(No Model.)

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J. C. DEBES.

TRACTION ENGINE.

No. 267,405. Patented Nov. 14, 1882.

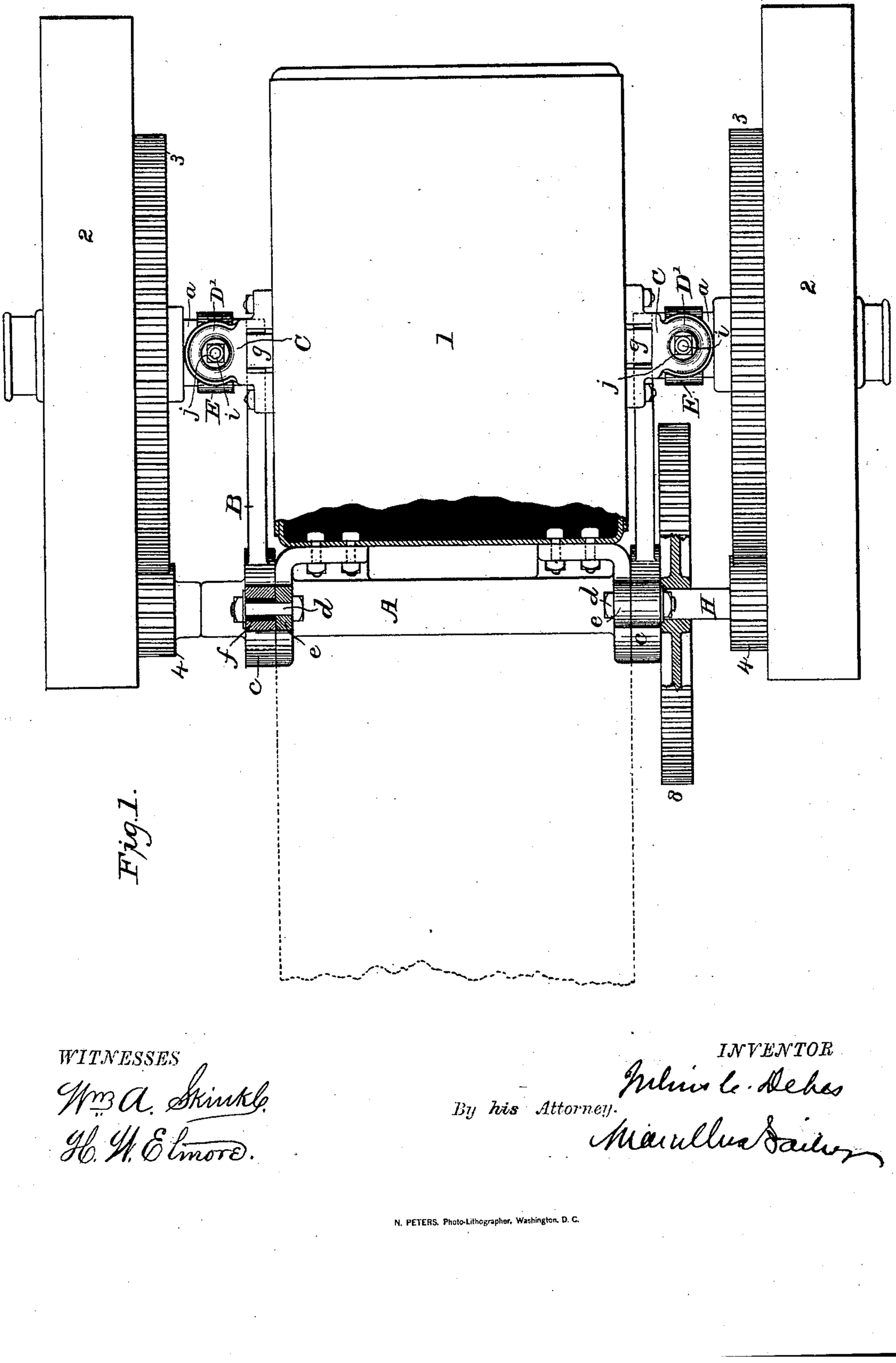

Fig. 1.

WITNESSES

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Maulsby & Baileys

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TRACTION ENGINE.

