No. 881,744. PATENTED MAR. 10, 1908.

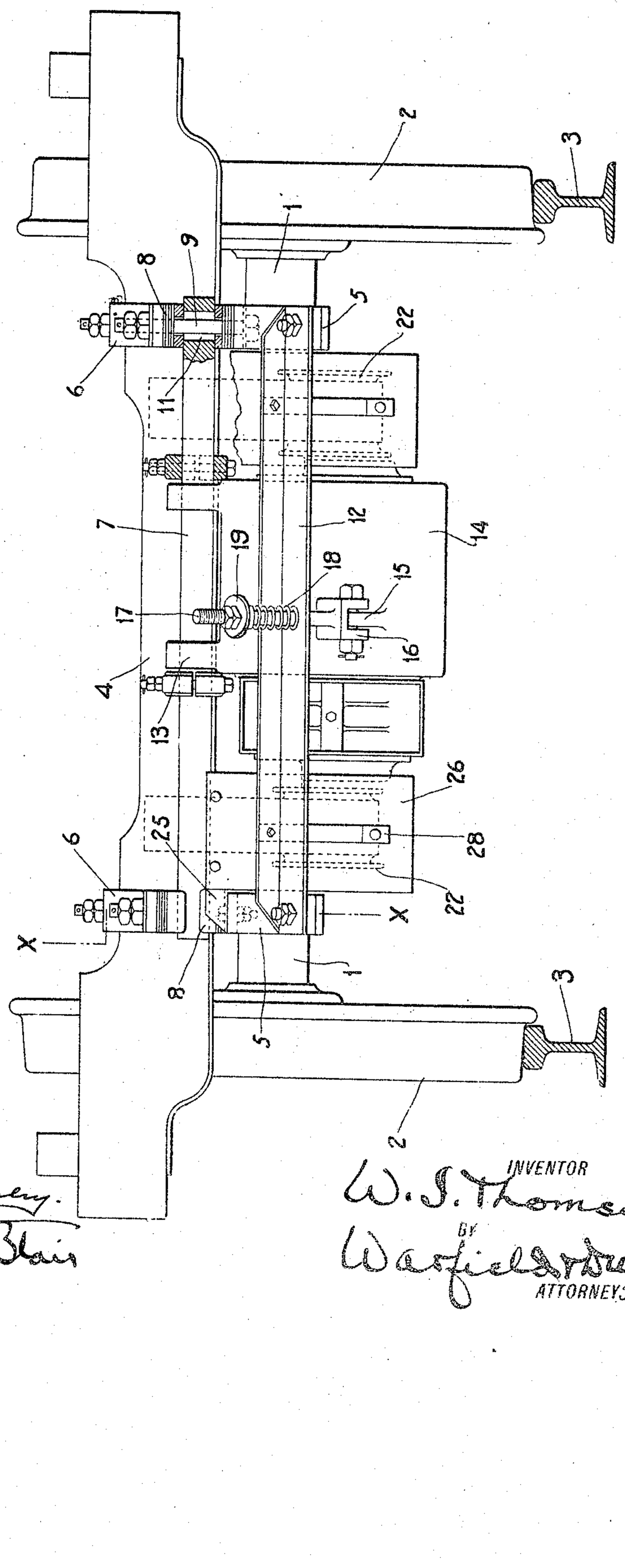
W. I. THOMSON.

CAR AXLE DRIVING GEAR FOR DYNAMOS.

APPLICATION FILED NOV. 6, 1905.

2 SHEETS—SHEET 1.

Fig. 1.



