

(No Model.)

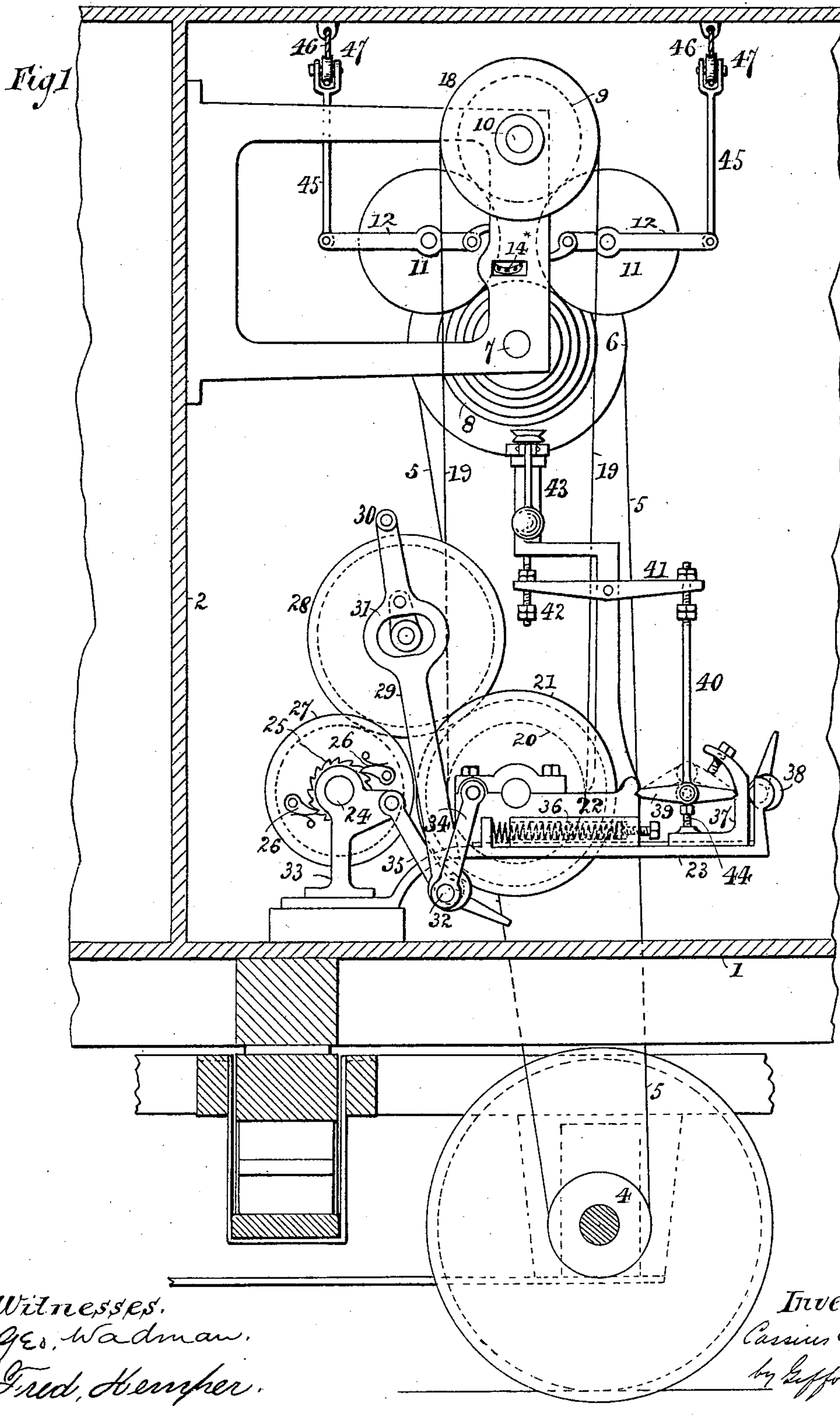
3 Sheets—Sheet 1.

