

No. 843,694.

PATENTED FEB. 12, 1907.

C. O. PALMER.
REEL FOR MINE LOCOMOTIVES.

APPLICATION FILED DEC. 17, 1906.

2 SHEETS—SHEET 1.

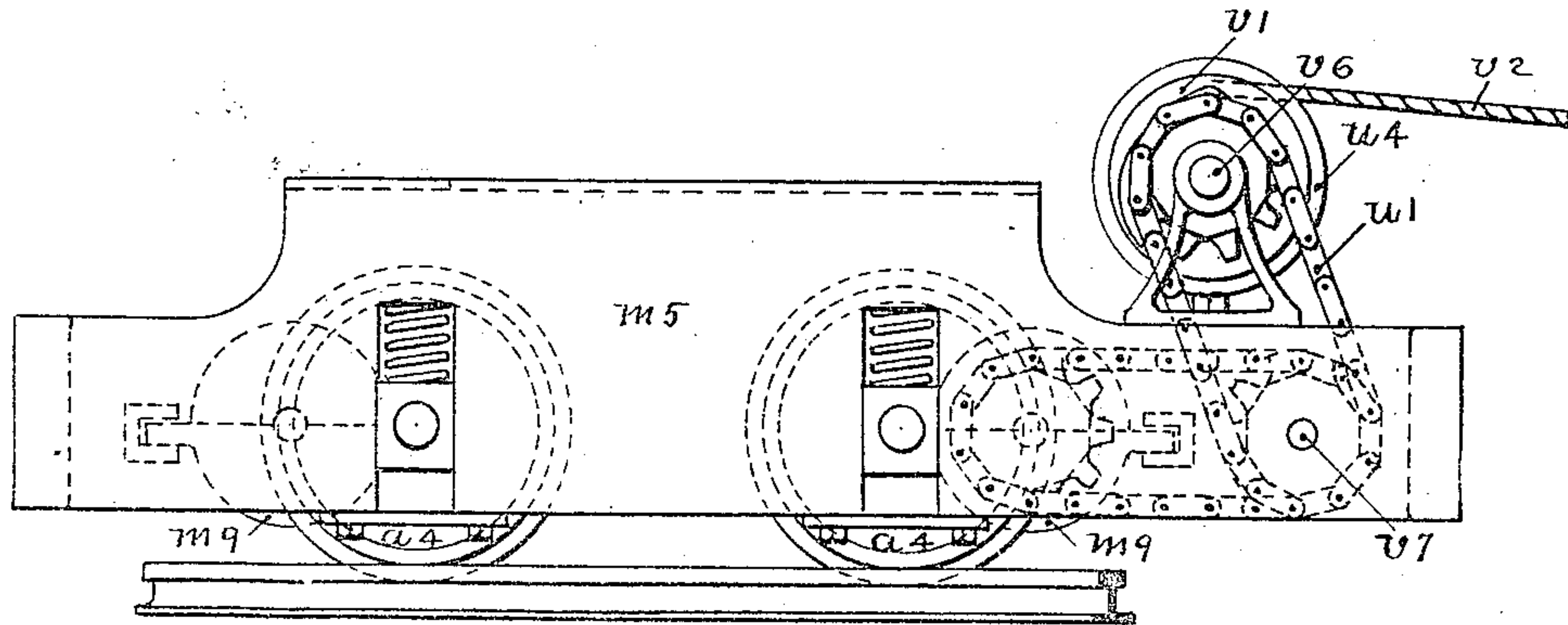


Fig. 1.

