

No. 653,391.

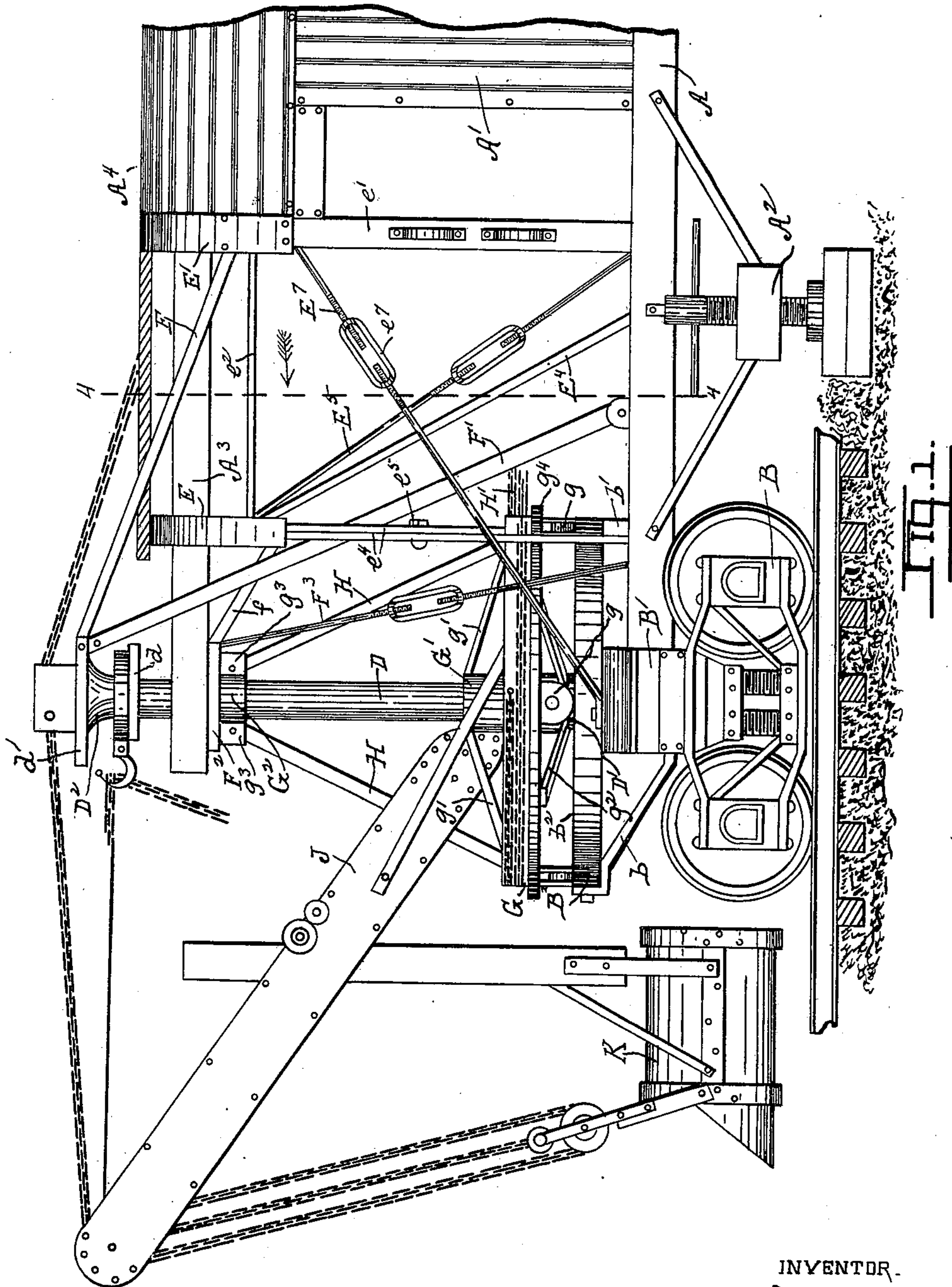
Patented July 10, 1900.

**W. MULLEN.
STEAM SHOVEL.**

(Application filed Oct. 25, 1899.)

(No Model.)

