No. 781,325. PATENTED JAN. 31, 1905.

J. W. WOOD.

STEERING MECHANISM FOR TRACTION ENGINES.

APPLICATION FILED MAY 5, 1904.

3 SHEETS—SHEET 1.

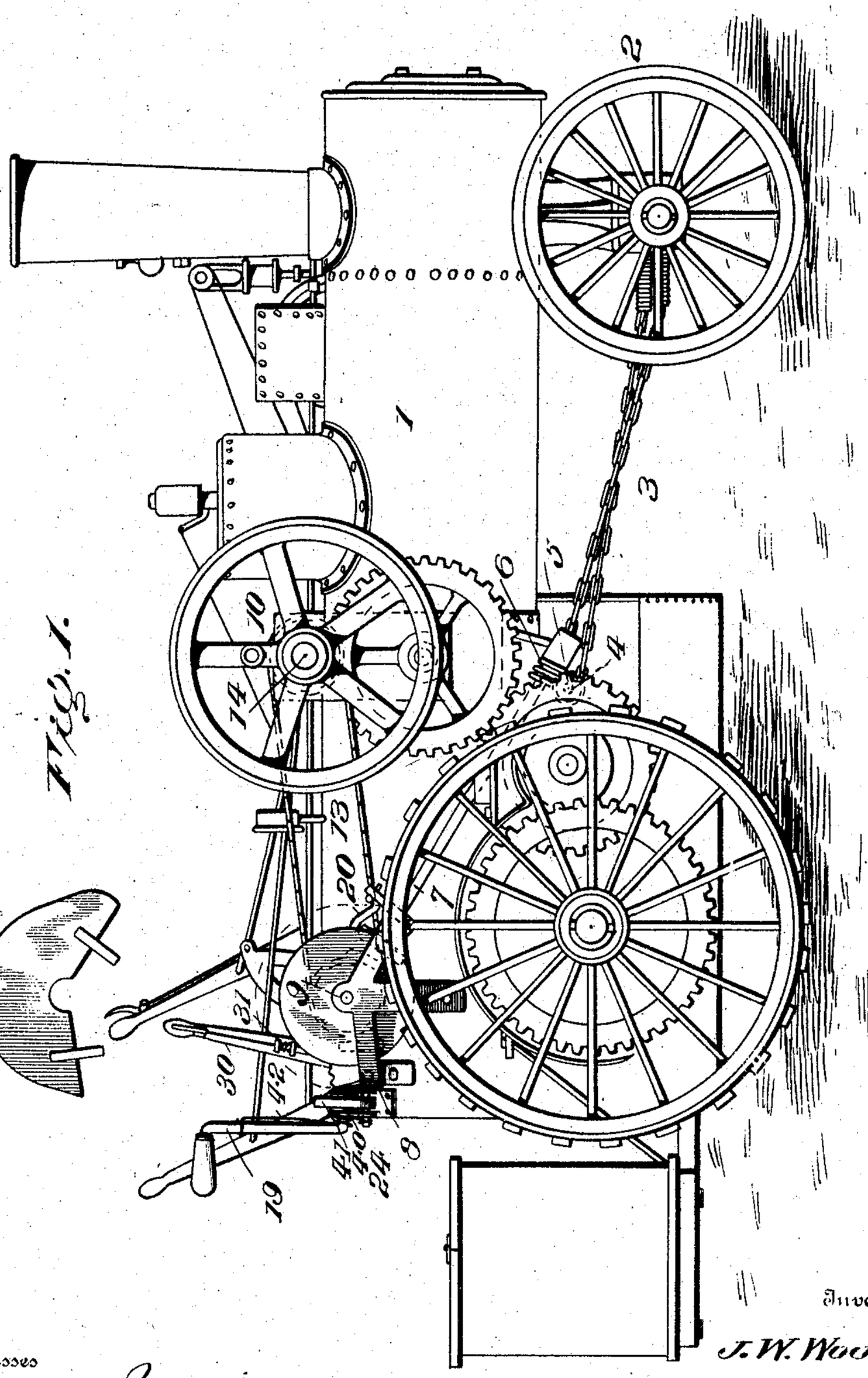


Fig. 1.

Witnesses

W. N. Woodson

Inventor

J. W. Wood

By R. A. B. Lacey. Attorneys

PHOTO-LITHOGRAPHED BY BACHETT & WILHELMS LITHO. & PTG. CO. NEW YORK.

