rod $g$ is pivotally connected at $g^3$ to the forward end of a short link $g^4$, the rear end of which is in turn pivotally connected to the upper end of the lever $f$. The lower end of the pole-pin $a^{12}$ is passed through a suitable seat formed in the rod $g$ at a point where it passes the said pin. This of course will cause the rod $g$, pin $a^{12}$, and equalizer $a^{10}$ to move together longitudinally of the pole. The relations of these parts are such that when the equalizer $a^{10}$ is drawn forward, so that the pin $a^{12}$ strikes the forward limits of the slots $a^{13}$ and $a^{14}$ in the pole $a^2$ and strap $a^{11}$, respectively, the brake-shoes will, through the intermediate connections, be moved into their idle positions, or away from the running faces of the rear wheels. Hence as long as the draft or drawing strain is applied to the equalizer the brakes will be held out of their working positions.

Near its forward end and forward of the outer extremity of the keeper-plate $g^2$ the rod $g$ is provided with a pair of depending fingers $g^5$, between which the ring $a^9$ of the neck-yoke $a^8$ is applied, as shown in Figs. 1 and 4. At its extreme forward end the rod $g$ is shown as provided with a finger-ring $g^6$, which when the thrust-rod $g$ is drawn forward and said ring turned upward over the end of the pole serves to hold the brakes in their inoperative position.

Assuming that the draft-animals are hitched to the wagon in the ordinary manner—that is, to the neck-yoke $a^8$ and the equalizer $a^{10}$—by means of the ordinary or suitable harness or draft-rigging, the automatic action of the brake will be substantially as follows: As already stated, as long as the drawing strain is applied to draw the wagon the brakes will be held idle or released. When, however, as in going downhill for instance, the wagon under the action of gravity is caused to run forward by itself, so that as the draft-animals hold back on their harness or draft-rigging the neck-yoke $a^8$ will be drawn rearward on the pole, and inasmuch as the drawing strain on the equalizer $a^{10}$ is now released, this back pull on the neck-yoke $a^8$ will force the said rod $g$, together with the link $g^4$ and other parts carried thereby, toward the rear. As is obvious by inspection of the drawings, this rearward movement of the thrust or push rod $g$ will, through the intermediate connections described, force the brake-beam $b$ rearward and the working faces of the brake-shoes into contact with the running faces of the rear wheels. It is also obvious that the greater the force or tendency the wagon may have to run forward or downhill by gravity proportionally greater will be the force with which the brakes will be set. Hence it will be practically just as easy to prevent the wagon from running away in running down a very steep hill as it will in running down a hill of very gradual incline. As soon as the bottom of the hill is reached and the drawing strain is again applied to the equalizer $a^{10}$ the brakes will be released and thrown out of their working position in a manner already described.

In my preferred arrangement of the brakes the relations of the bearing-plates $b^8$ to the cam-lever $c$ and their pivots are such that when the brakes are set they will be self-locking—that is, will be set so that they will of themselves remain set. This action is due to the fact that the point of contact between the cam ends of the lever $c$ and the bearing-plate is, when the brakes are set, thrown so close to a dead-center that there will be but little tendency of the pressure on the brake-shoes to throw the said levers $c$ into their releasing positions. The self-locking action of the brakes is further assisted by the friction between the beam-strips $b'$ and the bearing-arms $b^2$.

Attention is called to the fact that when the brakes stand in their released position the pivot-joint $g^3$ between the rod $g$ and link $g^4$ stands directly under and close to the pivot-rod $a^6$ of the pole $a^2$. Hence when the free end of the pole is dropped to the ground this pivotal joint $g^3$ will buckle without causing any perceptible movement of the brake-operating connections. It will be noted, however, that this pivot-joint $g^3$ is such that it can buckle or turn in one direction only.

It will be understood, of course, that various alterations in the details of construction above set forth may be made without departing from the spirit of my invention. For instance, so far as the broad idea of my invention is concerned, the draft-rigging might take various forms and might be applied to the

brake connections in various different ways. Furthermore, the term "draft-rigging," as used in this specification and in certain of the claims, is used in a very generic sense and is intended to include all draft appliances, whether the same be in the form of a harness for a draft animal or animals or connections to a mechanical or artificial power device.

What I claim, and desire to secure by Letters Patent of the United States, is as follows:

1. The combination with a wheeled vehicle and draft-rigging, of a brake-beam mounted to slide on suitable guides and provided with brake-shoes at its ends, and automatic operating connections from said draft-rigging to said brake-beam, involving a pair of cam-levers, the free ends of which are connected to a common link or connection and the cam ends of which act against the intermediate portion of said sliding brake-beam, substantially as described.

2. The combination with a wheeled vehicle and draft-rigging, of a brake-beam mounted to slide on suitable guides and provided with brake-shoes at its ends, and automatic operating connections from said draft-rigging to said brake-beam, involving the cam-levers $c$, connected for parallel movements, provided with the slots $c^2$ and working with their cam ends against the intermediate portion of said brake-beam, and links secured on said brake-beams and provided with parts that work in said slots $c^2$, to retract the brake-shoes, substantially as described.

3. The combination with the wheeled vehicle and draft-rigging, of a brake-beam mounted to slide on suitable guides, and provided with brake-shoes at its ends, and operative connections from said draft-rigging to said brake-beam, involving the cam-levers $c$, connected at their lower ends to a common link or connection, and the bearing-plates $b^8$ secured to the intermediate portion of said brake-beam and provided with vertical grooves in which the cam ends of said levers $c$ work, substantially as described.

4. The combination with a wheeled vehicle and draft-rigging, of the brake-beam $b$ mounted to slide on suitable guides and provided at its ends with brake-shoes $b^5$ and at its intermediate portion with the grooved bearing-plates $b^8$, the cam-levers $c$ pivoted at $c'$ and connected at their lower ends to the link-head $d$, the rod $d'$ adjustably securable to said head $d$, the slots $c^2$ in the cam ends of said levers $c$, and the link connections $c^4$ secured to said brake-beam $b$ and provided with antifriction-rollers $c^3$ which work in said slots $c^2$ and serve to hold the cam ends of said levers $c$ against said bearing-plates $b^8$, substantially as described.

5. The combination with a wheeled vehicle and draft-rigging, of a brake, and connections from said brake to said draft-rigging, provided with an adjustable rod or link section and arranged to automatically and positively apply and release the brakes, respectively, under the holdback and draft strains on said draft-rigging, substantially as described.

6. The combination with a wheeled vehicle, of a brake shoe or shoes operative on the wheel or wheels of the same, and provided each with a projecting spring scraper-section arranged to engage the coöperating wheel, in advance of the application of the brake.

7. The combination with a wheeled vehicle, of one or more brake-shoes involving each the shoe-block $b^5$, the spring scraper-section $b^6$ and the wearing-face $b^7$ arranged and operating substantially as described.

8. The combination with a wheeled vehicle, of a brake device involving, the brake-beam $b$, provided with brake-shoes at its ends, the bearing-plates $b^8$ on said beam $b$, the cam-levers $c$ pivoted at $c'$, provided with cam ends engaging the plates $b^8$ and having the slots $c^2$, the antifriction-rollers $c^3$ working in the slots $c^2$ and supported by the coöperating strap $c^4$ and studs $c^5$, the bracket $d$ pivoted to the lower ends of said levers $c$, and operating connections extending from said bracket $d$, substantially as described.

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

ED SKAAR.

Witnesses:
KNUT. A. ROE,
OLE K. KROKEN.