

No. 686,537.

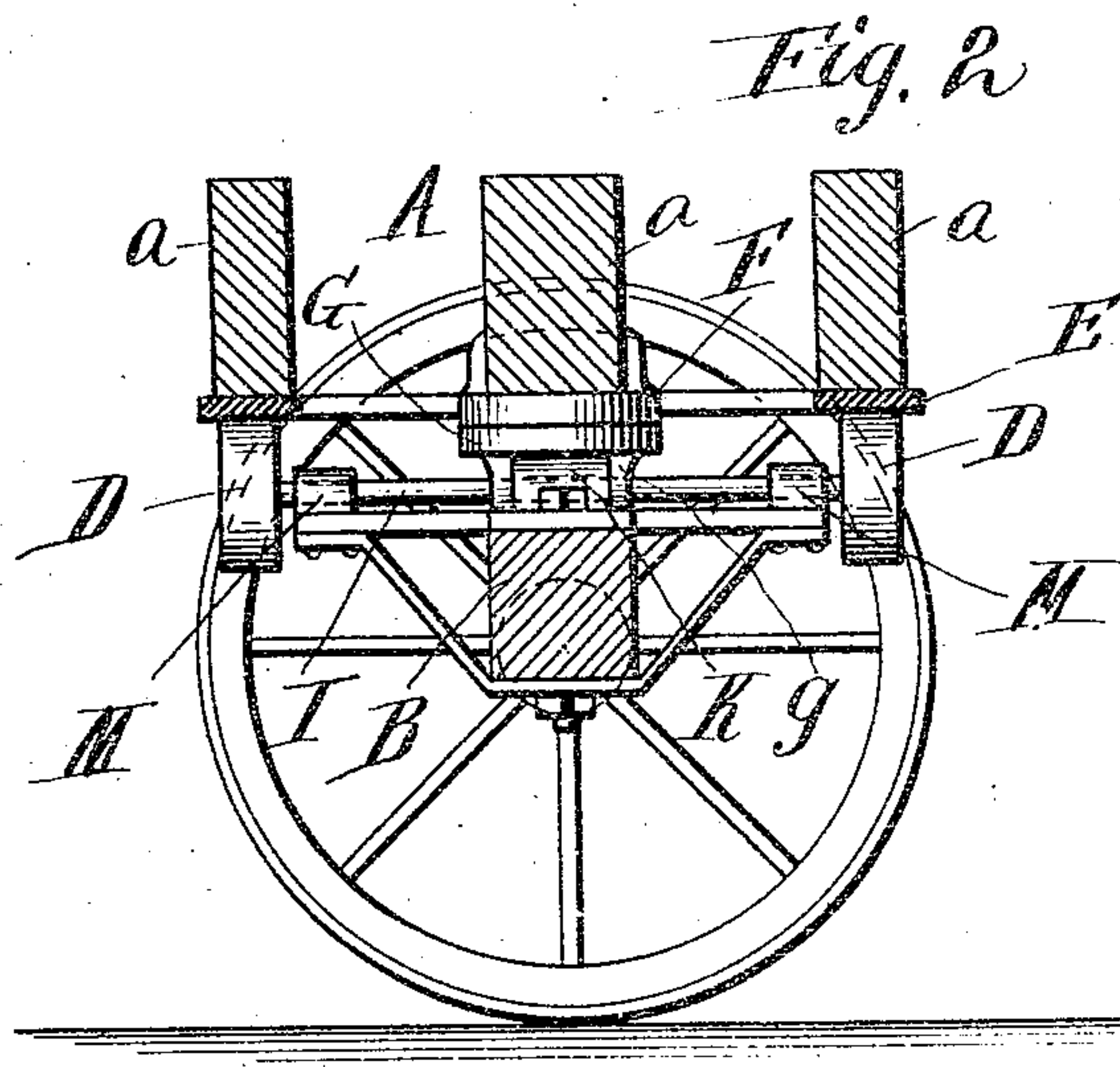
