No. 766,916. PATENTED AUG. 9, 1904.

V. P. TAYLOR.

BRAKE.

APPLICATION FILED DEC. 18, 1903.

NO MODEL. 4 SHEETS—SHEET 1.

Fig. 1.

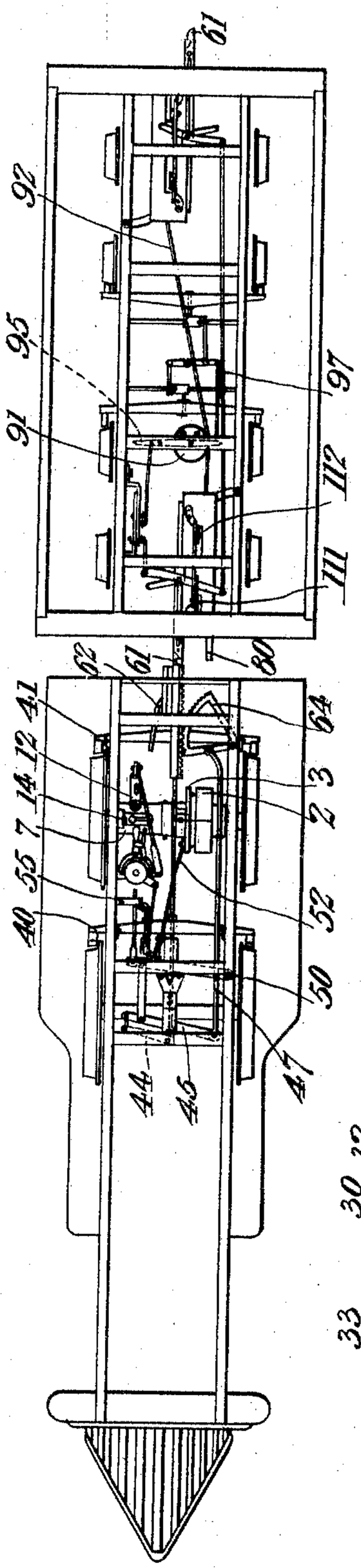


Fig. 7.

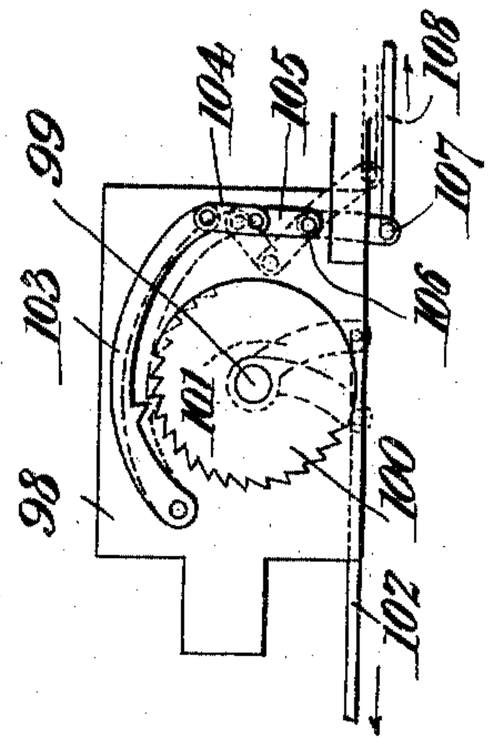


Fig. 9.

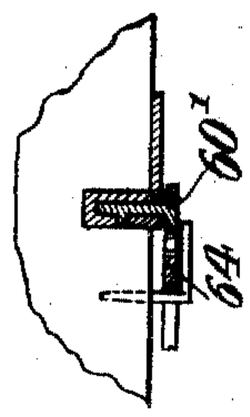
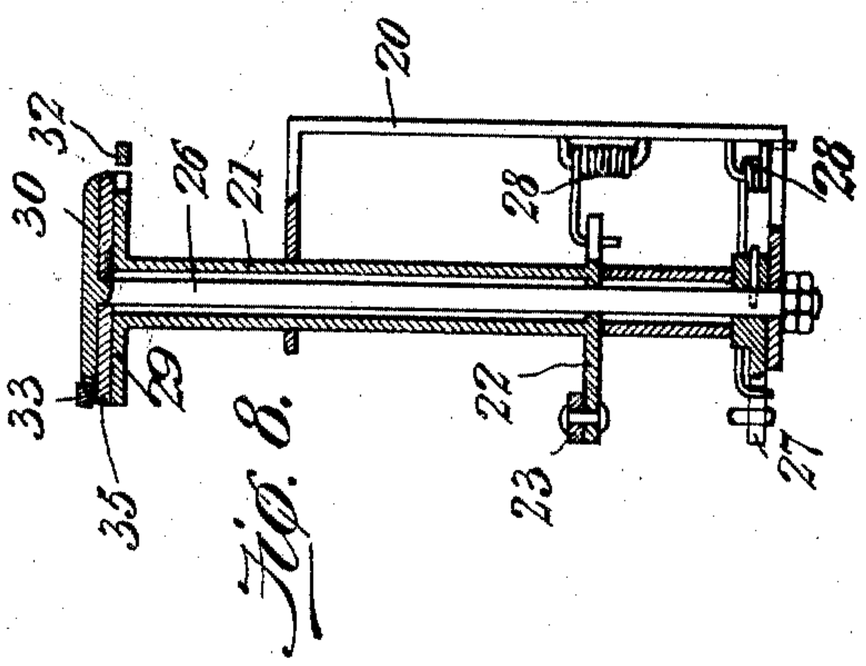


Fig. 8.