C. C. PALMER.

APPARATUS FOR TRANSMITTING POWER.

No. 390,799.

Patented Oct. 9, 1888.



(No Model.)

3 Sheets—Sheet 2.

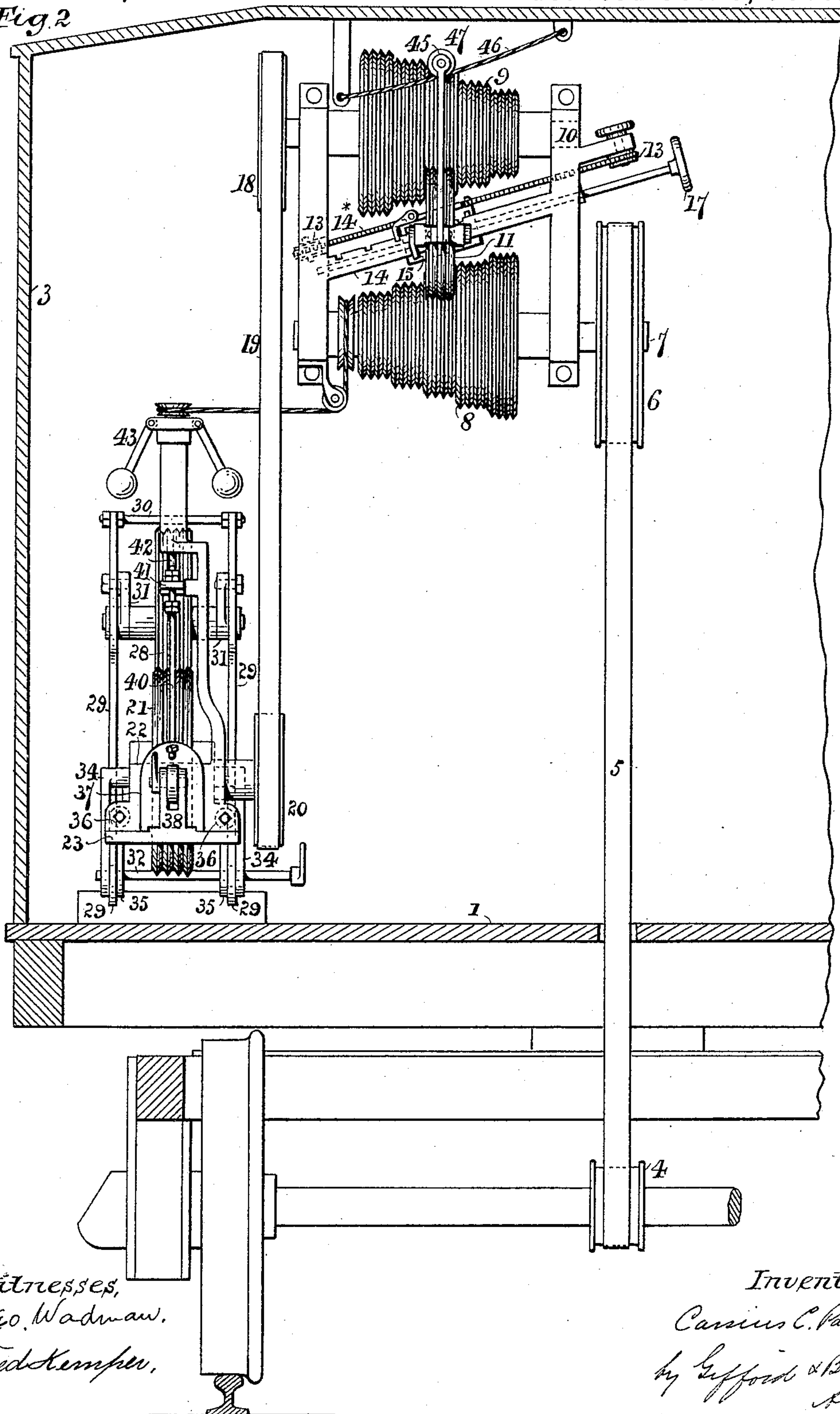
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Fig. 2



Witnesses,  
Geo. Wadman.  
Fred Kemper.