5 Sheets—Sheet 1.



WITNESSES

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AT T O R N E Y

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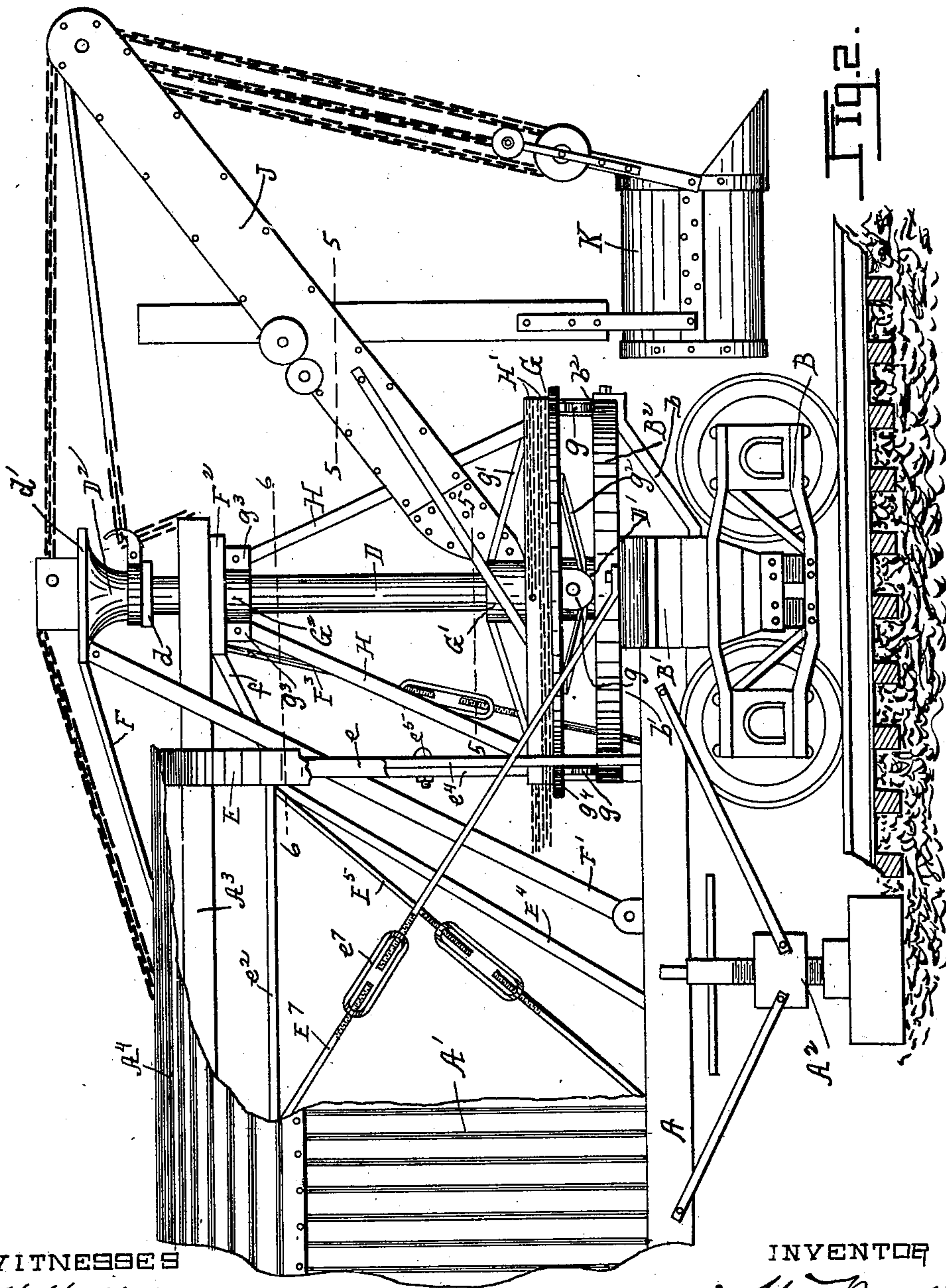
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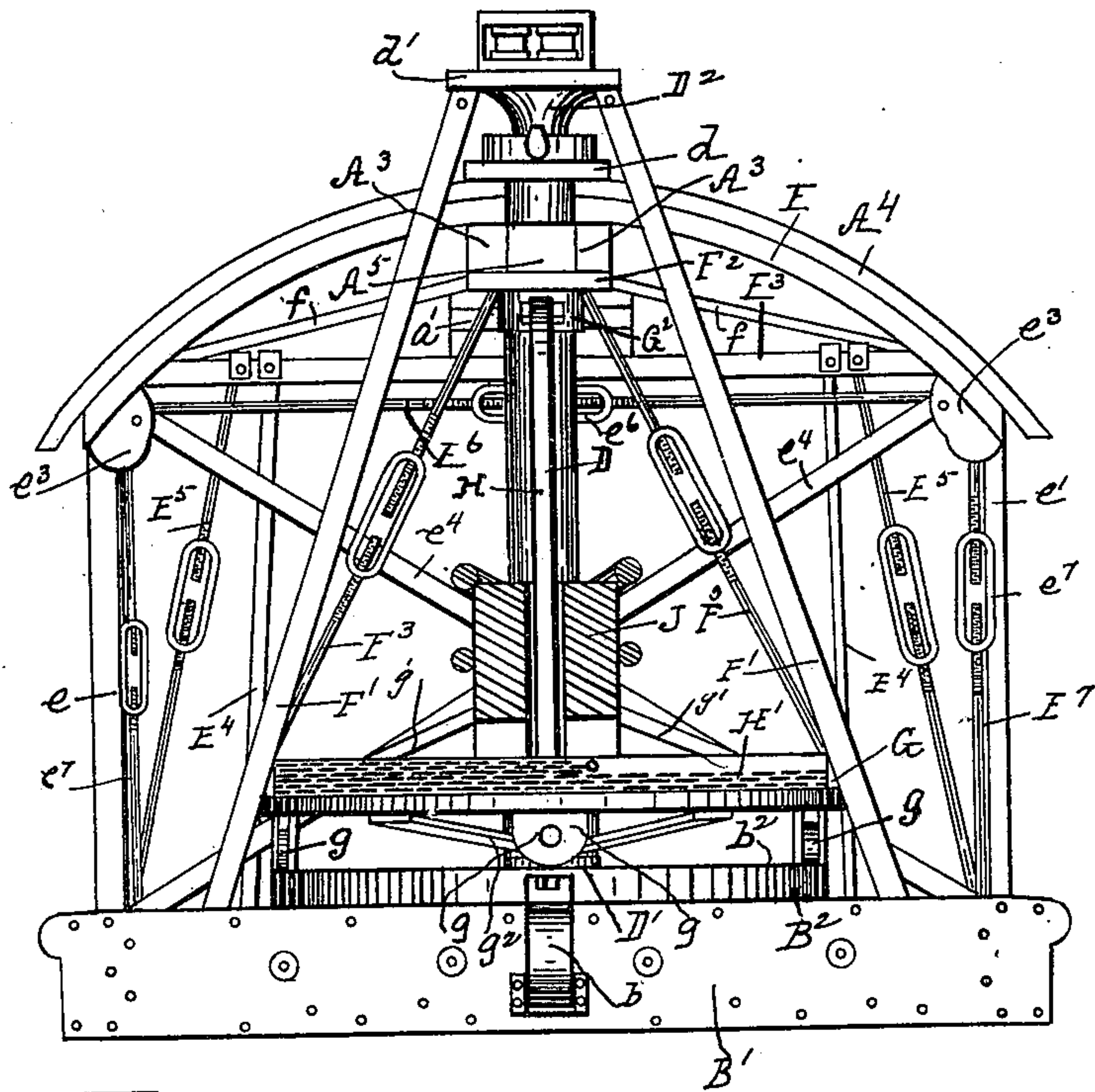