Witnesses
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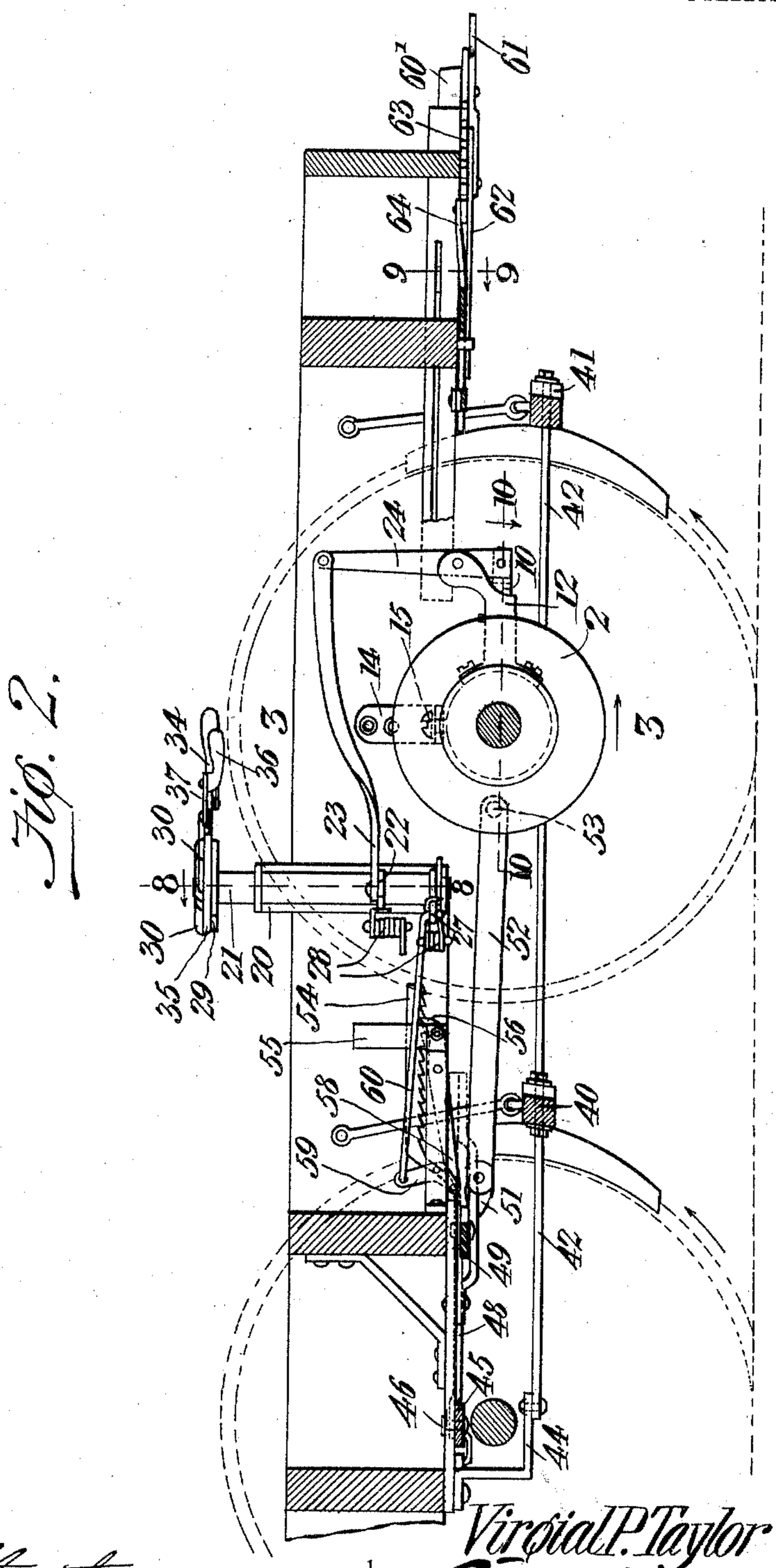
NO MODEL. 4 SHEETS—SHEET 2.

Fig. 2.



Witnesses

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NO MODEL. 4 SHEETS—SHEET 3.