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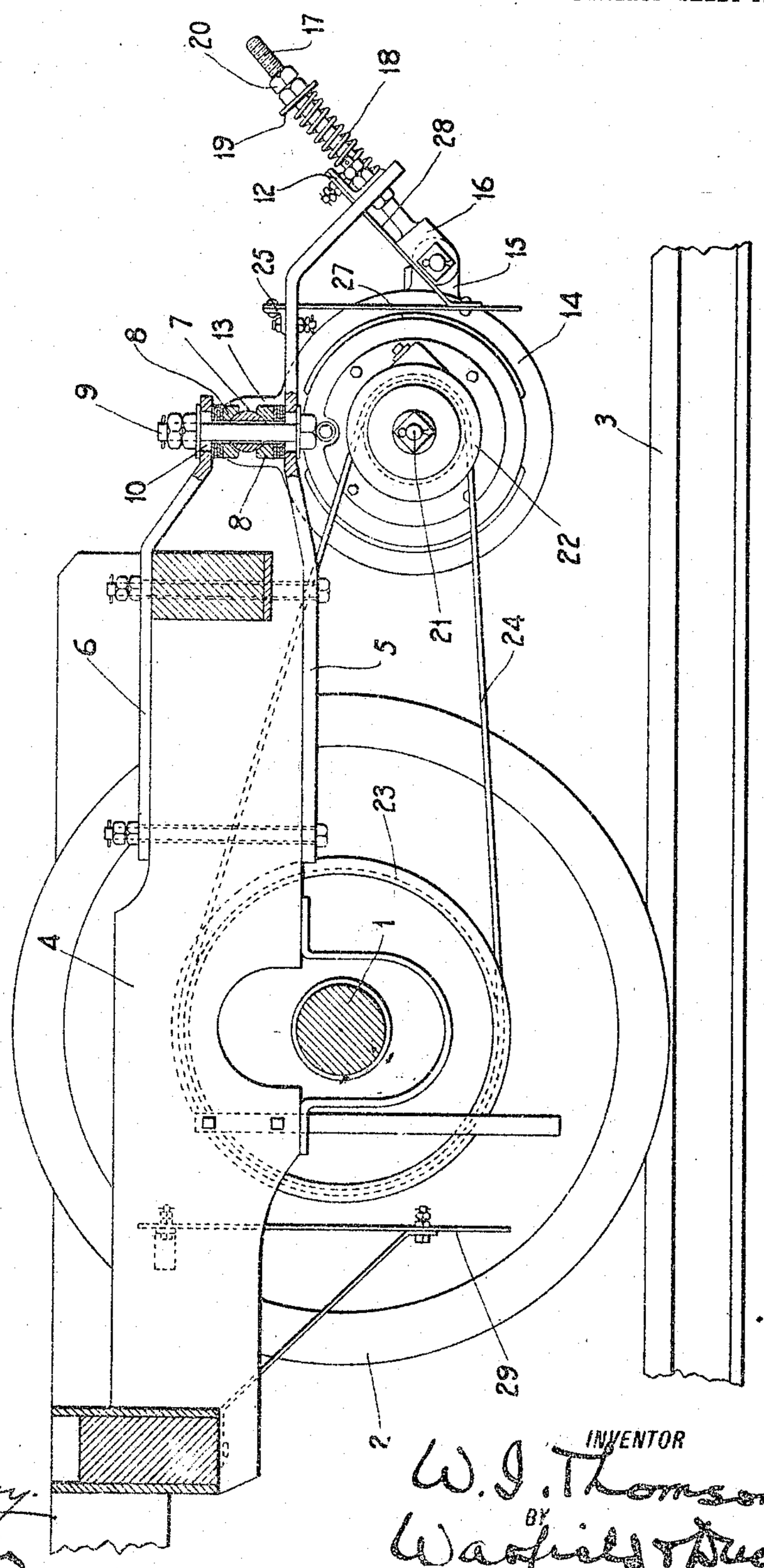
2 SHEETS—SHEET 2.

Fig. 2.



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CAR-AXLE DRIVING-GEAR FOR DYNAMOS.

No. 881,744. Specification of Letters Patent. Patented March 10, 1908.

Application filed November 6, 1905. Serial No. 285,981.

