(No Model.) 4 Sheets—Sheet 1.

# G. W. MacKENZIE, T. C. SLOANE & M. B. SLOAN.

## CAR BRAKE.

No. 515,692. Patented Feb. 27, 1894.

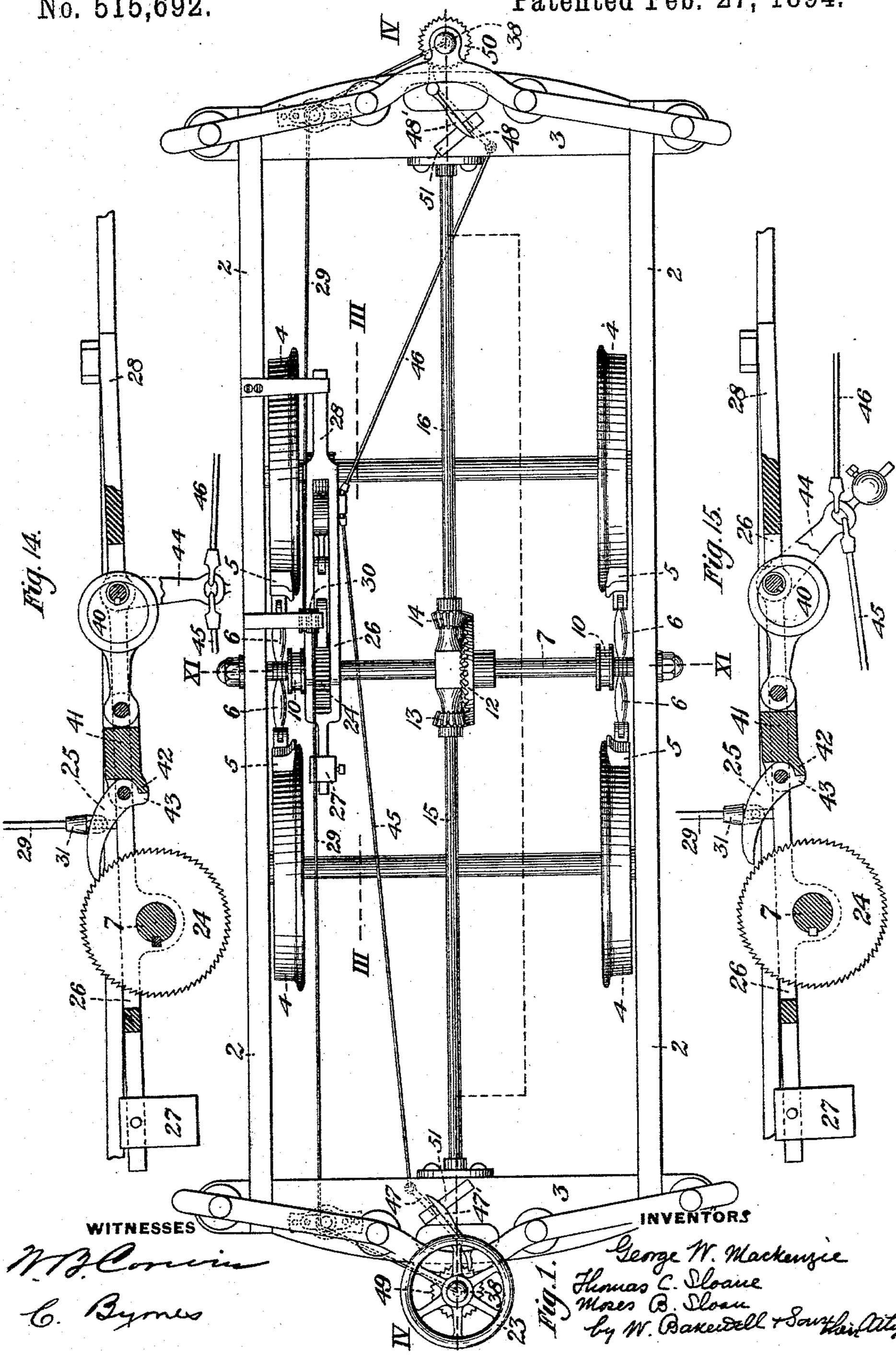



Fig. 14.

Fig. 15.

Fig. 1.

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.) 4 Sheets—Sheet 2.