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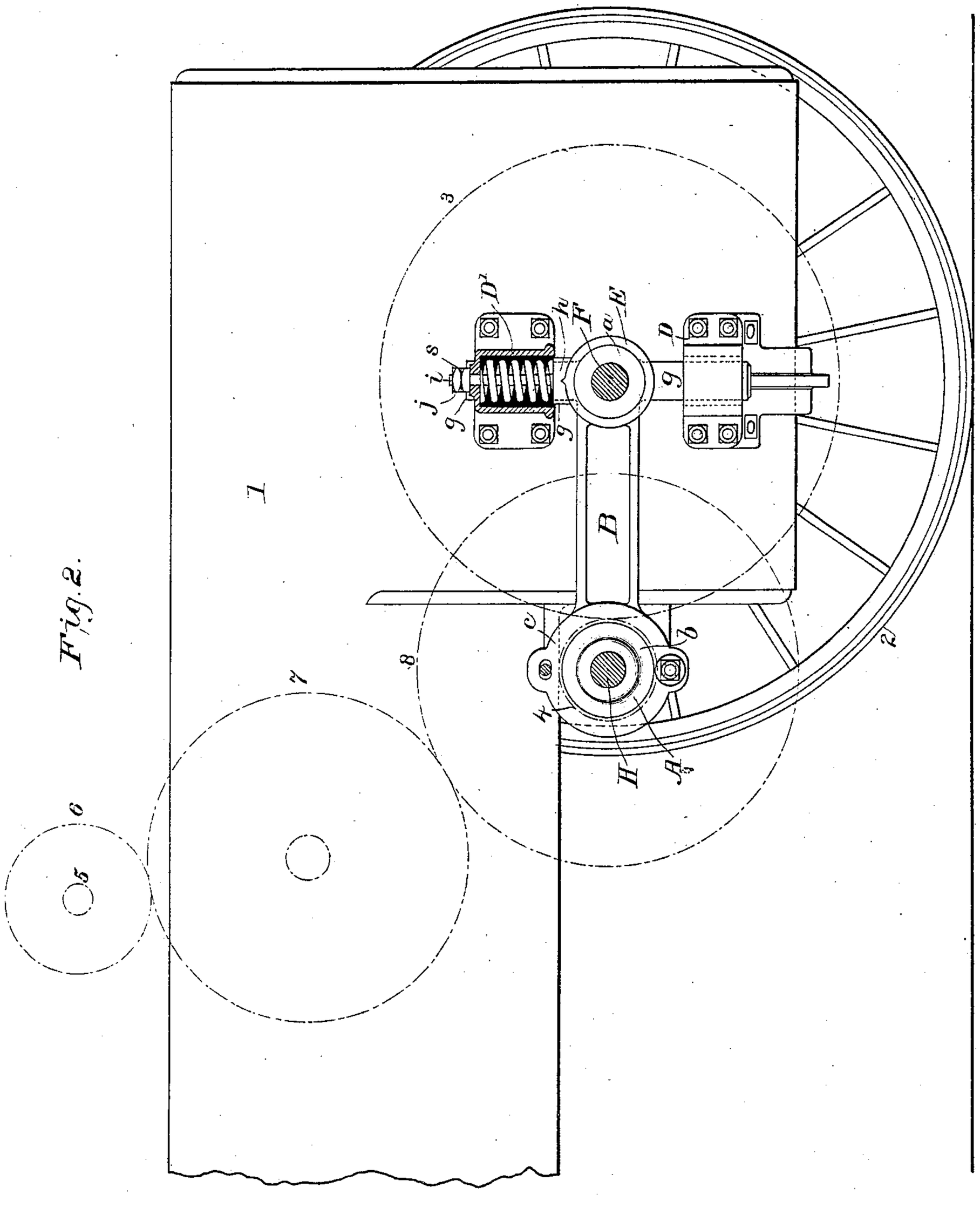

Fig. 2.