No. 781,325. PATENTED JAN. 31, 1905.

J. W. WOOD.

STEERING MECHANISM FOR TRACTION ENGINES.

APPLICATION FILED MAY 5, 1904.

3 SHEETS—SHEET 2.

Fig. 2

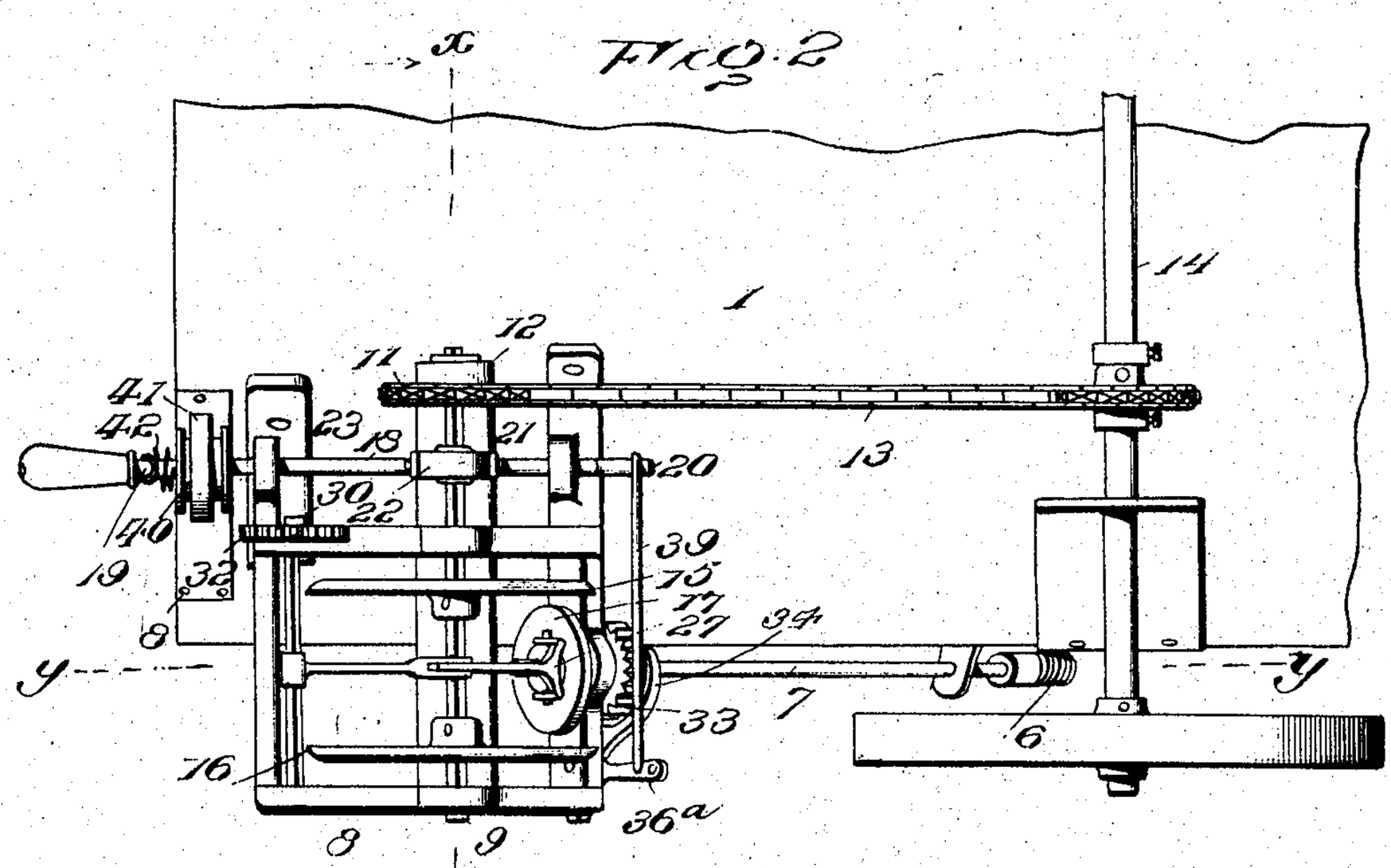


Fig. 3

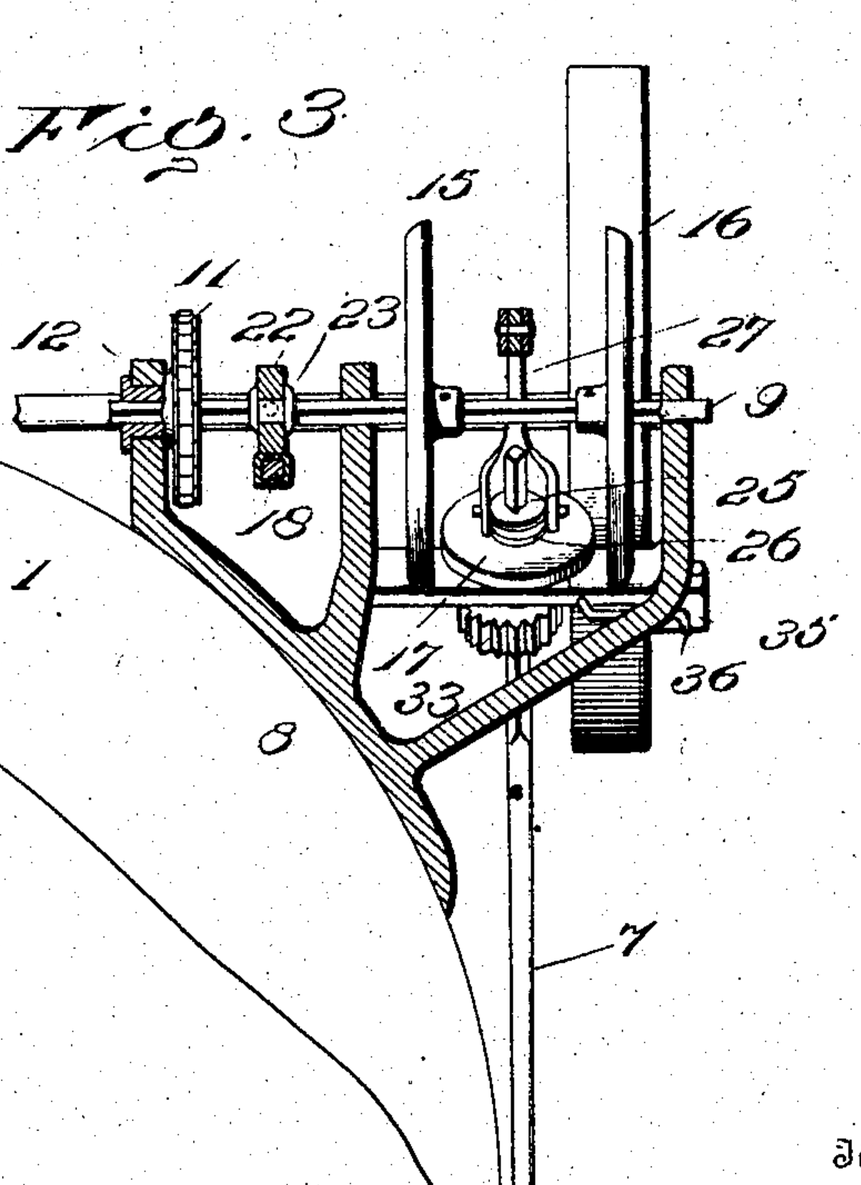
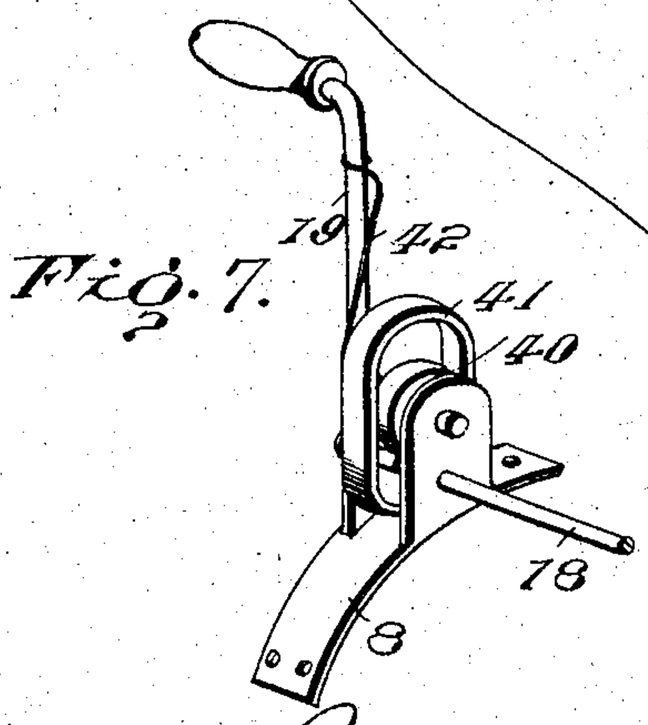


Fig. 7.



