

No. 665,539.

Patented Jan. 8, 1901.

M. MOSKOWITZ.

MEANS FOR GENERATING ELECTRICITY FROM AXLES OF LOCOMOTIVE TRUCKS.

(Application filed Mar. 13, 1900.)

(No Model.)

3 Sheets—Sheet 1.

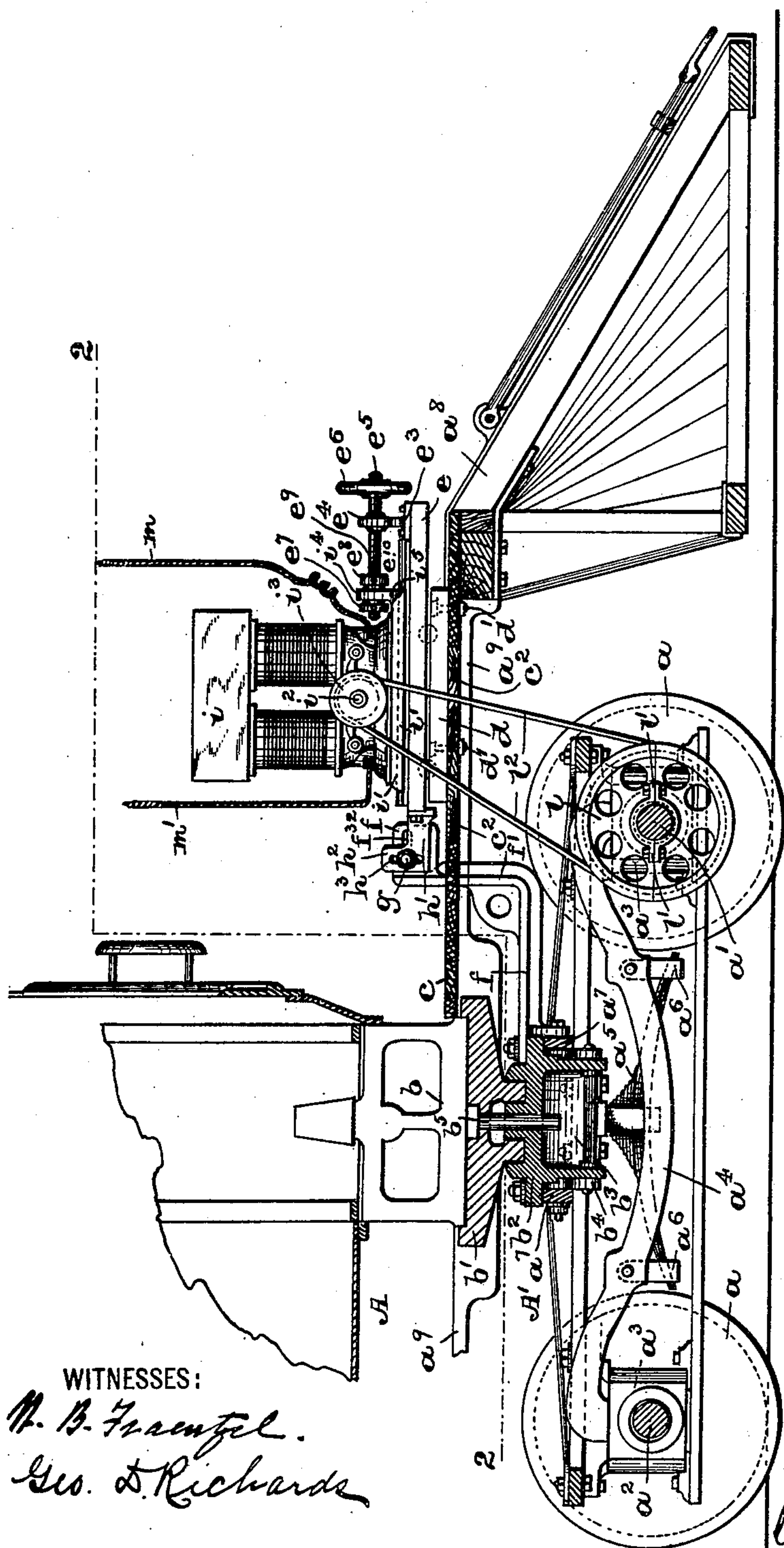


FIG. 1

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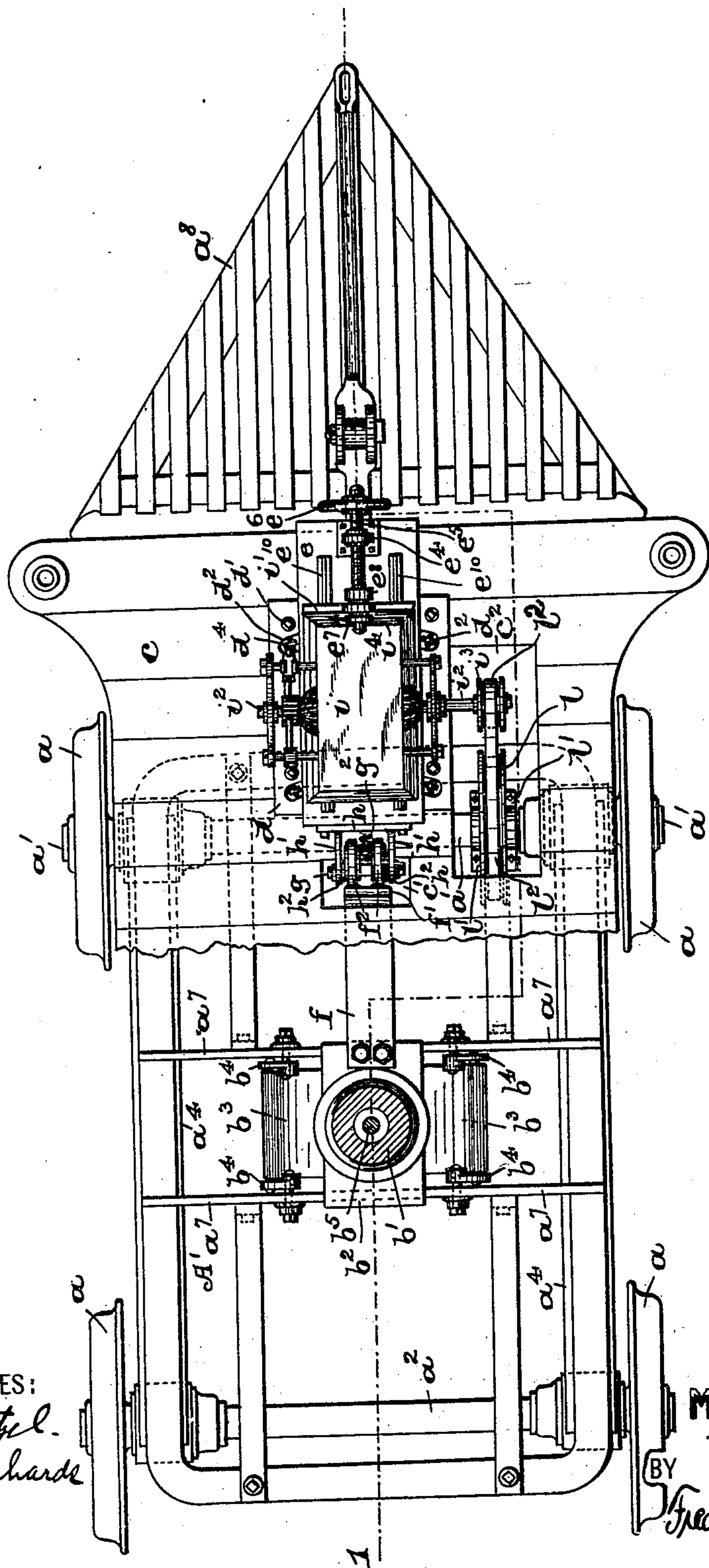
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3 