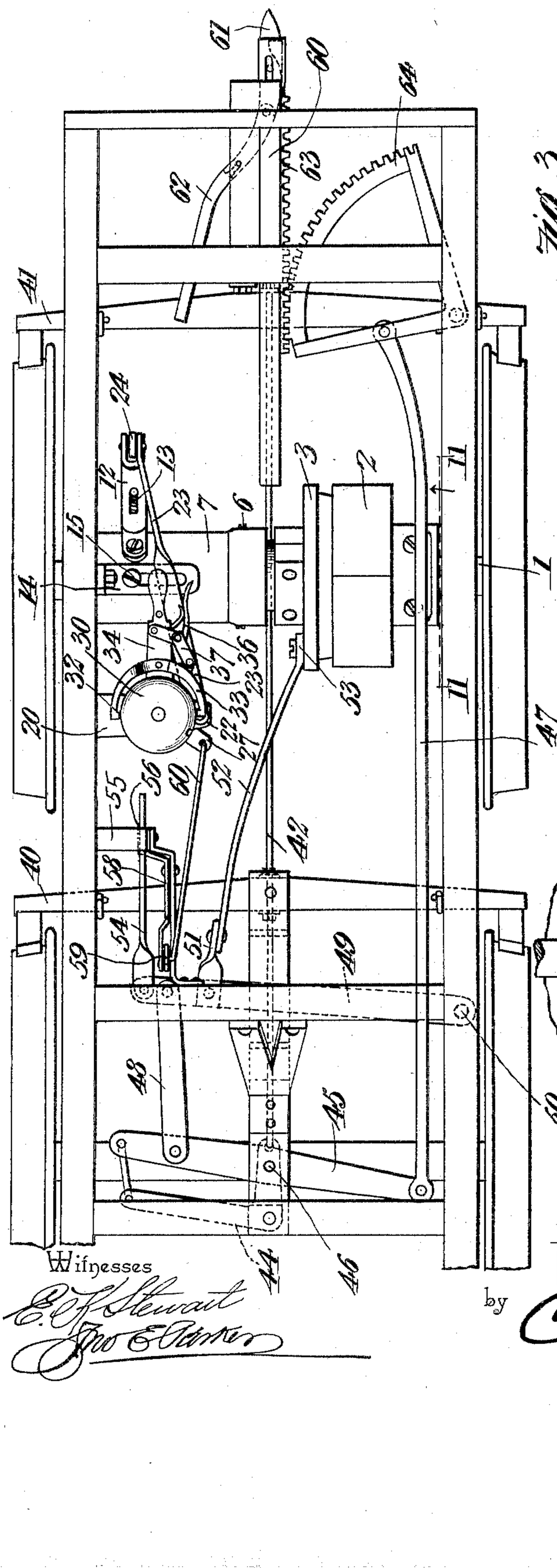

Fig. 3.

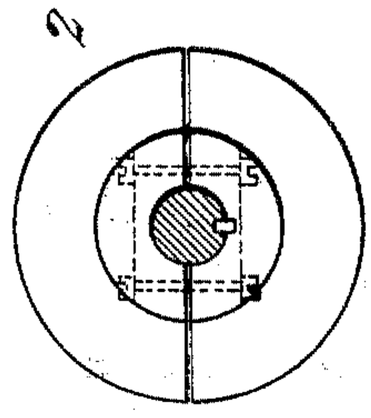

Fig. 11.

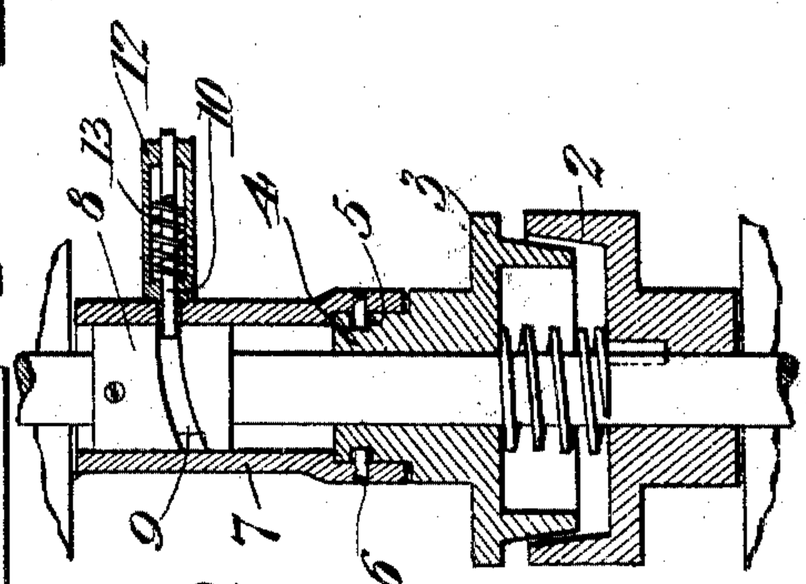

Fig. 10.

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APPLICATION FILED DEC. 18, 1903.

NO MODEL. 4 SHEETS—SHEET 4.

Fig. 4.