Inventor,  
Cassius C. Palmer.  
by Gifford & Brown.  
Attys.

(No Model.)

3 Sheets—Sheet 3.

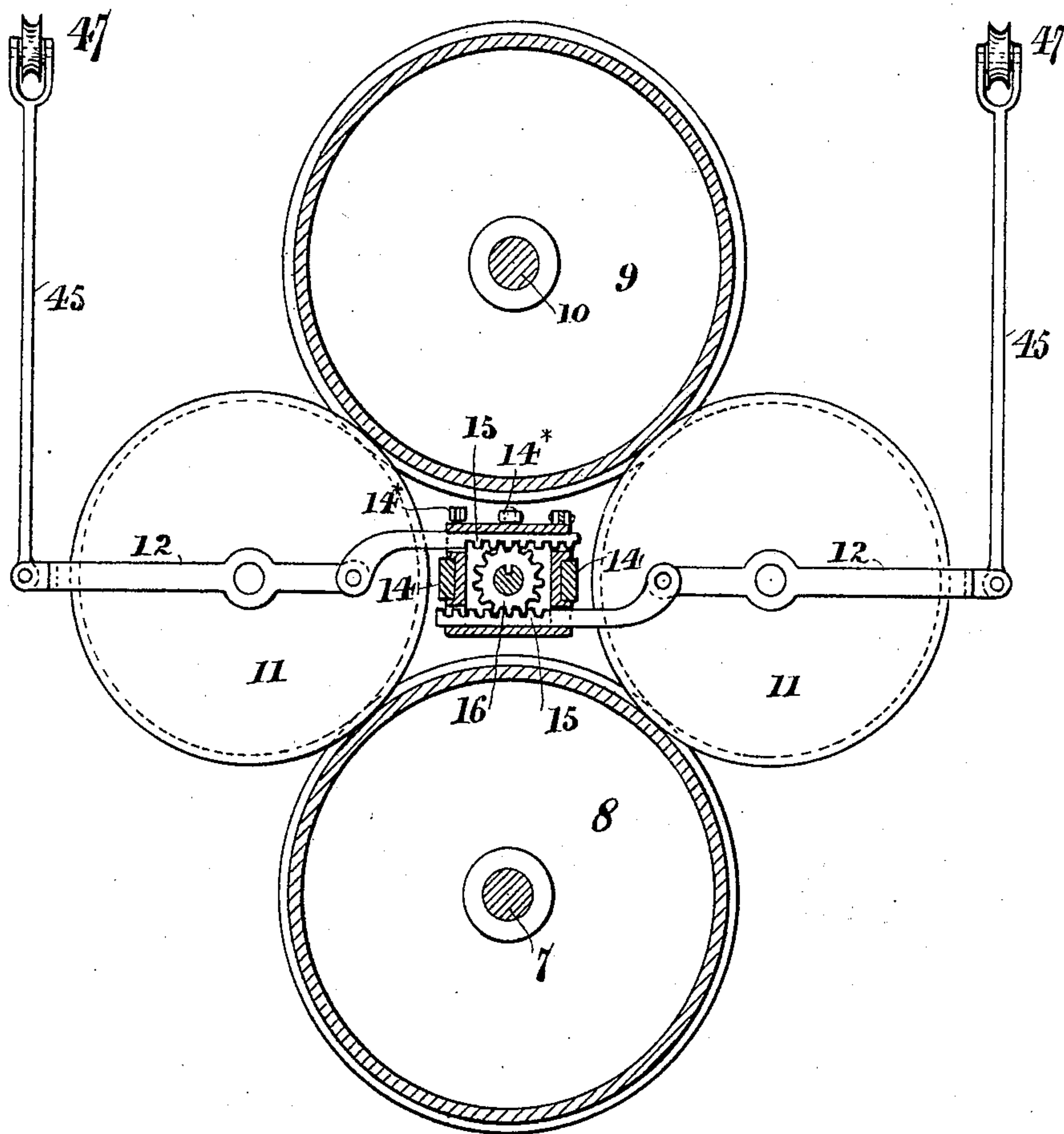
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APPARATUS FOR TRANSMITTING POWER.

