

(No Model.)

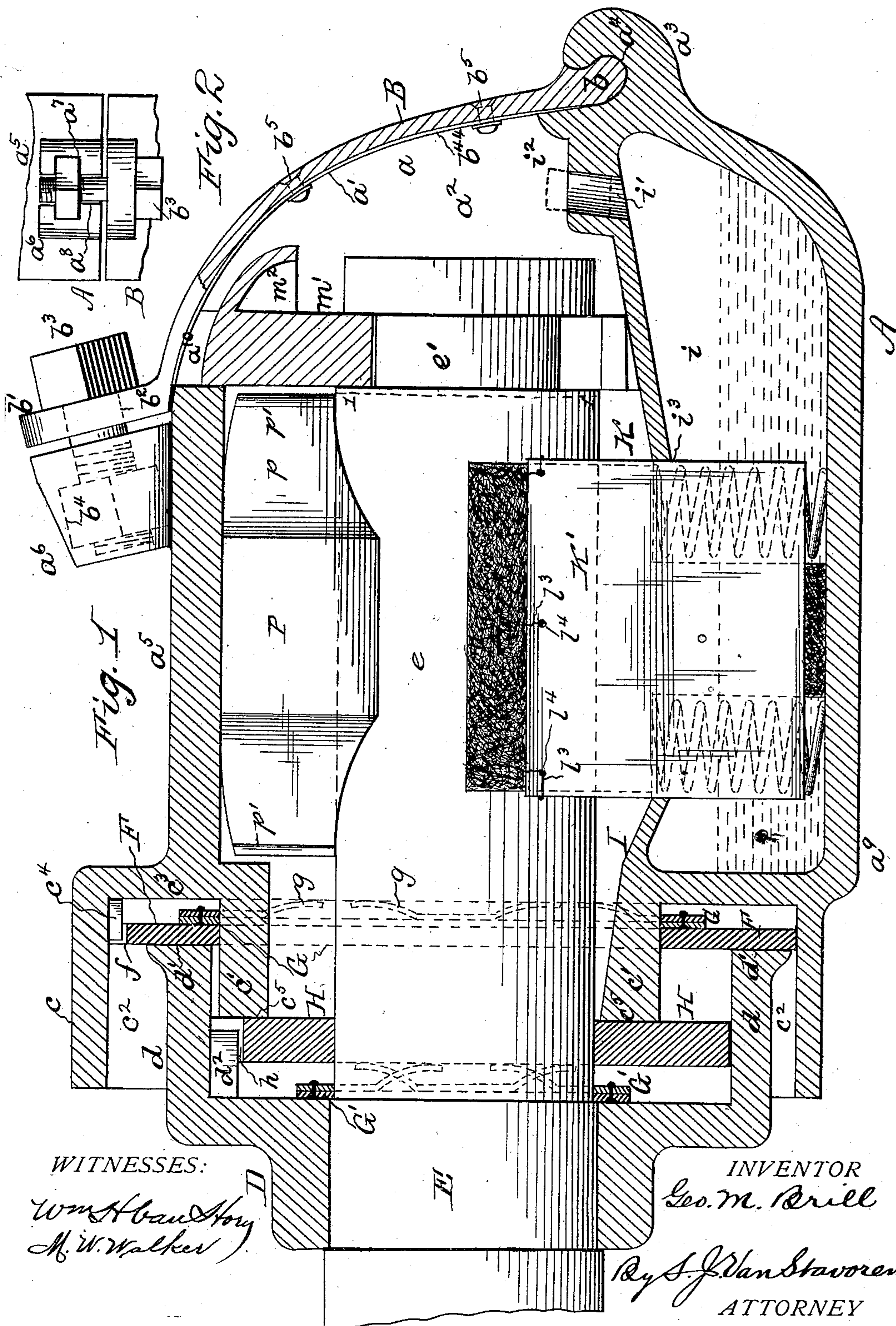
3 Sheets—Sheet 1.

G. M. BRILL.

CAR AXLE BOX.

No. 370,722.

Patented Sept. 27, 1887.



(No Model.)

3 Sheets—Sheet 2.

G. M. BRILL.

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Patented Sept. 27, 1887.