Fig. 3.

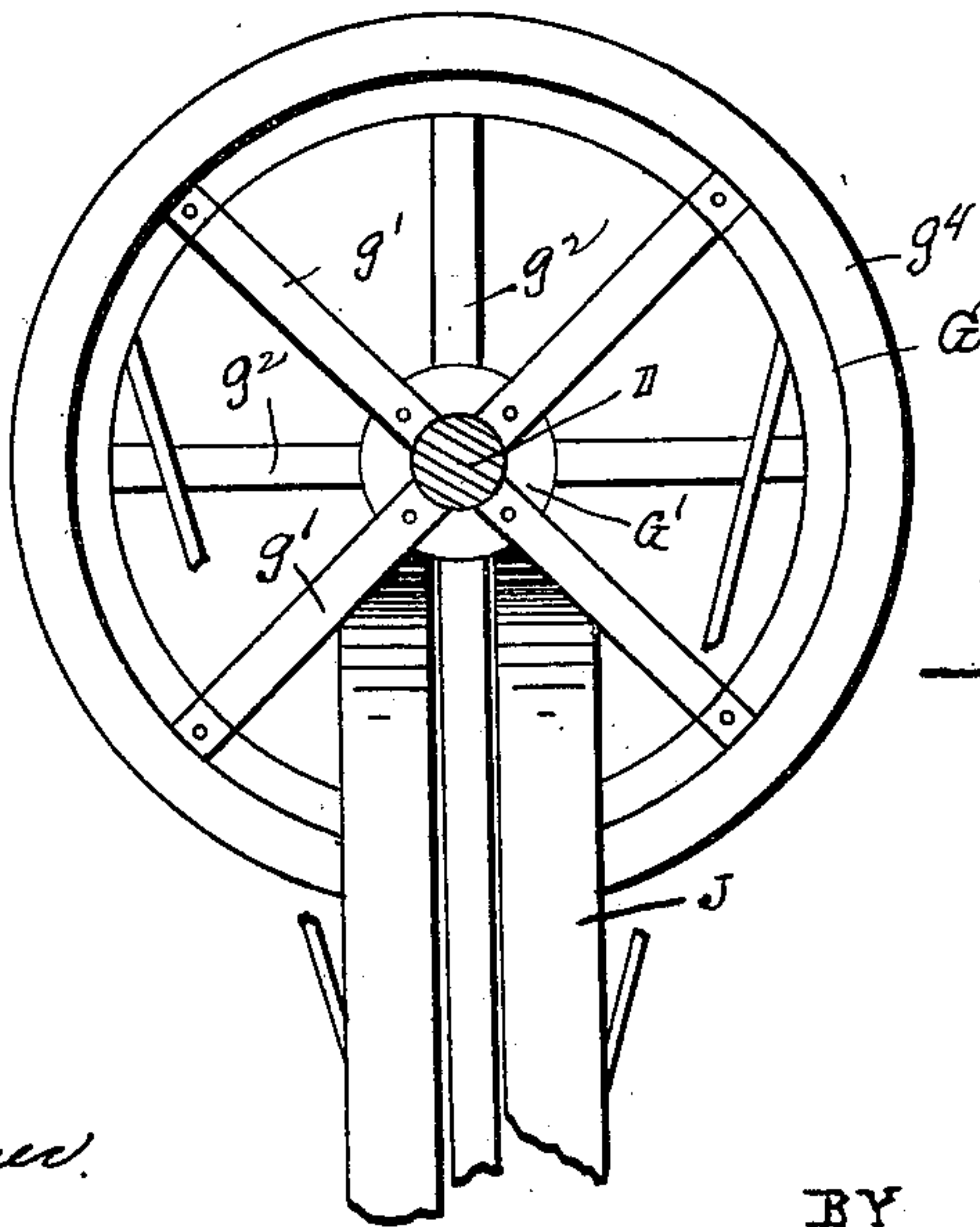


Fig. 5.