Witnesses

W. N. Woodson

Inventor

J. W. Wood

By R. H. Rose & Co. Attorneys

PHOTO-LITHOGRAPHED BY SACHETT & WILHELMS LITHO. & PTG. CO. NEW YORK.

No. 781,325. PATENTED JAN. 31, 1905.

J. W. WOOD.

STEERING MECHANISM FOR TRACTION ENGINES.

APPLICATION FILED MAY 6, 1904.

3 SHEETS—SHEET 3.

Fig. 4.

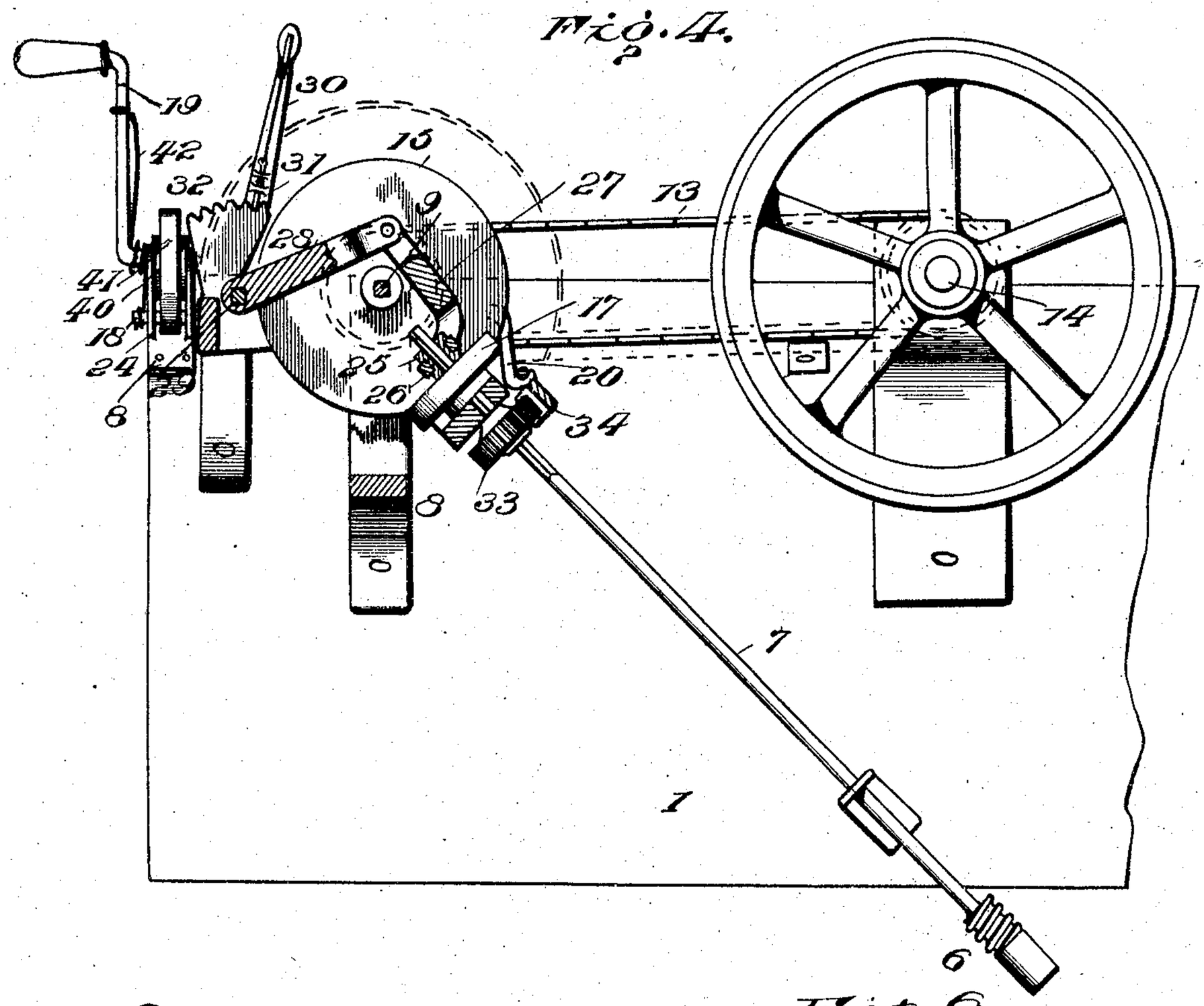


Fig. 5.