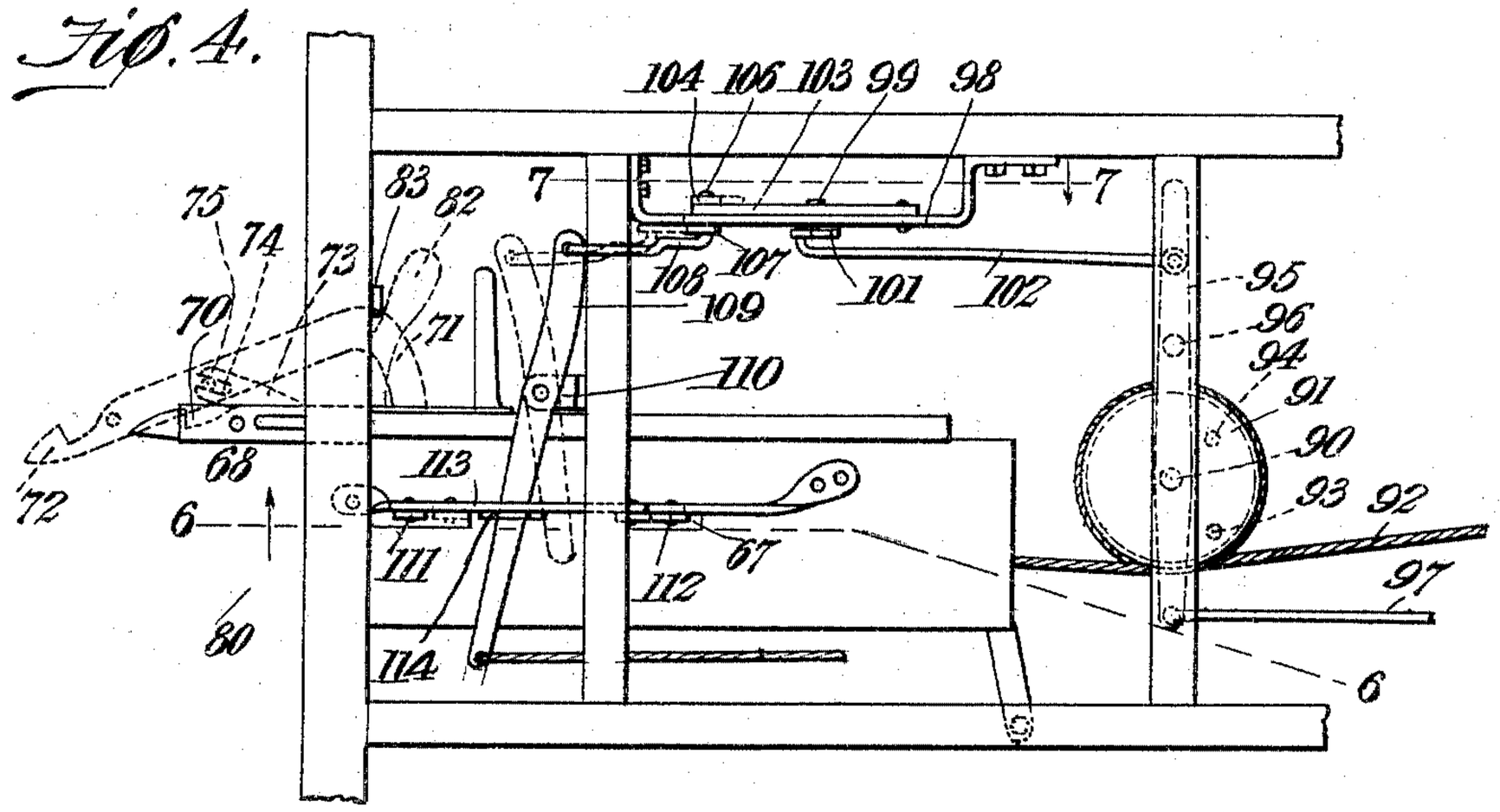

Fig. 5.