Sheets—Sheet 2.



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3 Sheets—Sheet 3

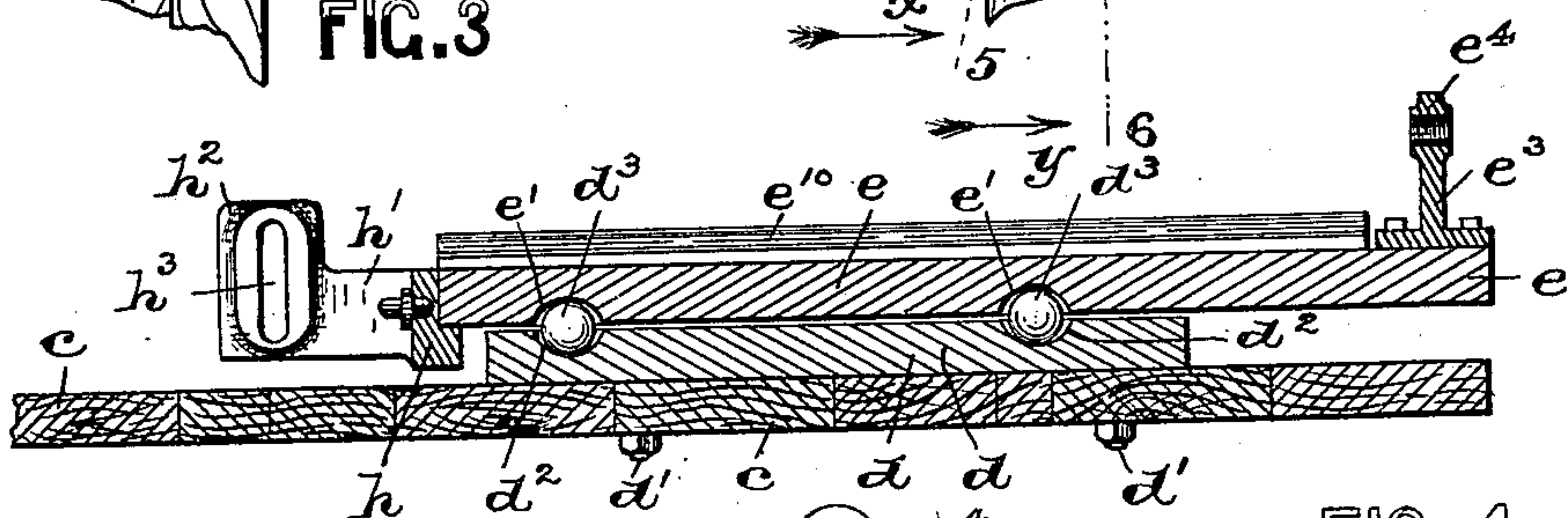
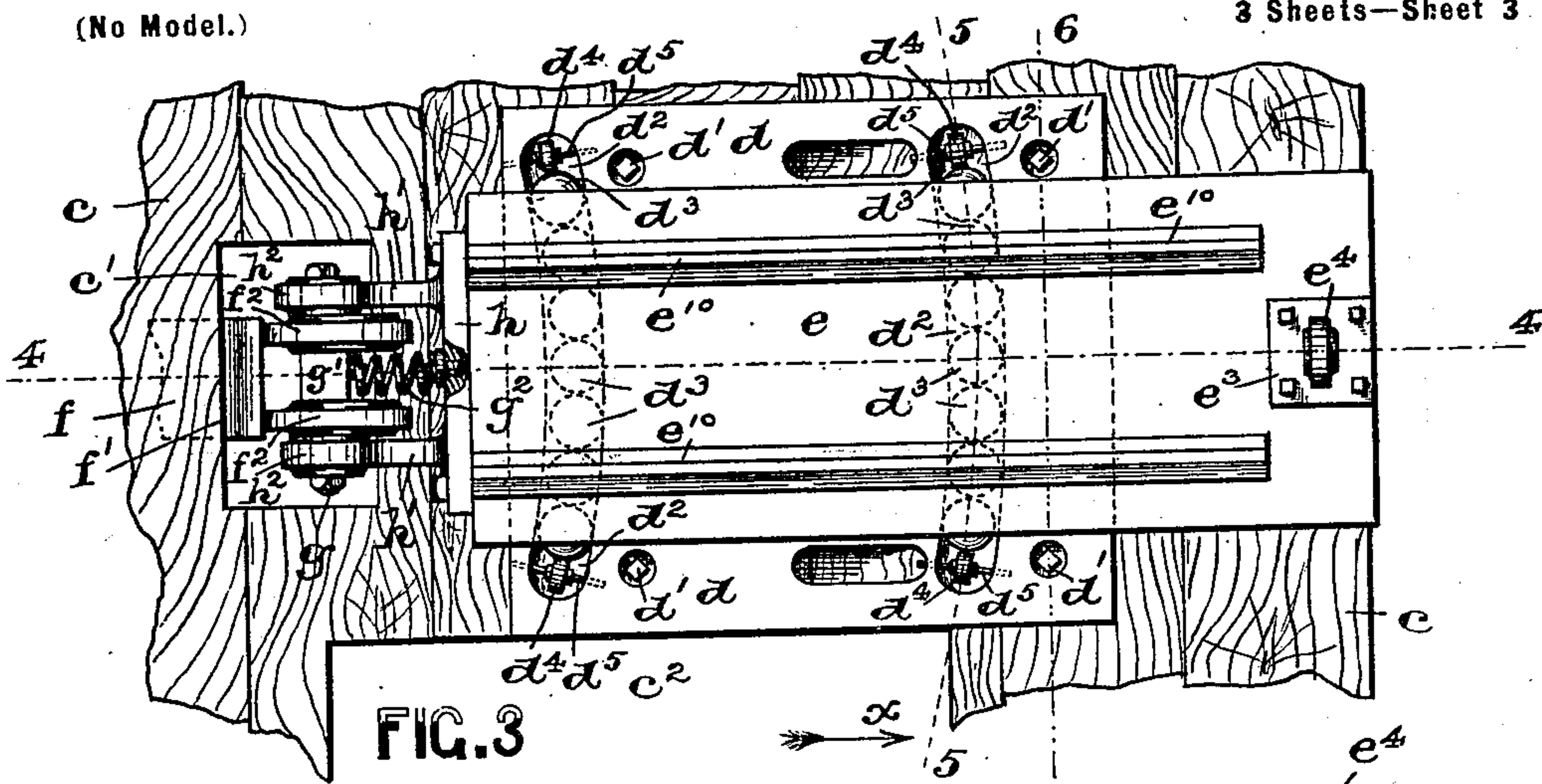