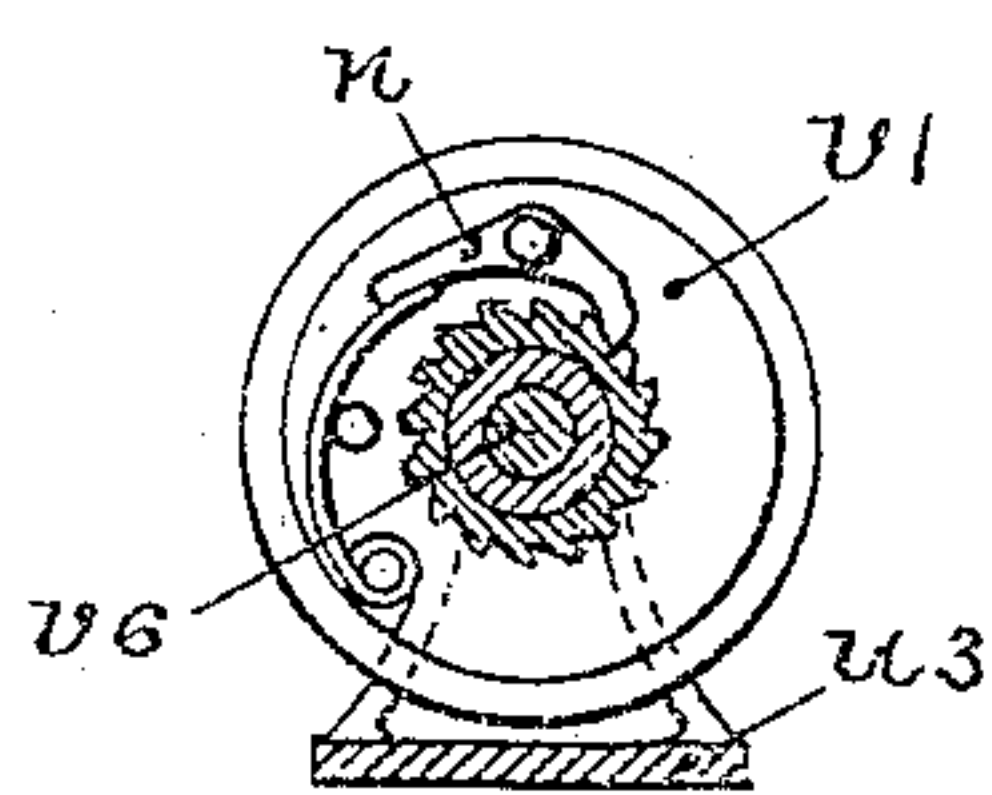


Fig. 4.