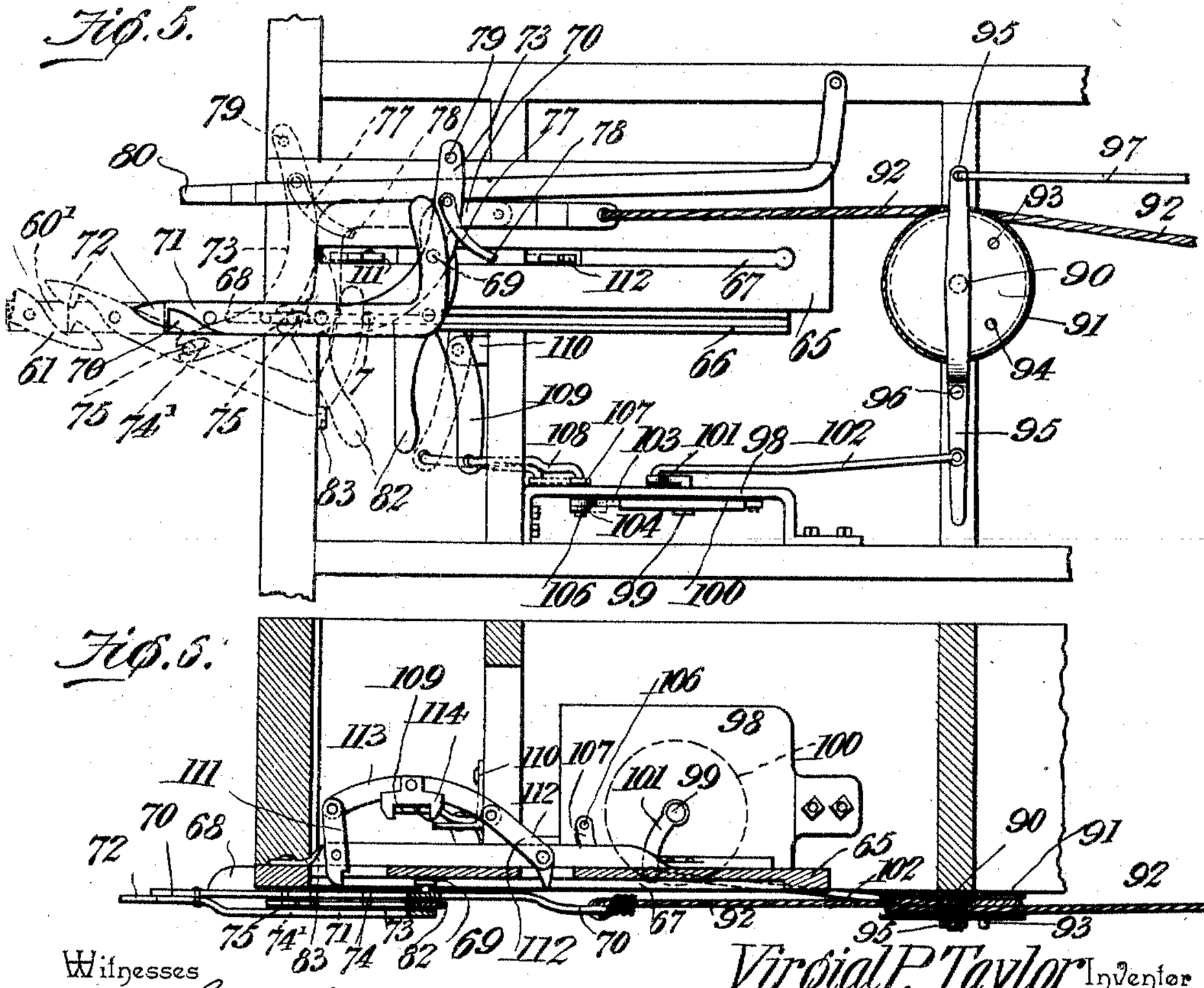

Fig. 6.

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No. 766,916. Patented August 9, 1904.

UNITED STATES PATENT OFFICE.

VIRGIAL P. TAYLOR, OF HATTIESBURG, MISSISSIPPI, ASSIGNOR OF ONE-HALF TO KETE LISCHKOFF, OF HATTIESBURG, MISSISSIPPI.

BRAKE.

SPECIFICATION forming part of Letters Patent No. 766,916, dated August 9, 1904.

Application filed December 18, 1903. Serial No. 185,718. (No model.)

To all whom it may concern:

Be it known that I, VIRGIAL P. TAYLOR, a citizen of the United States, residing at Hattiesburg, in the county of Perry and State of Mississippi, have invented a new and useful Brake, of which the following is a specification.

This invention relates to improvements in brakes, and particularly to that class of brakes employed for controlling railway-trains.

One object of the invention is to provide a mechanical braking apparatus by means of which an engineer may control the engine and all of the car-brakes throughout the length of the train and may apply the same with any desired degree of force and may positively lock the brakes when it is desired to stop the train in case of emergency.

A further object of the invention is to provide a braking apparatus that will be automatic in its character to the extent of applying the brakes on both sections of the train should the train become broken by the pulling out of a draw-head or similar injury to a coupling.

A still further object of the invention is to provide braking apparatus which may be readily locked and as readily released by proper change in the direction of movement of the engine, so that if the brakes are applied while the train is moving straight ahead it will merely be necessary to reverse the engine and travel a few feet rearward to release all of the brakes or in similar manner movement in forward direction will release brakes which have been set while traveling rearwardly.

With these and other objects in view, as will hereinafter more fully appear, the invention consists in the novel construction and arrangement of parts hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, and minor details of construction may be made without departing from the spirit or sacrificing any of the advantages of the invention.

In the accompanying drawings, Figure 1 is a plan view illustrating a portion of a locomotive and railway-train in outline and showing the application thereto of braking mechanism constructed in accordance with the invention. Fig. 2 is a longitudinal sectional elevation, drawn to a somewhat larger scale, illustrating the apparatus employed on the locomotive. Fig. 3 is a plan view of the mechanism shown in Fig. 2. Fig. 4 is a plan view of one end of a car or tender, showing the construction and arrangement of the braking mechanism carried thereby. Fig. 5 is a view similar to Fig. 4 looking from the under side of the platform-frame. Fig. 6 is a longitudinal sectional elevation of one end of a car on the line 6 6 of Fig. 4. Fig. 7 is a longitudinal sectional elevation on the line 7 7 of Fig. 4, illustrating the brake-locking means employed on each car. Fig. 8 is a sectional elevation on the line 8 8 of Fig. 2, illustrating the construction of the mechanism in the cab of the locomotive and by which the brakes may be applied and released. Fig. 9 is a transverse section on the line 9 9 of Fig. 2, illustrating the guiding device for the coupling member carried by the tender. Fig. 10 is a sectional plan view on the line 10 10 of Fig. 2, illustrating the construction of the clutch mechanism. Fig. 11 is a transverse sectional view on the line 11 11 of Fig. 3, showing the means for securing the clutch members to the driver-axle.

The majority of brakes employed on railway-trains at the present time are operated by air-pressure and are not in all cases reliable, owing to the danger of leakage and the necessity of employing flexible piping connections between the trains and the consequent danger of rupture of the flexible connections from excessive pressure or accidental cutting.

In carrying out the present invention provision is made for setting the brakes by the application of direct mechanical force from the engine, the braking-levers throughout the whole length of the train being at all times under the direct control of the engineer.

In the drawings, 1 represents one of the axles of a set of locomotive-drivers, and on said axle is rigidly secured a flanged clutching-disk 2, with which may engage a drum or

disk 3, that is loosely mounted on the axle and is movable toward and from the disk 2. The drum or disk 3 has a hub member 4, that is provided with an annular slot 5 for the reception of a pair of pins 6, carried by a longitudinally-movable sleeve 7, which is held from rotating with the axle. Within the sleeve 7 and secured rigidly to the axle is a sleeve 8, having one or more inclined cam-grooves 9, into which may extend a pin or pins 10, guided in a small bracket 12, secured to the sleeve 7. The several disks and sleeves are preferably made in sections for convenience in application to the axles. When in normal position, the pin is held outward from engagement with the cam-groove by means of a spring 13, and the axle and inner sleeve 8 may rotate freely as the train is moved without in any manner affecting the braking apparatus; but should the pin be forced inward and engage with one of the cam-slots the sleeve 7 and pin will be forced to move longitudinally of the axle in a direction toward the flanged disk 2. This movement will be transmitted to the hub 4 by means of the pins 6, and the clutching disk or drum 3 will be forced positively into engagement with the disk 2, and said disk or drum will be forced to revolve to an extent sufficient to set the brakes. During this movement the sleeve 7 will be held from revolving by means of a slotted bracket 14, carried by the frame of the engine, and a pin 15, that projects radially from the sleeve into the slot of the bracket and permits free longitudinal movement of the sleeve during the clutching and unclutching movements.