# G. W. MacKENZIE, T. C. SLOANE & M. B. SLOAN.

## CAR BRAKE.

No. 515,692. Patented Feb. 27, 1894.




Fig. 2.




Fig. 3.




WITNESSES

M. B. Sloan

C. Byrnes.

INVENTORS

George W. Mackenzie
Thomas C. Sloane
Moses B. Sloan
by W. Baxewell & Sons
their Attorneys

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

(No Model.) 4 Sheets—Sheet 3.

# G. W. MacKENZIE, T. C. SLOANE & M. B. SLOAN.

## CAR BRAKE.

No. 515,692. Patented Feb. 27, 1894.

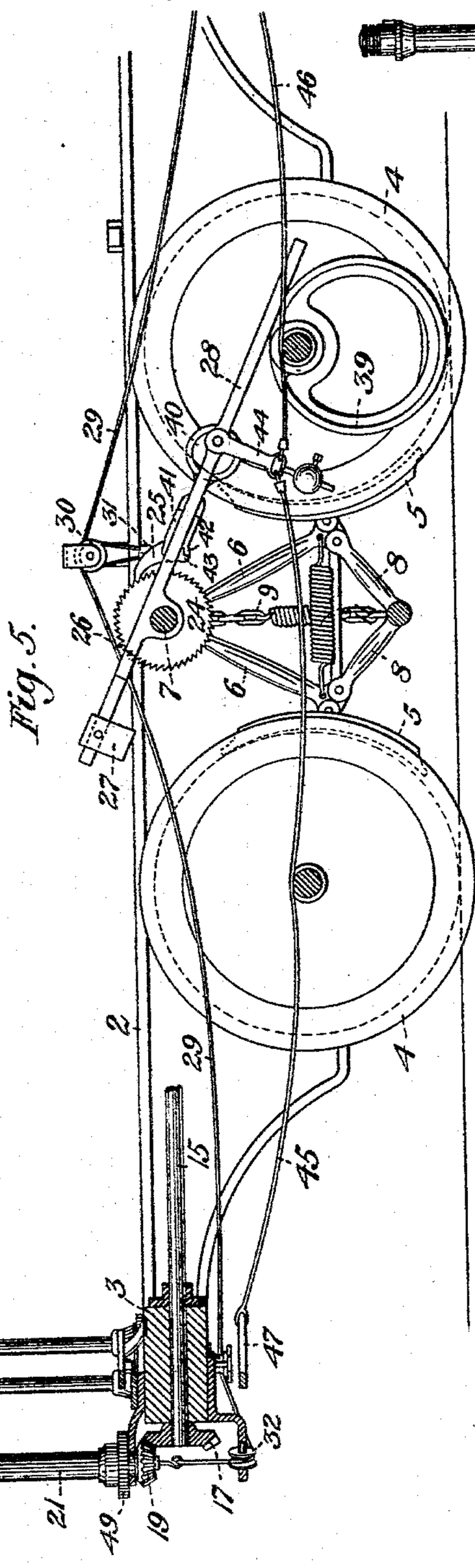


Fig. 5.