FIG. 5

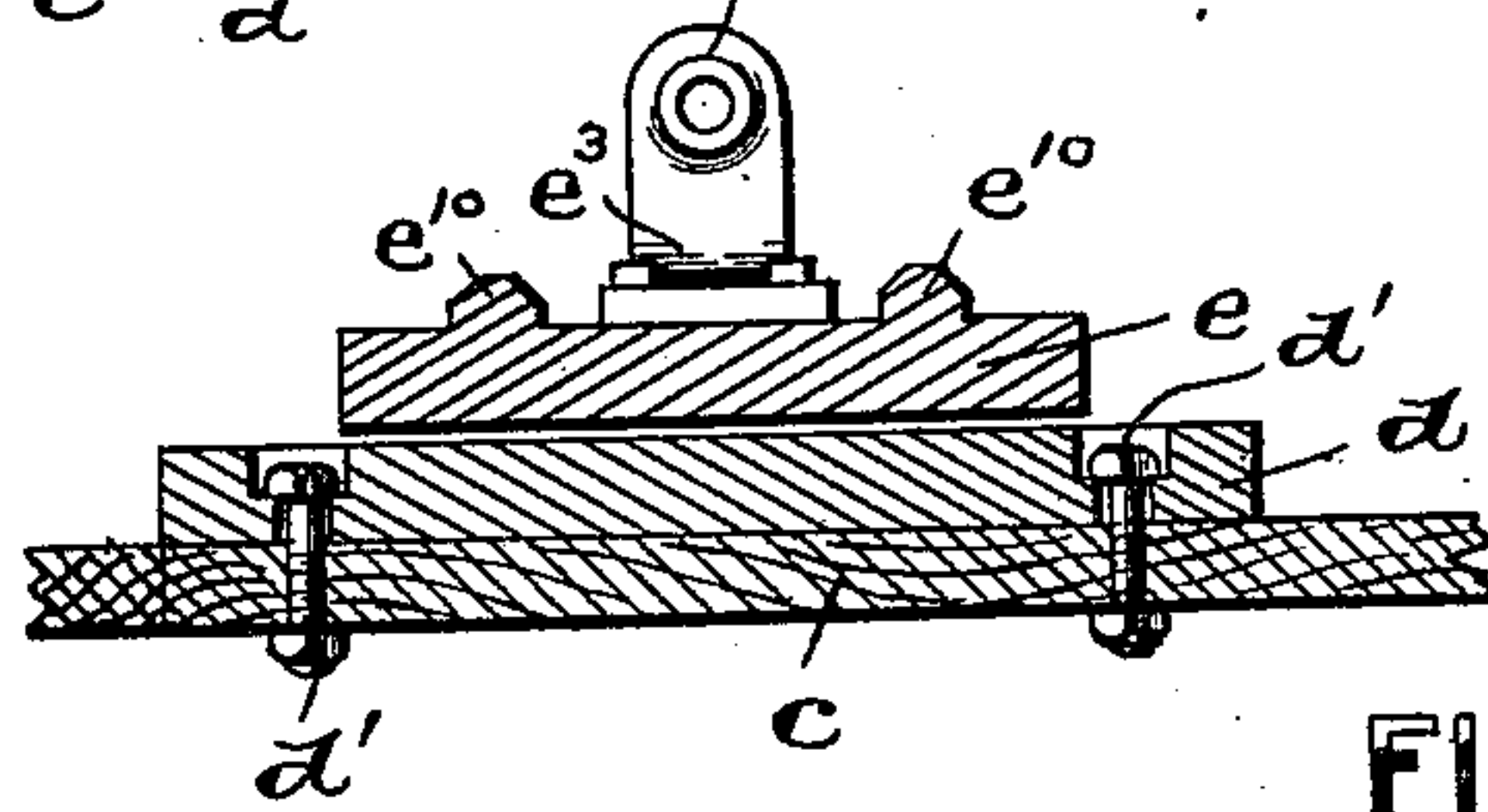
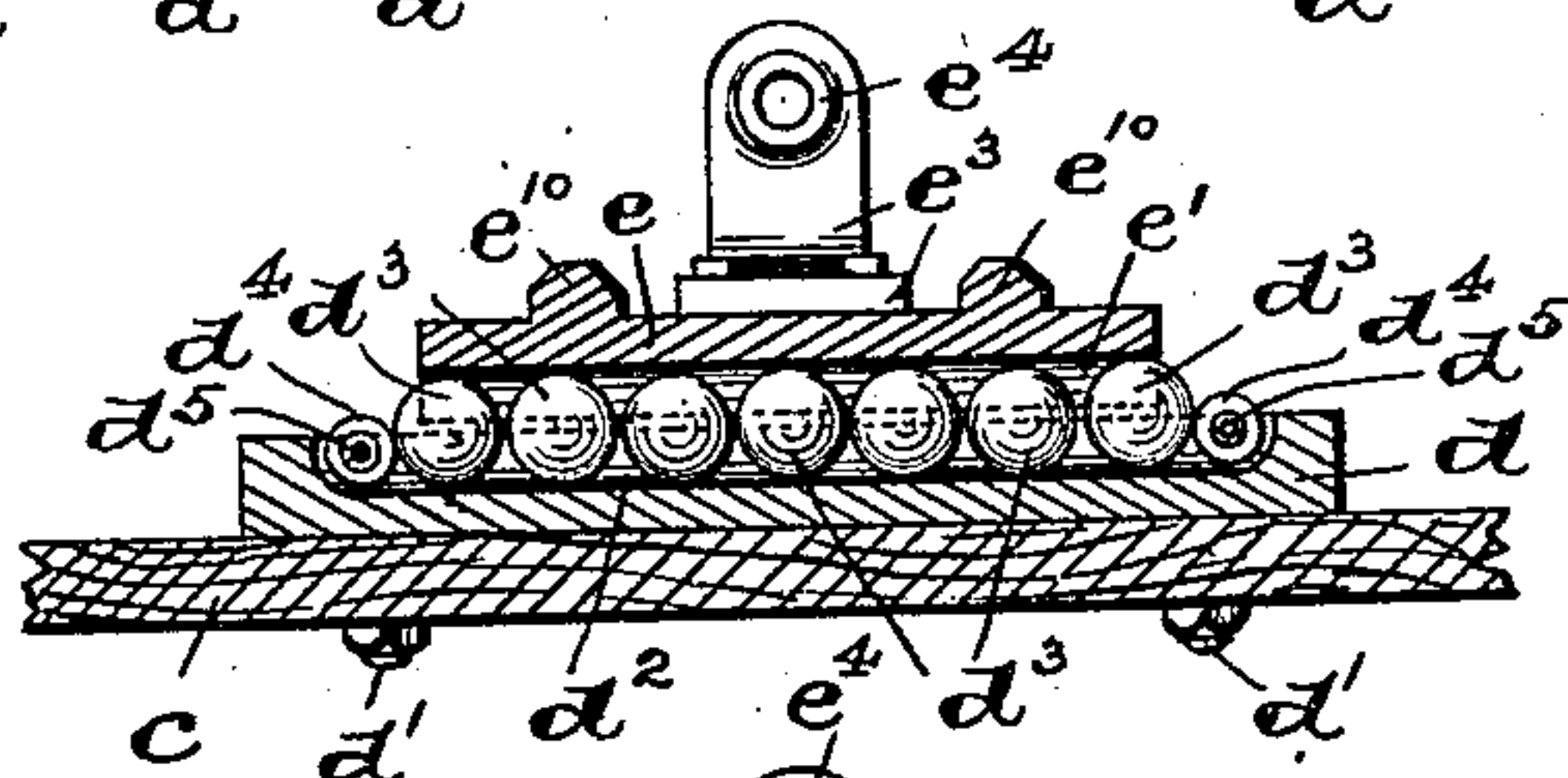


FIG. 6

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MEANS FOR GENERATING ELECTRICITY FROM AXLES OF LOCOMOTIVE-TRUCKS.

SPECIFICATION forming part of Letters Patent No. 665,539, dated January 8, 1901.