To any suitable portion of the frame of the engine is secured a bracket 20, having a guiding-opening for the passage of a hollow spindle 21, from the lower end of which extends a crank 22, that is connected by a link 23 to a lever 24, fulcrumed at the outer end of the pin-guiding bracket 12, and the lower end of said lever is pivotally connected to the pin, so that when the hollow spindle 21 is turned by the engineer the pin will be moved longitudinally into engagement with or disengagement from the cam-slots. Through the hollow spindle 21 extends a second spindle 26, the lower end of which extends through a guiding-opening formed in the lower arm of the bracket 20, and to said second spindle there is secured a crank-arm 27, that is connected to a means for releasing the brake, said releasing means being more fully described hereinafter. When the spindles are released after operative movement in one direction or the other, they are restored to initial position by means of small torsion-springs 28, carried by the frame or by the bracket 20 and connected to the crank-arms 22 and 27, respectively.

To the upper end of the hollow spindle 21 is secured a disk 29, and to the end of the spindle 26 is secured a similar disk 30, both disks being provided with notches, into one of which extends a latch 32 and into the other a similar latch 33, the two latches being formed integral and both being mounted pivotally on an arm 34, that projects radially from a loosely-mounted disk 35, carried between the two disks of the spindles 21 and 26. The arm or lever 34 is provided with a suitable handle within convenient reach of the engineer or fireman, and pivoted to this lever is a latch-operating lever 36, that is connected by a link 37 to the two latches 33 and 32, so that the engineer by properly manipulating the latch-bar may move the latch 32 into the notch of the disk 29 or may move the latch 33 into engagement with the notch of the disk 30. When engaged in the notch of disk 29, the latch 32 may be utilized as a medium for transmitting movement to the hollow spindle 21, and through this spindle and crank-arm 22 and its related parts the pin 11 may be moved into and out of engagement with the cam-slots of the sleeve 8.

Referring now more particularly to the braking system of the engine, 40 and 41 designate brake-beams provided with suitable shoes for contact with the peripheries of the drivers. The beams are connected for mutual movement by a rod 42, and the central portion of beam 40 is connected to the shorter arm of a bell-crank lever 44, pivoted at the point of bifurcation to the frame of the engine. The longer arm of the bell-crank lever is connected to one end of a transversely-disposed brake-lever 45, that is pivotally mounted at a point intermediate of its length on a pin 46. The opposite end of the lever 45 is connected by a tension-rod 47 to mechanism for transmitting the operative movement from the engine to the brake systems of the cars. The lever 45 is further connected by a link 48 to a transversely-extending lever 49, that is pivoted at one end on a stud 50, carried by the frame of the machine. Near the free end of the lever 49 is a projecting arm 51, that is connected by a link 52 to a pivot-pin 53, carried by the disk or drum 3, the position of this pin being normally in a radial line drawn from the center of rotation of the axle 1 to the connecting-arm 51, so that rotative movement of the disk 3 in either direction will exert pulling strain on the link 52 and transmit operative movement to all of the braking system without regard to the direction in which the train is traveling, thus permitting operation of the brakes while going either forward or backward.

In order to lock the brakes when set, the free end of the lever 49 is provided with a pivoted rack-bar 54, the outer end of which is guided in a suitable bracket 55 at a point immediately above a locking-tooth 56, over which the rack passes while the brakes are being applied, and the tooth by engagement with the rack will serve to positively lock the braking-levers in any position to which they

may be adjusted, so that the braking strain will be taken off the cam-slots and the pin by which the brakes receive preliminary movement.

The tooth 56 is carried by a pivoted lever 58, mounted on the bracket 55, and the opposite end of the lever 58 is connected by a bell-crank lever 59 and rod 60 to the crank-arm 27 of the spindle 26, so that the engineer by engaging the latch 33 with the notch of the disk 30 may turn the spindle and through the described connections may withdraw the tooth 56 from engagement with the rack and release the brake, the parts naturally returning to initial position and the brake-shoes moving out of contact with the wheels, auxiliary springs being employed, if necessary.

The several cars of the train, as well as the engine and tender, are connected together by any of the coupling devices in ordinary use, and each of the cars and the tender carries a separate braking system, including brake shoes and beams and a separate locking device, so that each car system may be independently locked. The several systems are connected in a continuous series throughout the whole length of the train, so that they may all be simultaneously applied and released.

At the rear of the engine is a suitable guide for a slidable draw-head 60′, to the outer end of which is pivoted a coupling member 61, and is further provided with a lever 62, which will permit ready release of the coupling should it be desired to detach the tender. On one side of the draw-head is a rack 63, with which intermeshes the teeth of a segment 64, pivoted to the under side of the engine-frame and connected by the rod 47 to the brake-lever 45, previously described, and when said brake-lever is operated tensional strain will be exerted on the link or rod 47, and the coupling 61 will be drawn forward. This movement will then be imparted to the braking system of the tender and following cars.