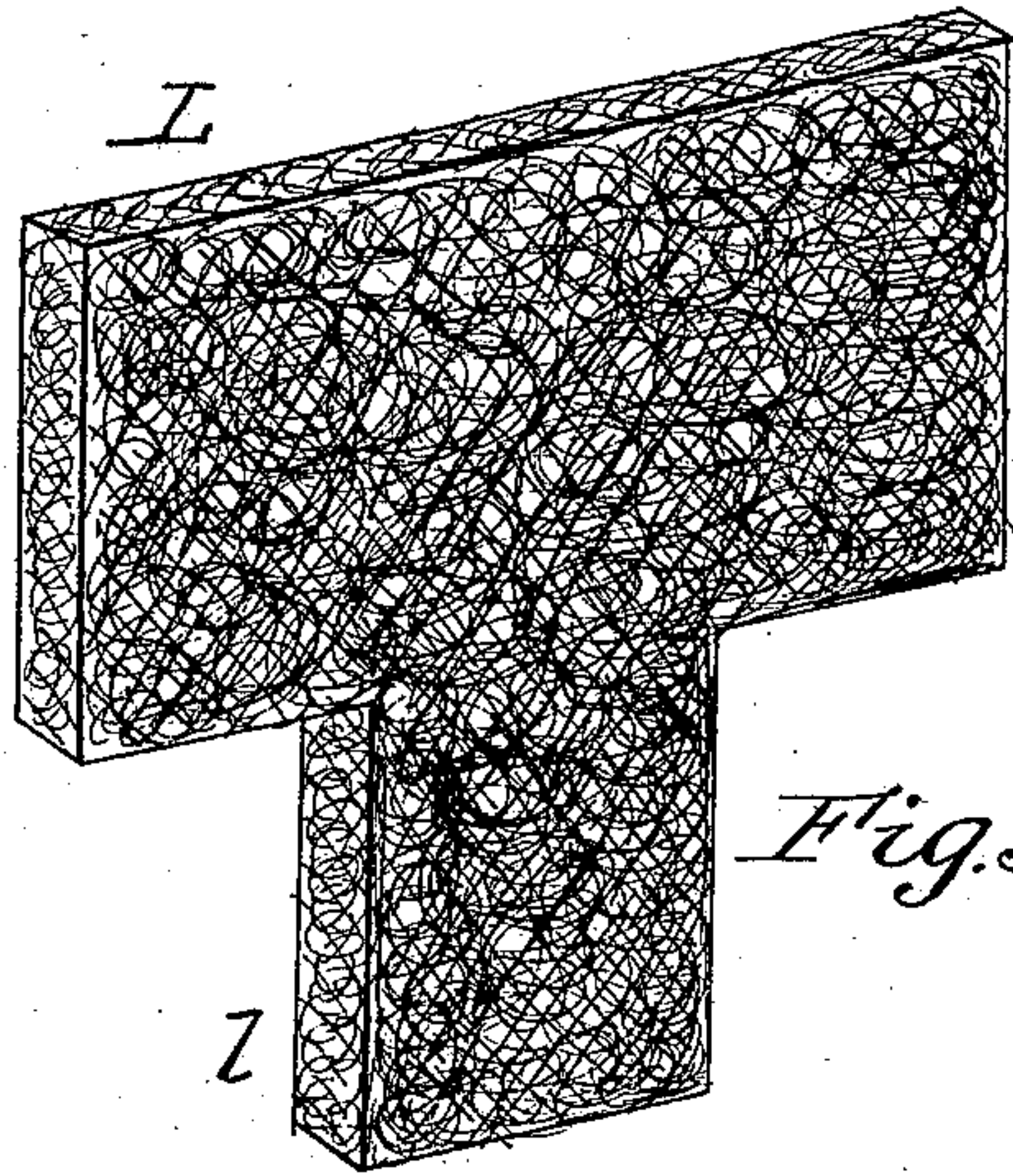


Fig. 5

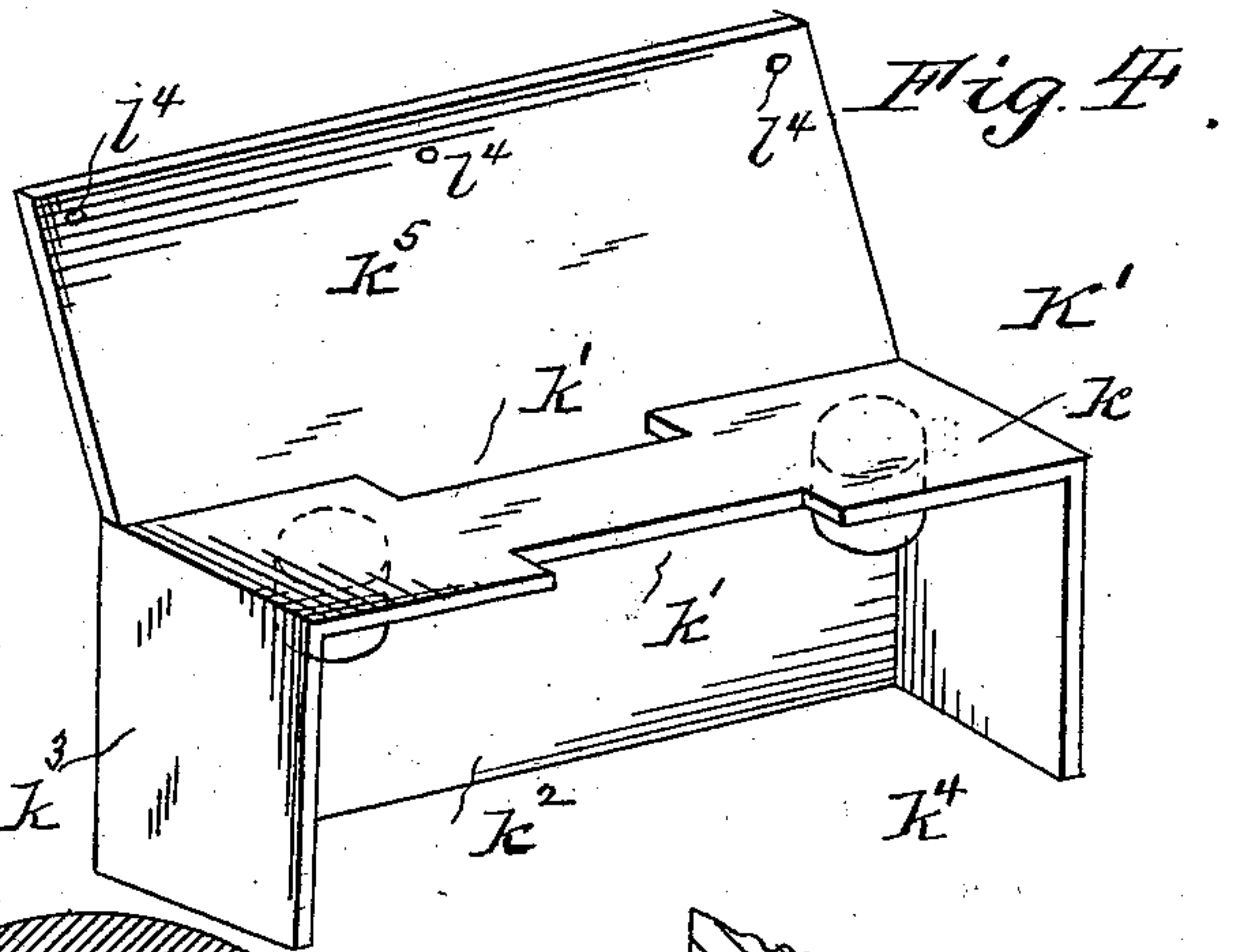