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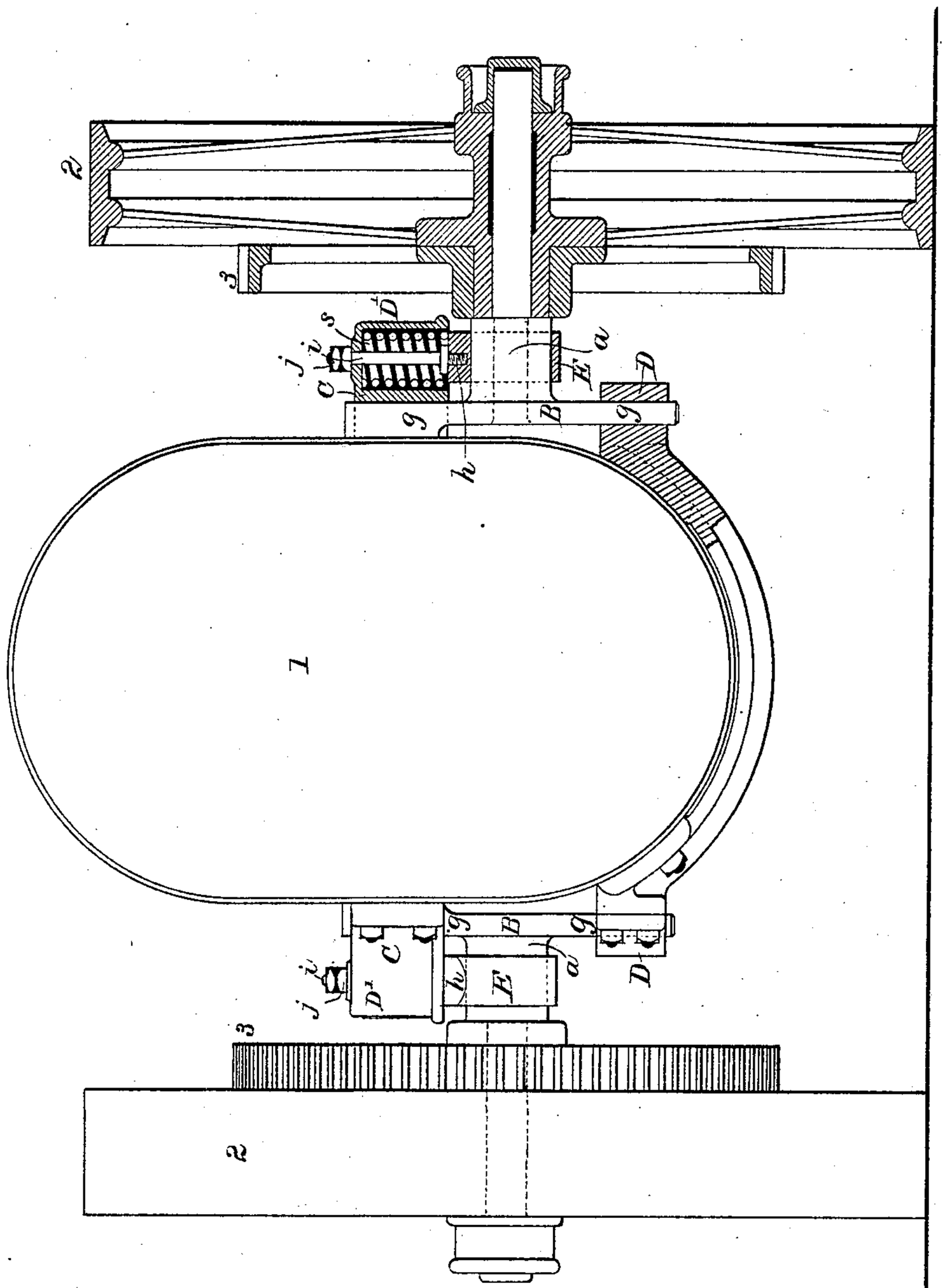
TRACTION ENGINE.

No. 267,405. Patented Nov. 14, 1882.

Fig. 3.



WITNESSES,
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(No Model.)

4 Sheets—Sheet 4.

J. C. DEBES.

TRACTION ENGINE.

No. 267,405. Patented Nov. 14, 1882.

Fig. 6.

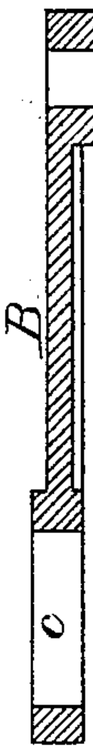

Fig. 4.