No. 390,799.

Patented Oct. 9, 1888.

Fig. 3



Witnesses.  
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# UNITED STATES PATENT OFFICE.

CASSIUS C. PALMER, OF PAINESVILLE, OHIO.

## APPARATUS FOR TRANSMITTING POWER.

SPECIFICATION forming part of Letters Patent No. 390,799, dated October 9, 1888.

Application filed January 31, 1888. Serial No. 262,566. (No model.)

*To all whom it may concern:*

Be it known that I, CASSIUS C. PALMER, of Painesville, State of Ohio, have invented a new and useful Improvement in Apparatus for Transmitting Power, of which the following is a specification.

This apparatus is especially designed to be used upon a railroad-car for transmitting the motion of the car-axle to a dynamo-electric machine; and it has for its object to regulate the speed of the dynamo-machine, so that it will not be too high when the train is running fast, and also to regulate the direction in which the power is transmitted, so that if the car be running backward the direction in which the dynamo-machine runs shall not be changed.

Figure 1 is an end elevation of the apparatus. Fig. 2 is a side elevation of the same. Fig. 3 is a detail.

I have shown the apparatus set up in a car, 1, 2, and 3, representing, respectively, the bottom, end, and side of the car.

4 is a pulley on the car-axle, from which the belt 5 is driven. This belt drives a pulley, 6, which is fast upon a shaft, 7.

8 is a pulley, the shape of which is conical, having several faces of varying diameter, fixed upon the shaft 7. 9 is a pulley of similar construction, fixed upon the shaft 10, but having its smallest diameter in the reverse direction from that of pulley 8. Power is communicated between these pulleys by means of a friction-wheel, 11, which may be moved in an inclined direction, so as to be brought to bear upon any of the several faces of pulley 8 and the corresponding face of pulley 9. This arrangement is shown more in detail in Fig. 3. There should be two friction-wheels, 11, mounted in frame 12, which extends between the wheels 8 and 9, so that the wheels 11 are arranged one on each side of the opening between the wheels 8 and 9. A wheel, 13, is connected with the frame on each side of the wheels 8 and 9. A chain, 14\*, runs over these wheels and connects with the frame 12, in which the wheels 11 are mounted. The inclination of this sprocket-chain is parallel to the surfaces of the pulleys 8 and 9, so that the frame containing the wheels 11, being suitably mounted and supported by turning the sprocket-wheels 13, the wheels 11 may be moved parallel with the surfaces of the pulleys 8 and 9, so as to

engage any required part of their surfaces. A useful arrangement for this purpose may be as follows: The guide-rods 14 extend from one frame to the other parallel with the surfaces of the pulleys 8 and 9, and the frame 12 of the wheels 11 is arranged to slide upon these guide-rods.

15 15 are racks, which engage with the pinion 16, extending the full length that the wheels 11 are to travel. This pinion 16 is moved by the hand-wheel 17, and by moving it the two wheels 11 may be made to approach or recede from each other, so as to grip or let go of the surfaces of the wheels 8 and 9. A useful way of supporting the outer extremities of the frame 12 is by having a rod, 45, suspending it on each end from a rope, 46, upon which the rod may run back and forth upon the rollers 47.

18 is a pulley mounted upon the shaft 10, which drives the belt 19, which belt in turn drives the pulley 20. Upon the same shaft with this pulley is fixed a friction-wheel, 21. The shaft which bears the pulley 20 and the friction-wheel 21 has its bearings in a sliding frame, 22, which slides upon guideways on the stationary frame 23.