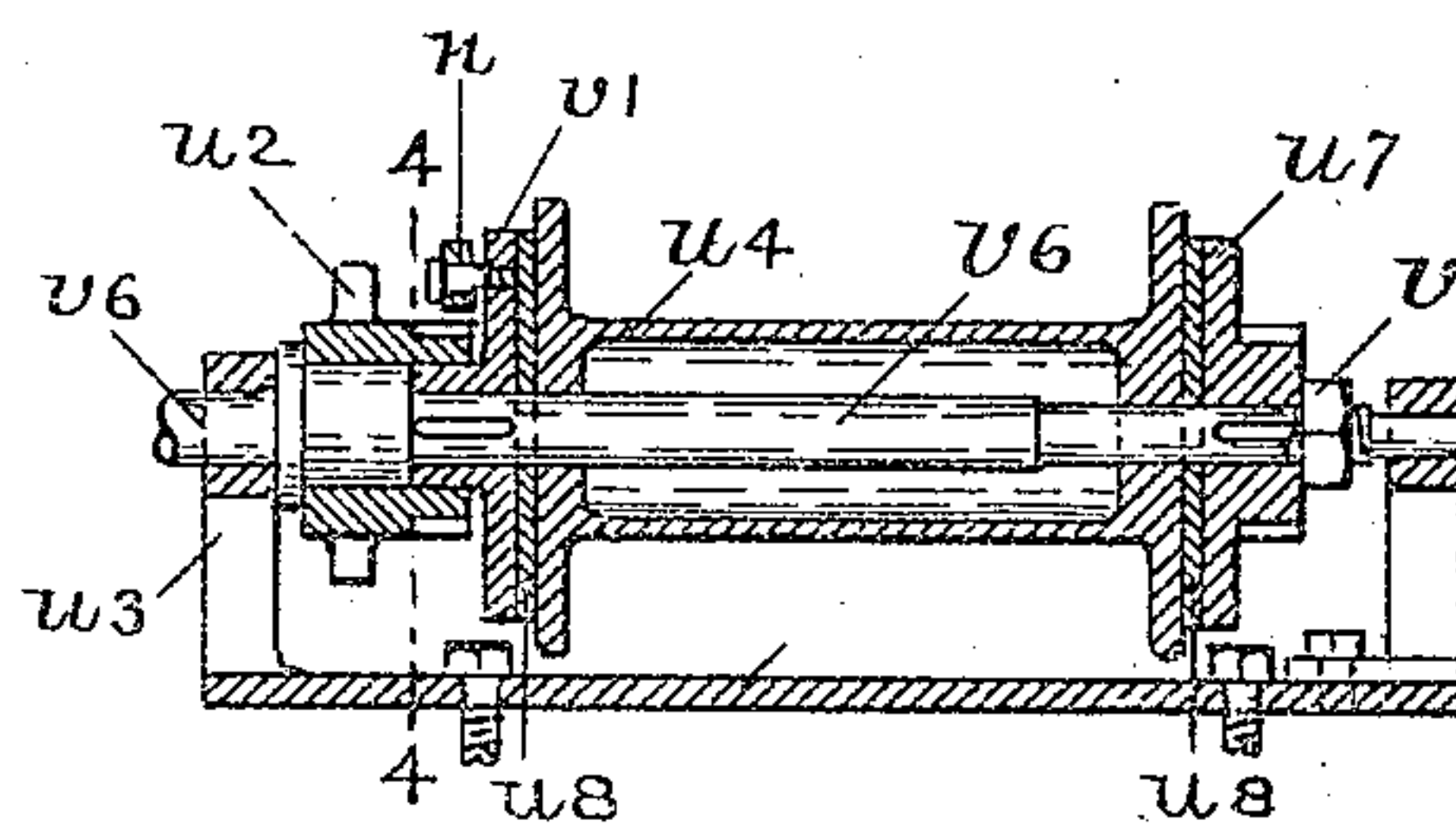


Fig. 3.

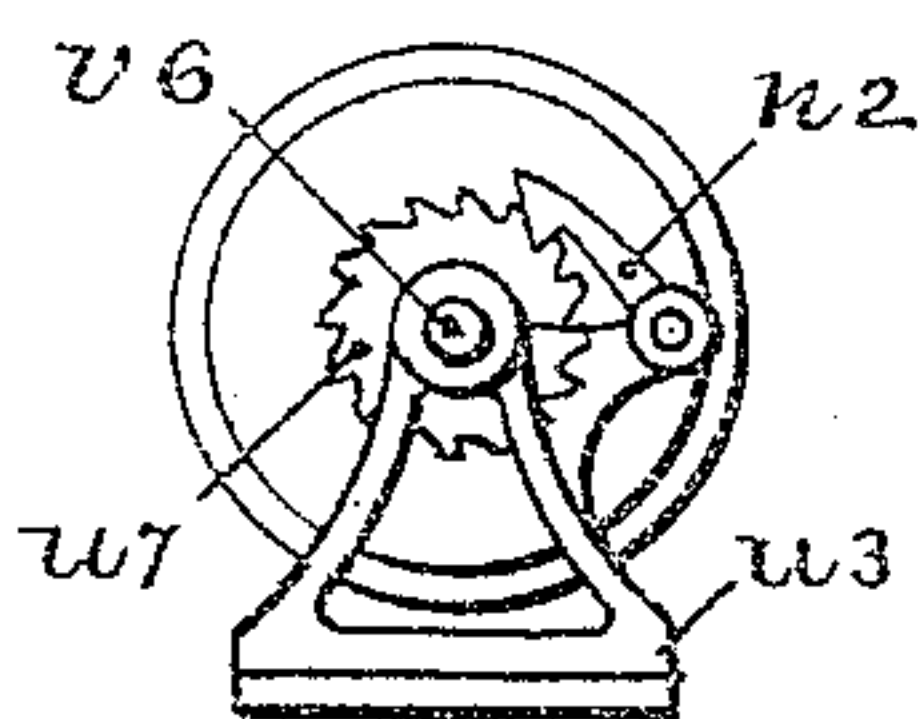


Fig. 5.