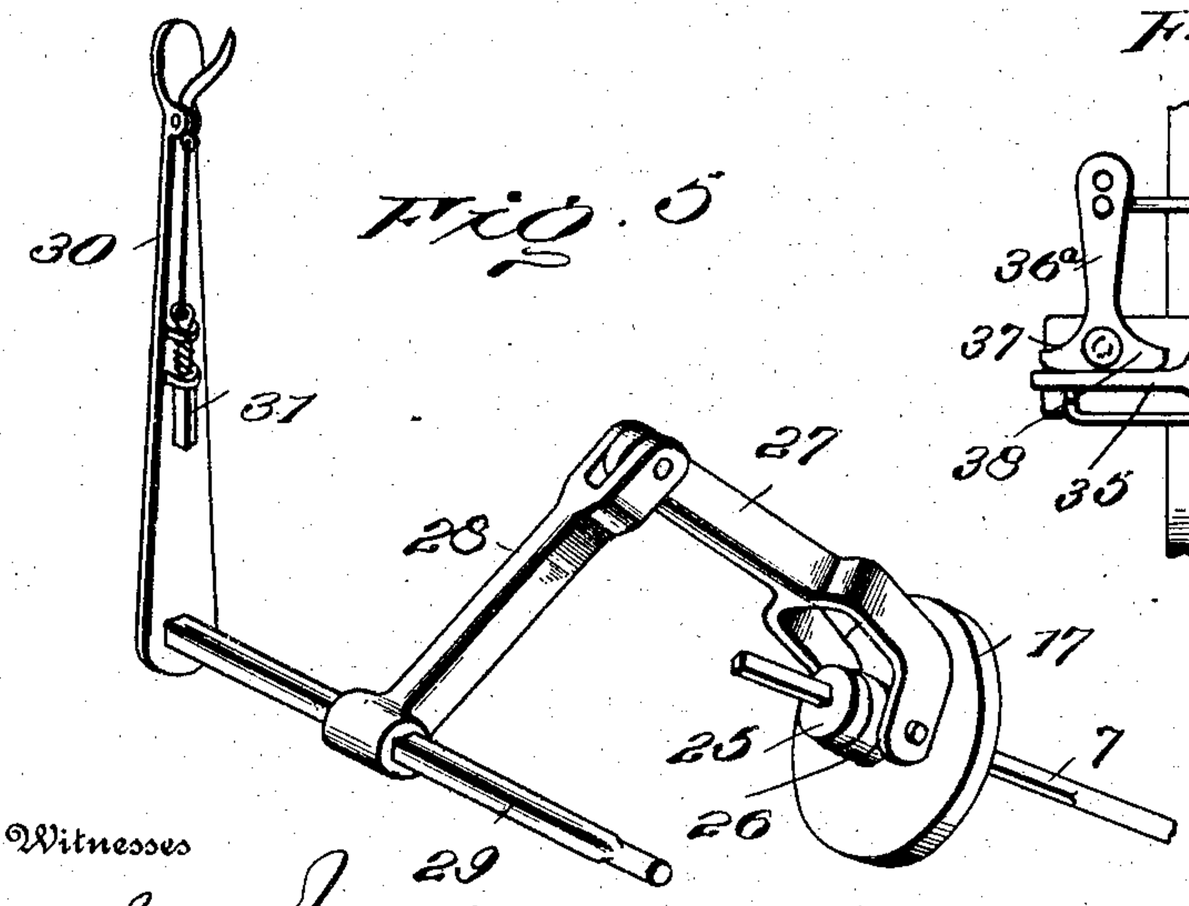
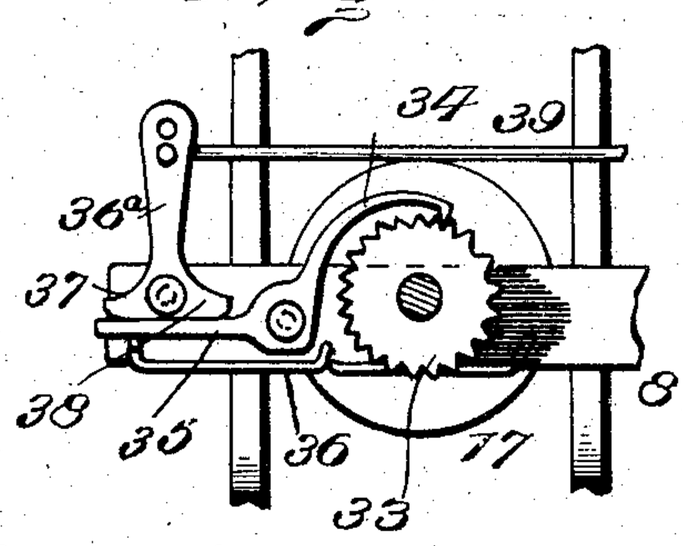


