

No. 750,028.

PATENTED JAN. 19, 1904.

F. GRÉGOIRE.
RAILWAY BRAKE.

APPLICATION FILED APR. 2, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

FIG. 2.

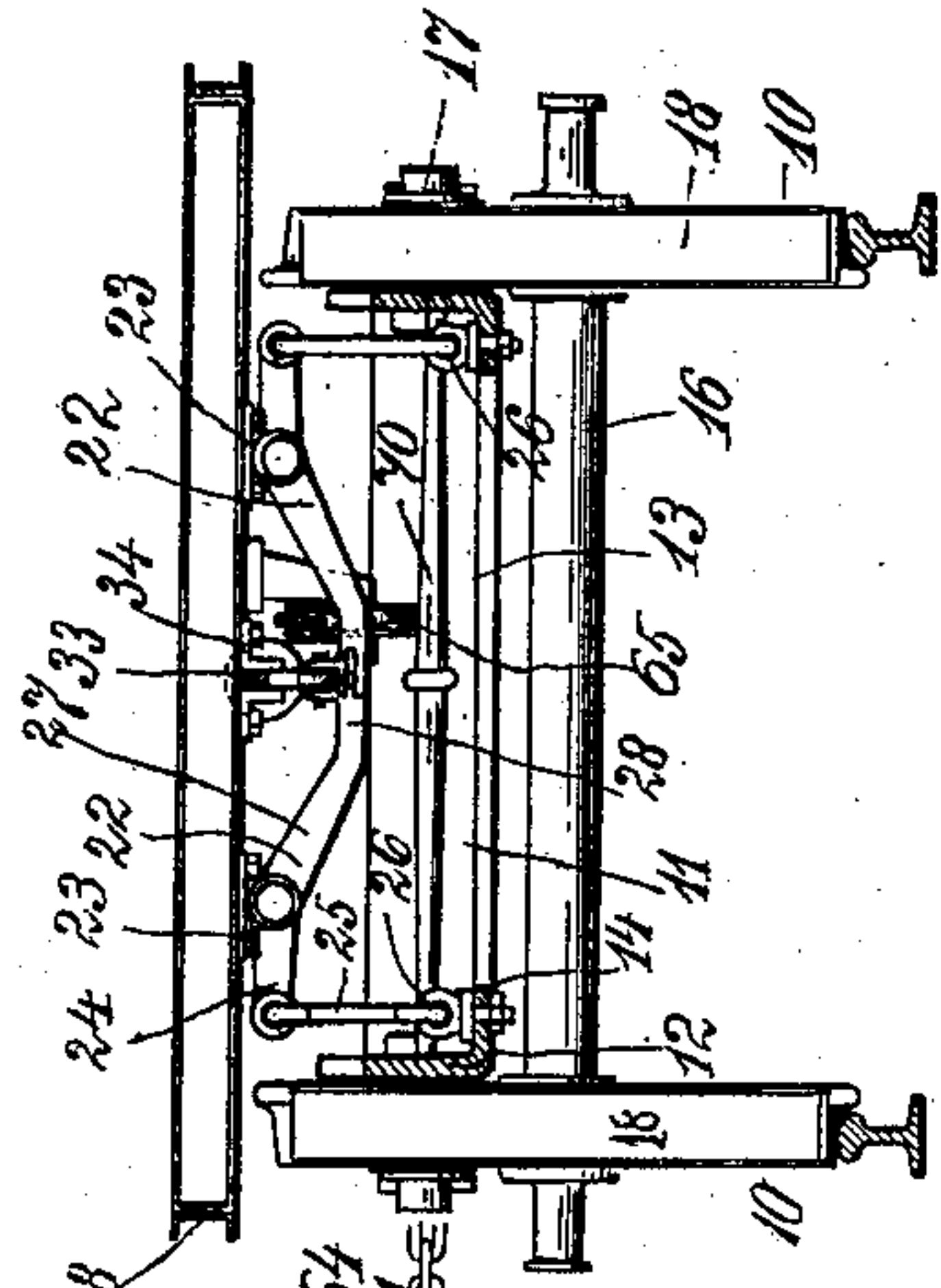
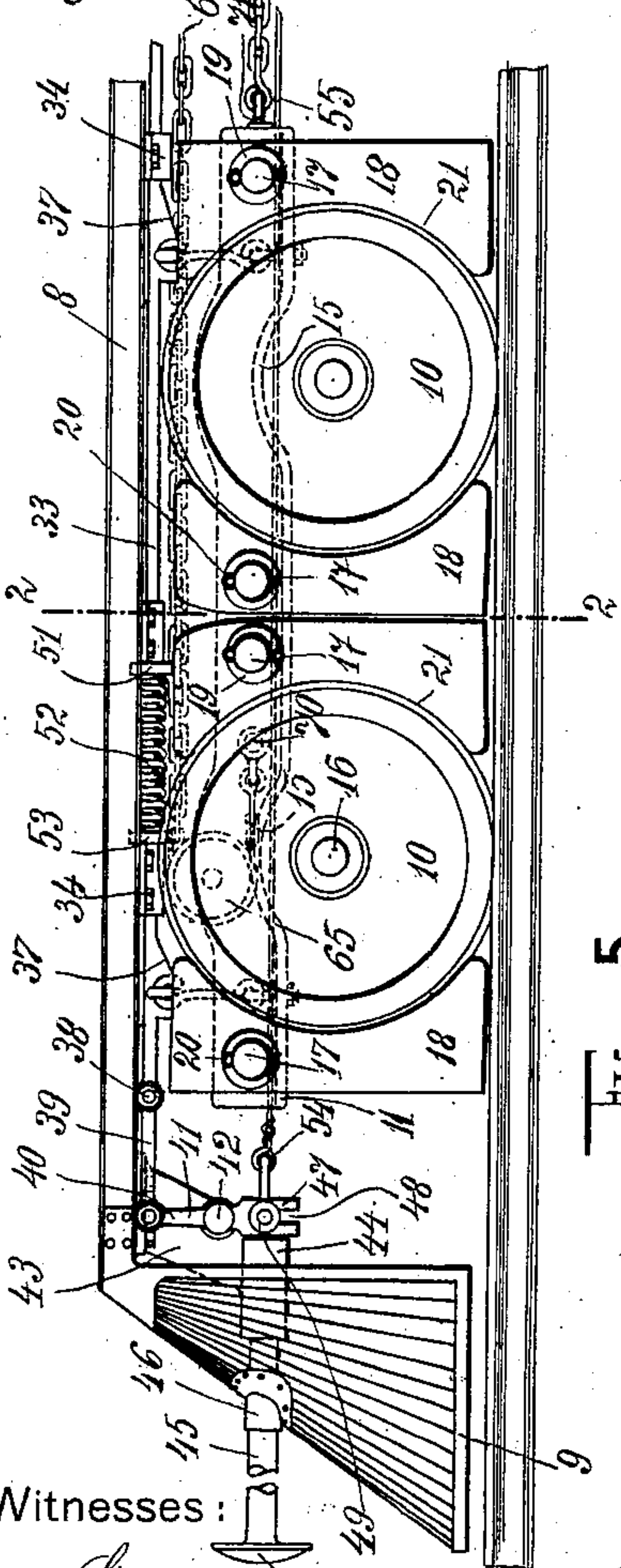