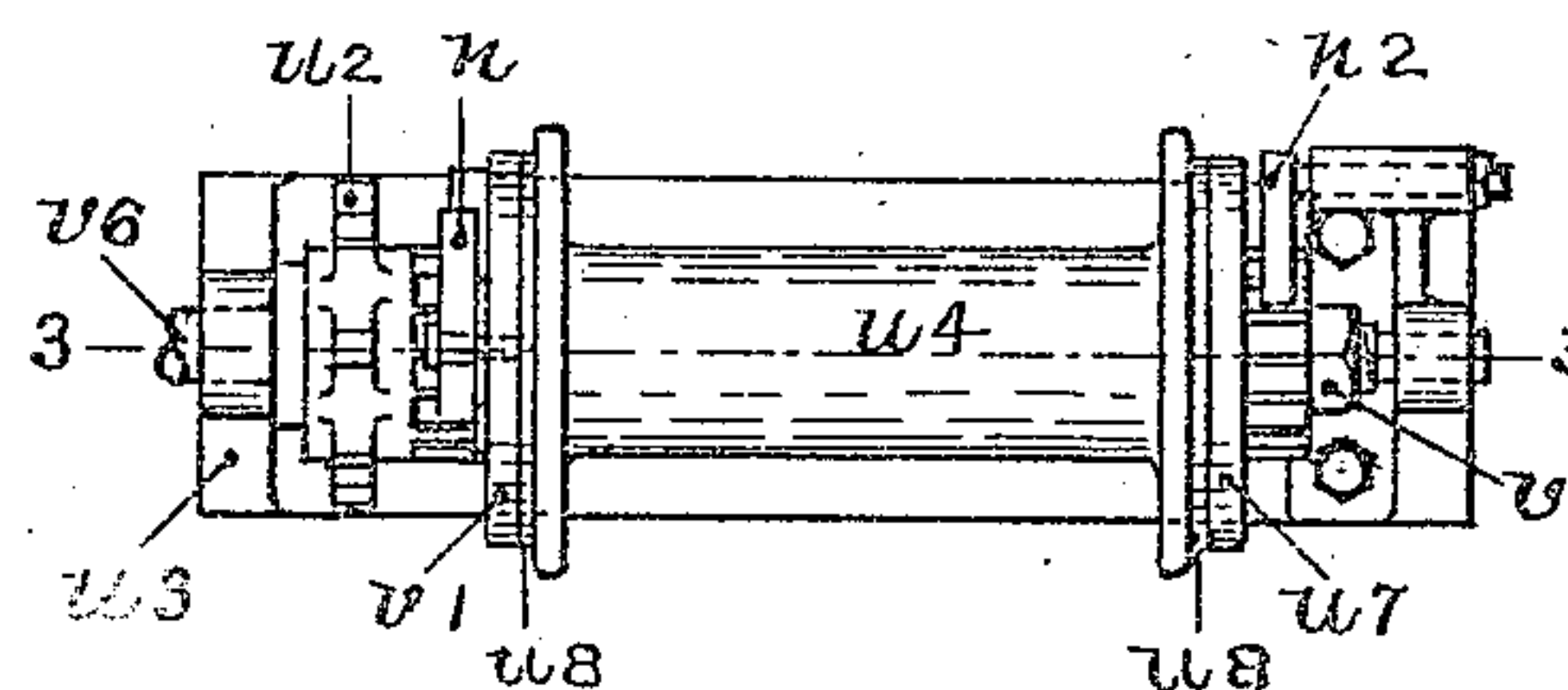


Fig. 2.

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David E. Haly,

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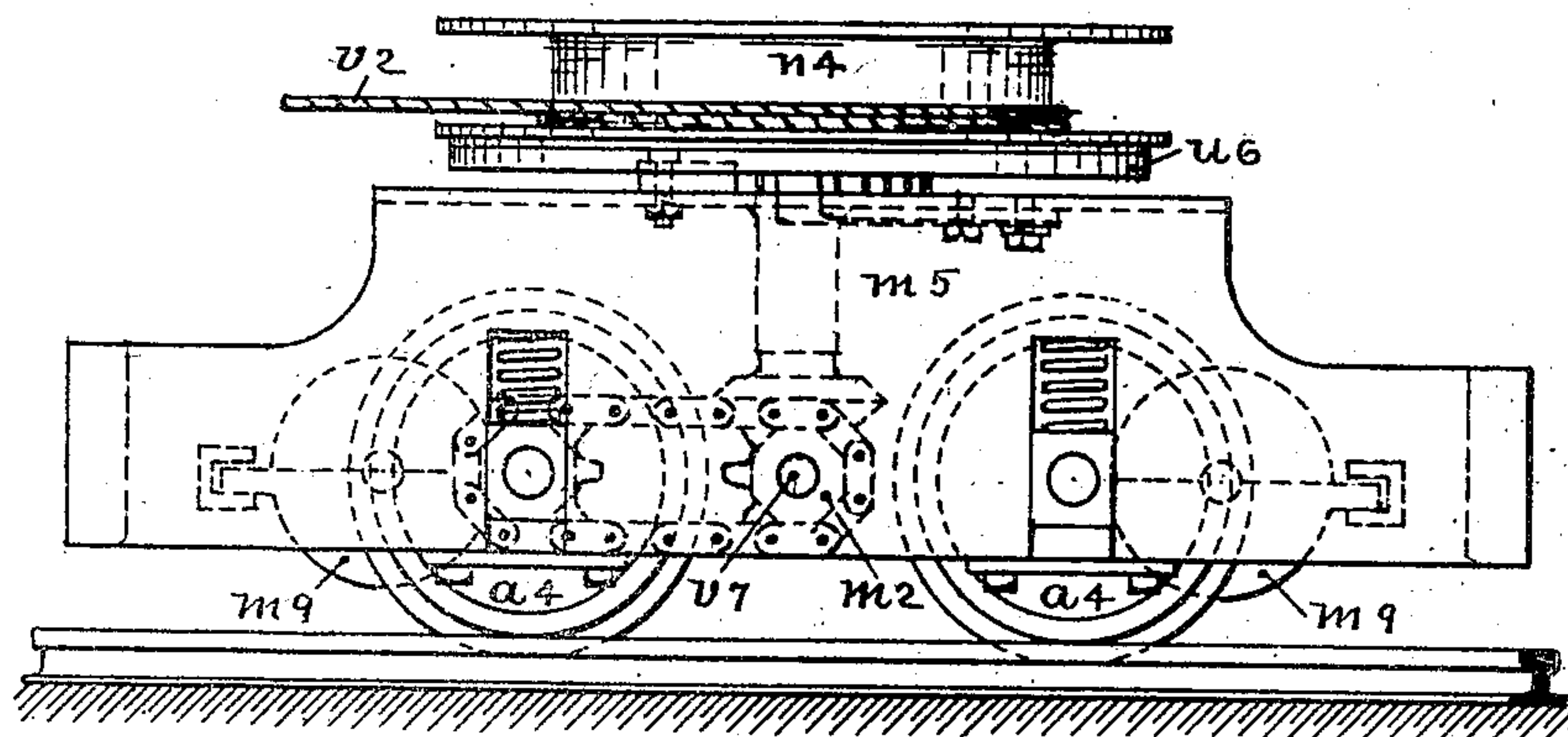