Application filed March 13, 1900. Serial No. 8,433. (No model.)

To all whom it may concern:

Be it known that I, MORRIS MOSKOWITZ, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Means for Generating Electricity from the Axles of Locomotive-Trucks; and I do 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 appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention has reference generally to improvements in means for generating electricity from car-axles; and the invention relates more particularly to a novel arrangement of dynamo upon a locomotive and a novel arrangement and construction of intermediate driving and operating means between the dynamo and the axle of a pivoted or swing truck of the locomotive.

As is well known, except in switching-locomotives and, perhaps, in some few other rare cases, all locomotives are provided with trucks which are of a peculiar construction to admit of running on very sharp curves. These trucks are known as center-bearing trucks, and in order that the transverse center line of the truck may assume a radial position to the curve the truck is made to swing or turn on a king-bolt in said center-bearing.

The principal object of my present invention, therefore, is to provide a novel arrangement of dynamo movably placed in position on the framework of a locomotive, preferably upon a platform or shelf directly back of or forming a part of the pilot, and a connecting means, as a belt, between the pulley-wheel of the dynamo and a wheel on one of the axles of the truck, the movement of the dynamo being caused and controlled by the swinging movement of the truck about its center-bearing, whereby the respective pulley-wheels of the dynamo and that on one of the truck-axles will at all times and under all conditions maintain their proper alinement, whether the locomotive is running on a straight track or over curves.

A further object of this invention is to pro-

vide a novel arrangement and construction of connecting mechanism placed between the dynamo and the swinging truck whereby the dynamo receives a circular motion in a plane about a center in the central axis of the pivotal pin or king-bolt of the truck to maintain the proper parallelism of the armature-shaft of the dynamo and the truck-axle and the proper alinement at all times of the pulley-wheels thereon to prevent the belt from running slack or being thrown off when passing over curves.

A further object of this invention is to provide, in connection with mechanism for the purposes above stated, an adjusting device for maintaining the belt taut when it becomes slack with constant wear or when it is desired to loosen the belt for repairs to the dynamo or other parts of the mechanism.

Other objects of this invention not here specifically set forth will be evident from the following specification.

My invention consists, primarily, in the novel arrangement of a dynamo or similar electric generator on a platform at the front of a locomotive, capable of movements corresponding to the movements of the truck about its center-bearing, to maintain the proper and constant alinement of the several working parts of the dynamo with those of the truck.

The invention furthermore consists in the arrangement of an automatically-adjustable connecting means between the dynamo and swinging truck to produce a radially-swinging motion of the dynamo, with its center of movement in the central axis of the king-bolt of the truck, but also permitting of a longitudinal reciprocatory motion of the dynamo and frame, caused by any uneven and unsteady movements of the framework of the locomotive, and said connecting means also being capable of a vertical adjustment automatically to compensate for the varying positions of the truck-axle with the fixed shelf or platform or other part of the framework on which the dynamo is placed, such changes of position being due to the variations in the road-bed.

The invention consists, finally, in the several novel arrangements and combinations of the various parts, as well as in the details of the construction thereof, all of which will be

described in detail in the accompanying specification and then finally embodied in the clauses of the claim, which form a part of this specification.

5 The invention is clearly illustrated in the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of a portion of a locomotive and its forward swinging truck, said section being taken on
10 line 1 1 in Fig. 2, said view also representing in side elevation a dynamo on a platform or shelf directly back of the pilot, a connecting means between the dynamo and swinging truck for giving to the dynamo a radial motion about a center in the central axis of the
15 king-bolt of the truck, and also a driving means between the dynamo and one of the truck-axes, and an adjusting device for adjusting the dynamo longitudinally to maintain the proper and operative relation between the dynamo and the truck-axle, and of the driving means between said parts. Fig.
20 2 is a part plan view and part horizontal section, taken on line 2 2 in Fig. 1, of the several parts of the mechanism represented in said Fig. 1. Fig. 3 is a top or plan view of a portion of the shelf or platform back of the pilot and a top view of the movable dynamo-support, as well as portions of the means for
25 causing the movements of said support, the dynamo being removed; and Fig. 4 is a longitudinal vertical section taken on line 4 4 in said Fig. 3. Fig. 5 is a vertical section on line 5 5 in said Fig. 3 looking in the direction of the arrow x , and Fig. 6 is a similar section taken on line 6 6 in said Fig. 3 looking in the direction of the arrow y in said figure.

Similar letters of reference are employed
40 in all of the above-described views to indicate corresponding parts.

Referring to the said drawings, A indicates a portion of any well-known construction of locomotive, and A' is the swing or center-bearing truck of the same. This truck consists of the four wheels a , which are secured on the axles a' and a'' . These axles carry the usual boxes a^3 , on which are supported the equalizers a^4 , from which elliptical springs
50 a^5 are suspended by means of hangers a^6 in the usual manner.

The cylinder-saddles b are securely bolted in the usual manner to a casting b' , called the "upper center-plate." This upper plate
55 rests upon a lower center-plate b^2 , which has cast upon it extensions b^3 , the ends of which are pivotally connected by means of the suspension-links b^4 , which links are likewise attached to the diagonal bars a^7 , fastened to
60 the truck-frame A'.

The center-bearing is provided with the usual king-bolt or center-pin b^5 , which passes through the center of both plates b' and b^2 . Thus the truck admits of a running on very
65 sharp curves, notwithstanding the long wheel-base.