Fig. 4

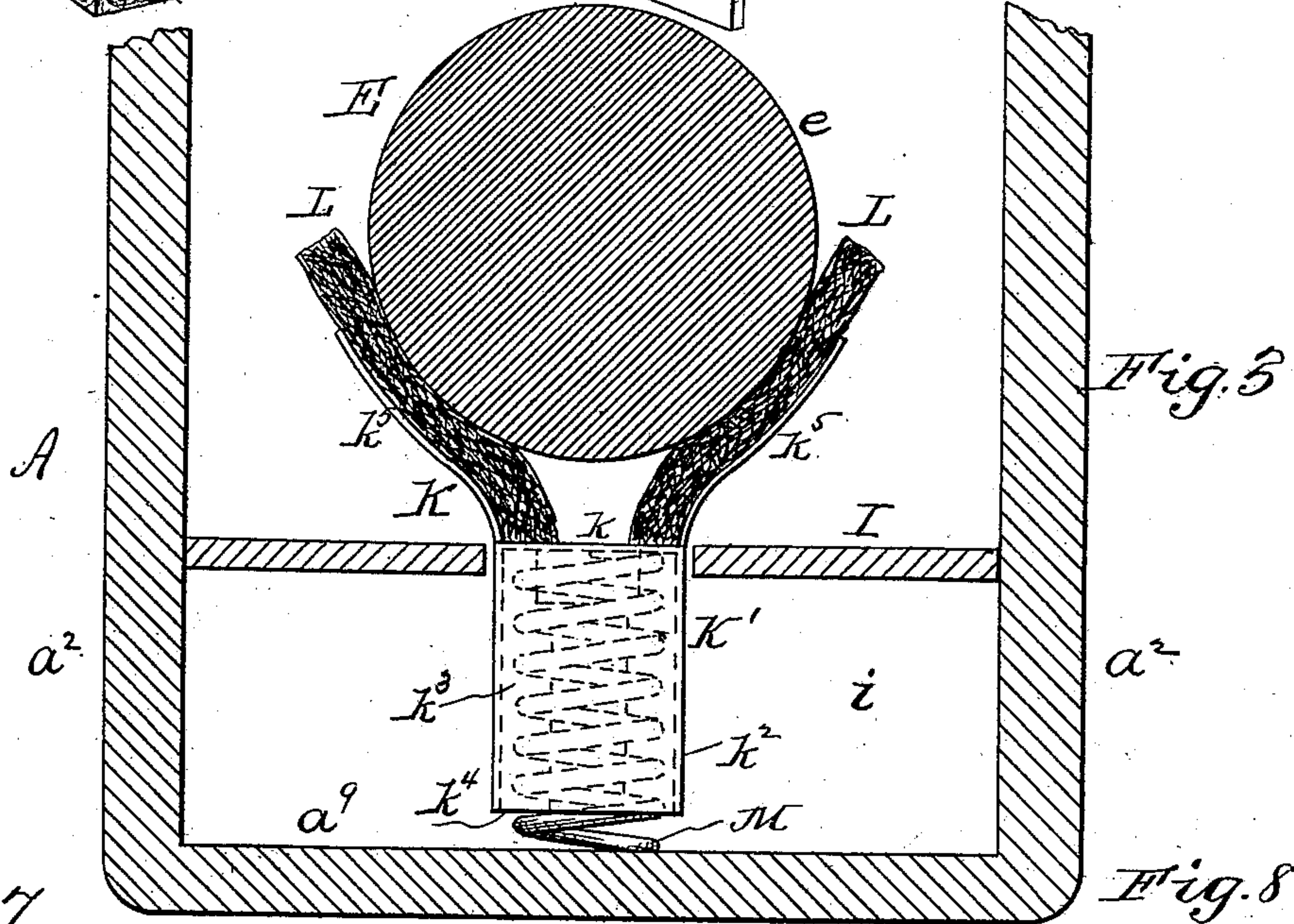
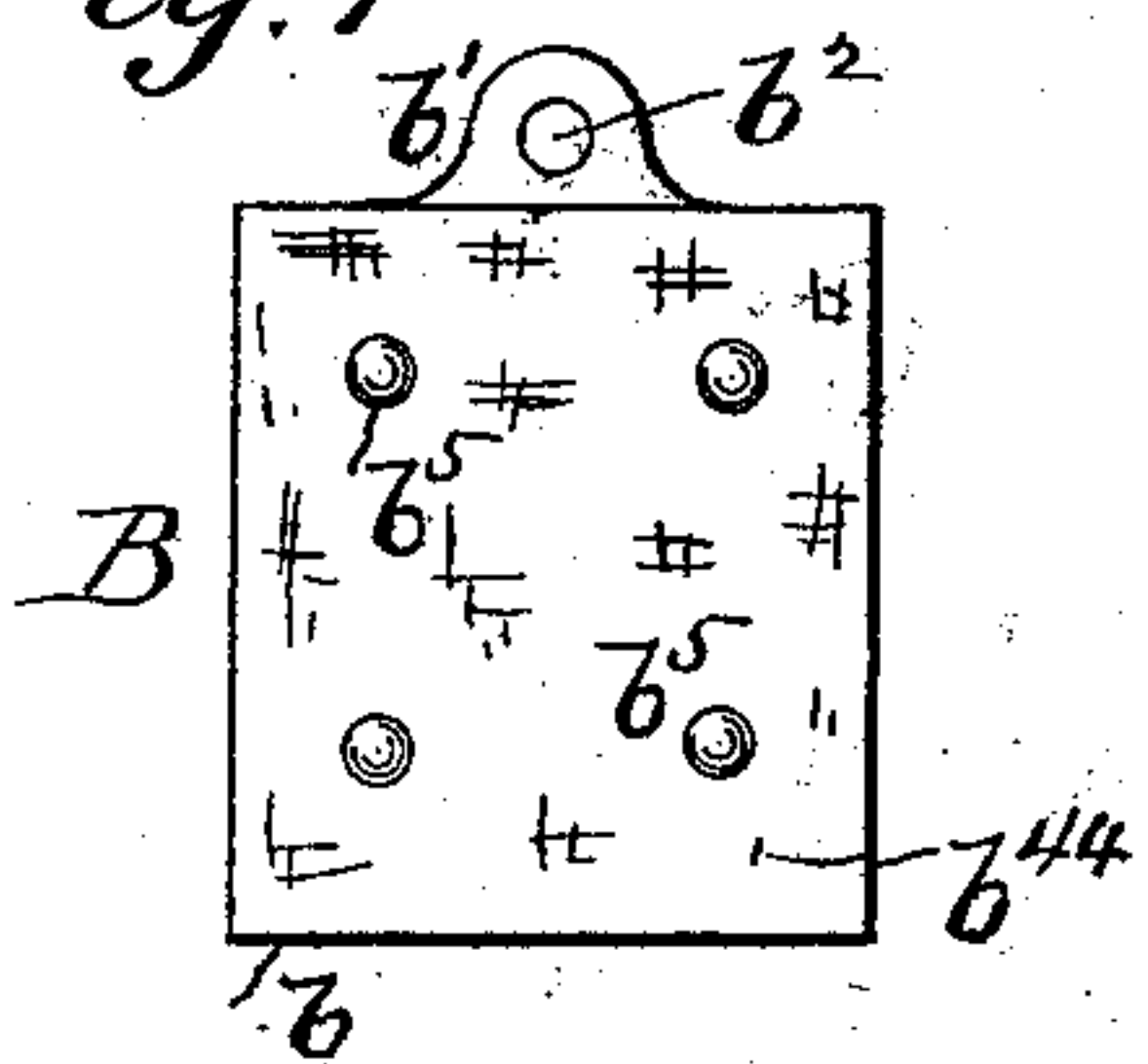