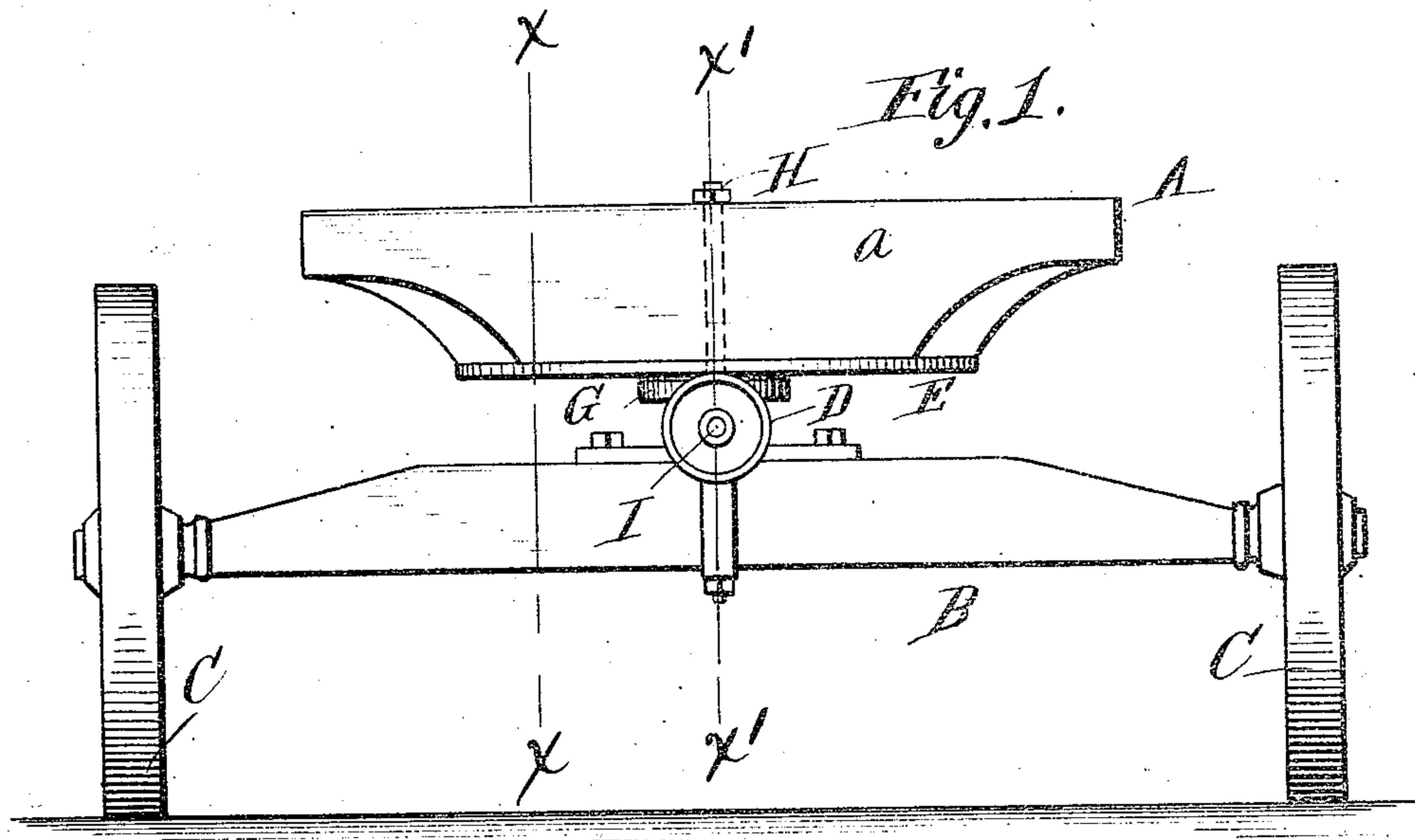
Patented Nov. 12, 1901.