As illustrated in Figs. 1 and 2, directly back

of the pilot a^8 and suitably secured upon the engine-frame a^9 is a platform or shelf c . Upon this shelf or platform, which is provided with suitably-disposed openings c' and c^2 , as will be seen from an inspection of Figs. 1, 2, and 3 of the drawings, I have arranged a platen d , which is secured in place, preferably, by means of bolts or screws d' and has
70 one or more curved grooves or ducts d^2 , which are provided with antifriction-bearings, as d^3 , or any other suitably-constructed supporting-travelers for the movable support thereon of a second platen e , formed in its under
75 surface, with one or more curved grooves or ducts e' , corresponding in position to the grooves or ducts in the platen d , with the upper portions of said antifriction bearings or travelers operatively extending into the
80 grooves or ducts in said upper movable platen e , substantially as illustrated more particularly in Figs. 4 and 5. As stated, the said grooves or ducts d^2 and e' are curved, their centers of curvatures being located in the
85 central axis of the king-bolt or center-pin b^5 of the center-bearing plates b' and b^2 . Suitably secured to the lower center-plate b^2 of the center-bearing of the truck by means of bolts or in any other manner is a forwardly-
90 extending bracket or support f , which has at its free end an upwardly-extending arm or post f' . This post projects through the opening c' in the platform c and has a pair of forwardly-extending lugs or ears f^2 , each lug or
95 ear f^2 being provided with longitudinally-disposed openings f^3 , substantially as illustrated. The slotted lugs or ears f^2 are arranged between a pair of lugs or ears h^2 , formed on the free ends of suitable arms or projections h' ,
100 extending from a plate or casting h , which is attached to one of the edges or other suitable portion of the movable platen e , resting upon the antifriction bearings or travelers d^3 , as above mentioned. The said lugs or ears h^2
105 are provided with vertical openings or slots h^3 , as illustrated in Figs. 1 and 4, and the several ears or lugs f^2 and h^2 are operatively connected by means of a pair of pins or bolts g , which are secured in a suitable block or nut
110 g' , arranged between the ears or lugs f^2 , a cushioning-spring g^2 being preferably placed between said block or nut g' and the casting h and between the ears or lugs of the several
115 parts, substantially as illustrated, to maintain the operative connection of the various parts and prevent them from becoming jammed or broken by sudden jars. It will thus be seen that by this arrangement of connecting mechanism between the platen e and
120 the swing-truck of the locomotive said platen e will be capable of a lateral motion upon the bearings or travelers in the lower platen d , caused by and corresponding to the pivotal swinging motion of the truck while running
125 over curves, and the proper relative positions of said movable platen with the truck will be maintained at all times, as will be clearly understood. When ball-travelers are employed

in the grooves or channels, as herein illustrated, in order that said balls or travelers will not jam and render the device inoperative suitable wheels or rollers d^4 , rotatively arranged on pins or spindles d^5 , may be arranged at or near the ends of the grooves or ducts d^2 , with which the end balls d^3 are in rolling contact, and thereby prevent the intermediate balls or travelers d^3 from rolling upon each other and becoming jammed in the groove or channel. Of course it will be evident that I may employ any other suitable bearing devices on which the upper platen e is movably placed. Aside from this lateral movement of the platen e a longitudinal movement is permitted for sudden jarring by the arrangement of the longitudinal slots f^3 in the ears or lugs f^2 , while the vertical slots h^3 permit of any up-and-down movements of the post or arm h' due to any irregularities that may exist in the road-bed. The plate e having thus been movably and operatively placed upon the lower platen d , or rather upon the bearings or travelers in said lower platen, I place upon said upper platen any suitable construction of dynamo or other electric generator i , which is provided with a suitable base i' and on one end of its armature-shaft i^2 has a driving-pulley i^3 .

Upon the axle a' of the truck I have secured a pulley-wheel l , which is preferably made in halves and is provided with flanges l' and bolts, whereby the said halves can be secured together and firmly clamped upon the axle in proper alinement with the pulley i^3 on the armature-shaft i^2 of the dynamo i . A belt l^2 is passed over the pulley-wheel, said belt passing through the opening c^2 in the shelf or platform c and being operatively arranged over the said dynamo-pulley i^3 . The dynamo can in this manner be operated from the truck-axle, and the electric current generated passes into and through the circuit-wires m and m' to any part of the locomotive or into the car or cars connected therewith for the purpose of lighting the same or otherwise employing the electric current generated.

Owing to the circular motion of the dynamo i and the platen e , on which it is arranged, such motion being controlled and caused by the corresponding motion of the truck about its king-bolt or center-pin, it will be evident that all points in the longitudinal axes of the armature-shaft i^2 and in the truck-axle a' when going around curves will describe concentric circles having their common center in the central axis of the king-bolt or center-pin of the swing-truck, and hence the pulley-wheels i^2 and l are never out of alinement and the belt l^2 is retained in its operative driving positions on said pulleys, whether the truck is running over curves or in a straight direction.

In order that the belt l^2 may be properly adjusted when the same is slack or when placing a new belt over the pulleys, I have pro-

vided the platen e with a pair of guides or tracks, as e^{10} , or any other suitably arranged and constructed guiding means, on which I place the base i' of the dynamo i . Upon said platen e is a standard e^3 , having a screw-threaded enlargement e^4 , in which is rotatively arranged a screw-threaded rod e^5 , provided at its free end with a hand-wheel e^6 or other suitable means for turning the same. The opposite end of said rod e^5 is loosely and operatively held in an eye i^4 of a post or bracket i^5 on the dynamo-base by means of a pair of collars or nuts e^7 and e^8 , which are arranged upon said rod and secured in position by pins e^9 , as shown in Fig. 1. In this manner by turning the rod e^5 in the required direction the dynamo i can be moved backward or forward longitudinally upon said pair of guides or tracks e^{10} on the platen e and the belt l^2 thereby slackened or tightened as necessity may demand.