FIG. 1.



Witnesses:

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FIG. 7.

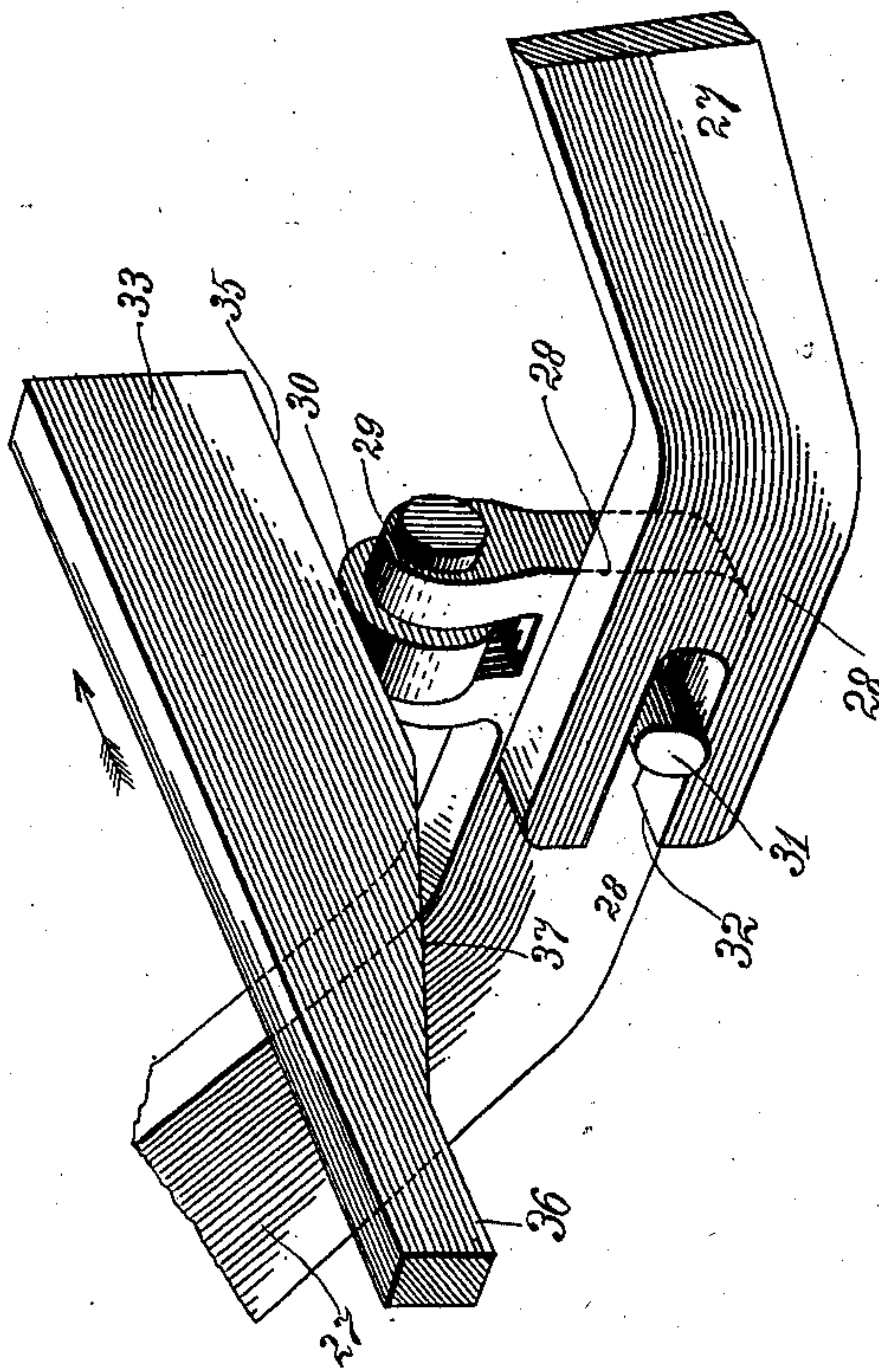
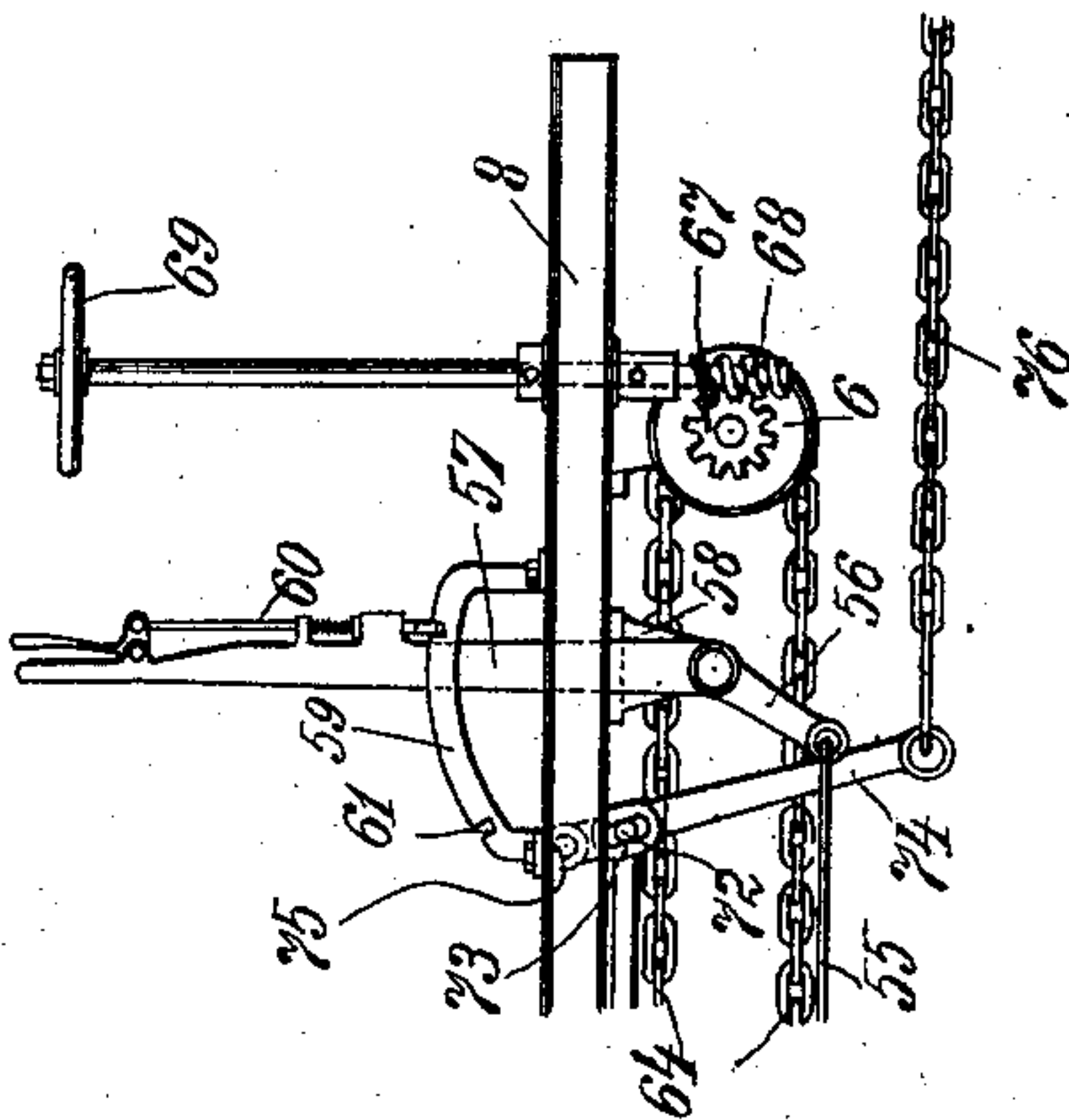