Fig. 6.



Witnesses

W. N. Woodson

Inventor

J. W. Wood

By R. S. & A. B. Lacey. Attorneys

No. 781,325. Patented January 31, 1905.

UNITED STATES PATENT OFFICE.

JAMES W. WOOD, OF GOODWATER, MISSOURI, ASSIGNOR OF ONE-HALF TO J. M. LUCAS, OF GOODWATER, MISSOURI.

STEERING MECHANISM FOR TRACTION-ENGINES.

SPECIFICATION forming part of Letters Patent No. 781,325, dated January 31, 1905.

Application filed May 5, 1904. Serial No. 206,538.

To all whom it may concern:

Be it known that I, JAMES W. WOOD, a citizen of the United States, residing at Goodwater, in the county of Iron and State of Missouri, have invented certain new and useful Improvements in Steering Mechanism for Traction-Engines, of which the following is a specification.

This invention provides a novel mechanism designed most especially for steering traction-engines, although adapted for analogous use in kindred machines propelled by mechanical means.

Under certain conditions it is desirable to have a quick action and under other conditions to have a slow movement. This invention provides for both of these conditions, as well as to lock the steering-wheels when it is required to travel in a direct course, thereby permitting the operator to have a certain amount of freedom, which would not be the case if the levers were required to be grasped at all times.

For a full description of the invention and the merits thereof and also to acquire a knowledge of the details of construction of the means for effecting the result reference is to be had to the following description and drawings hereto attached.

While the essential and characteristic features of the invention are susceptible of modification, still the preferred embodiment of the invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a traction-engine embodying the invention. Fig. 2 is a top plan view of a portion of a traction-engine, showing the appliances constituting the invention. Fig. 3 is a transverse section on the line X X of Fig. 2 looking in the direction indicated by the arrows. Fig. 4 is a longitudinal section on the line Y Y of Fig. 2. Fig. 5 is a detail perspective view of the means for moving the friction-wheel upon the power-transmitting shaft between the friction-drivers. Fig. 6 is a detail view of the means for holding the power-transmitting shaft and releasing the same when the drive-gearing is thrown into engagement. Fig. 7 is a detail view of the crank-handle, rock-shaft, and intermediate connecting means.

Corresponding and like parts are referred to in the following description and indicated in all the views of the drawings by the same reference characters.

The body of the traction-engine is indicated at 1, and the steering-wheels at 2, the same being loosely mounted upon the front axle, which has the usual king-bolt connection with the body, so as to move to direct the engine either to the right or to the left, as may be required. Chains or cables 3 connect the front axle with a shaft 4 in the accustomed manner, said shaft having a worm-pinion 5, which is in mesh with a worm-thread 6 at the lower end of the power-transmitting shaft 7, the latter being journaled in bearings provided at one side of the engine. The foregoing enumerated parts may be of any well-known construction.

A frame 8 is bolted or otherwise secured to a side of the engine and supports the operating parts of the steering mechanism. In general formation the frame 8 approximates a bracket and comprises a plurality of standards and arms in which the several shafts and coöperating parts are journaled. A shaft 9 is mounted in standards of the frame in such a manner as to receive both a rotary and a longitudinal movement and receives power from the engine 10, provided for propelling and operating the machine. A sprocket-wheel 11 is journaled to a standard 12 of the frame 8 and is connected by sprocket-chain 13 with the shaft 14, provided with the balance-wheel and deriving motion from the engine 10 and connected by intermediate gearing to the drive-wheels by means of which the machine is propelled. The shaft 9 is connected to the sprocket-wheel 11 so as to rotate therewith and to move longitudinally therethrough. For this purpose the opening of the sprocket-wheel 11 is made angular to receive a corresponding angular portion of the shaft 9. Friction wheels or disks 15 and 16 are secured to the shaft 9 so as to rotate and move therewith. These elements constitute friction-drivers and impart movement to a