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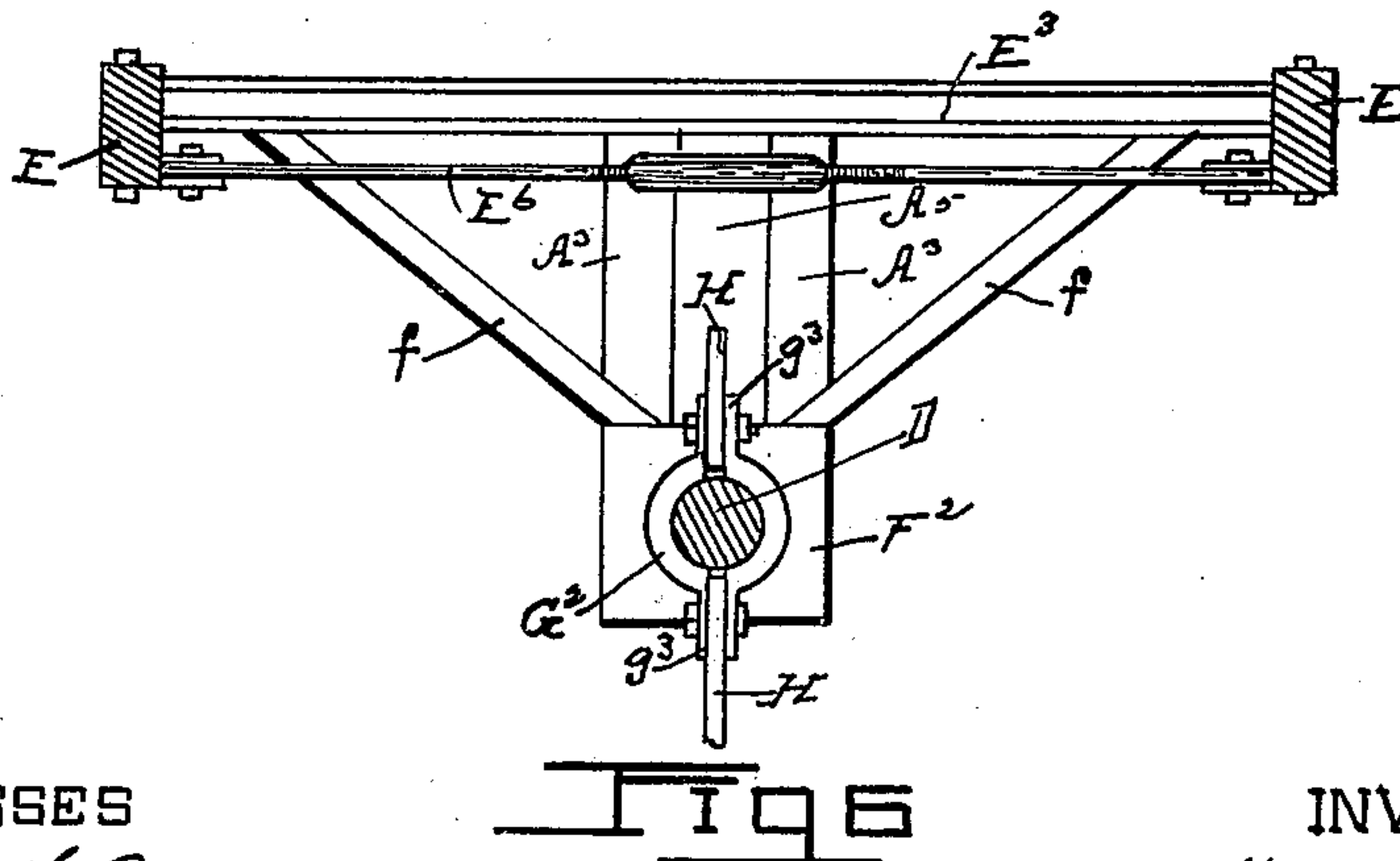
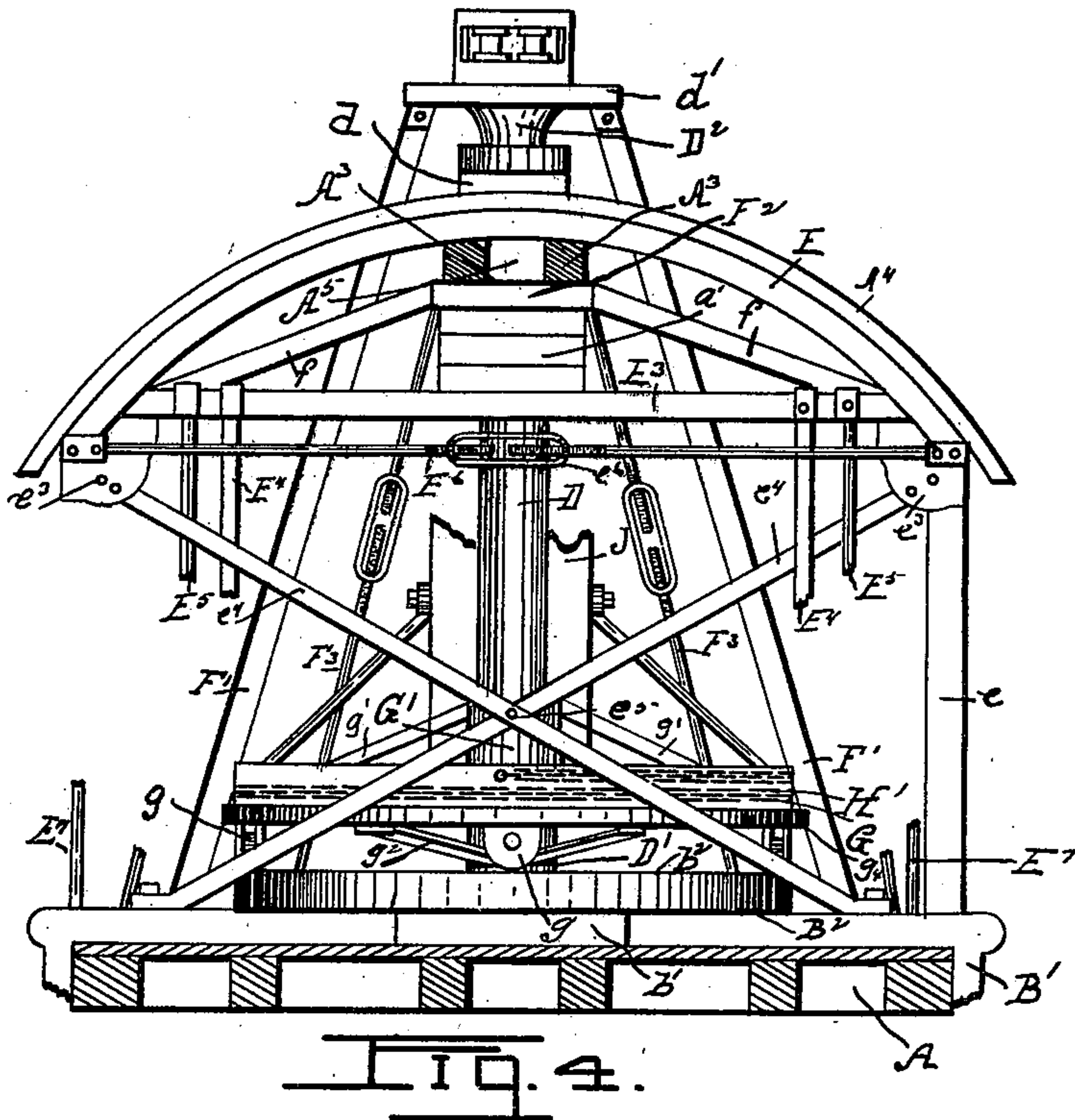