24 is the armature shaft of the dynamo-machine, and upon this shaft is mounted a ratchet-wheel, 25, and pawls 26, which will prevent the shaft from turning backward.

27 is a friction-wheel, also fixed upon the armature-shaft 24, and which is in the same plane with the friction-wheel 21.

It will be seen that when the frame 22 is slid forward the friction-wheels 21 and 27 will engage each other, and the motion of 21 will be imparted to the armature-shaft in the opposite direction to that in which wheel 21 moves.

28 is a friction-wheel in the same plane as the wheels 21 and 27, and which is so mounted that when the wheel 21 is drawn back from 27 the wheel 28 may be made to engage both of them, so that the motion of wheel 21 will be imparted to wheel 27, and the latter will move in the same direction as wheel 21. To this end wheel 28 is mounted in a yoke, 29. This yoke passes up on either side of the wheel 28, and is coupled together at the top by a bolt, 30, above the wheel 28. The bearings of the wheel 28 are suspended from the yoke 29 in the swinging arms 31, so that the wheel 28



will have considerable latitude for adjusting itself when thrown into engagement with the other friction-wheels.

The yoke 29 is mounted upon an eccentric shaft, 32, which shaft in turn is suspended from the frame 22, and the frame 33 by the pivoted arms 34 and 35, of which there are two pairs, one at each end of the eccentric shaft 32. This eccentric shaft 32 may be rotated by a suitable handle, so as to draw the yoke 29 downward and produce any desired pressure between the wheel 28 and the wheels 21 and 27. By rotating the eccentric-shaft in the opposite direction the connection may be broken between the three friction-wheels.

36 is a coil-spring interposed between studs, respectively on the sliding frame 22 and the stationary frame 23, the tendency of which spring is to continually press the wheel 21 back from the wheel 27. A suitable set-screw may be arranged for regulating the tension of this spring.

37 is a second sliding frame, sliding upon guideways in the stationary frame 23, and behind it is an upward projection of the frame 23, upon which is arranged an eccentric, 38. By turning this eccentric the sliding frame 37 may be advanced toward the wheel 27 when desired.

39 is a joggle-joint, the arms of which enter notches in sliding frames 22 and 37, respectively. The pivot of this toggle-joint is connected with the rod 40, which, through the lever 41, is connected with the rod 42 of the governor 43. This governor is driven from the shaft 7 through suitable connections, as shown.

44 is a set-screw arranged beneath the toggle-joint to prevent it being forced past the center.

The operation of the various parts is as follows: The motion from the car-axle being communicated to the pulley 8 is transferred to the pulley 9; but by means of the mechanism described the relative speed of these two pulleys may be regulated at pleasure. The motion of pulley 9 is communicated, as shown, to the shaft upon which the friction-wheel 21 is mounted. If the car is running forward and it is desired to communicate the motion of this friction-wheel directly to friction-wheel 27 upon the armature-shaft, to this end the eccentric-shaft 32 is turned so as to break the contact with friction-wheel 28, while the eccentric 38 is turned so as to force the sliding frames 22 and 37 forward sufficiently to engage the surfaces of friction-wheels 21 and 27. If, when the parts occupy this relationship, the car runs faster than it is desirable for the dynamo to run, the action of the governor 43 will be to raise the pivot of the toggle-joint 39, and thus allow the force of the spring 36 to throw the friction-wheel 21 backward until the pressure between the friction-wheels 21 and 27 becomes so slight as to reduce the speed transmitted. If, now, the car runs backward, the eccentric 38 will be turned so

as to break the connection between friction-wheels 21 and 27, and the eccentric 32 will be so turned as to make the connection between the wheel 28 and the wheels 21 and 27. Under these circumstances, power will be transmitted from 21 to 28 and thence to 27, and the relative motion between 21 and 27 will be the reverse of what it was before. The operation, however, of the governor and the toggle-joint will be precisely what it was before, excepting that it will effect the connections between the wheels 21 and 28. By the above arrangement I am enabled to control the communication of power from the axle of the car to the armature-shaft in such a way as to preserve the speed and direction of motion of the armature-shaft as nearly as possible constant.