J. B. RHODES.
WAGON OR OTHER VEHICLE.

(Application filed Nov. 12, 1900.)

(No Model.)

2 Sheets—Sheet 1.



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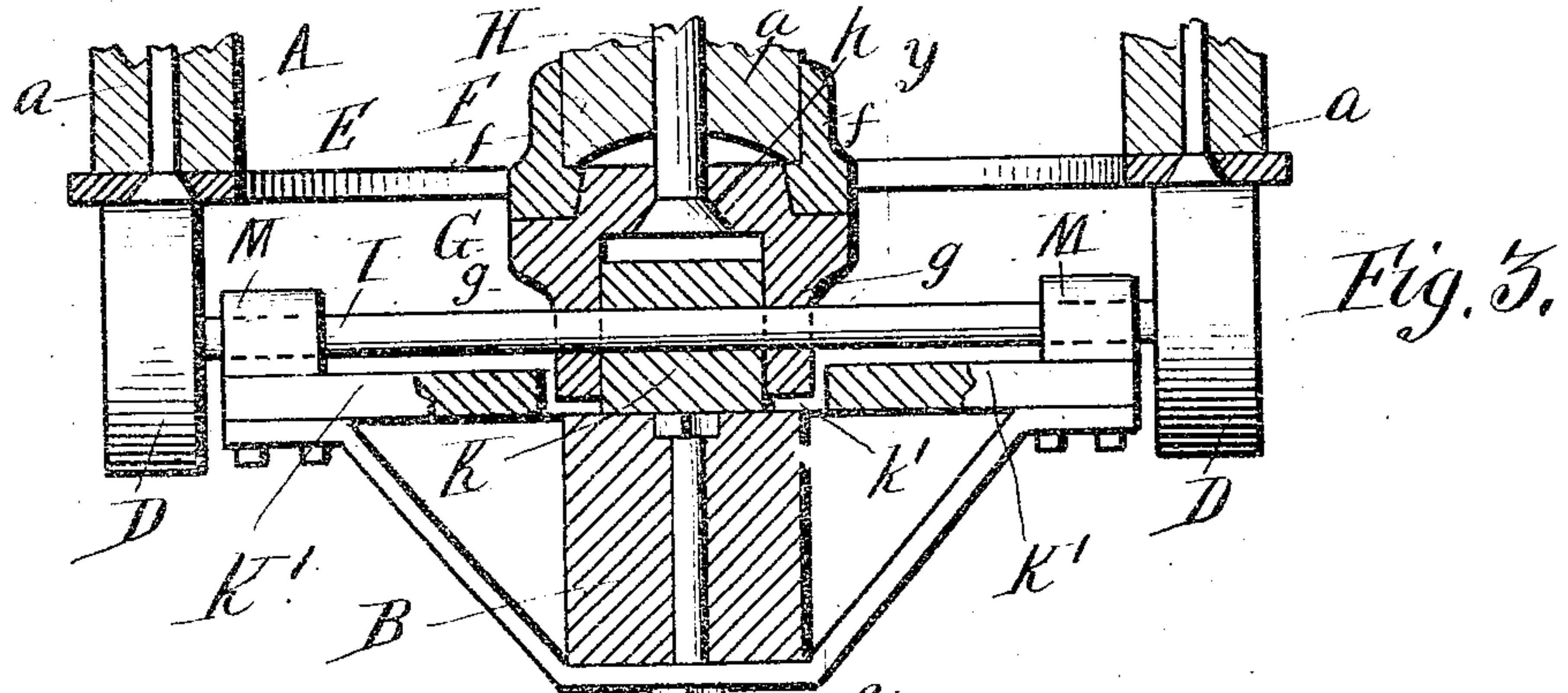


Fig. 3.