Fig. 3

Fig. 7



WITNESSES:

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M. W. Walker

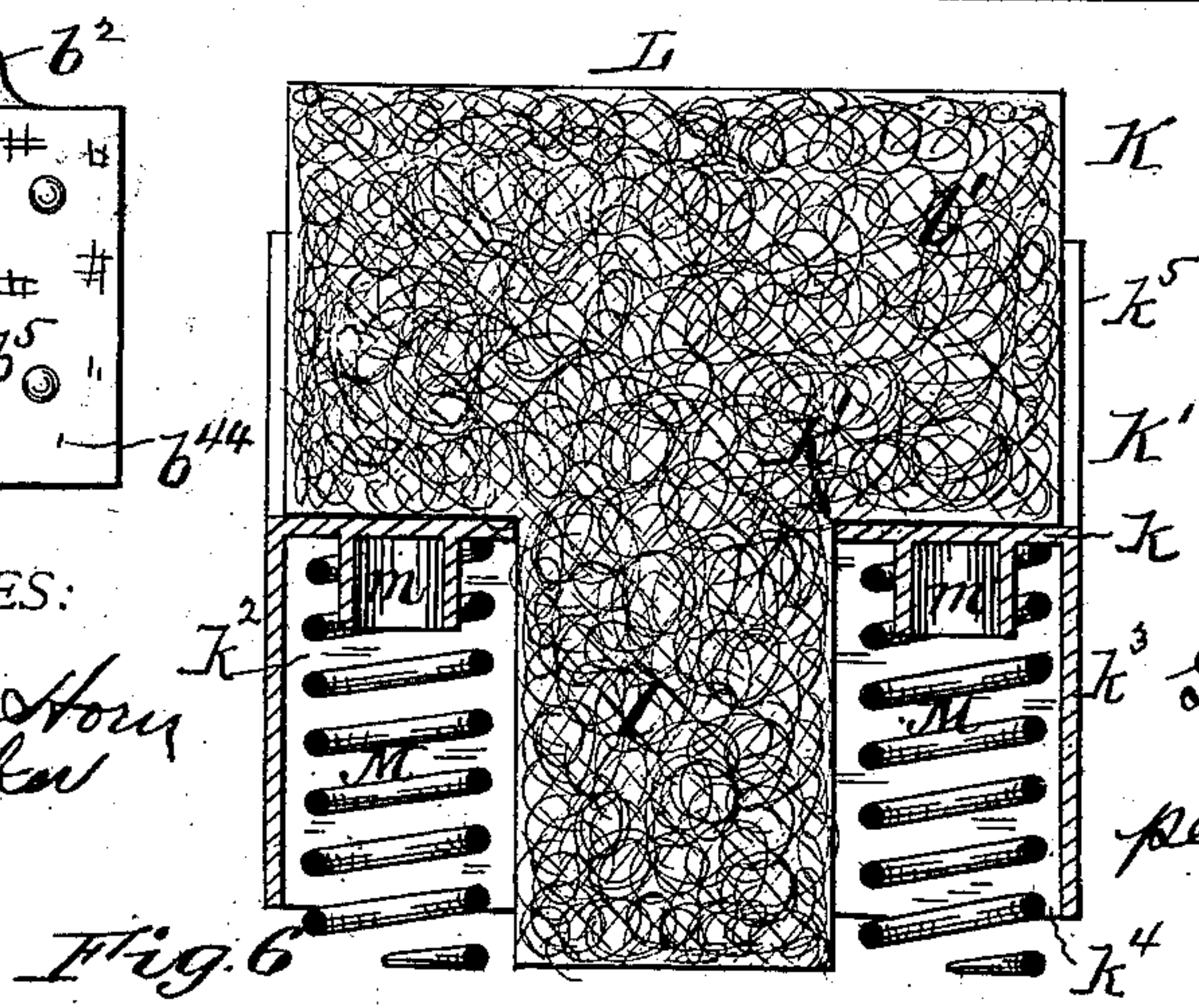


Fig. 6