It is obvious that if it is only desired to run the armature-shaft when the car runs forward, the wheel 28 and its supports may be dispensed with and the other parts remain unchanged.

The belt for communicating motion from the car-axle to the pulley 6 may be kept in position and tightened by such an apparatus, which is shown in Patent No. 290,600, granted to me.

Having thus described an apparatus in which my invention may be embodied, I do not limit myself to the precise construction shown, as I am well aware that it may be varied and modified in many of the particulars without departing from the principle of my invention.

I claim—

1. In combination, the stationary wheel 27, the wheel 21, the sliding frame 22, upon which the bearings of the wheel 21 are mounted, the spring 36, whereby the said sliding frame 22 is pushed away from the wheel 27, a governor, mechanism regulating the position of frame 22 from the governor, and means whereby the wheel 21 is driven, the contact between wheels 21 and 27 being regulated by the governor, substantially as described.

2. In combination, the friction-wheels 21, 27, and 28, the sliding frame upon which wheel 21 is mounted, the stationary frame upon which wheel 27 is mounted, the pivoted arms 34 and 35, and the yoke 29, connected therewith, upon which is mounted the wheel 28, substantially as described.

3. In combination, the stationary wheel 27, the wheel 21, mounted on a sliding frame, 22, the spring 36, whereby the wheel 21 is pressed back, and the toggle-joint acting in opposition to the spring, substantially as described.

4. In combination, the wheels 21 and 27, the sliding frame 22, supporting the bearings of wheel 21, the spring 36, the eccentric 38, the governor, and mechanism connected with the governor and interposed between the eccentric and the sliding frame 22, whereby the speed of the governor regulates the contact between the said wheels, substantially as described.

5. In combination, the stationary wheel 27, the movable wheels 21 and 28, the yoke 29, the



suspended arms 31, in which the wheel 28 has its bearings, and mechanism whereby said yoke is reciprocated, and mechanism whereby said wheel 21 is reciprocated, whereby the motions of wheel 27 are controlled, substantially as described.

6. In combination, the wheel 27, mounted in stationary bearings, the wheel 21, mounted in reciprocating bearings, the wheel 28, the yoke 29, upon which wheel 28 has its bearings, the pivoted arms 34 and 35, to the extremities of which the yoke is pivoted, and mechanism whereby the said yoke and the bearings of said wheel 21 are respectively reciprocated, substantially as described.

7. In combination, the stationary friction-wheel 27, the movable friction-wheels 28 and 21, the yoke upon which the wheel 28 is mounted and which is pivoted in a plane intermediate the bearings of the wheels 21 and 27, whereby the yoke may swing to adjust the contact of the wheel 28 equally upon 21 and 27, and mechanism whereby the bearings of wheel 21 are reciprocated, substantially as described.

8. In combination, the pulley upon the car-axle, the belt connecting the same with mechanism within the car, the driven shaft 24 within the car, the friction-wheel 27 upon said shaft, the friction-wheels 21 and 28, each provided with mechanism whereby it is movable to and from said wheel 27, and mechanism whereby the power from said belt is transmitted to the wheel 21, substantially as described.

9. In combination, the pulley upon the car-axle, the belt connecting the same with mechanism within the car, the driven shaft 24 within the car, the friction-wheel 27 upon said shaft, the friction-wheels 21 and 28, each provided with mechanism whereby it is movable to and from said wheel 27, the governor, mechanism whereby the contact of said wheels is controlled by the speed of the governor, and mechanism whereby the power from said belt is transmitted to the wheel 21 and to the governor, substantially as described.

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