To the under side of each car-frame is secured a slotted plate 65, the two slots of which, 66 and 67, receive, respectively, a rib 68 and a block 69, carried by an angular draw-head 70. To one arm of the angular draw-head is pivoted a lever 71, terminating at its outer end in a coupling member 72 for engagement with the corresponding coupling member of the engine or adjacent car. The draw-head is further provided with a bell-crank lever 73, pivoted on a pin 74 to the rear of the pivot-pin on which lever 71 is mounted. The outer end of the lever 73 is provided with an elongated slot 74′ to receive a pin 75, carried by the lever 71, and near the opposite end of the lever 73 is pivoted a small locking-lever 77, having a downturned tongue 78, that will engage in the corner or angle formed at the intersection of two portions of the draw-head, and thus limit the opening movement of the coupling member. To provide for the opening of the coupling by hand, the lever 73 is provided with a pin or lug 79, which may be engaged by a hand-operated lever 80, pivoted to the frame of the car and having an operating-handle arranged at the end of the car within convenient reach of the brakeman. When the hand-lever 80 is caught and pulled outward toward the side of the car, the pin 79 will be engaged, and the lever 73 will be moved in such manner as to cause swinging movement of the coupling-lever 71 until the coupling-head 72 has been disengaged from the mating coupling member on the adjacent car. It is intended, however, that the mechanism be so arranged as to permit of the automatic uncoupling should the main couplings of the cars break or the train part in such manner that the weight of the train will be thrown on the couplings of the braking system. To this end, therefore, the angular draw-head carries a pivoted cam-lever 82, one end of which is arranged in such a manner as to engage the rear face of the lever 73. The opposite arm of the lever moves into engagement with a fixed lug or pin 83, carried by the train, and serves as a means for automatically shifting the coupling-lever 71 when the strain becomes too great.

The frame of the car carries a stud or spindle 90, on which is mounted a grooved sheave 91, around which passes a flexible cable 92, extending between the draw-heads at the opposite ends of the car and serving as a means for transmitting operative movement from one draw-head to the other. This sheave carries a pair of pins 93 and 94, one or other of which may engage with a lever 95, that is pivoted at 96 to the car-frame. The opposite end of the lever is connected to a brake-rod 97, which is held under tensional strain to apply the brakes when the sheave is turned, and one or other of the pins engages the lever 95. The system of brake-levers employed may vary with the type of car and the road, and in some cases both ends of the lever 95 may be coupled to the brake-rods for the purpose of operating the break beams and shoes.

It is desirable that the brakes be independently locked on each car in case the train should break in two or more sections, so that both sections will be instantly stopped and danger of collision between them avoided.

To the frame of each car is secured a plate 98, having an opening for the passage of a pin 99, to which is secured a ratchet-wheel 100. To the opposite end of the pin is secured a crank 101, that is connected by a link 102 to the lever 95, and on each application of the brakes the ratchet-wheel is turned to an extent dependent on the extent of rotative movement of the sheave 91. The plate 98 further carries a pawl 103, having a tooth for engaging the teeth of the ratchet-wheel, and the free end of the pawl is connected by a link 104 to a crank-arm 105 on a pin 106, extending

through an opening in the plate 98. The pin 106 further carries a crank-arm 107, that is connected by a link 108 to one arm of a lever 109, pivoted on a bracket 110, carried by the frame of the car.

To a rib or web on the grooved plate 65 are pivoted two fingers 111 and 112, that are connected together by a link 113, and from the link extends lugs 114, disposed, respectively, on opposite sides of the free end of the lever 109. The fingers extend down through the slot 67 in the plate 65, and between them reciprocates the block 69 of the draw-head; but under ordinary circumstances this block will not come in contact with either of the fingers.

Should the train break and the weight of the train be thrown on any one of the coupling members of the brake system, the strain exerted will be sufficient to bring all of the blocks 69 of the several cars into contact with the fingers 111, and while the application of the brakes will follow through the longitudinal movement imparted to the cable 92 the movement of the finger 111 will be transmitted through link 113 and one of the fingers 114 to the lever 109, and this in turn will move the pawl-bar 103 into engagement with the teeth of the ratchet-wheel 101 and the latter will be locked, thus firmly holding the brakes and arresting the movement of the train, so that there can be no possibility of collision between the two or more broken sections. For movement in the opposite direction the blocks 69 will come into engagement with the fingers 112, and through these the several pawls 103 will be moved to release the ratchet-wheels, and thus permit the release of the brakes.

With apparatus of this character the whole system of brakes throughout the train is at all times under the control of the engineer or fireman, and the brakes may be mechanically applied simultaneously and with any desired degree of force without regard to the direction of travel of the train. The brakes may be locked after setting by the locking mechanism on the engine and may be readily unlocked, or by quick movement of the releasing means a gradual release of the brakes may be effected, and thus permit the engineer to bring his train to a stop at any desired point, thus being of especial value in platform stops or for stopping the engine for taking on supplies of fuel or water. There is, furthermore, no danger of the train running away or of collision between sections of a broken train, inasmuch as all of the brakes throughout the length of the train will be immediately set as soon as the strain is thrown on the coupling members of the braking system, and when final parting occurs, by the automatic release of the brake-couplings all of the brakes on the several cars will be firmly locked in the positions to which they have been adjusted.