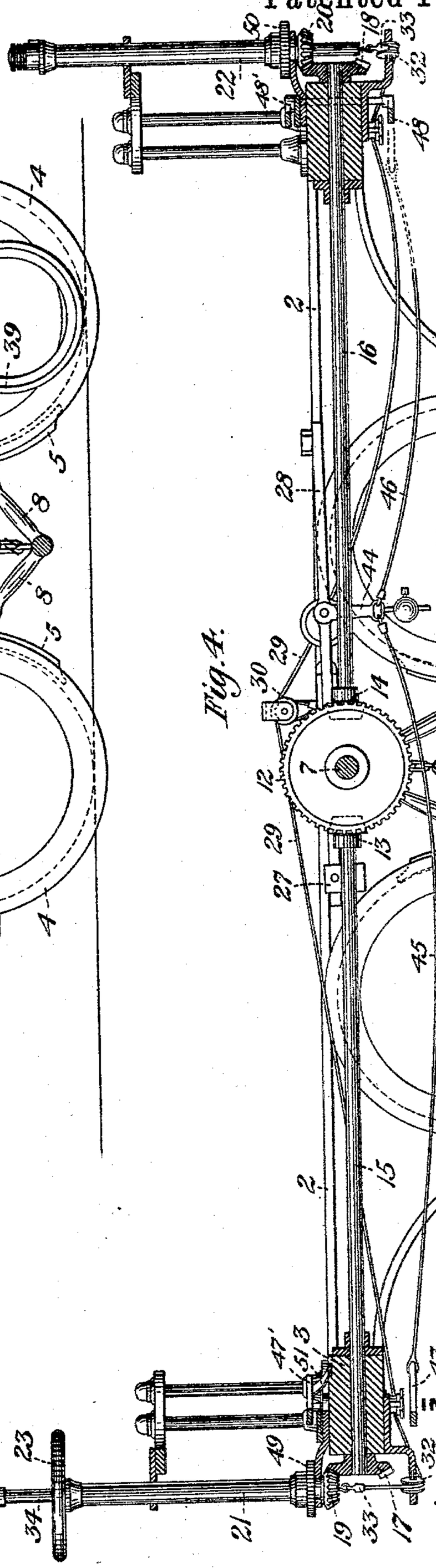


Fig. 4.

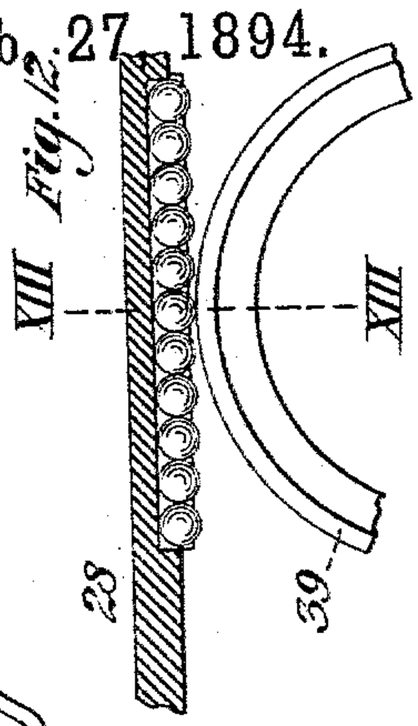


Fig. 12.

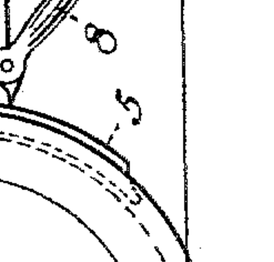


Fig. 13.

WITNESSES

W. B. Corwin

C. Byrnes

INVENTORS

George W. Mackenzie

Thomas C. Sloane

Moses B. Sloan

by W. Baxewell & Sons

their Attorneys

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

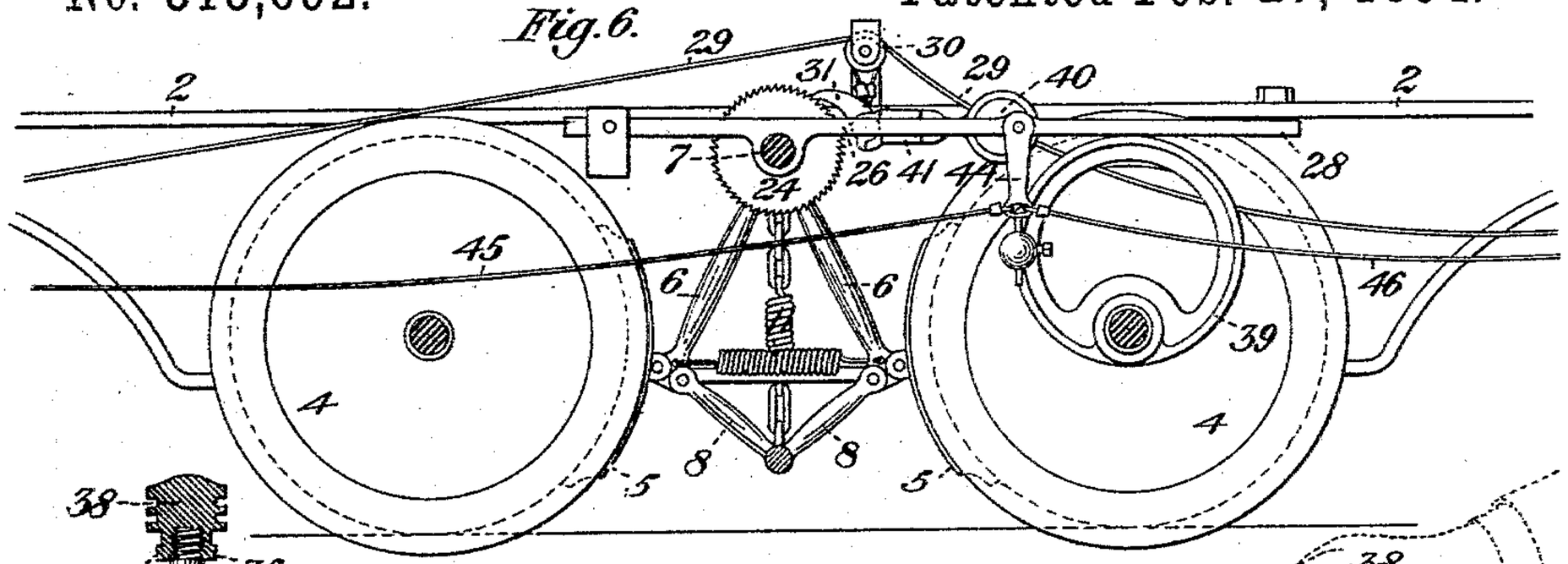
(No Model.) 4 Sheets—Sheet 4.