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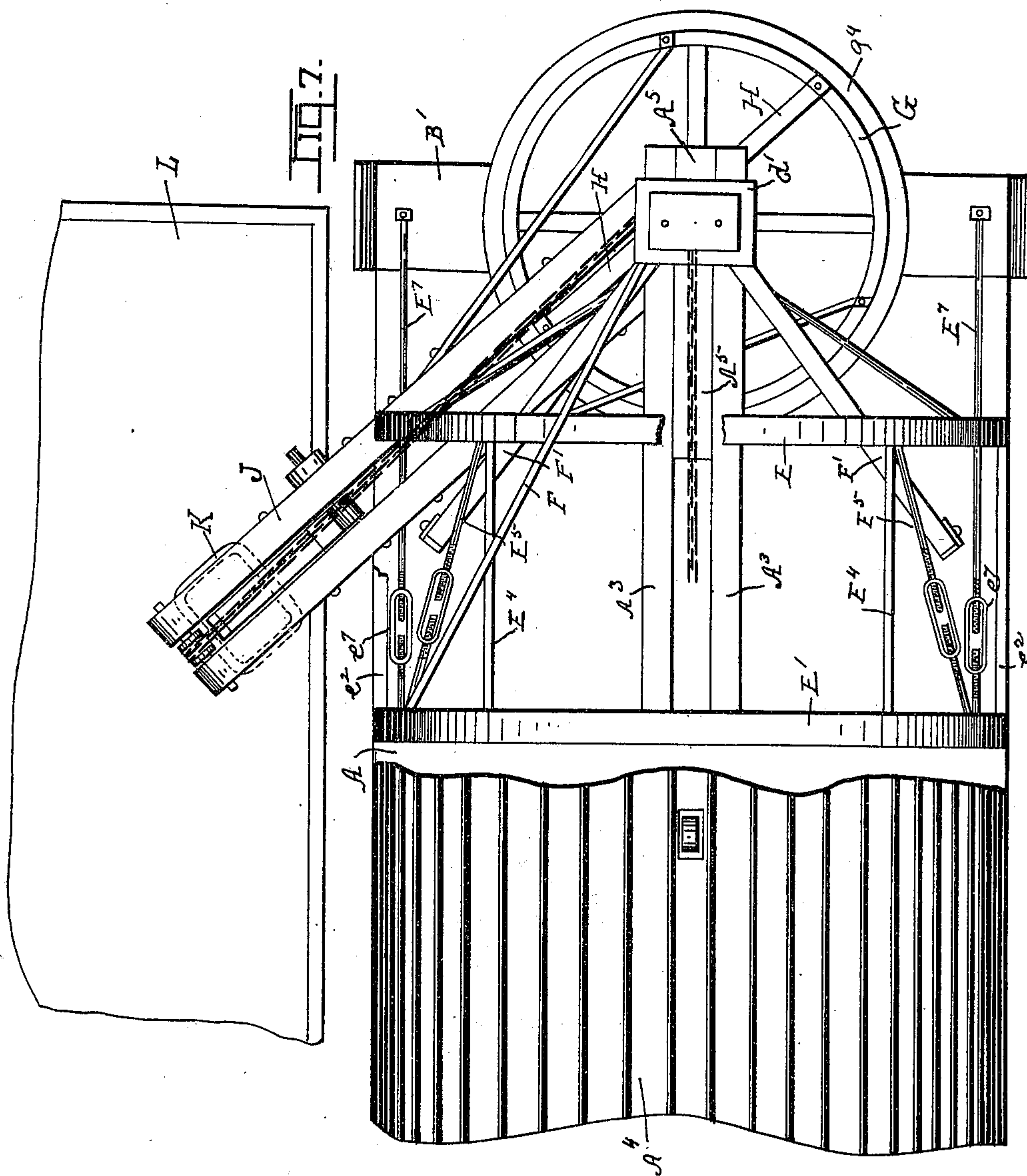
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UNITED STATES PATENT OFFICE.