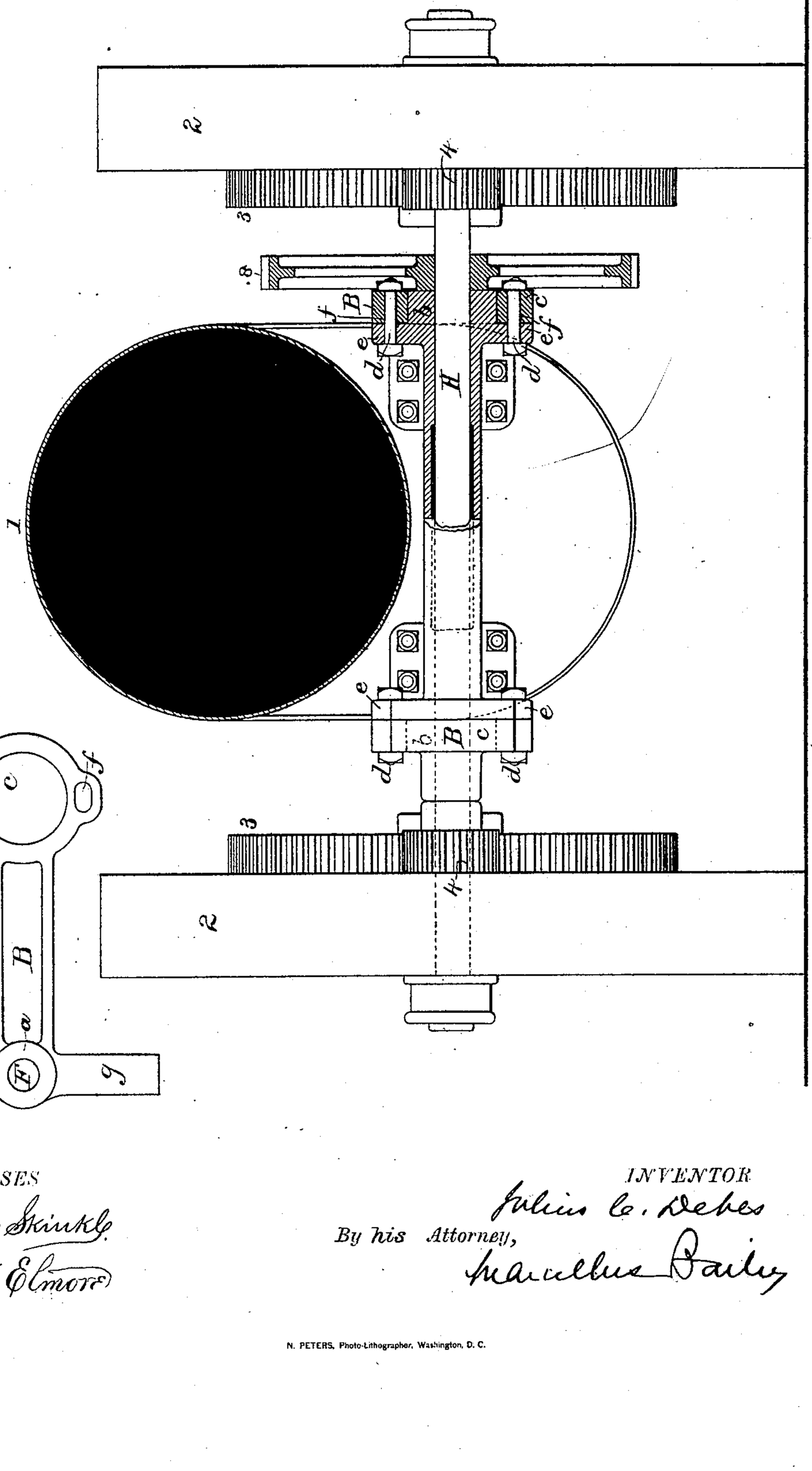

Fig. 5.

WITNESSES

Wm A. Skinkle

H. W. Elmore

INVENTOR

Julius C. Debes

By his Attorney,

Marcellus Bailey

UNITED STATES PATENT OFFICE.

JULIUS C. DEBES, OF MOUNT VERNON, OHIO, ASSIGNOR TO C. & G. COOPER & CO., OF SAME PLACE.

TRACTION-ENGINE.

SPECIFICATION forming part of Letters Patent No. 267,405, dated November 14, 1882.

Application filed October 10, 1882. (No model.)

To all whom it may concern:

Be it known that I, JULIUS C. DEBES, of Mount Vernon, Knox county, State of Ohio, have invented a certain new and useful Improvement in Traction-Engines, of which the following is a specification.