Having thus described the invention, what is claimed is—

1. In combination, a car or vehicle having a revoluble shaft or axle, a collar secured thereto and having a cam-groove, a loose clutching member embracing the collar, a pin extending through an opening in said loose clutching member and adapted to enter the cam-groove, means for moving the pin, a rigid clutching member secured to the shaft, a braking system, a lever or link connected at one end to the braking system, and at the opposite end to the loose clutching member.

2. In combination with a vehicle having a revoluble shaft or axle, of a sleeve rigidly secured to the axle and provided with an annular cam-groove, a second sleeve mounted on the first and movable longitudinally of the shaft, a pin carried by said second sleeve and movable into and out of engagement with the cam-groove, means for operating the pin, a clutching member rigid with the shaft, a second clutching member loose on the shaft, means for connecting the said clutching member to the outer sleeve, a system of braking-levers, and means for operatively connecting the system of braking-levers to the second clutching member.

3. In combination, a vehicle having a revoluble shaft or axle, a cam-sleeve rigid with the axle, a second sleeve surrounded by the first, a pin carried by the sleeve and engaging the cam-groove, a flanged clutching-disk rigid with the axle, a movable clutching-disk for engaging the rigid clutching-disk, means for connecting the movable clutching-disk to the second sleeve, a system of braking-levers, a crank-pin carried by the movable clutching-disk, and a link or rod connecting the brake-levers to the crank-pin.

4. In combination, a vehicle having a revoluble shaft or axle, a cam-sleeve rigid with the axle, a second sleeve mounted on the first, a radially-movable pin carried by the second sleeve and adapted to engage the cam-sleeve, a flanged clutching-disk rigid with the shaft, a second clutching-disk movable toward and from the first, means for connecting the movable clutching-disk to the second sleeve, a system of braking-levers operatively connected to the second disk, a revoluble spindle, a spindle-operating means, and mechanism connecting the spindle to the pin, substantially as specified.

5. In combination, brake-applying mechanism, a hollow spindle, means for connecting the same to the applying mechanism and controlling the operation thereof, a second spindle, an operating-lever, means for operatively connecting the lever to one or other of the spindles, an automatic locking mechanism, and means for connecting the second spindle to the locking mechanism.

6. In combination, a brake-applying mechanism, including a rack movable with the brake-applying mechanism, a lever fulcrumed at a point intermediate of its length, and hav-

ing a tooth for engagement with the rack, a hollow spindle connected to the brake-applying mechanism, a second spindle extending through the first and connected to the tooth-carrying lever, notched disks secured to the respective spindles, an operating-lever, and means for connecting the operating-lever to either of said disks.

7. In combination, train-braking mechanism including independent braking systems on the several cars, coupling connections for connecting the systems in a continuous series, said coupling connections including pivotally-mounted couplers, and means for effecting pivotal movement of said couplers and positively separating the same when the train parts.

8. In combination, train-braking mechanism including independent braking systems on the several cars, pivotally-mounted couplers connecting the several systems in a continuous series, levers carrying said couplers, and means for engaging and moving the levers to effect positive separation of the couplers when the train parts.

9. In combination, train-braking mechanism including a set of braking-levers for each car, means for coupling the several sets of levers in a continuous series, a toothed locking-disk movable with the braking-levers, and a disk-engaging pawl movable to engaging and disengaging positions by the operation of the brakes.

10. In combination, train-braking mechanism including a system of braking-levers for each of the cars, means for coupling the several sets of braking-levers in a continuous series, and independent locking means carried by each car and including a revoluble disk connected to and movable with the braking-levers, a pawl for engaging the disk, and means for connecting said pawl to the coupling devices whereby the pawl will be moved to engaging and disengaging positions on movement of said coupling devices.

11. In combination, a train-braking system including braking-levers for each of the cars, means for coupling the several sets of braking-levers in a continuous series, and independent locking means carried by each car and including a toothed disk connected to and movable with the levers, a pawl for engaging said toothed disk, and a pair of pivoted fingers disposed in the path of movement of the coupling devices and operable on excessive movement of said coupling devices to move the pawl to both locking and release positions.

12. In combination, a braking mechanism including brake-levers on each car, means for coupling the braking-levers in a continuous series, a toothed locking-disk movable with the levers, a pawl for engaging the disk, a pair of fingers disposed in the path of movement of the coupling means, a link connecting said fingers, a pair of studs projecting from the link, and a pawl-operating lever disposed between said studs.

13. In combination, braking-levers on each car of a train, a locking-disk, a pivotally-mounted lever connected to the disk and connected also to the braking-levers, a sheave mounted adjacent to said lever, a pair of pins carried by the sheave and adapted to engage the lever, coupling members for connecting the braking systems of the several cars, and a flexible cable or chain connecting the coupling members of each car and extending around said sheave.

14. In combination, braking-levers arranged on the several cars of a train, pivoted coupling-bars for connecting the levers in a continuous series, a lever pivotally connected to each coupling-bar, a cam-lever engaging the pivoted lever, and a lug or stop disposed in the path of movement of the cam-lever and serving by engagement therewith to move the coupling-bar to release position.

In testimony that I claim the foregoing as my own I have hereunto affixed my signature in the presence of two witnesses.

VIRGIAL P. TAYLOR.

Witnesses:

J. H. JOCHUM, Jr.,

J. ROSS COLHOUN.