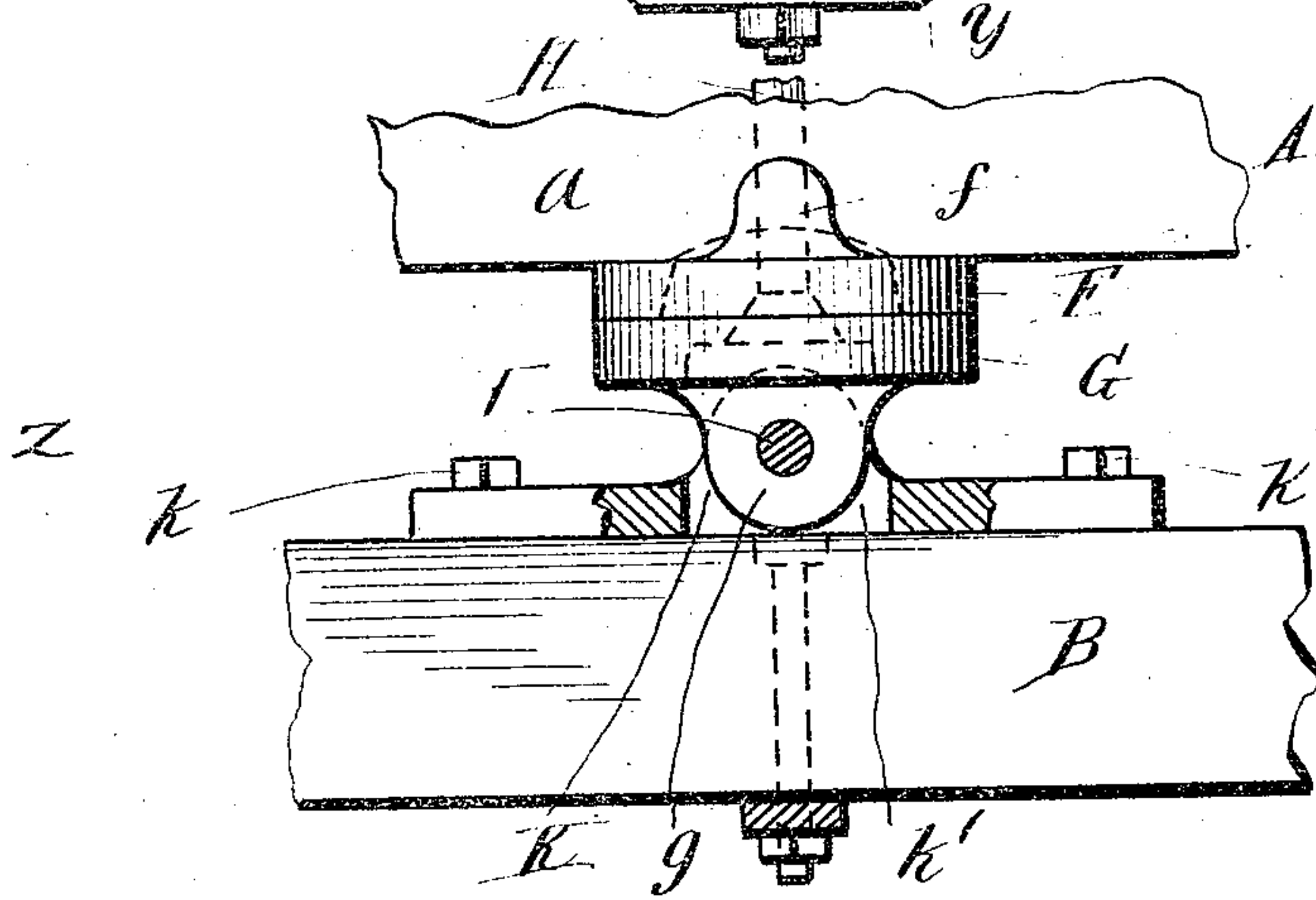


Fig. 4.