friction-wheel 17, arranged between them and mounted upon the upper end of the power-transmitting shaft 7 in such a manner as to rotate with said shaft, but free to move thereon toward and from the shaft 9 to vary the relative speeds of the shafts 7 and 9 when the friction-wheel 17 is in engagement with either of the friction-drivers 15 or 16.

A rock-shaft 18 is mounted in uprights of the frame 8 and coöperates at one end with a crank-handle 19 and at the opposite end with a crank 20 and intermediate of its ends with arms 21, which are loosely connected to opposite sides of a collar 22, loosely mounted upon the shaft 9 between shoulders 23. A spring 24 coöperates with the rock-shaft 18 to hold the same in a normal position—that is, with the friction-wheel 17 central of the friction-drivers 15 and 16. Upon rocking the shaft 18 in one direction by the application of power to the crank-handle 19 the shaft 9 is moved longitudinally to bring one or the other of the friction-drivers 15 or 16 into engagement with the friction-wheel 17, and by rocking the shaft 18 in the opposite direction the shaft 9 is moved so as to bring the other friction-driver into engagement with the friction-wheel 17 to rotate the power-transmitting shaft 7 in the reverse direction. The rotation of the power-transmitting shaft 7 and the steering of the machine will depend upon which one of the friction-drivers, 15 or 16, is in engagement with the friction-wheel 17, as will be readily comprehended.

The friction-wheel 17 is provided with an annularly-grooved hub 25, to which is fitted a collar 26, and a link 27, forked at one end, has its fork members pivotally connected to opposite sides of the collar 26 and is pivotally connected at its opposite end to an arm 28, projected from a rock-shaft 29, arranged parallel with the shaft 9 and provided at one end with an operating-lever 30, having a latch-bolt 31 to engage with a toothed segment 32, so as to hold the rock-shaft 29 and friction-wheel 17 in the adjusted position. As shown, the upper end portion of the power-transmitting shaft 7 is made angular and is passed through an opening of corresponding shape in the friction-wheel 17, whereby said parts 7 and 17 rotate in unison.

When the shaft 9 is in normal position, the power-transmitting shaft 7 is locked, and to effect this result the following means have been devised and consist of a ratchet-wheel 33 and a pawl 34: The ratchet-wheel 33 is secured to the shaft 7, whereas the pawl 34 is pivoted to a part of the frame 8 and has an extension 35. A spring 36 normally exerts a pressure upon the extension 35, so as to hold the pawl 34 in engagement with the teeth of the ratchet-wheel 33. A lever 36^a, having oppositely-disposed toe extensions 37 and 38, is pivoted to the frame 8 in such position as to lie against the extension 35 when the pawl 34 is in engagement with the teeth of the ratchet-wheel 33. A rocking movement of the lever 36^a either to the right or to the left will bring one or the other of the toe extensions 37 and 38 into engagement with the extension 35 and move the same against the action of the spring 36 and disconnect the pawl 34 from the ratchet-wheel 33. This result is brought about by connecting the lever 36^a with the crank 20, a rod 39 or like connection being employed.

When the engine is in motion and traveling in a direct course, the shaft 9 occupies a normal position and the shaft 7 is locked by engagement of the pawl 34 with the teeth of the ratchet-wheel 33. The shaft 9 is continuously driven in the same direction so long as the machine is in motion. If it be required to steer to the right, the shaft 18 is rocked to move the shaft 9 and bring one of the friction-drivers in engagement with the friction-wheel 17. To steer to the left, the shaft 18 is rocked in an opposite direction, so as to bring the other friction-driver into engagement with the friction-wheel 17. The rocking of the shaft 18 either to the right or to the left produces a corresponding movement of the lever 36^a, and one or the other of the toe extensions pressing upon the extension 35 withdraws the pawl 34 from engagement with the ratchet-wheel 33, thereby releasing the power-transmitting shaft 7. To impart a quick movement to the power-transmitting shaft 7, the lever 30 is operated so as to move the friction-wheel 17 away from the shaft 9, so as to engage with the outer portion of the friction-driver to be moved in contact therewith. By moving the friction-wheel 17 nearer the shaft 9 a slower speed is imparted to the power-transmitting shaft.