# G. W. MacKENZIE, T. C. SLOANE & M. B. SLOAN.

## CAR BRAKE.

No. 515,692. Patented Feb. 27, 1894.

Fig. 6.



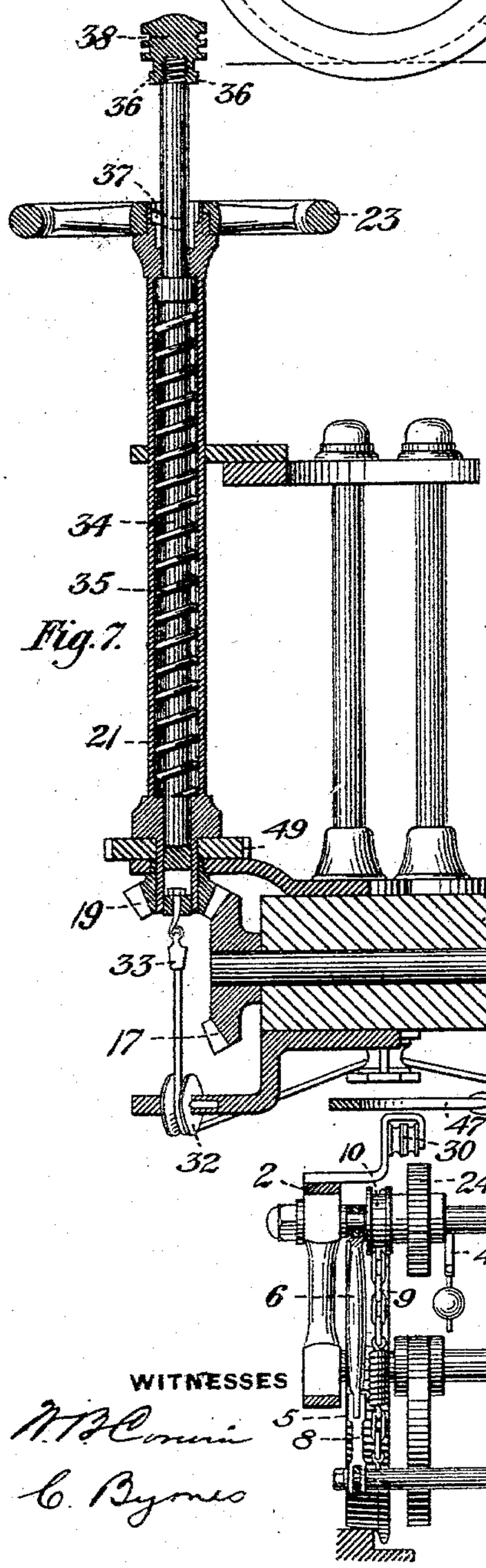




Fig. 7.