To all whom it may concern:

Be it known that I, WILLIAM I. THOMSON, residing at Newark, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Car-Axle Driving-Gear for Dynamos, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to electrical machinery.

One of the objects thereof is to provide durable and efficient power-transmitting means between a car axle and a dynamo.

Another object is to provide reliable means of the above type the continuity of action of which can be depended upon and the dynamo be held in its operative position under all conditions of use.

Another object is to provide means of the type first mentioned which shall be readily maintained in a condition of highest efficiency.

Another object is to provide simple, efficient and inexpensive means for protecting the power-transmitting mechanism of a car-axle connected dynamo against the effects of the severe conditions to which it is exposed in use.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the apparatus hereinafter described and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, wherein is shown one of various possible embodiments of my invention, Figure 1 is an end view of the same. Fig. 2 is a sectional elevation taken on the line *x*—*x* of Fig. 1.

Similar reference characters refer to similar parts throughout both views of the drawing.

This invention will be most readily understood if the following facts are borne in mind. In the case of a dynamo mounted in the above relation, the means whereby power is transmitted to or from the car axle are likely to become deranged by the flying bits of rock ballast or other foreign matter entering the parts thereof. This is particularly true where a belt-drive, which is otherwise highly efficient, is employed. If the belt breaks, the dynamo is likely to swing free and injure itself by contact with surrounding parts, or even tear itself loose, with a chance of derailment of the train. It is, moreover, peculiarly important in this art that the dynamo be maintained in operative condition as its substantially constant action is often depended upon, with the comparatively small storage batteries in use, to supply light to the cars. Also, on account of its exposed location, it is severely affected by unfavorable weather conditions. If it be attempted to protect the transmission by means of a casing, I have found that in cold weather there is a tendency for moisture, as from the drip of steam traps, to enter this casing, and together with the snow which may sift therein, gradually accumulate upon the side walls or bottom thereof to such an extent as to interfere with the efficient action of the power-transmitting means. The above and other defects are remedied and many positive advantages attained in constructions of the nature of that hereinafter described.

Referring now to Fig. 2 of the accompanying drawings, there is shown a car axle 1 provided with wheels 2 traveling upon the rails 3 and having mounted thereon a truck 4 of any desired construction. Between straps 5 and 6, secured to each side of the truck, is mounted a cross-bar 7 resting within bearing-blocks 8. Bolts 9 pass through these straps, blocks and ends of the cross-bar, the slots 10 in the straps being elongated in the direction of travel of the truck and the slots 11 in the cross-bar being extended in a transverse direction for purposes hereinafter described. Straps 5 project beyond the cross-bar 7 and have positioned thereon a second cross-member 12 preferably formed of angle iron. Upon cross-bar 7 is suspended, as by the heavy, perforated lugs 13, a dynamo 14 of any desired construction. The casing of this dynamo is provided upon the side remote from the axle 1 with a perforated lug 15

about which is secured a clevis 16 the shank 17 of which passes through cross-member 12 and is provided with a coil-spring 18 adjustably held in place by the washer 19 and lock-nuts 20. Upon each end of the dynamo-shaft 21 is mounted a pulley 22 each of which is connected with the corresponding pulley 23 fixed upon the axle 1, by a section of a belt 24.

Mounted upon the side of pulleys 22 remote from axle 1 and secured to the straps 5, as by angle iron 25, are what may be termed "shields" 26. As the construction of these devices is identical upon each side of the truck, that upon one side only will be described in detail. Shield 26 comprises broadly a substantially upright plate 27 having riveted to the rear surface thereof a brace 28 which is inclined toward and riveted to the cross-member 12. As the plate 27 is preferably of a width greater than that of the corresponding pulley and together with certain interposed parts of the truck extends vertically from top to bottom of the power-transmitting means, it will be seen that no foreign matter traveling in a direction parallel to the movement of the truck will strike the transmitting mechanism. This mechanism is protected against the entry of foreign matter during the movement of the truck in the opposite direction by shields 29, the construction of which is substantially identical with that of shields 26 above described, the parts being preferably of somewhat larger size on account of their proximity to the relatively large pulleys 23.