FIG. 5.



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2 SHEETS—SHEET 2.

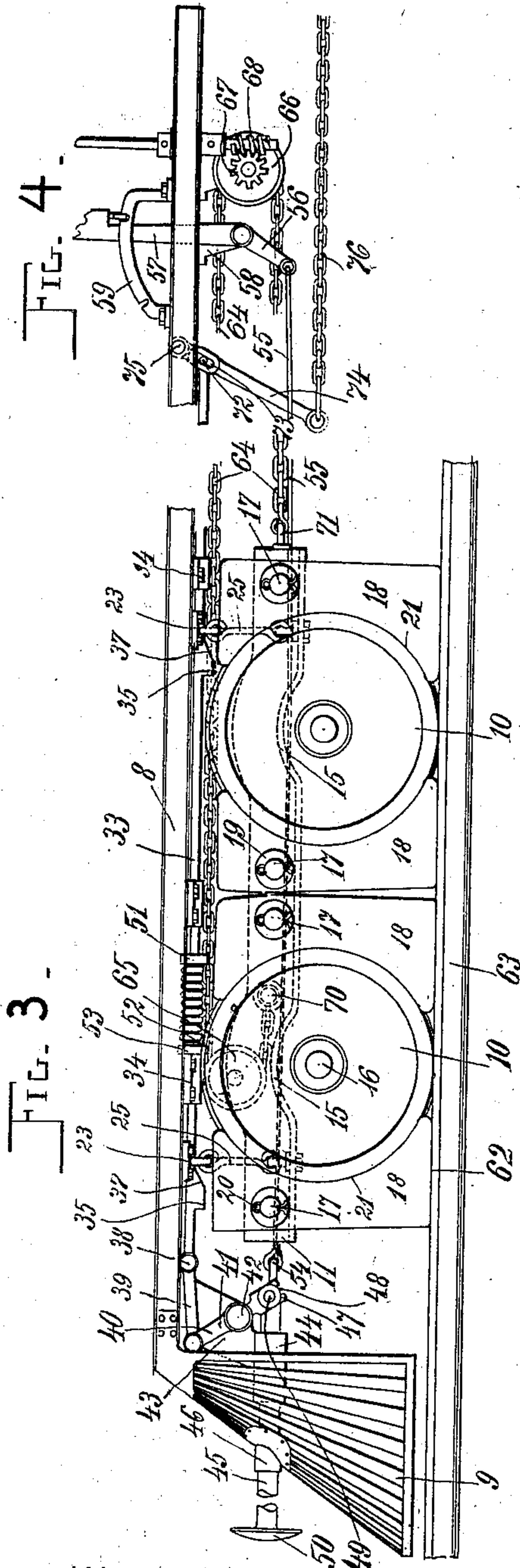
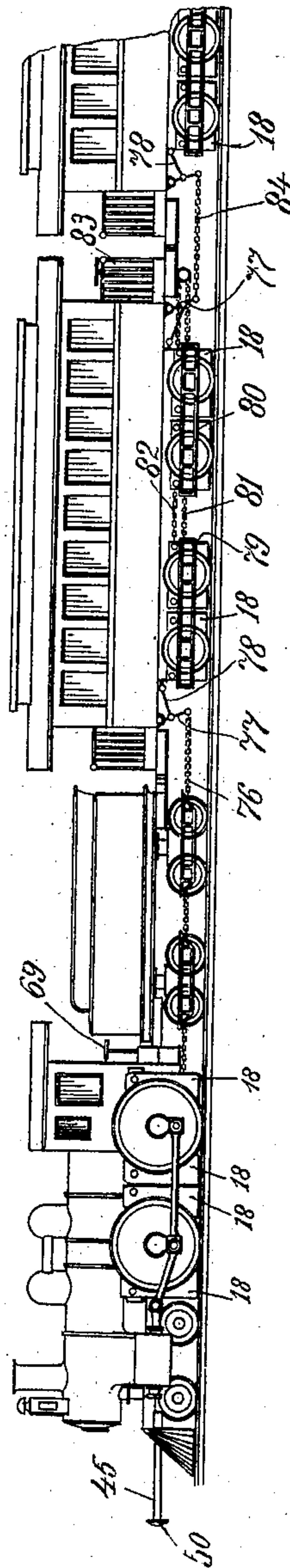