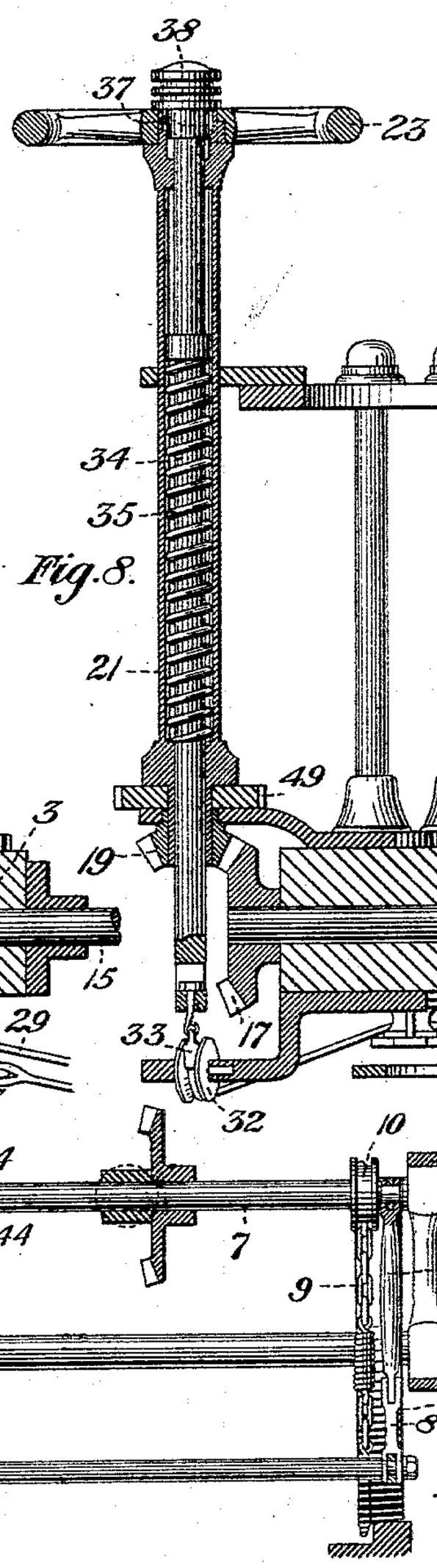



Fig. 8.

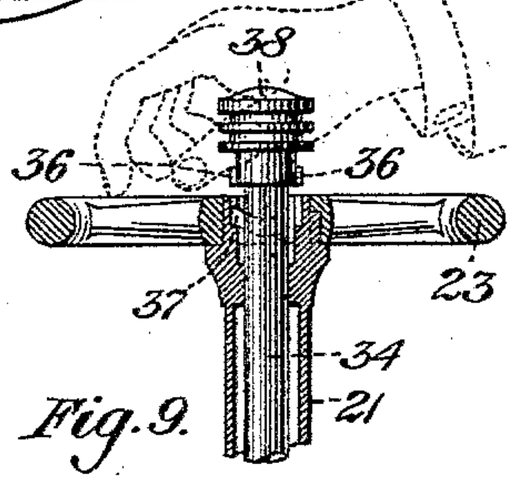



Fig. 9.

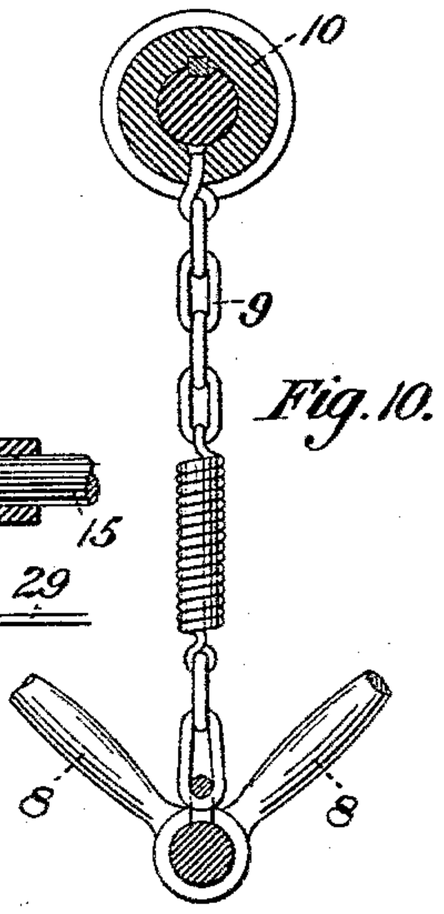



Fig. 10.

Fig. 11.

WITNESSES

W. B. Connis

C. Byrnes

INVENTORS

George W. Mackenzie

Thomas C. Sloane

Moses B. Sloan

by W. Baxendell & Sons

their Attorneys

THE NATIONAL LITHOGRAPHING COMPANY,
WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

GEORGE W. MACKENZIE, THOMAS C. SLOANE, AND MOSES B. SLOAN, OF BEAVER, PENNSYLVANIA.