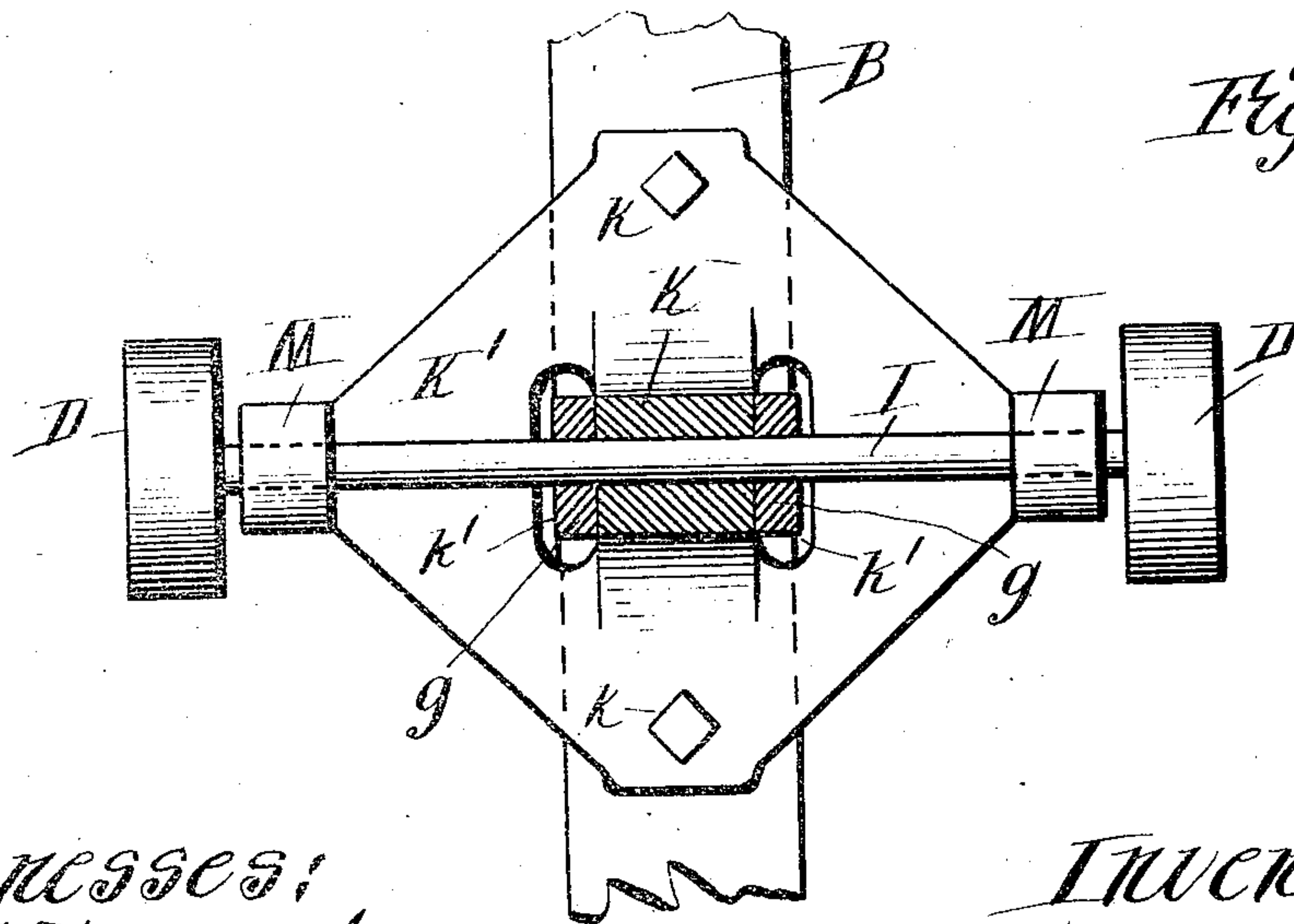


Fig. 5.

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UNITED STATES PATENT OFFICE.

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WAGON OR OTHER VEHICLE.

SPECIFICATION forming part of Letters Patent No. 686,537, dated November 12, 1901.

Application filed November 12, 1900. Serial No. 36,261. (No model.)

To all whom it may concern:

Be it known that I, JAY B. RHODES, a citizen of the United States, residing at Harvey, in the county of Cook, State of Illinois, have invented a certain new and useful Improvement in Wagons or other Vehicles, of which the following is a specification.

My invention relates to a connection between the body or body-frame of a wagon or other vehicle and a horizontally-swinging and longitudinally-tilting axle.

In a construction characterized by my invention the weight of the forward portion of the body or body-frame is substantially or in part sustained by antifriction wheels or rolls, which are in turn supported upon the front axle. The body or body-frame bearing, which rests upon these antifriction-rolls, is adapted to provide a circular track which is traversed by the antifriction-rolls when the front axle is swung horizontally about a vertical middle axis, in which way friction is reduced and turning rendered comparatively easy. In order to maintain the proper assemblage of these parts and at the same time permit all necessary swinging action on the part of the front axle, a swivel coupling device is interposed as a bearing connection between the body or body-frame and the axle. The antifriction-rolls are arranged to prevent the axle from rocking or rolling about its axis, and to such end said rolls are respectively positioned forward and rearward of the axle. These antifriction-rolls, however, permit an end or longitudinal tilt of the front axle in either direction and at the same time maintain their bearing contact with the circular track regardless of the extent to which the axle may be swung about its middle point, and to such end the rolls are supported to rotate about an axis which is at all times transverse or at right angles to the axle. The swivel coupling device is also hinge-connected with the front axle, so as to relatively yield in conformity with such tilt on the part of the front axle as may occur by reason of one of the front wheels running into a depression or running over a rise.