WILLIAM MULLEN, OF ELIZABETHTOWN, PENNSYLVANIA.

STEAM-SHOVEL.

SPECIFICATION forming part of Letters Patent No. 653,391, dated July 10, 1900.

Application filed October 25, 1899. Serial No. 734,720. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM MULLEN, a citizen of the United States, residing at Elizabethtown, county of Lancaster, State of Pennsylvania, have invented certain Improvements in Steam-Shovels, of which the following is a specification.

This invention relates to improvements in that class of shovels operated by cranes and designed for loading large quantities of earth and stone onto cars or other vehicles, said cranes being supported by movable platforms. It has been found impossible to employ shovels of this class now in use in narrow cuts without widening the cuts for the special purpose of obtaining room for the working of the shovels, thus greatly increasing the cost of operating the same. The difficulty has been that after the shovel had taken up the load the jib carrying said shovel could be swung toward the car to be loaded at but little more than a right angle with the side of the platform on which the crane was supported, so that it was necessary for the vehicle intended to receive the load to be some distance from the side of the crane-platform that it might be under the shovel when the load was dumped therefrom.

The object of my improvement is to overcome this difficulty by so lengthening the arc of the movement of the jib of the crane that the shovel can dump into vehicles immediately adjacent to the side of the platform supporting said crane.

With this end in view the invention consists in so disposing the braces of the post of the crane that the arc of the movement of the jib will be such as to permit the shovel to dump into a vehicle immediately adjacent to the platform supporting said crane.

The invention consists, further, in various details of construction and the combination of parts, as hereinafter fully described and then pointed out in the claims.

For the purposes of this specification the end of the car on which the crane is erected is taken to be the front end, and when the terms "right" and "left" are used they refer to the right and left of the car when looking toward the crane from the end of the car opposite to that on which said crane is located. In the construction about to be described the

jib of the crane is swung from right to left to dump the load from the shovel; but by reversing the location of the open and closed sides of the arch and of the various struts and braces peculiar to those sides, as will be understood from the specification, a crane can be constructed whereby the jib will be swung from left to right to dump the load from the shovel.

In the accompanying drawings, which form a part of this specification, Figure 1 is an elevation of the left side of the front end of a car carrying a crane and shovel embodying my invention; Fig. 2, a similar view of the right side of the same end of the car, parts being cut away; Fig. 3, a front end elevation; Fig. 4, a vertical transverse section on broken line 4 4 of Fig. 1; Fig. 5, a horizontal section on broken line 5 5 of Fig. 2; Fig. 6, a bottom plan view of the parts above broken line 6 6 of Fig. 2; and Fig. 7, a top plan view, parts being cut away.

Similar letters indicate like parts throughout the several views.

Referring to the details of the drawings, A indicates the platform of a box-car, A' the house or box on said platform, open at the front end and wherein is housed the engine (not shown) for operating the shovel, and A² jacks or braces resting on the ground on each side of the car and adapted to aid in maintaining platform A in a horizontal position.

B indicates the front truck of the car, and B' is the bolster thereof, which rises somewhat above platform A and forms a support for the rigid circular track-plate B². The front of this track-plate is supported by a bracket b, secured to the front of bolster B', and the rear by a block b', resting on platform A.