Fig. 6.

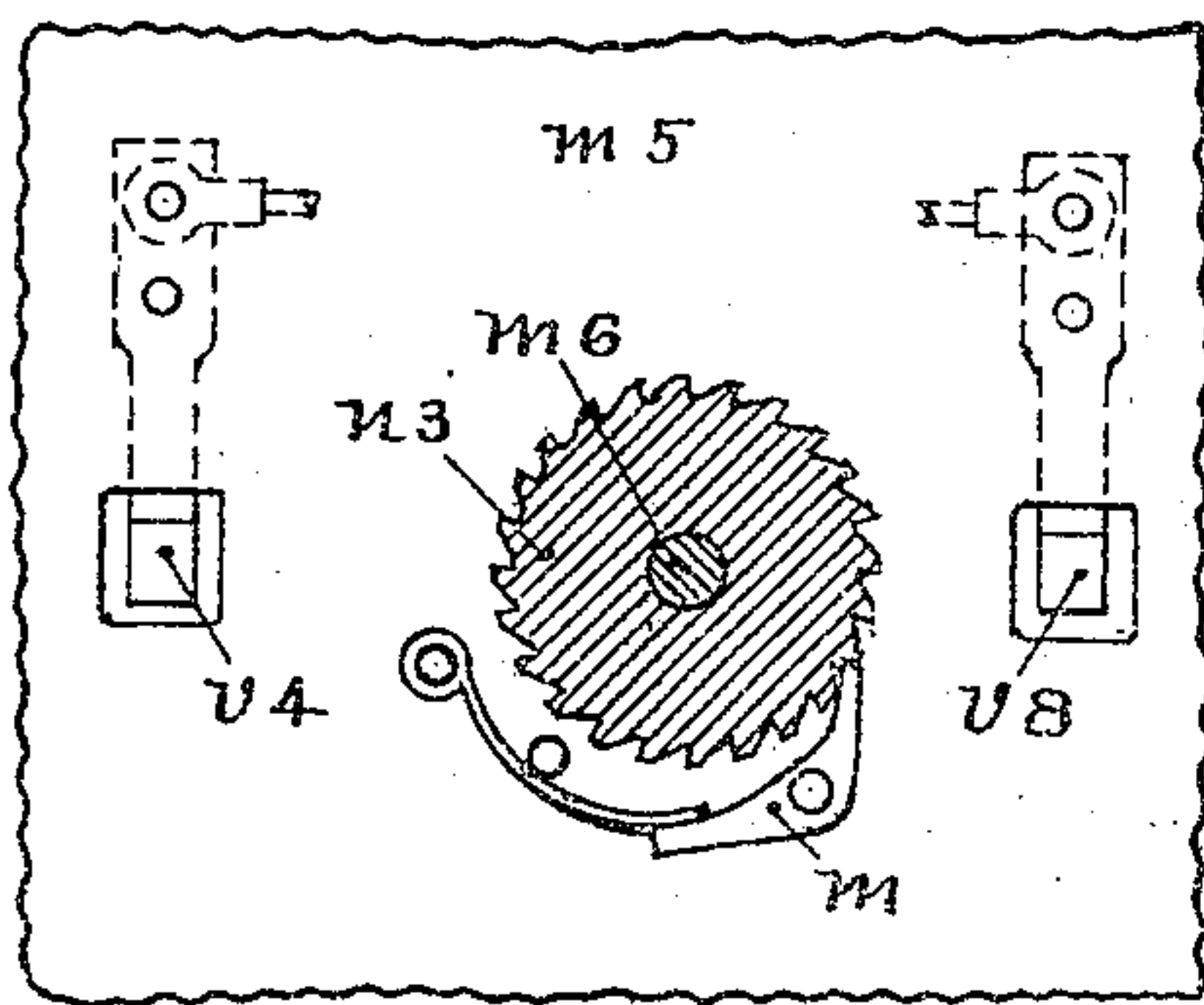