FIG. 6 -



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UNITED STATES PATENT OFFICE.

FÉLIX GRÉGOIRE, OF ST. JEAN BAPTISTE, CANADA.

RAILWAY-BRAKE.

SPECIFICATION forming part of Letters Patent No. 750,028, dated January 19, 1904.

Application filed April 2, 1903. Serial No. 150,744. (No model.)

To all whom it may concern:

Be it known that I, FÉLIX GRÉGOIRE, a subject of the King of Great Britain, residing at St. Jean Baptiste, county of Provencher, Province of Manitoba, Canada, have invented certain new and useful Improvements in Railway-Brakes; and I do hereby declare that the following is 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 railway-brakes, and it is intended especially as an emergency-brake, being expected to arrest within a comparatively short distance an advancing train. While the brake is intended especially as an emergency-brake, I have provided such a construction as enables it to be used under ordinary circumstances for bringing trains slowly to a standstill in the usual manner.

The results of the many disastrous railway collisions seem to indicate that the great loss of life which is often occasioned is usually brought about by the destruction or annihilation of the cars or portions of them. Little damage is actually done by the sudden stopping of the train, which is evidenced by the fact that persons not located at the demolished portion of the train suffer no serious inconvenience from the sudden arrest of their motion in which they shared with the less fortunate victims. Hence it would seem that it is perfectly feasible to stop a train suddenly within a few feet of another train with which it was about to collide by applying a powerful braking force in this way, either actually averting the collision altogether or materially reducing the velocity of the train before the collision, in either case operating to reduce the destructive nature of the collision, and so preventing loss of life.

My invention contemplates the employment of a powerful brake system in conjunction with automatic means for applying the brakes, and I provide automatic means for actuating the brakes when a collision is imminent.

The invention consists in the construction and combination of parts, to be more fully described hereinafter, and definitely set forth in the claims.

In the drawings, which fully illustrate my invention, Figure 1 represents in side elevation a portion of a locomotive truck and frame to which my brake has been applied. In this view the brake is represented in its inoperative position. Fig. 2 represents a cross-section supposed to be taken through Fig. 1, substantially on the line 2 2. Fig. 3 is a side elevation substantially similar to Fig. 1, except that it represents the brake as being applied. Fig. 4 represents, also in side elevation, a portion of certain mechanism by means of which the brakes may be applied by hand instead of being automatically applied. This view also represents the arrangement for passing the brake connections between the different cars of the train, these parts being shown in a relation or position corresponding to the "applied" position of the brake shown in Fig. 3. Fig. 5 represents the same parts shown in Fig. 4, this view being more complete, however, and representing the connection between the cars in a relation or position corresponding to the inactive or "unapplied" position of the brake, as shown in Fig. 1. Fig. 6 represents in side elevation and upon a much-reduced scale a portion of a train to which my brake system has been applied. Fig. 7 represents in perspective, upon a much-enlarged scale, a detail of the brake-actuating mechanism.