My invention is designed with a view to allow the power-driven truck-wheels of a traction-engine to vibrate or move up and down without disturbing or affecting the gearing by which they are driven, in this way preventing the gearing from being injuriously affected by the jarring and jolting to which the engine is necessarily more or less subjected as it travels over the ground. To this end I mount each of said power-driven or main truck-wheels on an axle which is capable of vibrating up and down on a center coincident with the axis of the driving-shaft, from which movement is transmitted to the gear-wheel that is carried by and attached to the truck-wheel, so that the truck-wheel, when it moves up or down, shall move in the arc of a circle of which the axis of the said shaft is the center, thus preserving unimpaired and unchanged the relative positions and distances of the gear-wheels, and consequently preventing the jarring or jolting from disturbing their pitch-line or injuriously affecting their action.

In carrying out my invention, the main truck-wheel axle is carried by and forms part of a vibratory axle-link, which is capable of movement on the axis of the driving-shaft as a center, and has its free end supported in guides on the boiler or body of the traction-engine, which prevent it from moving laterally, but allow it to move up and down. The driving-shaft is supported in a sleeve, which furnishes a bearing for it, and the axle-links are hung on this sleeve instead of on the rotary driving-shaft, thus removing all strain from the latter By reason of this mode of hanging the main truck-wheel axles I am enabled to use springs between the truck-wheels and engine, for the purpose of preventing the transmission of the jars and jolts to the body of the engine. These springs I connect to the upper guide-brackets of the axle-links and arrange the connecting mechanism between the springs and the truck-wheels in such manner that it can accommodate itself to the varying movements of the wheels.

The nature of my invention and the manner in which the same is or may be carried into effect can best be explained and understood by reference to the accompanying drawings, in which I have represented the preferred embodiment of my invention.

In the drawings I have represented only the main truck-wheels and the devices immediately connected therewith. The portion of the boiler which adjoins them is indicated in outline.

Figure 1 is a sectional plan of the structure. Fig. 2 is a sectional side elevation, with the near traction-wheel removed. Fig. 3 is a sectional rear elevation. Fig. 4 is a sectional front elevation. Fig. 5 is an elevation of one of the axle-links detached. Fig. 6 is a horizontal longitudinal central section of the same.

The traction-engine shown in the drawings in illustration of my invention is one of the type made by C. & G. Cooper & Co., of Mount Vernon, Ohio.

1 is the boiler. 2 are the independently-mounted traction or main truck-wheels, each of which has an attached gear-wheel, 3, which is driven from the counter-shaft H (mounted below the boiler in front of the fire-box) by pinions 4. The counter-shaft H in this instance constitutes what I term the "driving-shaft," by which I intend that shaft or rotating instrumentality on the boiler or body of the engine, from which motion is directly transmitted by belt or teeth to the traction or main truck-wheels.

The driving-shaft is actuated from the engine-shaft 5 through the medium of pinion 6 thereon, which meshes with the intermediate gear-wheel, 7, which is in gear with the toothed wheel 8 on the driving-shaft.

I now proceed to describe those parts in which my improvement is embodied. Each of the main truck-wheels is supported in the same way, so that a description of one will answer for both.

Each truck-wheel is mounted on an axle, F, which, for the purposes hereinbefore stated, is made movable up and down on the axis of driving-shaft H as a center. The manner in which

I prefer to impart this capacity for movement to the axle is as follows: It is attached to and carried by what I term an "axle-link," B, (shown separately in Figs. 5 and 6,) being for this purpose inserted and firmly secured in an axle-hub, *a*, formed on the free end of the link. The other end of the axle-link is to be pivoted or hung so as to move on the axis of shaft H as a center.

In order both to provide a complete bearing and protection for the driving-shaft, and also to take off from it the strain to which it would be subjected were the axle-links hung directly upon it, I make use of a stationary hollow casting or sleeve, A, which incloses and forms a bearing for the driving-shaft, and is bolted to the front of the fire-box in the position indicated. The ends of the sleeve are formed with cylindrical hubs *b*, upon which fit the annular parts *c* of the axle-links, which are held thereon by collar-bolts *d*, passing through the flanges *e* of the hub, said bolts passing through curved slots *f* in the parts *c* of the links, and thus permitting a limited movement of vibration to the links upon the cylindrical hubs *b*, which are concentric with the driving-shaft H. In order to prevent the link from other than up-and-down movement it is provided with two extensions, *g*, each of which is a flat rectangular bar fitting in upper and lower guide-brackets, C D, firmly attached to the boiler-casing. The apertures in the guide-brackets through which the extensions move are wider from front to rear than the extensions, as indicated in the plan view, so as to allow room for the up-and-down movement of the extensions in a curved path; but they embrace closely the faces of the extensions, so as to prevent them from all lateral play or chattering. The brackets thus made are as strong and efficient as though the extensions and their guideways in the brackets were curved, and the construction is more convenient and cheaper.