Fig. 8

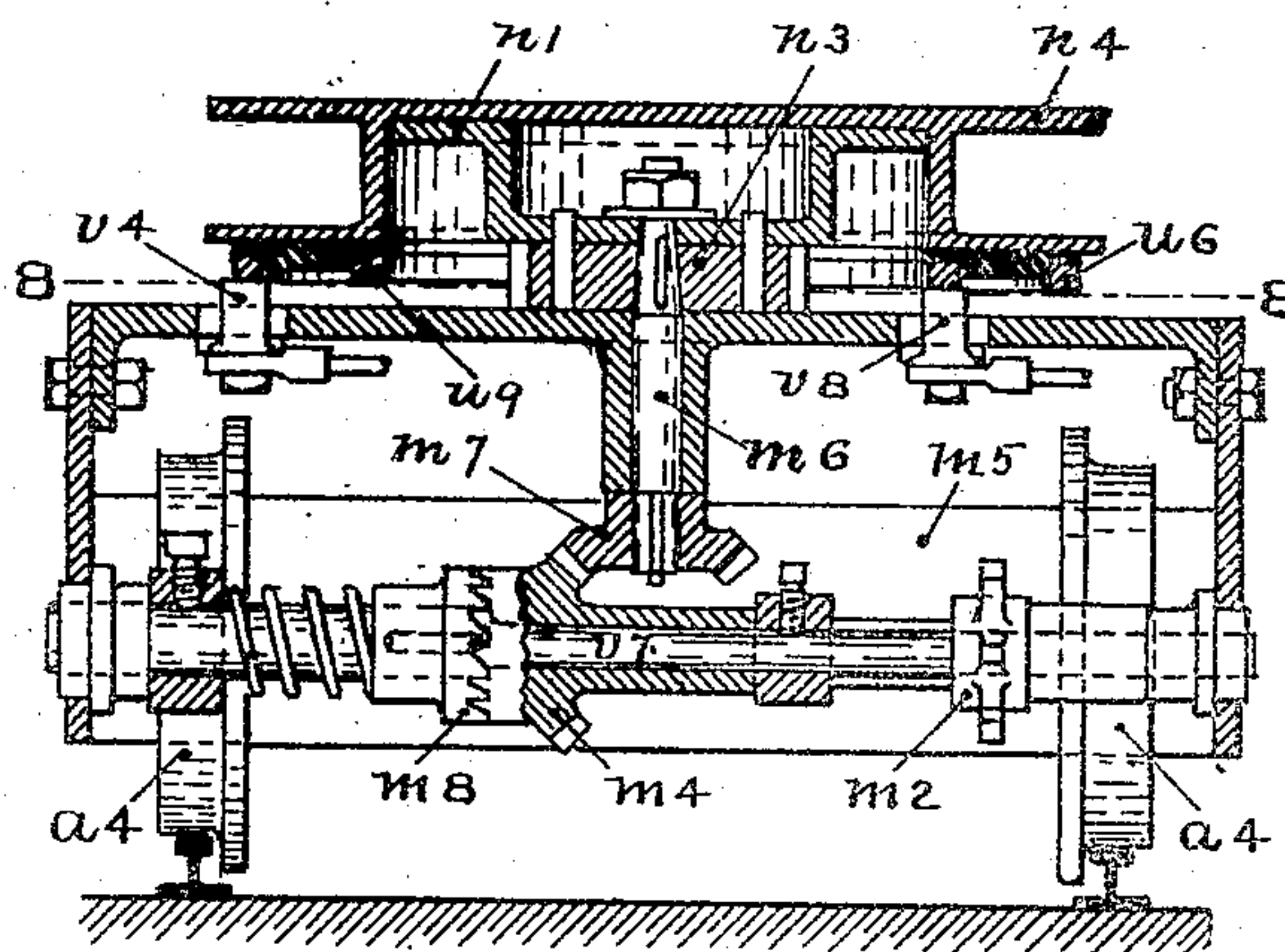


Fig. 7.