As a matter of detail and further improvement the swivel coupling device comprises a couple of members respectively connected

with the body-frame and the front axle and having a rotary connection the one with the other, the lower of such coupling members being hinge-connected with the front axle and held in couple with the upper coupling member by a king-bolt, which serves as a swivel pin or bolt about which the lower hinged coupling member can turn when the front axle is swung horizontally.

My invention thus set forth can be employed in a wagon or other vehicle in which the usual front bolster is absent, or it may be and preferably is employed in a wagon or other vehicle having either a single bolster or an upper and a lower bolster, in which last-mentioned case the lower bolster may be regarded as a part of the front axle. Ordinarily, however, I prefer employing a front bolster for well-known reasons, and in such case the circular track or bearing can be secured to the bolster after the manner of an upper circle of a fifth-wheel. As it is not necessary for the king-bolt employed in connection with my invention to rotate independently of the bolster, it can be simply driven into a vertical hole in the bolster and, if desired, keyed to the latter, in which way wear of the wall of the bolt-hole in the bolster will be avoided.

In the accompanying drawings, Figure 1 represents in end elevation the portion of a wagon or other vehicle comprising the wheeled front axle and a bolster supported thereon and connected therewith in accordance with my invention. Fig. 2 is a section through Fig. 1 on line xx . Fig. 3 is a section through Fig. 1 on line $x'x'$ on a larger scale, the upper portion of the bolster being broken away. Fig. 4 is a section on line yy in Fig. 3 with portions of the axle broken away. Fig. 5 is a sectional plan on line zz in Fig. 4.

In said drawings the body or body-frame of the wagon or other vehicle is not shown, but is understood to be present and to be connected with or secured upon the front bolster A in any known or suitable way. The bolster can be of any ordinary or suitable construction, the selected form or construction being a bolster composed of parallel bars a , understood to be suitably connected together and secured to or connected with the body or body-frame in any ordinary or approved man-

ner. The axle B may be a single bar or a composite structure, as preferred, and, if desired, it may be provided with a lower bolster, the results so far as my invention is concerned being practically the same in either case. The ends or spindle portions of the axle are supported by wheels C, as usual, and the axle is capable of horizontal swing and end or longitudinal tilt.

The axle is steadied and prevented from rolling by antifriction-rolls D, supported upon the axle and having a rolling bearing contact with a circular track or bearing E, arranged over the antifriction-rolls and bolted or otherwise suitably secured to the bolster A. These antifriction-rolls are respectively arranged forward and rearward of the axle and traverse the circular bearing E on the bolster when the axle is swung horizontally either way about its middle point. Regardless, therefore, of the extent to which the axle may be swung the antifriction-rolls thus engaging the circular track will steady the axle and prevent it from rocking or rolling about its longitudinal axle. These antifriction-rolls also partially or substantially sustain the weight of the forward portion of the body or body-frame, and hence reduce friction when the axle is swung horizontally and permit it to be thus moved with comparative ease. The antifriction-rolls also serve as rounded bearing contacts or fulcrums between the axle and the upper bearing-plate or circular track E and permit the axle to readily tilt about a horizontal axis at right angles to its length when, for example, one of the front wheels runs into a depression or runs over a rise along the road. When the axle is thus tilted, the antifriction-rolls maintain their bearing contact with the circular bearing on the bolster, such contact being maintained whether the axle is at right angles or oblique to the longitudinal line of the body or body-frame of the wagon or other vehicle.

In order to maintain the proper relative connection or assemblage of parts and to permit the axle to both swing and tilt independent of the body or body-frame, a swivel-coupling is interposed as or in a bearing connection between the same and the axle and hinge-connected with the latter. Where a bolster is employed as practically a part of the body-frame and as a means for permitting the use of front wheels relatively smaller than the rear wheels of the wagon or other vehicle, one member of the swivel-coupling is rigid with the bolster, while the other member of such coupling is hinge-connected with the axle. The swivel-coupling illustrated comprises an upper member F, which is secured to the bolster, and a lower member G, which is hinged upon the axle and adapted to have a rotary or swivel connection with the upper coupling member. The two coupling members are also tied or connected together by a king-bolt H, which further serves as a swivel-pin adapted to permit the lower coupling member to rotate

about an axis passing longitudinally through the king-bolt.