## CAR-BRAKE.

SPECIFICATION forming part of Letters Patent No. 515,692, dated February 27, 1894.

Application filed November 15, 1892. Serial No. 452,097. (No model.)

*To all whom it may concern:*

Be it known that we, GEORGE W. MACKENZIE, THOMAS C. SLOANE, and MOSES B. SLOAN, all of Beaver, in the county of Beaver and State of Pennsylvania, have invented a new and useful Improvement in Braking Systems, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view of the lower portion of a car frame provided with our improved brake mechanism. Fig. 2 is a side elevation of the same. Fig. 3 is a longitudinal sectional view on the line III—III of Fig. 1. Fig. 4 is a longitudinal sectional view on the line IV—IV of Fig. 1. Fig. 5 is a similar view with the parts in a different position. Fig. 6 is a detail view of the braking eccentric and connections. Figs. 7 to 11 are detail views of different portions of the brake mechanism. Figs. 12 and 13 are detail views of the friction bearing between the eccentric and the braking lever. Figs. 14 and 15 are views of the pawl and ratchet mechanism upon the actuating shaft.

Like symbols of reference indicate like parts in each figure.

Our invention relates to the devices employed in braking cars, and its object is to attain a braking mechanism which may be actuated either by the momentum of the car or by hand, as desired, the two systems being entirely independent of each other. This system of two separate brake-actuating mechanisms, arranged to work the same brake, and moving independently of each other, we believe to be new, and therefore desire to patent the same broadly, as well as the construction and arrangements of the parts as hereinafter more fully described and set forth in the claims.

In the drawings, 2, 2, represent the side bars, and 3, 3, the end beams of a car frame which is supported upon the wheels 4. Between each side pair of wheels, is a double brake consisting of the two brake shoes 5 pivotally hung at the ends of toggle links 6, having collars taking about the actuating shaft 7. A second set of toggle levers 8 is pivoted to the links 6, and taking about a shaft passing through the lower ends of the set 8 are chains 9 which pass around winding drums 10 upon the shaft 7, and are secured thereto as shown in Fig. 10. Thus, it is evident that when the shaft 7 is rotated the chains pulling the links 8 upwardly, will spread the shoes and press them against the wheels. When the chain is released, a spiral spring 11 serves to retract the shoes.

We do not wish to restrict ourselves to the particular brakes shown, as it is evident that many different forms may be operated by the chains which are actuated through the shaft 7. The shaft 7 is provided with a bevel wheel 12, with which mesh the bevel wheels 13 and 14, carried upon the independent longitudinal shafts 15 and 16 respectively. At the outer ends of the shafts are bevel wheels 17 and 18 respectively, which mesh with the bevel wheels 19 and 20 carried upon the vertical hollow brake shafts 21 and 22, to one of which the usual hand wheel 23 is secured. Thus the brakes may be actuated by hand power from either end of the car as desired.

To the shaft 7 is secured a ratchet wheel 24, which is engaged by a pawl 25 pivoted between the arms of a yoke 26 carried upon collars loosely surrounding the shaft at either side of the ratchet wheel. Upon a stem at one end of the pivoted yoke, is carried an adjustable counterweight 27, while the other end terminates in a flat lever arm 28, which normally rests against the bottom of the car or a suitable projection therefrom, being held upwardly by wire ropes 29, passing over sheaves 30, and joined to the swivel connection 31 (Figs. 14 and 15). These ropes pass over vertical sheaves 32 at each end of the car, and are joined by swivel connections 33 to brake rods 34 passing upwardly through the hollow brake shafts 21 and normally held upwardly by spiral springs 35 bearing against shoulders thereon. The upper protruding end of each rod 34 is provided with lugs 36, which may be engaged with cam grooves 37 in the upper end of the brake shaft, as shown in Fig. 8, a suitable handle 38 being provided for depressing and turning the brake rods. A cam 39 is keyed to the shaft of the wheels 4, directly beneath the lever arm 28, and it will be seen that if either of the brake rods is in its normal