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UNITED STATES PATENT OFFICE.

CHARLES O. PALMER, OF CLEVELAND, OHIO.

REEL FOR MINE-LOCOMOTIVES.

No. 843,694.

Specification of Letters Patent.

Patented Feb. 12, 1907.

Application filed December 17, 1906. Serial No. 348,167.

To all whom it may concern:

Be it known that I, CHARLES O. PALMER, a citizen of the United States of America, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Reels for Mine-Locomotives; and I hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in reels for mine-locomotives, and has for its object to provide a simple reel for a gathering-locomotive whose winding and unwinding of the wire thereon shall proceed automatically without attention from the driver.

My invention relates more especially to reels operated by friction-controlled winding mechanism and is in the nature of an improvement on the reel-drive shown in my patent for a motor-car, No. 609,043, of August 16, 1898. In many of these locomotives as now devised it is necessary for the driver to shift a reel-lever from time to time in order that the reel-driving mechanism may be engaged properly to wind the wire on said reel. In the absence of such attention the winding mechanism works improperly and the cable that is to be wound on the reel is run over by the car-wheels and badly injured. Two separate insulated wires or a twin cable are generally used, and a cross connection between the wires would be considerable damage, and every precaution should be taken to avoid it. These insulated wires are quite expensive, and the cost of their occasional renewal is a drawback to the use of the reel, although its advantages are very important. I endeavor to overcome this drawback by making the winding and unwinding depend on the movement of the locomotive and independent of the attentions of the driver. The principal use of these reel-locomotives is in making up the train for the heavier locomotives which haul the train along the mine-entries to the tippie. They operate in the mine-rooms where there is no trolley-wire, and owing to the limited use of the track it is of the cheapest kind of construction. The gathering-locomotive moves alternately forward and backward at very frequent intervals and into rooms in every direction, so that the said reel-lever requires frequent attention.

In my present invention the friction-clutch of the reel is driven through a pawl and

ratchet or its equivalent which winds the reel in one direction only. I also hold the friction-clutch from turning backward and unwinding the reel by another pawl and ratchet or its equivalent, all of which will be more fully described, and pointed out in the claims.

In the drawings accompanying and forming part of this specification, Figure 1 is a side view showing a gathering-locomotive supplied with a vertically-revolving reel embodying my improved construction. Fig. 2 is a top view of the said reel. Fig. 3 is a vertical section on line 3 3 of Fig. 2. Fig. 4 is a section on line 4 4 of Fig. 3 looking toward the right. Fig. 5 is a view of the right-hand end of Fig. 2. Fig. 6 is a side view of a gathering-locomotive supplied with a horizontally-revolving reel of my improved construction. Fig. 7 is a transverse section through the center of the reel of Fig. 6. Fig. 8 is a horizontal section on line 8 8 of Fig. 7.

The same characters designate the same parts throughout the several views.

The car-frame m^5 is mounted on wheels a^4 and is driven by electric motors m^9 , geared to the axles in the ordinary way. In order to allow for the inequalities of the track, the frame is mounted on springs in the usual manner. The reel, which is mounted on the frame, is preferably wound up by a driving connection in train with the car-axle. In order that the distance from center to center of sprocket-wheels shall be nearly constant when running over a rough track, an intermediate shaft v^7 is placed in the frame on a level with the axle, and the winding of the reel is done through it. Such a driving-train is shown in Figs. 1 and 6.

Referring now to the reel shown in the first six figures, the conveyer-reel u^1 turns loosely on the reel-shaft v^9 , which is journaled in the frame u^3 , which in turn is bolted to the locomotive-frame m^5 . At the ends of the reel u^1 are the friction-disks v^7 and u^7 , that are splined on the reel-shaft v^9 . Between the flanges of the said reel and disks are the leather washers u^8 , that serve to increase the friction between its adjacent surfaces. Two friction-disks are preferable to one, as the friction-surface is thereby doubled. Journaled on the reel-shaft v^9 , adjacent to disk v^7 , is the sprocket-wheel u^2 , having ratchet-teeth formed on its side. Pivoted on the friction-disk v^7 and engaging said ratchet-teeth is the pawl n . The said sprocket-wheel is driven by a chain from the inter-

mediate shaft v' , which in turn is driven by a chain from the motor-shaft, as shown in Fig. 1. The ratchet-teeth on the sprocket-wheel are pointed in the direction necessary to engage the pawl to wind up the cable when going backward; but the pawl slips when the locomotive is moving in the opposite direction and the cable v^2 is being paid out. On the other end of the reel (see Fig. 5) and pivoted to the reel-frame u^3 is the pawl n^2 , that engages the ratchet-teeth formed on the friction-disk u^7 . The ratchet-teeth on the disk u^7 are pointed in the direction to engage the pawl n^2 and prevent the friction-disks moving backward when the reel is being unwound. When the reel is being wound up, the pawl n^2 slips.