Throughout the drawings and specification the same numerals of reference indicate like parts.

Referring more particularly to the parts, 8 represents a portion of a locomotive-frame, which carries at its front a suitable cow-catcher or fender 9, and this frame is supported in any desired manner upon the wheels 10. Behind the wheels 10 I mount a brake frame or beam 11, which is of substantially rectangular form, comprising side members 12, which lie directly opposite the wheels, on their inner sides, as shown most clearly in Fig. 2. This frame comprises also cross members 13, which may be of substantially the same form as the said side members 12, and these side members, it will be observed, are angular in cross-section, comprising substantially horizontal flanges 14, which project inwardly and away from the wheels. The side members 12 are

arched or curved upwardly, as may be necessary, as indicated at 15, where they pass above the axles 16 of the wheels, and these side members are provided with outwardly-projecting studs 17 of large diameter and great strength. Four of these studs are shown, two of which correspond to each of the wheels 10. Upon these studs are pivotally mounted the brake-shoes 18, which are preferably provided with bosses or hubs 19 around the aforesaid studs, and they are retained in place in any suitable manner, such as by means of the split pins 20.

The brake-shoes 18 are of substantially the form shown, consisting of blocks of durable material having curved rubbing-faces 21, which normally lie adjacent to the periphery of the wheels 10, though not in contact with the same.

I provide means whereby the brake frame or beam 11 may be lowered, and this will have the effect of applying the brake-shoes 18 in a manner which will be described hereinafter. The mechanism for effecting an automatic depression of the brake-frame will now be described. Beneath the locomotive-frame 8 there are mounted bell-crank levers 22, which are supported upon suitable brackets 23, as indicated. To their outer arms 24 links 25 are attached, from which links is suspended the aforesaid brake-frame 11 by means of suitable eyebolts 26, which are mounted, as indicated, in the aforesaid flanges 14. The inner arms 27 of these bell-crank levers 22 are depressed or inclined downwardly and formed at their extremities into substantially horizontal extensions 28, which project across the central line of the car. As indicated most clearly in Figs. 2 and 7, the arrangement of the bell-crank levers, which lie opposite to each other, is such that the aforesaid extensions 28 lie adjacent to each other. Referring now more especially to Fig. 7, it should appear that one of these extensions is formed into a bracket 29, supporting a friction-roller 30. The same extension is further provided with a laterally-projecting pin 31, which lies in a slot or elongated recess 32, which is provided in the adjacent extension. Above the roller 30 there is mounted a brake-bar 33, which is disposed longitudinally below the locomotive-frame, being guided in suitable brackets 34. It should appear that adjacent to each of the rollers 30 this brake-bar is provided with a depressed face 35 and an elevated face 36, which faces are connected by an inclined face 37. It should be understood that when the depressed face 35 is in contact with the friction-roller the inner extremities of the bell-crank levers 22 are maintained in a depressed position, the relation of the parts being such as that shown in Figs. 2 and 7. It should also appear that if the brake-bar 33 were moved longitudinally in the direction of the arrow shown in Fig. 7 the inclined face 37 would

pass over the roller, allowing the same to rest eventually against the elevated face 36, in this manner allowing the inner arms of the bell-crank levers 22 to be elevated, which would effect a depression of the brake-frame, as will be readily understood. As briefly stated above, this depression of the brake-frame applies the brakes.