A cam 40 is attached to the inner end of the crank-handle 19 and is arranged to operate in a frame 41, attached to the outer end of the rock-shaft 18. The cam 40 may be of any formation and, as shown, consists of a disk mounted eccentrically upon the inner arm of the crank-handle. By this means a leverage connection is interposed between the crank-handle and rock-shaft, thereby rendering the movement of the shafts 18 and 9 comparatively easy. A spring 42 coöperates with the crank-handle to normally hold the same in a position so that the friction-drivers 15 and 16 occupy a position with the friction-wheel 17 at a point intermediate thereof.

Having thus described the invention, what is claimed as new is—

1. In steering mechanism for traction-engines and the like, the combination of a power-transmitting shaft, a friction-wheel connected to said shaft for rotation therewith, a shaft arranged at a right angle to the power-transmitting shaft and mounted for rotary and longitudinal movement, friction-drivers secured to said shaft and spaced apart to receive said

friction-wheel between them, a rotary element adapted to have power applied thereto and forming a slidable mounting for the shaft carrying the friction-drivers, and means for moving the shaft carrying the friction-drivers to bring either one of the latter into engagement with the aforesaid friction-wheel, substantially as set forth.

2. In steering mechanism for traction-engines and the like, the combination of a power-transmitting shaft provided with a friction-wheel, a second shaft arranged at a right angle to the power-transmitting shaft and mounted for rotary and longitudinal movement, friction-drivers secured to said second shaft and receiving the friction-wheel between them, a power-driven wheel mounted to rotate in a fixed plane and slidably receiving said second shaft, a rock-shaft, and connections between said rock-shaft and the said second shaft to move the latter to throw one or the other of the friction-drivers into engagement with said friction-wheel, substantially as specified.

3. In steering mechanism for traction-engines and the like, the combination of a power-transmitting shaft, spaced friction-drivers, a friction-wheel mounted upon the power-transmitting shaft for rotation therewith and slidable thereon between the friction-drivers toward and from their axial line of rotation, and means for moving the friction-drivers to bring one or the other into engagement with the said friction-wheel, substantially as set forth.

4. In steering mechanism for traction-engines and the like, the combination of a power-transmitting shaft, a second shaft arranged at a right angle thereto, spaced friction-drivers secured to said second shaft, means for positively moving the second shaft longitudinally, a friction-wheel mounted upon the power-transmitting shaft for rotation therewith and to have independent sliding movement thereon, and means for positively moving the friction-wheel upon the power-transmitting shaft toward and from the axial line of rotation of said friction-drivers, substantially as specified.

5. In combination, a power-transmitting shaft, means for imparting rotary movement thereto, a lock mechanism for securing the power-transmitting shaft against movement under normal conditions, and means for effecting a release of the power-transmitting shaft when the driving mechanism is thrown into gear therewith, substantially as set forth.

6. In combination, a power-transmitting shaft, actuating means therefor, a ratchet-wheel secured to said shaft, a pawl coöperating with the ratchet-wheel to normally secure the power-transmitting shaft against rotation, and a lever having oppositely-disposed extensions for coöperation with said pawl and connected with the actuating mechanism to be operated thereby for releasing the power-transmitting shaft when throwing the actuating mechanism into gear, substantially as specified.

7. In combination, a power-transmitting shaft, actuating mechanism for imparting a direct and reverse movement thereto, a ratchet-wheel secured to the power-transmitting shaft, a pawl for coöperation with said ratchet-wheel and having an extension, a lever having oppositely-disposed extensions to engage with the extension of said pawl, and connecting means between said lever and the actuating means, whereby the power-transmitting shaft is released upon throwing the actuating mechanism in gear in one direction or the other, substantially as described.

8. In combination, a power-transmitting shaft, a second shaft mounted for rotary and longitudinal movement, gearing between said shafts, a rock-shaft having connection with said second shaft to move the same longitudinally to throw the drive-gearing into and out of action, a lock mechanism coöperating with the power-transmitting shaft, and means for releasing said lock mechanism and connected with the aforesaid rock-shaft for simultaneous movement therewith, substantially as specified.

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

JAMES W. WOOD. [L. S.]

Witnesses:
CORA LUCAS,
JAMES PAYNE.