D is the post of the crane, which post of the crane is rigidly secured in a base D', supported on bolster B' and at the center of track-plate B². The upper end of post D passes between the horizontal brace-beams A³, extending forward from beneath the top of the roof A⁴ of house or box A', said upper end of post D being held firmly in place between said brace-beams by filling-blocks A⁵. Somewhat above beams A³ a collar d is rigidly secured on post D, and a short distance above said collar is the post-cap E², having

on the top thereof a rim d' . The front end of roof A^4 is supported by arches E and E' , the first arch E being located adjacent to post D and the second E' back of arch E . Arch E is supported on one side by a post e , the other end of the arch being upheld, as will be described, and the arch E' is supported by posts e' , the two arches being connected at their springing lines by horizontal tie-bars e^2 . On the ends of arch E are formed inwardly-projecting brackets e^3 , whereon is secured the horizontal transverse beam E^3 , formed of channel-iron, on which rests the underpinning a' , that supports brace-beams A^3 . To each of the brackets e^3 is attached a transversely-disposed tie-strut e^4 , that extends diagonally downward and is rigidly secured to the platform A , the lower end of each tie-strut resting on said platform approximately below the bracket e^3 , to which the upper end of the other tie-strut is secured, and at the point where they cross each other said tie-struts are bolted together, as shown at e^5 . The ends of arch E are united by a tie-rod E^6 , the ends whereof are connected by a turnbuckle e^6 . Arch E is further supported by struts E^4 , secured to transverse beam E^3 near the ends thereof, and thence extending diagonally downward and backward to platform A , to which they are fastened. The forward strain on arch E is counteracted by tie-rods E^5 , also secured to beam E^3 near the ends thereof and extending downward and backward to platform A , each of said tie-rods E^5 being divided into two sections having their inner ends connected by turnbuckles. Rearward strain on arch E' is counteracted by two tie-rods E^7 , one attached to each end of said arch and extending forward and being secured to an end of bolster B' , as shown in Figs. 1 and 3, the tension on each of said tie-rods E^7 being regulated by turnbuckles e^7 . From the left side of the rear edge of rim d' of post-cap D^2 a tie-strut F extends backward and outward and is secured to the left side of the transverse beam (not shown) connecting the ends of arch E' , and from said rim d' tie-struts F' also extend downward and outward to near the opposite sides of platform A , where they are secured. Beneath brace-beams A^3 is a plate F^2 , through which post D passes, and from each end of the rear edge of plate F^2 a tie-strut f extends to the adjacent end of transverse beam E^3 of arch E , where it is secured. Post D is further braced by one tie-rod F^3 , extending from the edge of plate F^2 to the platform A , as shown in Figs. 1 and 2, or by two such tie-rods extending from the intersection of said plate and post to platform A , as shown in Figs. 3 and 4.

G indicates a turn-table having rollers g , which travel on track b^2 of track-plate B^2 , and on post D is a revoluble sleeve G' , located just above base D' of said post and extending above the upper edge of said turn-table. The upper edge of sleeve G' is connected with

turn-table G by radial tie-struts g' , and the lower edge of said sleeve is also connected with said turn-table by tie-struts g^2 , said sleeve G' forming, as it were, the hub of turn-table G . To the upper portion of sleeve G' is secured jib J , as is usual, and on post D , just below plate F^2 , is a loose sleeve G^2 between oppositely-located pairs of jaws g^2 , whereon are secured the upper ends of tie-struts H , which extend downward and outward and are secured to opposite sides of the turn-table. One of these tie-struts H passes down between the beam forming jib J . Turn-table G has a horizontal rim g^4 about its lower edge, and above said rim the chains H' , through which the turn-table is operated, are secured to the periphery thereof. The tie-struts H are placed opposite each other and in line with the center of jib J , and the lower end of each of said tie-struts is secured to and bears upon turn-table G directly above one of the rollers g . By this construction post D is supported against the strain exerted thereon by jib J and its load by braces located directly in the line of action of said strain, and the post is so supported in any and all positions into which the jib may be thrown by the movement of turn-table G . As a rule the shovel takes up its load in front of the car, and bracket b thus serves as an additional support to the front of track-plate B^2 against the greater strain put thereon by the shovel in working under and loosening its load from the mass from which it takes said load.

K represents a shovel or bucket attached to and operated through jib J and the various parts connected therewith. In Fig. 7 the jib is shown as thrown around, so that the shovel or bucket K may dump into a car L , drawn up immediately by the side of box-car $A A'$.

In this specification I have not shown or described the connections between the turn-table and the engine from which it is operated, nor the connections with the engine whereby the jib and the bucket or shovel are raised and lowered, nor many of the lesser members of the jib, for these parts are in general use and are well known to all parties having a knowledge of the use of this class of shovels, and they form no part of my invention.

I do not restrict myself to the details of construction herein shown and described, as it is obvious that many alterations may be made therein without departing from the principle and scope of my invention.

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

1. The combination, with a movable platform, of a turn-table on the platform, a crane having the post thereof passing through the center of the turn-table, a revoluble sleeve on the post and located above the turn-table, and a brace on the side of said post opposite the jib of the crane and having one end se-

cured to the revoluble sleeve and the other end secured to the turn-table, for the purpose specified.