For the purpose of making the actuation of the brake-rod 33 automatic it is extended forwardly beneath the locomotive-frame to the point 38, at which point it is pivotally connected with a link 39, the extremity of which link is attached to the upper arm 40 of a plunger-lever 41, which lever is pivoted at 42 to a suitable bracket 43. This bracket 43 is formed below into a housing 44, in which a plunger 45 is adapted to slide, the said plunger being provided with additional guiding means consisting of the bracket 46, which is attached to the forward portion of the cow-catcher, as indicated. It should appear that the lower arm 47 of the aforesaid plunger-lever is provided with a longitudinally-disposed slot or opening 48, in which is mounted a transverse pin or cross-head 49, which is carried by the inner extremity of the plunger 45. As indicated in Fig. 6, the plunger 45 projects a substantial amount in advance of the locomotive. Its extremity is provided with an enlargement or head 50, and it should be understood that this head should come into contact with an object upon the track before the body of the locomotive. When it strikes such an object, as suggested, this plunger 45 is moved rearwardly, sliding in its supports, as will be readily understood. This rearward movement of the plunger of course actuates the plunger-lever 41, which in turn actuates the brake-bar 33, so as to effect a longitudinal displacement of the said brake-bar. The displacement of this brake-bar, as already described, allows the frame 12 to be depressed, so as to apply the brakes. In order to normally maintain the plunger 45 in an extended position, the brake-bar 33 carries a rigid collar 51, which receives the thrust of a helical spring 52, the opposite extremity of which spring thrusts against a collar or bracket 53, which is rigid with the locomotive-frame 8. From this arrangement evidently the plunger 45 will be normally maintained in an extended position and returned to said extended position after it has been moved rearwardly in the manner suggested. As stated, Fig. 3 represents the parts in active relation.

Arrangement is provided whereby the engineer may apply the brake as an emergency-brake by hand. For this purpose to the aforesaid cross-head 49 there is secured an eye 54, to which is attached the extremity of a line or cable 55, the other extremity of which cable attaches to the lower arm 56 of a controlling-lever 57. This lever may be mounted on a suitable bracket 58 and coöper-

ates with a segment 59 and carries also locking mechanism 60, which by means of the notches 61 enables the said lever to be maintained in its operative or inoperative position.

5 It should be understood that this lever 57 would be operated by the engineer when a collision was apparently about to take place. For this reason the lever is placed within easy reach of the engineer, being placed preferably
10 just in the rear of the cab.

When the brake frame or beam 11 is lowered in the manner described, all the brake-shoes 18 carried by it of course move downwardly with it. As this takes place their
15 lower faces 62 are brought into contact with the heads of the rails 63. At the same time the curved faces 21 of the brakes come into contact with the peripheral faces of the wheels. In order that the brake-shoes should
20 accommodate themselves at once to both the rail and the wheel, the lower edges 62 aforesaid are inclined upwardly away from the wheel, as will be readily understood. It should appear that these brake-shoes, as it were, jam
25 in the angles between the wheels and the rails and exert a powerful brake force upon the wheels as a consequence.

When the brake is to be used as an ordinary brake—that is, under ordinary circumstances
30 where it is desired to arrest the progress of the train gradually—it is applied by simply moving the brake-frame 11 longitudinally with respect to the car, and evidently pressure will be brought to bear by the shoes 18 upon the
35 wheels whether the frame be moved forwardly or rearwardly. It is preferable, however, to apply the brakes in this manner by drawing the frame toward the rear of the train—that is, in a direction opposite to that in which the
40 train is advancing—as the brake will be found more efficient under these circumstances. The arrangement I have shown for applying the brake in this simple manner comprises a chain 64, which passes at its forward portion over
45 a chain-wheel 65, which is attached below the locomotive-frame 8, the rear of the chain passing around a second chain-wheel 66. This latter chain-wheel carries a worm-wheel 67, which coöperates with a worm 68, actuated by
50 a hand-wheel 69. The forward extremity of the chain 64 is attached to a cross-bar 70, carried by the aforesaid brake-frame 11, in such a manner as to enable the chain to pull the entire frame forwardly. The other end of the
55 chain 64 is attached in an eye 71, carried at the rear of said brake-frame. From this arrangement it should appear that a rotation of the hand-wheel 69 in either direction would operate to apply the brakes, it being understood that the direction in which the hand-wheel would be turned should depend upon the direction in which the train was moving.