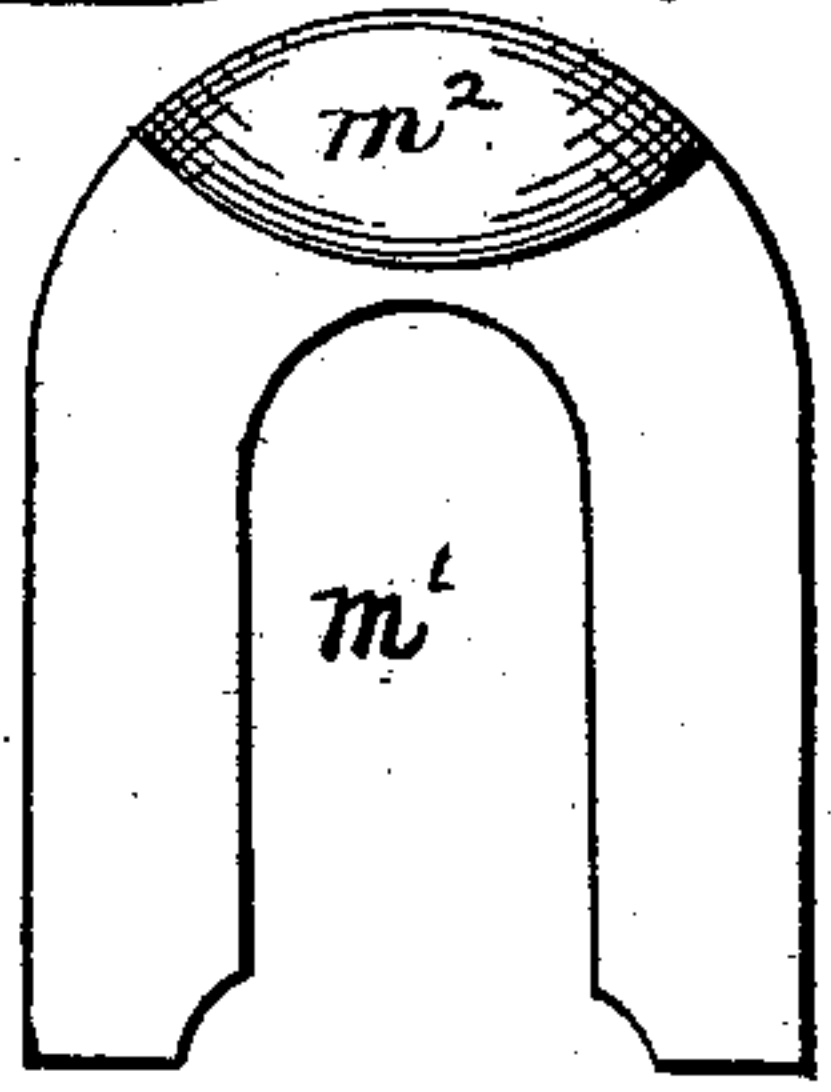


Fig. 8

INVENTOR

Geo. M. Brill

per J. Van Stavern

ATTORNEY

(No Model.)

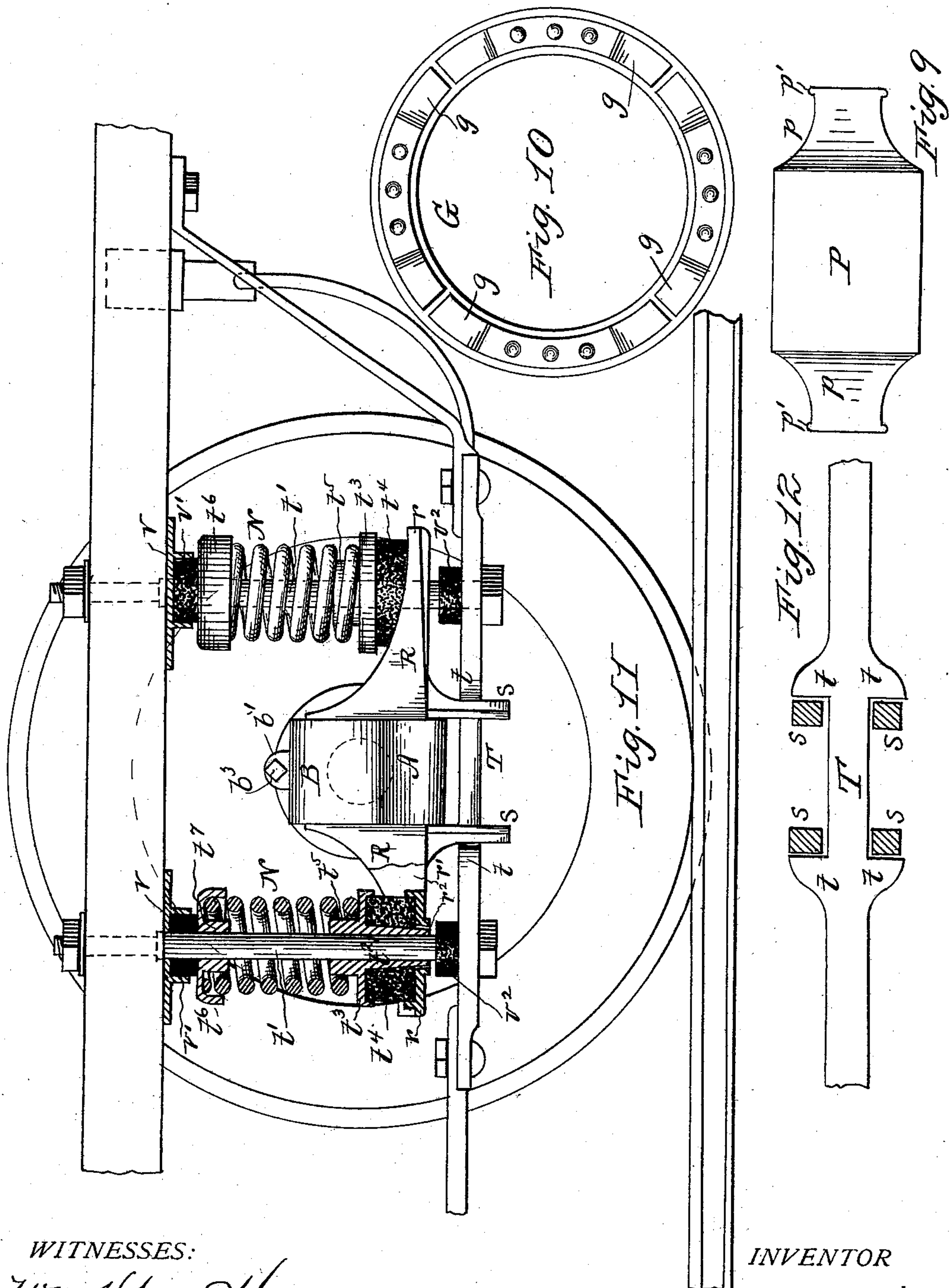
3 Sheets—Sheet 3.