raised position, the lever arm is thereby held above the path of the cam by one of the wire ropes. In practice, one of the rods is held in its lower position by engaging the lugs with the cam slots in the hollow brake shaft, the other being raised, as shown in Figs. 2 and 4. Now, if the other rod be also depressed by the hand of the operator, the lever 28 swings downwardly the pawl slipping over the ratchet teeth, and the lever arm 28 comes within the path of the cam, it being shown in its lowermost position in Fig. 5. It is evident that the arm may be depressed to any extent desired, the spring 35 holding the lever in its adjusted position by pressing the pawl against the ratchet teeth, as it imparts an opposing strain to the rope. Now, as the wheels rotate the cam raises the lever arm 28, and turns the actuating shaft 7 by means of the pawl and ratchet connection, the amount which the shaft is rotated depending upon the distance which the lever is lowered. Hence, the degree of pressure which the brakes shall exert when actuated by the shaft 7 is entirely under the control of the operator, and if desired the parts may be so adjusted that the wheels may be locked before a revolution of the same has been made.

To release the brakes when set by either system, we employ the mechanism shown in Figs. 6, 14, and 15. An eccentric 40 is pivoted between the yoke arms, the eccentric strap being pivotally connected to a link 41, which has a shoulder or offset 42 engaging a projection 43 upon the under side of the pawl 25. Projecting from the eccentric shaft, is a weighted arm 44, with which connect the two wire ropes 45 and 46. These ropes lead to levers 47 and 48, and upon the upper end of these lever shafts are the usual pawls or triggers 47′ and 48′, engaging the ratchet wheels 49 and 50, as shown in Fig. 1. Suitable springs 51 hold these triggers in normal closed position, and it is evident that upon operating either trigger, the eccentric is turned and the pawl lifted, allowing the chains to unwind and release the brakes.

The operation of the system is obvious. The parts being in the position shown in Figs. 2 and 4, with one brake rod raised and the other locked in downward position, and the brake wheel applied to the brake shaft containing the raised brake rod, if the operator desires to apply the power brake he pushes down the brake-rod the desired distance and the cam acting upon the lever-arm 28 brakes the car. If it is desired to brake by hand, the operator turns the wheel 23 which actuates the shaft 7 through the shaft 15 and bevel-wheels 12 and 13. The triggers release both brakes, as they lift the pawl which holds the actuating shaft 7. If the car is passing dangerous portions of the track or there is other reason for sudden stoppage of the car, the operator may push down the brake-rod but hold the pawl back by applying his foot to the trigger 47′, the lever-arm then rising and falling without effect. Now, if the trigger be released, the pawl at once falls and the car is immediately braked.

In Figs. 12 and 13, we illustrate a ball-bearing between the meeting surfaces of the eccentric and lever-arm, and it is evident that any system of rollers or other friction bearings may be used.

As shown in Fig. 10, we preferably employ a spiral spring interposed in the winding-chain, which prevents a too sudden application of the brake and diminishes the liability to strain and breakage.

The advantages of the invention are obvious. Two brake-operating mechanisms are used upon the same brake and these are independent of each other, while a single trigger releases the brake set by either system.

The parts are simple, strong and not liable to get out of order, while enormous braking power is attained, the greater the momentum of the car, the greater being the power applied to the brakes. Both systems are under the complete control of a single operator, who can regulate to a nicety the power of the brakes and release the same under either system.

Many changes may be made in the form and arrangement of the various parts without departure from our invention, since

What we claim is—

1. A braking-system consisting of two independent brake-actuating mechanisms connected to and actuating the same winding-shaft, and a mechanism for releasing the brakes set by either mechanism; substantially as described.

2. A braking-system, comprising a winding shaft, a pivoted lever having actuating connections with said shaft, a cam, and means for bringing the lever within the path of the cam; substantially as described.

3. A braking system comprising a braking mechanism actuated by the movement of the car, and a second independently-acting car braking mechanism connected with the same brakes; substantially as described.

4. A braking system comprising a winding-shaft provided with a ratchet wheel, a pivoted lever having a pawl engaging said ratchet-wheel, a cam actuated by the movement of the car, and connections by which the lever may be brought within the path of the cam; substantially as described.

5. A braking-system comprising a winding-shaft connected to the brakes and having a ratchet-wheel thereon, a pivoted lever having a pawl engaging said ratchet-wheel, means for disengaging said pawl, a cam operated by the car, and means for bringing the lever within the path of the cam; substantially as described.