The operation of the above described embodiment of my invention is as follows: Assuming the dynamo to be mounted in the position shown, the same is laterally adjusted by means of the slots 11 so as to bring the pulleys 22 opposite the corresponding shields and otherwise in a position so as to act most efficiently. The extent of compression of spring 18 is then adjusted so as to bring the desired tension upon each section of the belt and, if necessary, either end of the cross-bar 7 is adjusted in a longitudinal direction by means of slots 10 so as to line up the dynamo shaft with respect to the axle to make the belt section run true. The shields 26 and 29 operate to prevent the throwing of any foreign matter against the belt sections or pulleys, and on account of the relatively high speed of the train, it has been found that it is inexpedient to make the shields of any considerable dimensions, as the direction of travel of such foreign matter relative to the parts mounted upon the car is substantially parallel to that of the travel of the car.

It will thus be seen that I have provided a simple construction well adapted to accomplish the several objects of my invention. By reason of the use of a sectional belt, the dynamo is maintained in operative condition even though one of the sections is destroyed or becomes so loose as to fail to act. On account of the spacing of the sections one from another, moreover, it is extremely unlikely that the same will be simultaneously rendered inoperative inasmuch as they could not in the natural course of events be injured by the same piece of flying ballast or other foreign matter. By reason of the power being applied at both ends of the dynamo-shaft, moreover, the tendency to cramp the shaft and cut the bearings is materially lessened and the power more efficiently applied, and, as the tensioning means comprising the spring 18 are positioned opposite and substantially midway between the sections, there is no material tendency to twist the dynamo out of adjustment. If one section is destroyed, moreover, not only is the dynamo maintained in operative condition, but the lost section is replaced at less cost than would be necessary to replace a belt sufficiently heavy to transmit the power required under the conditions of use with any degree of certainty.

On account of the upright disposition and substantially free lower edges of the shields 26 and 29, it will be seen that not only are the interposed parts protected against solid particles, but that any liquid which might otherwise accumulate thereon and impede the action of the power-transmitting means, immediately upon striking these members runs to the lowermost portion thereof and falls therefrom; or, in case of freezing before leaving these parts, the ice is of such form and so positioned as to have no effect upon the parts which it is desired to protect.

As many changes could be made in the above construction and many apparently widely different embodiments of my invention could be made without departing from the scope thereof, I intend that all matter contained in the above description or shown in the accompanying drawings shall be interpreted as illustrative and not in a limiting sense.

I desire it also to be understood that the language used in the following claims is intended to cover all of the generic and specific features of the invention herein described and all statements of the scope of the invention which, as a matter of language, might be said to fall therebetween.

Certain features herein shown and described are shown, described and claimed in my co-pending application, Serial No. 285,980, filed November 6, 1905, and accordingly are not claimed herein.

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

1. In apparatus of the class described, in combination, a car axle, a dynamo mounted

adjacent said car axle, and a belt comprising a plurality of independently operative sections each of which is adapted to transmit power from said car axle to the shaft of said dynamo.

2. In apparatus of the class described, in combination, a car axle, a dynamo mounted adjacent said axle, a belt comprising a plurality of parallel independently operative sections adapted to transmit power between said car axle and the shaft of said dynamo, and resilient means tending to move said dynamo away from said axle.

3. In apparatus of the class described, in combination, a car axle, a dynamo mounted adjacent said axle, a pair of pulleys upon said axle, a pulley upon each end of the shaft of said dynamo, a belt comprising a plurality of parallel sections respectively connecting said pulleys in pairs, and resilient means connected with said dynamo between the pulleys mounted upon the shaft thereof adapted to tend to move said dynamo away from said axle.