The lower guide-brackets, D, as shown in the drawings, form part of one casting, which extends across under the boiler; but they can be made separate, like the upper brackets, C, if desired. I also remark that the sleeve A, if desired, can be made in two separate parts, furnishing bearings for the respective ends of the driving-shaft, and also the axle-links; but I much prefer to make it a continuous sleeve, as represented.

The foregoing combination of the axle-link, axle, and truck-wheel permits me to introduce without trouble, and without disturbing the pitch-line of the driving-gearing, a bearing spring or springs between the truck-wheel and the engine or boiler structure which it supports. This can be accomplished in a variety of ways. The way preferred is represented in the drawings, and may be described as follows: Each upper bracket, C, is formed with a cylindrical shell or case, D, closed at top and open at the bottom, which is so placed as to overhang the axle-link hub *a*. The shell or case D contains a spring, which, in this instance, is a stiff metallic spiral spring, *s*, but which may be a rubber block or other suitable form of spring.

Loosely encircling the hub *a* is a wrought-iron ring, E, and from a cylindrical boss, *h*, on the top of the ring (of a diameter somewhat less than the internal diameter of the spring-containing case D) projects a stout bolt, *i*, which passes up centrally through the case, and projects through a hole in the top of the same, where it is held in place by nuts *j*, screwed down upon its projecting upper end. The base of the spring bears upon the boss *h*, and the weight of the structure which comes on the axle is thus spring-sustained. The ring fits the hub sufficiently loosely to permit it to accommodate itself to the movement of the axle, while preserving a straight bearing for the spring.

Having now described my invention and the best way known to me of carrying the same into effect, what I claim, and desire to secure by Letters Patent, is—

1. The combination, with the driving-shaft and traction or main truck wheel geared thereto, of a wheel-carrying axle capable of vibratory up-and-down movement on the axis of the driving-shaft as a center, and supported against lateral movement or movement in the direction of its length, substantially as hereinbefore set forth.

2. The combination of two independently-driven traction or main traction wheels, and a driving-shaft mounted on the engine or boiler structure, and geared to said wheels, of two independent wheel-supporting axles, each constructed and arranged to have independent vibratory movement upon the axis of the driving-shaft as a center, substantially as herein-before set forth.

3. The combination, substantially as herein-before set forth, of the driving-shaft, the truck-wheels geared thereto, the axle-links provided with wheel-supporting axles, and hung so as to be capable of vibration upon the axis of the driving-shaft as a center, and means, substantially as described, whereby said links are prevented from lateral movement.

4. The combination, substantially as herein-before set forth, of the driving-shaft, the bearing-sleeve inclosing the same, the truck-wheels, and the vibratory axle-links, provided with wheel-supporting axles, and mounted upon said sleeve concentrically with the driving-shaft.

5. The vibratory axle-links mounted so as to move upon the axis of the driving-shaft as a center, and provided above and below their axle-carrying ends with extensions, as described, in combination with guide-brackets attached to the boiler or engine structure, and adapted to receive and support said extensions, substantially as hereinbefore set forth.

6. The combination of the driving-shaft, the truck-wheels, their axles vibrating upon the axis of the driving-shaft as a center and sup-

ported against lateral movement, and bearing-springs interposed between the axles and the boiler-structure, substantially as and for the purposes hereinbefore set forth.

7. The combination of the vibratory axle-links, the truck-wheels mounted thereon, the guide-brackets, the bearing-springs carried by the upper brackets, and the connecting rods or bolts mounted on the axle-links and extending through the cases which contain the bearing-springs, substantially as and for the purposes hereinbefore set forth.

In testimony whereof I have hereunto set my hand this 27th day of September, 1882.

JULIUS C. DEBES.

Witnesses:
M. BAILEY,
E. A. DICK.