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UNITED STATES PATENT OFFICE.

GEORGE M. BRILL, OF PHILADELPHIA, PENNSYLVANIA.

CAR-AXLE BOX.

SPECIFICATION forming part of Letters Patent No. 370,722, dated September 27, 1887.

Application filed July 9, 1886. Serial No. 207,553. (No model.)

To all whom it may concern:

Be it known that I, GEORGE M. BRILL, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Car-Axle Boxes, of which the following is a specification, reference being had therein to the accompanying drawings, wherein—

10 Figure 1 is a longitudinal section, partly in elevation, showing an axle-box embodying my improvements. Fig. 2 is a plan in detail, showing screw or bolt and nut and lug for nut for fastening the lid to the axle-box. Fig. 3 is a cross-section of part of box and axle, showing in elevation the oiling device for the axle. 15 Fig. 4 is a perspective, partly broken away, of frame of oiling device. Fig. 5 is a perspective showing preferable form or configuration of fibrous material for the oiling device. Fig. 6 20 is a longitudinal section of the oiling device. Fig. 7 is a rear view of axle-box lid. Fig. 8 is an elevation of key for front end of axle-journal to prevent end movement or thrust of the axle. Fig. 9 is a plan of axle-bearing. Fig. 10 is an elevation of pressure-rings for the dust shields or plates of the axle-box. Fig. 11 is an elevation, partly sectional, showing front end view of axle-box with depending 30 brackets or lugs engaging with stops on the truss or brace rod to prevent side movement of axle-box, and also bearings for the supporting-springs, part of car, and a wheel for same; and Fig. 12 is a plan, partly sectional, of brace-rod and axle-box lugs shown in Fig. 11.

35 My invention has relation to axle-boxes and their spring-supports; and it has for its objects to provide a simple and effective form of dust-shield for the rear end of the box and 40 for the lid or its joint; a brass or bearing having tapered ends provided with vertical corner beads to adapt it to be removed for replacement, or for other purposes, through the front end of the box while it is on the car, and 45 without removing or displacing any of the parts of the box except opening its lid; a simple, effective, and durable oiling device composed of a metal frame having packing or layers of fibrous material arranged to feed the 50 oil to the sides of the journal and rise in the box with the journal as its bearing wears away;

abutting lugs for preventing side movement of the box; a closed oil-well integral with the axle-box and which is filled from the interior of the box; and supports for the springs for the car, which supports are arranged to obviate chafing or wearing of the springs. 55

My invention accordingly consists of the combination, construction, and arrangement of parts as hereinafter described. 60

In the drawings, A represents the axle-box, the front part of which is open, as shown at *a*, and the front edges, *a'*, of its sides *a²* are made rounding, as indicated, and are more or less finished to make said edges smooth. At the 65 bottom of opening *a* and on the front of the box are formed lugs *a³*, having curved recesses *a⁴* of any suitable shape. The opening *a* is closed by a lid, B, which is curved correspondingly to the outline of opening *a*, and said lid 70 rests or bears upon the finished front edges, *a'*, of the sides *a²* and upon the upper side of the top *a⁵* of box A. The bottom edge, *b*, of the lid is shaped or curved to correspond with and snugly fit the outline of the recesses *a⁴* in 75 lugs *a³* to hold the bottom part of the lid securely in position.

At the upper part of the lid B is formed a projecting central lug, *b'*, having an opening, *b²*, for the passage of a bolt, *b³*, which screws 80 into a nut, *b⁴*, resting or cast in a lug, *a⁶*, on the top of the box, as shown in Figs. 1 and 2, the lug *a⁶* being preferably formed with open-top transverse slot *a⁷*, so that the nut *b⁴* may be loosely placed therein, and with open longitudinal slot *a⁸* for the passage of bolt *b³*, (seen 85 more plainly in Fig. 2;) but any suitable construction of lug may be employed. When the lid B is in position on the box, it is securely held thereon by the lugs *a³* and the bolt *b³*, 90 and by turning or screwing up the latter the lid is brought in close impingement with the curved edges *a'* of the sides and with the top *a⁵* of the box, to make a tight joint therewith; but to avoid any possibility of imperfect joint 95 between the lid and box, or to make a perfectly dust-tight joint, I prefer to line the rear side of the lid with a plate of spring metal, *b⁴⁴*, so that as the screw *b³* is adjusted the spring-plate *b⁴⁴* is subject to pressure between 100 the lid and box to hermetically seal the joint between them. This plate may be secured to