As a matter of further improvement the lower coupling member G is hinge-connected with the axle by a spindle-rod I, arranged to extend through bearings on the axle and provided at each end portion with one of the antifriction-rolls D. With this arrangement the spindle-rod I, which may be sectional or in one piece, is positioned at right angles to the length of the axle, which latter is provided with bearings suitable to support the rod and permit the rolls D to occupy the relative positions hereinbefore described. When, therefore, the axle is swung about its middle point or a vertical axis passing through its middle, the antifriction-rolls thus journaled on the rod-spindle will be bodily carried around with the axle, and during such bodily movement said rolls will traverse the upper circular track and rotate about an axis passing centrally and longitudinally through the rod-spindle, this axis being at all times at right angles to the length of the axle. In this way the rolls will at all times contact with the circular track or bearing and will be maintained in position relatively to the axle to prevent axial rock of the latter. At the same time, however, the axle, regardless of the extent to which it may be swung around either way, will be free to tilt longitudinally about an axis common to the antifriction-rolls and the hinge connection between the centrally-arranged swivel-coupling and the axle, such axis, for example, being the longitudinal axis of the rod-spindle, which affords journals for the rolls and a hinge-pintle for a hinge-joint between the axle and the centrally-arranged swivel-coupling.

With reference to matters of detail illustrated in the drawings and capable of modification or variation in form according to need or desire so far as the general principles of my invention are concerned, but having various advantages and involving simplicity, compactness, strength, and desirable adaptation for the purposes for which they are intended and constituting matters of further improvement, the lower coupling member G is provided with a pair of downwardly-projecting cheeks g, forming a clevis-shaped device which straddles a bearing K on the axle. This bearing K supports the middle portion of the spindle-rod I, which latter passes through and serves to hinge the cheeks g of the lower coupling member to such bearing. In this way the rod I, which serves as a spindle or provides spindle portions or journals for the two antifriction-rolls, also serves as a pivot or pintle for a hinge connection between the swivel-coupling and the axle. A frame or plate K' is bolted to the axle, as at k k, and is preferably provided with the aforesaid bearing K for the middle of the spindle-rod I and also provided with bearings M M for the end portions of the spindle-rod. The plate K' is also provided with slots or openings k'

k' , extending parallel with the axle and providing working space for the lower end portions of the cheek-pieces g of the lower coupling member. The upper portion of the lower coupling member is fitted to the upper coupling member, so as to turn independently of the same—for example, by a swivel-joint, comprising a hub portion on one member having its bearing in a socket in the other member. The upper portion of the lower coupling member G is also provided with a centrally-arranged opening for the king-bolt, the lower end portion of such opening or hole being laterally enlarged or flared to receive a head h on the lower end of the king-bolt. By this arrangement the head h of the king-bolt can be made rounded or conical and counter-sunk in the upper portion of the lower coupling member G , which latter can turn about the king-bolt or the axis thereof. A particular advantage of this arrangement is that the king-bolt can be rigid with the bolster—as, for example, it can be driven into a vertical hole through the bolster—and also keyed to the latter in any desired way. The king-bolt, therefore, need not turn, and hence it can have a firm steady connection with the bolster and will not wear its bearing therein. Where the axle comprises a set of bars or sections, the upper coupling member can be provided with cheeks f , fitted to the sides of the middle section or bar of the bolster, and the king-bolt can also be driven into a hole formed through such middle bar or section. The coupling member F can, however, be modified with reference to such other form of bolster as may be employed.

From the foregoing it will be seen that, if desired, the antifriction-rolls, which are supported upon the axle, may practically sustain the weight of the superimposed load or that such weight can be divided or distributed between the rolls and the hinge connection between the lower coupling member and the axle; also, that while a lower bolster could be secured upon the axle my invention permits the use of such bolster to be dispensed with, since, as illustrated, the casting or bearing-plate K' , which is secured to the axle, can be provided with bearings M for end portions of the rod I , which afford journals for the antifriction-rolls, and with a centrally-arranged and upwardly-extending bearing K , affording a support for the middle portion of said rod, which provides a pintle for the hinge connection between the axle and the lower member G of a two-part swivel-coupling having its upper part or member F rigid with the superimposed bolster or vehicle body or body-frame, as the case may be. The construction of swivel-coupling illustrated also permits me to avoid hinging the king-bolt to the pintle, since if thus hinged to the pintle it would be necessary to arrange the king-bolt to turn axially in a vertical hole through the bolster when the axle is swung horizontally.