2. The combination, with a movable platform, of a turn-table on the platform, a crane having the post thereof passing through the center of the turn-table, a revoluble sleeve on the post and located above the turn-table, and a brace passing between the longitudinal members of the jib of the crane and having one end secured to the revoluble sleeve and the other end secured to the turn-table, for the purpose specified.

3. The combination, with a movable platform, of a turn-table on the platform, a crane having the post thereof passing through the center of the turn-table, a revoluble sleeve on the post and located above the turn-table, and braces on opposite sides of said post and in line with the jib, said braces having the upper ends secured to the revoluble sleeve and the lower ends secured to the turn-table, for the purpose specified.

4. The combination, with a movable platform, of a turn-table on the platform, rollers under the turn-table, a crane having the post thereof passing through the center of the turn-table, a revoluble sleeve on the post and located above the turn-table, and braces on opposite sides of said post and in line with the jib, the upper end of each of said braces being secured to the revoluble sleeve and the lower end of each secured to the turn-table above one of said rollers, for the purpose specified.

5. The combination, with a movable platform, of a track-plate projecting beyond the edge of the platform, a bracket supporting the projecting portion of the track-plate, a turn-table on the track-plate, a crane having the post thereof passing through the center of the turn-table, a revoluble sleeve on the post and located above the turn-table, and a brace passing between the longitudinal members of the jib of the crane and having one end secured to the revoluble sleeve and the other end secured to the turn-table, for the purpose specified.

6. The combination, with a movable platform, of a track-plate projecting beyond the edge of the platform, a bracket supporting the projecting portion of the track-plate, a turn-table having rollers engaging the track of said plate, a crane having the post thereof passing through the center of the turn-table, a revoluble sleeve on the post and located above the turn-table, and braces on opposite sides of said post and in line with the jib, the upper end of each of said braces being secured to the revoluble sleeve and the lower end of each secured to the turn-table above one of said rollers, for the purpose specified.

7. The combination, with a movable platform, of a crane on said platform, an arch extending transversely of the platform and located behind the crane, a vertical post supporting one end of the arch, struts supporting

the other end of said arch and so disposed as to permit the jib of the crane to swing under said other end of the arch, and braces connected with the arch and supporting the upper end of the post of the crane, for the purpose specified.

8. The combination, with a movable platform, of a crane on said platform, an arch extending transversely of the platform and located behind the crane, a vertical post supporting one end of the arch, struts connected with the ends of the arch, each of said struts extending transversely of the platform and having its lower end secured thereto, braces adapted to prevent transverse movement of the arch and so disposed as to permit the jib of the crane to be swung under the end of said arch unsupported by a post, and braces connected with the arch and supporting the upper end of the post of the crane, for the purpose specified.

9. The combination, with a movable platform, of a crane on said platform, an arch extending transversely of the platform and located behind the crane, a vertical post supporting one end of the arch, struts supporting the other end of the arch and so disposed as to permit the jib of the crane to swing under said other end of the arch, a horizontal brace-beam supported on the arch and having connected therewith the upper end of the post of the crane, and diagonally-disposed braces connected with the arch and with the upper end of the post of the crane, for the purpose specified.

10. The combination, with a movable platform, of a crane on said platform, an arch extending transversely of the platform and located behind the crane, a vertical post supporting one end of the arch, struts supporting the other end of the arch, braces adapted to prevent movement of the arch, a horizontal brace-beam supported on the arch and engaged by the upper end of the post of the crane, braces extending from the upper end of the post rearwardly to the platform, and braces extending from the upper end of said post and connected with the arch, all said braces being so disposed as to permit the jib of the crane to swing under the end of the arch unsupported by a post, for the purpose specified.

11. The combination, with a movable platform, of a crane on said platform, an arch extending transversely of the platform and located behind the crane, a vertical post supporting one end of the arch, struts supporting the other end of the arch, a second arch parallel with and located behind the first arch, horizontal braces connecting the ends of the two arches, a horizontal brace-beam supported by both arches and having the upper end of the crane-post secured thereto, and braces extending from the upper end of the crane-post and connected with the first arch, all braces being so disposed as to permit the jib of the crane to swing under said end of

the first arch unsupported by a post, for the purpose specified.

12. The combination, with a movable platform, of a crane on said platform, an arch extending transversely of the platform and located behind the crane, a vertical post supporting one end of the arch, struts supporting the other end of the arch, a second arch parallel with and located behind the first arch, horizontal braces connecting the ends of the two arches, a horizontal brace-beam supported by both arches and having the upper end of the crane-post secured thereto, braces connected with the second arch and extending to the platform, a brace connected

with the top of the crane-post and extending to the second arch, diagonally-disposed braces connected with the upper end of the crane-post and with the first arch, and diagonally-disposed braces connected with the upper end of the crane-post and with said platform, all braces being so disposed as to permit the jib of the crane to swing under said end of the first arch unsupported by a post, for the purpose specified.

WM. MULLEN.

Witnesses:

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WM. R. GERHART.