It should be understood that all the cars in case of a passenger-train would be fitted or
65 supplied with substantially the same arrange-

ment which has been described in connection with the locomotive. Arrangement is made whereby the movement of the plunger 45 or the aforesaid emergency-lever 57 would operate not only to apply the brake upon the lo-
70 comotive, but also throughout the entire train, and in order to operatively connect the brake systems of the successive cars an arrangement such as that illustrated in Figs. 4 and 5 is adopted. While these figures represent the
75 arrangement at the rear of the locomotive for connecting it with the foremost passenger-coach, it should be understood that a similar or corresponding arrangement would be adopted for connecting the foremost coach with the
80 second coach, and so on. Referring especially to Figs. 4 and 5, it should appear that the rear extremity of the aforesaid brake-bar 33 is provided with a transverse pin or cross-head 72, which is received in an elongated slot 73,
85 formed in a connecting-lever 74, which lever is pivoted at 75 to the aforesaid frame 8. To its lower extremity there is attached a chain 76, the opposite extremity of which attaches to a substantially similar connecting-lever 77,
90 disposed at the forward extremity of the first passenger-coach. A link 78 operatively connects this lever 77 with the brake-frame of the forward truck 79, and the rear truck 80 is connected with the forward truck by a chain
95 81. In connection with each coach a chain 82 is provided, which operates in conjunction with brake mechanism 83, which is substantially similar to the hand-brake mechanism described in connection with the locomotive.
100 The forward coach is connected with the coach behind it by a chain 84, which performs the same function as the chain 76, as already described. From this arrangement it should ap-
105 pear that the application of the emergency-brake in the locomotive will also apply the emergency-brake throughout the entire train.

While I have shown in the accompanying drawings the preferred form of my invention,
110 it will be understood that I do not limit myself to the precise form shown, for many of the details may be changed in form or position without affecting the operativeness or utility of my invention, and I therefore re-
115 serve the right to make all such modifications as are included within the scope of the following claims or of mechanical equivalents to the structures set forth.

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

1. In a railway-brake, in combination, a member, brake-shoes carried thereby, means for moving said member in a substantially
125 vertical direction, means for moving said member in a substantially horizontal direction, and independent means for producing said movements of said member.

2. In a railway-brake, in combination, a brake-frame, brake-shoes carried thereby,
130

means for moving said frame in one direction, whereby a powerful brake force is applied, means for moving said brake-frame in another direction, whereby a less powerful
5 brake force is applied, and independent means for moving said brake-frame in either direction.

3. In a railway-brake, in combination, a brake-frame, brake-shoes pivotally carried
10 thereby, said brake-shoes constituting combination wheel and track brakes, means for depressing said frame to apply said brake-shoes, and means for moving said frame substantially horizontally to apply said brake-
15 shoes.

4. In a railway-brake, in combination, a brake-beam, a shoe pivoted thereto and having rubbing-faces adapted to be applied respectively to the wheel and the rail, means
20 for depressing said beam to apply said brake-shoe simultaneously to the wheel and the rail, and means for moving said beam to apply said brake-shoe to said wheel alone.

5. In a railway-brake, in combination, a
25 truck, a brake-beam, a shoe pivotally mounted thereupon and having faces adapted to be applied respectively to the wheel and the rail, a forwardly-extending member projecting beyond all other parts moving with said truck,
30 and adapted to strike an obstruction upon the track, means actuated thereby for depressing said beam, and independent means for moving said brake-beam to apply said brake-shoe to said wheel alone.

35 6. In a railway-brake, in combination, a beam, shoes pivotally mounted thereupon and having faces adapted to be applied respectively to the wheel and the rail, said shoes being disposed forwardly and rearwardly of

the wheels, means for forcing said beam downwardly to apply said shoes to the wheels and rails, and means for moving said beam forwardly or rearwardly to apply said shoes to the wheels alone.

7. In a railway-brake, in combination, a
45 truck, a brake-beam, shoes pivotally mounted thereupon having faces adapted to be applied respectively to the wheels and the rails, a member extending forwardly and projecting in advance of all other parts moving with
50 said truck and adapted to be actuated by striking an obstruction upon the track, means connecting said member with said beam to depress said beam, means for constraining said member toward an extended position, and in-
55 dependent means for moving said beam in a substantially horizontal direction.

8. In a railway-brake, in combination, a
truck, a brake-beam, shoes pivotally mounted thereupon and having faces adapted to be
60 applied respectively to the wheels and the rails, whereby the depressing of said beam may apply said shoes simultaneously to the rails and the wheels, a member extending forwardly and projecting in advance of all other
65 parts moving with said truck, said member being adapted to be struck by an obstruction upon the track, means actuated thereby for depressing said beam, said shoes being disposed forwardly and rearwardly of the wheels,
70 and means for moving said brake-beam forwardly and rearwardly.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

FÉLIX GRÉGOIRE.

Witnesses:

A. N. RENAUD,
X. SARRASIN.