4. In apparatus of the class described, in combination, a car axle, a truck mounted upon said axle, a dynamo mounted upon said truck and adapted to swing with reference to said axle, a belt comprising a plurality of independently operative parallel sections each of which is adapted to transmit power from said axle to the shaft of said dynamo, and means connected with said dynamo upon the side thereof remote from said axle adapted to tend to swing said dynamo away from said axle.

5. In apparatus of the class described, in combination, a car axle, a dynamo mounted adjacent said axle, a pair of pulleys upon said axle, a pulley upon each end of the shaft of said dynamo, a belt comprising a plurality of independent sections respectively connecting the said pulleys in pairs, and independent means adapted to adjust the distance between each of said pulleys upon said dynamo and the corresponding pulley upon said axle.

6. In apparatus of the class described, in combination, a car axle, a dynamo mounted adjacent said axle, a pair of pulleys upon said axle, a pulley upon each end of the shaft of said dynamo, a belt comprising a plurality of independent sections respectively connecting the said pulleys in pairs, independent means adapted to adjust the distance between each of said pulleys upon said dynamo and the corresponding pulley upon said axle, and means connected with said dynamo adapted to tend to swing the same away from said axle.

7. In apparatus of the class described, in combination, a car axle, a dynamo mounted adjacent said axle, a belt comprising a plurality of independently operative sections each adapted to transmit power from said axle to the shaft of said dynamo, and resilient means tending to move said dynamo away from said axle.

8. In apparatus of the class described, in combination, a car axle, a truck mounted upon said axle, a dynamo suspended from said truck and adapted to swing with relation thereto, a pulley upon each end of the shaft of said dynamo, a pair of pulleys upon said axle, a belt comprising a plurality of sections respectively adapted to connect said pulleys in pairs, and means connected with said dynamo between the pulleys upon the shaft thereof adapted to tend to swing the same away from said axle.

9. In apparatus of the class described, in combination, a car axle, a truck mounted upon said axle, a dynamo suspended from said truck and adapted to swing with relation thereto, a pulley upon each end of the shaft of said dynamo, a pair of pulleys upon said axle, a belt comprising a plurality of sections respectively adapted to connect said pulleys in pairs, means connected with said dynamo between the pulleys upon the shaft thereof adapted to tend to swing the same away from said axle, and means adapted to adjust the angular disposition of the shaft of said dynamo with reference to said axle.

10. In apparatus of the class described, in combination, a car axle, a truck mounted thereon, a cross-member upon said truck each end of which is adjustable thereon in a longitudinal direction, a dynamo mounted upon said cross-member and adapted to swing with reference to said truck, a pulley upon each end of the shaft of said dynamo, a pair of pulleys upon said axle, a belt comprising a plurality of independent sections adapted to connect said pulleys in pairs, each of said sections being adapted to transmit power between said dynamo and said axle, and spring-pressed means connected with said dynamo adapted to tend to swing the same away from said axle.

11. In apparatus of the class described, in combination, an axle, a wheel upon said axle, a rail upon which said wheel is adapted to run, a dynamo, power transmitting means connecting said dynamo and said axle, and an upright shield adjacent to said power transmitting means and substantially in the plane of movement thereof, said shield being so mounted as to protect said power transmitting means in the direction of its travel and so formed as to drain from itself natural accumulations.

12. In apparatus of the class described, in combination, an axle, a wheel upon said axle, a rail upon which said wheel is adapted to run, a dynamo, power transmitting means connecting said dynamo and said axle, and a pair of substantially upright shields, respectively mounted at each end of said power

transmitting means and substantially in the plane of travel thereof relative to said rail, said shields being so mounted as to protect said power transmitting means in its direction of travel in either forward or reverse running, and being so formed as to drain from themselves natural accumulations.

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

WILLIAM I. THOMSON.

Witnesses:
A. C. MOORE,
ELMER E. ALLBEE.