The operations of the several mechanisms and of the several parts of such mechanisms are practical and in construction very simple, and a noiselessly-operating mechanism is provided for operating a dynamo or other electric generator from the rotating axle of a pivoted or swing truck of a locomotive, and the dynamo being placed on the platform or shelf c as far above the road-bed as possible the dynamo can be more readily protected from the dirt, dust, and stones always whirled up in large quantities underneath the trucks of locomotives or cars, and its utility and efficiency is greatly prolonged.

It will be understood that I may use in connection with the dynamo i and its circuits $m m'$ any of the well-known forms and constructions of pole-changers acting automatically or otherwise, whereby the current generated by the said dynamo can be made to travel in either direction, according to the direction of the travel of the locomotive.

I am fully aware that many changes may be made in the several arrangements of the mechanism and in the various arrangements and combinations of the parts thereof, as well as in the details of the construction of such parts, as herein set forth and as illustrated in the accompanying drawings, without departing from the scope of my present invention. Hence I do not limit my invention to the exact arrangements of the mechanism nor to the various arrangements and combinations of the parts thereof as described in the specification and illustrated in the accompanying drawings, nor do I confine myself to the details of the construction of any of said parts.

Having thus described my invention, what I claim is—

1. The combination, with a pivoted or swing truck of a locomotive, and a fixed platform at the front of the locomotive and located above the said truck, of a dynamo or electric generator, arranged on said platform and having a lateral circular motion controlled by the corresponding motion of said truck about its cen-

ter-bearing, substantially as and for the purposes set forth.

2. The combination, with a pivoted or swing truck of a locomotive, and a fixed platform at the front of the locomotive and located above the said truck, of a dynamo or electric generator, arranged on said platform and having a lateral circular motion controlled by the corresponding motion of said truck about its center-bearing, and an operative driving mechanism between said dynamo and one of the truck-axes, substantially as and for the purposes set forth.

3. The combination, with a pivoted or swing truck of a locomotive, and a fixed platform at the front of the locomotive and located above the said truck, of a dynamo or electric generator, arranged on said platform and having a lateral circular motion controlled by the corresponding motion of said truck about its center-bearing, and an operative driving mechanism between said dynamo and one of the truck-axes, consisting, of a pulley-wheel on the armature-shaft of the dynamo, a pulley-wheel on said truck-axle, and a belt passing over said pulleys, substantially as and for the purposes set forth.

4. The combination, with a pivoted or swing truck of a locomotive, and a fixed platform at the front of the locomotive and located above the said truck, of a dynamo or electric generator, arranged on said platform and having a lateral circular motion controlled by the corresponding motion of said truck about its center-bearing, and a means of longitudinal adjustment of the dynamo connected with the latter, substantially as and for the purposes set forth.

5. The combination, with a pivoted or swing truck of a locomotive, and a fixed platform at the front of the locomotive and located above the said truck, of a dynamo or electric generator, arranged on said platform and having a lateral circular motion controlled by the corresponding motion of said truck about its center-bearing, a means of longitudinal adjustment of the dynamo connected with the latter, and an operative driving mechanism between said dynamo and one of the truck-axes, substantially as and for the purposes set forth.

6. The combination, with a pivoted or swing truck of a locomotive, and a fixed platform at the front of the locomotive and located above the said truck, of a dynamo or electric generator, arranged on said platform and having a lateral circular motion controlled by the corresponding motion of said truck about its center-bearing, a means of longitudinal adjustment of the dynamo connected with the latter, and an operative driving mechanism between said dynamo and one of the truck-axes, consisting, of a pulley-wheel on the armature-shaft of the dynamo, a pulley-wheel on said truck-axle, and a belt passing over said pulleys, substantially as and for the purposes set forth.

7. In a locomotive, the combination, with a pivoted or swing truck, and the framework of the locomotive, and a fixed platform thereon at the front of the locomotive, of a fixed shelf on said platform, a movable platen on said shelf, a dynamo or electric generator on said platen, and an operative driving mechanism between said dynamo and one of the truck-axes, substantially as and for the purposes set forth.

8. In a locomotive, the combination, with a pivoted or swing truck, and the framework of the locomotive, and a fixed platform thereon at the front of the locomotive, of a fixed shelf on said platform, a movable platen on said shelf, a dynamo or electric generator on said platen, and an operative driving mechanism between said dynamo and one of the truck-axes, consisting, of a pulley-wheel on the armature-shaft of the dynamo, a pulley-wheel on said truck-axle, and a belt passing over said pulleys, substantially as and for the purposes set forth.

9. In a locomotive, the combination, with a pivoted or swing truck and the framework of the locomotive, and a fixed platform thereon at the front of the locomotive, of a fixed shelf on said platform, a platen on said shelf, a means of connection between said platen and truck for causing a lateral circular motion of said platen controlled by the corresponding motion of the truck, a dynamo or electric generator on said platform, and an operative driving mechanism between said dynamo and one of the truck-axes, substantially as and for the purposes set forth.

10. In a locomotive, the combination, with a pivoted or swing truck and the framework of the locomotive, and a fixed platform thereon at the front of the locomotive, of a fixed shelf on said platform, a platen on said shelf, a means of connection between said platen and truck for causing a lateral circular motion of said platen controlled by the corresponding motion of the truck, a dynamo or electric generator on said platform, and an operative driving mechanism between said dynamo and one of the truck-axes, consisting, of a pulley-wheel on the armature-shaft of the dynamo, a pulley-wheel on said truck-axle, and a belt passing over said pulleys, substantially as and for the purposes set forth.