The bearing-plate or casting K' can be

clamped to or bolted upon the axle in any suitable way, a simple and effective arrangement being to fasten it down upon the axle by bolts k and by a bent brace-bar bolted to the under side of the axle and having its upwardly-extending arms, which are arranged in a vertical plane transverse to the axle, bolted to the under side of the front and rear portions of the plate or casting K' at points under the bearings M .

What I claim as my invention is—

1. In a connection between the body or body-frame of a wagon or other vehicle, and a horizontally-swinging and longitudinally-tilting axle therefor; a circular bearing-track; antifriction-rolls supported upon and maintained respectively forward and rearward of the axle and engaging the circular bearing-track; and a centrally-arranged hinged, swivel-coupling bearing operating in conformity with the swing of the axle and permitting the axle to tilt longitudinally.

2. In a connection between the body or body-frame of a wagon or other vehicle, and a horizontally-swinging and longitudinally-tilting axle; a circular bearing-track; antifriction-rolls supported upon and maintained respectively forward and rearward of the axle and engaging the circular bearing-track; a centrally-arranged hinged, swivel-coupling bearing operating in conformity with the swing of the axle and permitting the axle to tilt longitudinally; and a king-bolt with which the hinged swivel-coupling has a swivel connection.

3. In a connection between the body or body-frame of a wagon or other vehicle and a horizontally-swinging and longitudinally-tilting axle; antifriction-rolls supported and arranged respectively forward and rearward of the axle, and maintained to each rotate about an axis at substantially right angles to such axle; a circular-track bearing upon the antifriction-rolls and traversed by the latter when the axle is swung either way; and a centrally-arranged hinged, swivel-coupling which permits the axle to swing and to tilt longitudinally.

4. In a connection between the body or body-frame of a wagon or other vehicle and a horizontally-swinging and longitudinally-tilting axle; antifriction-rolls supported by the axle and respectively arranged and maintained forward and rearward of the same; a circular-track bearing upon the antifriction-rolls and traversed by the latter when the axle is swung either way; a centrally-arranged swivel-coupling bearing having a hinge connection with the axle and permitting the tilt and swing thereof; and a king-bolt with which the lower member of the hinged swivel-coupling is connected by a swivel-joint.

5. In a connection between the body or body-frame of a wagon or other vehicle and a horizontally-swinging and longitudinally-tilting axle; a spindle-rod supported upon the axle and arranged transversely thereto;

antifriction-rolls on the ends of the spindle-rod; a circular-track bearing upon the anti-friction-rolls; and a centrally-arranged swivel-coupling hinge-connected with the axle
5 by the spindle-rod which carries the antifriction-rolls.

6. In a connection between the body or body-frame of a wagon or other vehicle and
10 a horizontally-swinging and longitudinally-tilting axle; a bolster; a circular bearing-track secured to the bolster; antifriction-rolls supported upon the axle and arranged to contact with and traverse the circular bearing-track; and a centrally-arranged swivel-coupling
15 having an upper member secured to the bolster and a lower member hinge-connected with the axle.

7. In a connection between the body or body-frame of a wagon or other vehicle and
20 a horizontally-swinging and longitudinally-tilting axle; a bolster provided with a circular bearing-track; antifriction-rolls supported on the axle and arranged to contact with and traverse the circular bearing-track; a
25 centrally-arranged swivel-coupling having an

upper member on the bolster and a lower member hinge-connected with the axle; and a king-bolt rigid with the bolster and engaging the lower member of the swivel-coupling which has a swivel connection with the king-
30 bolt.

8. In a connection between the body or body-frame of a wagon or other vehicle and a horizontally-swinging and longitudinally-tilting axle; a bearing-plate or casting rigidly
35 secured to the axle and having forward and rearward extending portions provided with bearings for a rod and having a central bearing also adapted for said rod; antifriction-rolls mounted on a rod which is in turn sup-
40 ported by the bearings on said plate or casting; a circular bearing-track resting upon the antifriction-rolls; and a swivel-coupling device having a lower part or member hinged
45 to the central bearing on the plate or casting.

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