the lid in any suitable manner; but I prefer to cover the entire inner side of the lid with the plate b'' , as shown in Figs. 1 and 7, and to rivet it to the lid, the rivets b^5 being placed within or away from the edges of the lid, so as to leave the edges of the plate free, loose, or flap-like, so that they will have more or less elasticity and admit of conforming more readily to the outline of the edges of the sides and top of the box, or to any imperfections therein when not finished or smoothed off. The rear end of the box is an open one and is preferably formed with a rearwardly-projecting annular flange, c , within which is another parallel annular flange, c' , which does not project backwardly as far as the flange c , or the flange c' is shorter than the flange c , and between these flanges is a wide annular space or recess, c^2 , into which passes an annular flange, d , projecting forwardly from a collar, D, suitably fastened to the axle E in any desired manner. This collar D is separate from or has no connection with the wheels of the car; hence the box and its appurtenances herein described may be easily and economically applied to cars in service.

Between the edge d' of flange d and the side c^3 of space or recess c^2 is an annular ring, F, fitting snugly in space or recess c^2 and held in close impingement against the edge d' of flange d by a spring or pressure ring, G, located between ring F and side c^3 . The ring F is preferably prevented from turning by means of one or more lugs, c^4 , formed in space or recess c^2 , fitting in or engaging with slots f in the periphery of ring F, as plainly shown in Fig. 1.

The springs g for the ring G may be plate-springs of any suitable shape, riveted or otherwise secured to the ring, as indicated in Fig. 10; or any other form of springs may be used. They impinge against the side c^3 and press the ring G, and in turn the ring F, against the edge d' of flange d to make a tight joint therewith and form a shield for excluding dust from the interior of the axle-box.

Between the outer edge, c^5 , of flange c' and the collar D is another annular ring, H, which snugly but loosely fits the axle and the interior of flange d , and is prevented from rotating by ribs or lugs d^2 on the inside of flange d entering peripheral recesses h in said ring. Its front face abuts against the edge c^5 of flange c' , and is maintained in close impingement by a pressure or spring ring, G', loosely surrounding the axle and located between collar D and ring H, and constructed in a manner similar to spring or pressure ring G. The ring H therefore forms a second plate or shield for excluding dust or dirt from the box A. These dust-shields F and H, being loose on their bearings, give with the axle as it moves longitudinally. During such movement, however, their contact with the box parts against which they bear is maintained by the spring or pressure rings. These shields, it will be noted, are so arranged that the larger one of them, or the shield F, is in advance of the smaller one, or the shield H, that the former has its bearing

or closing surface against the edge of collar-flange d , and the latter or smaller shield bears against the edge c^5 of box-flange c' , and that shield F is supported upon the box and shield H upon the axle. This described arrangement of the two shields, it will be noted, provides a tortuous path for the travel of dust or dirt to the interior of the axle-box, and gives virtually two separate shields, so that if, by any possibility, any dirt gains access through or by the first shield, F, the second shield, H, bars its entrance to the box. The flange c is made deep, as shown in Fig. 1, to form a guard or shed to exclude dust from the collar-flange d . The lugs c^4 d^2 on box A and collar D and recesses f and h in shields F and H may be dispensed with, in which case the shields may rotate or be held stationary by friction or pressure of the spring-rings.

The shields may be made of wood, fiber, or any other suitable material. I prefer to make them of fiber, or one of fiber and the other of wood. The lower part of flange c' has its upper surface inclined downwardly to meet a false bottom, I, in box A, which bottom inclines from its center to flange c' and to the front of the box. This inclination is provided to conduct waste or surplus oil back to the oil-well i of the box, which is located between the false bottom I and the bottom a^9 of the box. The bottom or top I of the well has an opening, i' , near the front of the box with removable plug i^2 , through which oil is filled into the well i .

In the center of the bottom I is an elongated opening, i^3 , in which loosely fits an oiling device, K, for the axle-journal e . This oiler is preferably composed of a sheet-metal frame, K', having top k , in which are elongated side openings or slots, k' , centrally located, depending sides k^2 , and ends k^3 , with open bottom k^4 and upwardly-projecting side flanges or flaps, k^5 . To the latter and the sides k^2 of frame K' are secured T-shaped pieces of fibrous or wick-like material, L, the vertical limbs l of which pass down through the slots k' to and, if desired, project below the bottom of frame K'. The horizontal limbs l' of the fibrous material are substantially of a length equal to that of the flaps or flanges k^5 , and are tacked to the latter by stitching, as shown at l^1 , Fig. 1, or any other suitable fastening may be employed. When stitched or similarly secured to frame K', suitable openings, l^4 , are provided for the passage of the thread. Within frame K' and at each end are placed, preferably, spiral springs M, held in place by cups or pins m , depending from the under side of frame top plate, k , as shown more plainly in Fig. 6. These springs rest upon the bottom a^9 of the box and impart an upward spring-pressure to the oiling device. The flaps k^5 , with fibrous lining L, are spread apart to embrace the sides of the axle, as shown in Fig. 3, the sheet-metal flaps being elastic or flexible enough to permit this spreading, and the spring-pressure of the oiling de-

vice, being an upward one, maintains the fibrous lining in contact with the journal at all times during the vertical vibrations of the box and as the journal wears. The oiling device or its frame is of such an economical construction that when worn it can be cheaply replaced by a like device.

If desired, the upper end of the fibrous material L may project above the flaps k^5 , as indicated in Fig. 3; but this is not essential.

Near the forward end of axle E is an annular groove, e' , for engagement with an inverted-U or yoke shaped key, m' , (see Figs. 1 and 8,) which key slides in vertical grooves a^{10} on or in the inner surfaces of the box-sides a^2 . The tops of these grooves are in front of the front edge of the top of the box, so that when the lid B is opened or removed the key m' can be readily removed or inserted, as desired. To facilitate removal, it is formed on its front side with a handle, knob, or lug, m^2 .