11. In a locomotive, the combination, with a pivoted or swing truck and the framework of the locomotive, and a fixed platform thereon at the front of the locomotive, of a fixed shelf on said platform, a platen on said shelf, a means of connection between said platen and truck for causing a lateral circular motion of said platen controlled by the corresponding motion of the truck, a dynamo or electric generator on said platform, an operative driving mechanism between said dynamo and one of the truck-axes, and a means of longitudinal adjustment of the dynamo on said platen, substantially as and for the purposes set forth.

12. In a locomotive, the combination, with a pivoted or swing truck and the framework of the locomotive, and a fixed platform thereon at the front of the locomotive, of a fixed shelf on said platform, antifriction bearings or travelers thereon, a platen movably arranged on said bearings or travelers, a dynamo or electric generator on said platen, and an operative driving mechanism between said dynamo and one of the truck-axles, substantially as and for the purposes set forth.

13. In a locomotive the combination, with a pivoted or swing truck and the framework of the locomotive, and a fixed platform thereon at the front of the locomotive, of a fixed shelf on said platform, antifriction bearings or travelers thereon, a platen movably arranged on said bearings or travelers, a dynamo or electric generator on said platen, and an operative driving mechanism between said dynamo and one of the truck-axles, consisting, of a pulley-wheel on the armature-shaft of the dynamo, a pulley-wheel on said truck-axle, and a belt passing over said pulleys, substantially as and for the purposes set forth.

14. In a locomotive, the combination, with a pivoted or swing truck and the framework of the locomotive, and a fixed platform thereon at the front of the locomotive, of a fixed shelf on said platform, antifriction bearings or travelers thereon, a platen movably arranged on said bearings or travelers, a means of connection between said platen and truck for causing a lateral circular motion of said platen controlled by the corresponding circular motion of the truck, a dynamo or electric generator on said movable platen, and an operative driving means between said dynamo and one of the truck-axles, substantially as and for the purposes set forth.

15. In a locomotive, the combination, with a pivoted or swing truck and the framework of the locomotive, and a fixed platform thereon at the front of the locomotive, of a fixed shelf on said platform, antifriction bearings or travelers thereon, a platen movably arranged on said bearings or travelers, a means of connection between said platen and truck for causing a lateral circular motion of said platen controlled by the corresponding circular motion of the truck, a dynamo or electric generator on said movable platen, and an operative driving mechanism between said dynamo and one of the truck-axles, consisting, of a pulley-wheel on the armature-shaft of the dynamo, a pulley-wheel on said truck-axle, and a belt passing over said pulleys, substantially as and for the purposes set forth.

16. In a locomotive, the combination, with a pivoted or swing truck and the framework of the locomotive, and a fixed platform thereon at the front of the locomotive, of a fixed shelf on said platform, antifriction bearings or travelers thereon, a platen movably arranged on said bearings or travelers, a means

of connection between said platen and truck for causing a lateral circular motion of said platen controlled by the corresponding circular motion of the truck, a dynamo or electric generator on said movable platen, an operative driving mechanism between said dynamo and one of the truck-axles, and a means of longitudinal adjustment of the dynamo on said platen, substantially as and for the purposes set forth.

17. In a locomotive, the combination, with a pivoted or swing truck and the framework of the locomotive, and a fixed platform thereon at the front of the locomotive, of a fixed shelf on said platform, a lower platen thereon, having a traveler-receiving groove or grooves, ball-bearings or travelers in said groove or grooves, an upper platen movably supported on said ball-bearings or travelers, a dynamo or electric generator on said movable platen, and an operative driving mechanism between said dynamo and one of the truck-axles, substantially as and for the purposes set forth.

18. In a locomotive, the combination, with a pivoted or swing truck and the framework of the locomotive, and a fixed platform thereon at the front of the locomotive, of a fixed shelf on said platform, a lower platen thereon, having a traveler-receiving groove or grooves, ball-bearings or travelers in said groove or grooves, an upper platen movably supported on said ball-bearings or travelers, a dynamo or electric generator on said movable platen, and an operative driving mechanism between said dynamo and one of the truck-axles, consisting, of a pulley-wheel on the armature-shaft of the dynamo, a pulley-wheel on said truck-axle, and a belt passing over said pulleys, substantially as and for the purposes set forth.

19. In a locomotive, the combination, with a pivoted or swing truck and the framework of the locomotive, and a fixed platform thereon at the front of the locomotive, of a fixed shelf on said platform, a lower platen thereon, having a traveler-receiving groove or grooves, ball-bearings or travelers in said groove or grooves, an upper platen movably supported on said ball-bearings or travelers, a dynamo or electric generator on said movable platen, a means of connection between said upper movable platen and truck for causing a lateral circular motion of said platen controlled by the corresponding circular motion of the truck, and an operative driving mechanism between said dynamo and one of the truck-axles, substantially as and for the purposes set forth.

20. In a locomotive, the combination, with a pivoted or swing truck and the framework of the locomotive, and a fixed platform thereon at the front of the locomotive, of a fixed shelf on said platform, a lower platen thereon, having a traveler-receiving groove or grooves, ball-bearings or travelers in said groove or grooves, an upper platen movably

supported on said ball-bearings or travelers, a dynamo or electric generator on said movable platen, a means of connection between said upper movable platen and truck for causing a lateral circular motion of said platen controlled by the corresponding circular motion of the truck, an operative driving mechanism between said dynamo and one of the truck-axes, and a means of longitudinal ad-

justment of the dynamo on said platen, substantially as and for the purposes set forth.

In testimony that I claim the invention set forth above I have hereunto set my hand this 10th day of March, 1900.

MORRIS MOSKOWITZ.

Witnesses:

FREDK. C. FRAENTZEL,
W. B. FRAENTZEL.