The amount of friction on the reel is regulated by the nut v on the reel-shaft u^6 and is made sufficient to give the requisite pull on the electric cable that is wound thereon and is enough to wind it up properly, and so keep it from being run over as the car backs toward the entry. As already stated, one ratchet is engaged when the wire is unreel and the locomotive is moving away from the entry, and the other ratchet is engaged when the car is moving toward the entry, so that one or the other ratchet is engaged all the time, and when one is engaged the other slips. Both ratchets allow for the same direction of positive rotation of the friction-disks, that direction being the one in which to wind up the cable.

In Figs. 6, 7, 8 are shown a horizontally-revolving reel embodying my invention. The reel n^1 rests on the friction-disk n' , the weight alone supplying the necessary friction to give the cable the required tension. The friction-disk n' is attached to ratchet-disk n^3 , which is provided with ratchet-teeth that engage the pawl m , pivoted on the locomotive-frame, and prevent its backward motion when the cable is being unwound. The said friction-disk is driven by shaft m^6 (to which it is secured) by means of the gears m^7 and m^4 through the single acting jawed clutch m^8 , the intermediate shaft v^7 , and the sprocket-wheel m^2 , then through a chain from a motor axle or shaft in driving connection therewith. All of said gears and sprocket-wheels are secured in their respective shafts except gear m^4 , that revolves loosely and is provided with teeth that engage the teeth of the clutch-jaw m^8 , that is splined on shaft m^6 . The said clutch-teeth drive the reel only when winding up the cable. When the gear m^4 moves in the opposite direction, the clutch-jaw m^8 slides out of engagement and the gear m^4 slips on its shaft.

The action of pawl m in Fig. 8 is the same as pawl n in Fig. 5—namely, to prevent the friction-disk turning backward, but allowing it to be driven forward. Also the action of the clutch m^8 with gear m^4 of Fig. 7 is the

same as of pawl n and the ratchet-teeth of Fig. 4, which is to drive the friction-disk to wind up the cable on the reel.

In Fig. 7 are shown two metal rings u^8 and u^9 , to which the respective inner ends of the electric wires of the cable v^2 are connected and to which the stationary brushes v^4 and v^8 are in electrical contact.

I have not gone into the matter of the electrical details, nor have I shown the mechanism for guiding the cable on the reel, as these may be of any suitable construction well known in the art and do not form part of my invention. It is also obvious that in the construction shown in Fig. 6 the cable may be guided in various directions by idle pulleys situated on the frame as may be desired.

In my invention I prefer to have the reel geared to wind on the wire faster than the locomotive moves, the friction allowing the reel to slip, so that the wire receives only the requisite tension.

I have here shown only the disk form of friction-clutch, and that is the form I prefer, although other forms may be used without departing from the nature of the invention.

The purpose of the intermediate driving connection between the car-axle and the reel is to admit the vertical play of the wheels to accommodate an uneven track without damaging the driving-chain; otherwise the driving connection from the car-axle to the reel could be made direct, as shown in my aforesaid patent on a motor-car, No. 609,043, dated August 16, 1898.

Having thus described my invention, I claim—

1. The combination of a car-frame supported on wheels and having a motor and reel attached thereto, a flexible conductor wound on said reel, conductor connections from the reel to the motor, a frictionally-controlled driving-train from the car-axle to the reel, a ratchet or clutch in said driving-train acting to wind up said conductor or cable, and a clutch or ratchet holding said reel-disk from unwinding substantially as set forth.

2. The combination of a car-frame supported on wheels and having a motor and reel attached thereto, a flexible conductor wound on said reel, a friction-disk on the side of said reel, ratchet-teeth on said friction-disk; a stationary pawl engaging said ratchet to prevent the unwinding of the reel and a driving-train with a clutch or ratchet from the car-axle to the reel for winding up the conductor on the reel substantially as and for the purpose set forth.

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

CHARLES O. PALMER.

Witnesses:

VICTOR C. LYNCH,
N. L. McDONNELL.