6. A braking-system comprising a winding-shaft connected to the brakes, a pivoted lever having actuating connections with said shaft, a cam, and a connection between said lever and a brake-rod at the end of the car by which

the lever may be dropped into the path of the cam; substantially as described.

7. A braking-system comprising a winding-shaft connected to the brakes, a pivoted lever having actuating connections with said shaft, a cam, and connections between said lever and brake-rods at each end of the car, by which the lever may be brought within the path of the cam; substantially as and for the purposes described.

8. A braking-system comprising a winding-shaft connected to the brakes, a pivoted lever having actuating connections with said shaft, a cam, connections between said lever and brake-rods at each end of the car, by which the lever may be brought within the path of the cam, and means at each end of the car for releasing the brakes; substantially as and for the purposes described.

9. A braking-system comprising a winding-shaft connected to the brakes, a pivoted lever having actuating connections with said shaft, a cam arranged to operate the lever, and a hand-wheel having actuating connections with said winding-shaft; substantially as described.

10. A braking-system comprising a winding-shaft connected to the brakes and having a ratchet-wheel thereon, a pivoted lever having a pawl engaging said ratchet-wheel, mechanism having connections with a lever at the end of the cars and located upon the said pivoted lever, arranged to release the pawl, a cam operated by the car, and means for bringing the lever within the path of the cam; substantially as and for the purposes described.

11. A braking-system comprising a winding-shaft connected to the brakes, a pivoted lever having actuating connections therewith, a rope or chain connecting the lever with movable brake rods at each end of the car, and a cam within the path of which the lever may be brought by the ropes or chains; substantially as and for the purposes described.

12. A hollow rotary brake shaft having actuating connections with a winding-shaft, and a vertically movable brake-rod within said shaft, a pivoted lever connected to the brake-rod, said lever having actuating connections with the said winding-shaft, and a cam within the path of which the lever may be lowered; substantially as described.

13. A hollow rotary brake-shaft, having actuating connections with a winding shaft and a vertically movable brake-rod within said shaft, a spring arranged to hold the brake-rod in elevated position, a pivoted lever connected to the brake-rod, said lever having actuating connections with the said winding-shaft, and a cam within the path of which the lever may be lowered; substantially as described.

14. A hollow rotary brake-shaft having actuating connections with a winding-shaft and a vertically movable brake-rod within said shaft, a spring arranged to hold the brake-rod in elevated position, means for locking said rod in its lowermost position, a pivoted lever connected to the brake-rod, said lever having actuating connections with the said winding-shaft, and a cam within the path of which the lever may be lowered; substantially as described.

15. A hollow rotary brake-shaft, having actuating connections with a winding shaft, and a vertically movable brake-rod within said shaft, a pivoted lever connected to the brake-rod, said lever having actuating connections with the said winding-shaft, a ratchet-wheel upon the brake-shaft, a pawl engaging said ratchet-wheel and having connection with the pivoted lever, and a cam within the path of which the lever may be brought; substantially as described.

16. In a car-braking system, a single trigger or pawl having connection with and arranged to release two independently operating brake-actuating mechanisms; substantially as described.

17. In a car-braking system, a cam, a lever connected to the winding-shaft and arranged to be brought within the cam-path, and a ball or roller-bearing between said cam and lever; substantially as and for the purposes described.

18. In a brake, a winding-shaft, two toggle-links pivoted thereto and carrying brake-shoes, two toggle-links pivoted to the said links and taking loosely, at their lower ends, about a shaft, and a chain connecting the winding-shaft and toggle-link shaft; substantially as and for the purposes described.

19. In a brake, a winding-shaft, two toggle-links pivoted thereto and carrying brake-shoes, a spring connecting these links, two toggle-links pivoted to the said links, and taking loosely at their lower ends about a shaft, and a chain connecting the winding-shaft and toggle-link shaft; substantially as and for the purposes described.

20. In a brake, a winding-shaft, two toggle-links pivoted thereto and carrying brake-shoes, two toggle-links pivoted to the first-named links, a winding-chain connected to the second pair of links, and a spring interposed in said chain; substantially as and for the purposes described.

In testimony whereof we have hereunto set our hands this 18th day of October, A. D. 1892.

GEORGE W. MACKENZIE.
his
THOMAS C. × SLOANE.
mark
MOSES B. SLOAN.

Witnesses:
A. T. ANDERSON,
JOHN K. WOOLCLAIR.