The journal brass or bearing P is made or formed with contracted or tapering ends p , having at its corners vertical beads, ridges, or ribs p' to adapt it to be taken hold of and drawn out through the box-opening a while the box is on the car or on the axle, the key m' being first removed. The latter, it will be noted, not only prevents end-thrust of the axle, but also maintains the brass or bearing in position, and the usual or independent keys heretofore employed for the brass may be dispensed with.

If desired, the groove in journal may be dispensed with, and the key then abuts against the end of the journal, as indicated by dotted line 1 1, Fig. 2.

The axle-box A is formed with side flanges or platforms, R, having spring-bearings r , and openings r' between the bearings and the sides of the box. (See Fig. 11.)

To prevent undue lateral movement of the box, it may have depending lugs or brackets S, which abut against lugs t on the brace or truss rod T, located below the box, as shown in Figs. 11 and 12. The spring-bearings r of the latter have a central opening, r^2 , of a larger diameter than that of the stay-bolt t' , for the reception or passage of a plunger, t^2 , depending from a plate or cap, t^3 , and surrounding the bolt t' , as shown in Fig. 11.

Between the bearings r and cap t^3 is a rubber spring or block, t^4 , and as the lower edge of the cap-plunger t^2 passes down into the bearing-opening r^2 said edge does not come in contact with sides of the opening in said rubber block, and all chafing, wearing, or deterioration of said block is avoided. The cap t^3 has on its upper side a pin, t^5 , for holding the lower end of a spiral spring, N, in position or line, and as this pin is within the mandrel-hole of the spring any dirt deposited thereon works off of the same over the top of the cap t^3 . The upper end of spring N is held in place by a cap, t^6 , having a pin, t^7 , and between the cap and sill plate or cup v is a rubber block, v' , and between truss or rod T and bearing r is a like block, v^2 . This described construction

of bearings for the springs and the arrangement of the latter afford a strong, durable, and economical spring-support for the car.

From the foregoing it will be noted that the upper end of the lid is not permanently affixed to the axle-box, or, in other words, the lid opens from above downwardly; that the bottom edge of the lid has a loose interlocking engagement with the box to admit of such described manner of opening or removing the lid; that it has at its upper edge a bolt-and-nut fastening with the box, which nut is preferably of wrought-iron, or is separate from and loosely located upon the top of the box. The lid is not, therefore, a self-locking lid, but one that is locked by manually adjusting the bolt or fastening devices, and by suitably screwing up the bolt a varying pressure is applied to the free or flap edges of plate b^{44} to make a tight joint between the lid and box. The loose nut being separate from the box, it is, when stripped, worn, or lost, readily replaced by a new one. It will be further noted that the collar D, with its flange for impingement against the dust-shields in the axle-box, is separate from the car-wheels; that it is affixed to the axle and the box, and it may therefore be economically applied to cars already in use without necessitating the removal of the wheels from their axles, and in building new cars the old form of wheels are used, as heretofore, and that the oil-well of the box is cast integral therewith, and the oiling device is composed of a metal frame, to which the oiling-pads are secured; hence as the pads wear they are detached from the frame and replaced by new ones.

The truss-bar arrangements and the combination rubber springs and spiral springs, and the supports for the same herein shown, I do not claim, as they form the subject-matter of another application filed of even date herewith, Serial No. 207,522.

I am aware that car-axle boxes having rear open ends in which are placed one or more dust-shields, against which annular flanges or sleeves impinge to close the rear open ends of the boxes, are not new; but heretofore these flanges or sleeves were either an integral part of the wheel or were separate from and bolted to the front side of the wheels. In the one case the axle-boxes, as described, can only be applied to new cars, or to cars the wheels of which have the flanges or sleeves cast on them, and in the other, while the flanges may be bolted to old car-wheels, yet patterns of flanges or sleeves must be made to suit the different configured sides of different styles of old wheels, and when in use the hammering of the wheels upon the rails loosens the fastening-bolts of the sleeves or flanges to impair their usefulness. In either case, however, when these wheel flanges and boxes are used upon cars for narrow gage of track wherein the wheels in practice are located some distance from the car-sleepers or from the axle-journals, the wheel-flanges must be extended to meet and enter the rear end of

the axle-boxes, or extra sills must be secured to the side sills of the cars, in order to provide for locating the boxes within suitable range or distance of the flanges.

5 Upon different gages of roadway, as the distance from the axle-journals to the sides of the wheels vary, the exact degree of extension for the flanges or the width of the extra sills also varies, and no standard gage can be made
10 when the flanges or sleeves are secured to the wheels; but where the flanges or collars D upon the axle are used, as above described, a standard gage or point of location upon the axle is allowable for all the variations in gage
15 of the wheels of the car, and the axle-boxes are always located below the sleepers of the car; hence the main advantages to be derived from the use of collar D upon the axle instead of upon the car wheels are, the collars
20 can be put as close to the axle-box as desired in different gage of cars. The axle-boxes are thus always located directly under the car-sleepers, which position is the proper one, and no extra car-sill pieces or extension of flanges
25 are necessary when changing the gage of cars.

What I claim is—

1. A car axle box having at its front end and at the lower edge of its lid opening a lug or lugs, a^3 , provided with recess a^4 , and upon
30 its top a lug, a^6 , having a longitudinal and a transverse slot, a nut, b^4 , having a threaded opening and located in said transverse slot, which opening aligns with said longitudinal slot, in combination with lid having its lower
35 edge fitting into recess a^4 , and a lug, b^1 , at its top edge, having a screw or bolt, b^3 , for engagement with nut b^4 to secure the lid to the axle-box, substantially as set forth.

2. A car-axle box having at the lower edge
40 of its lid opening a lug or lugs provided with recesses, and on its top a slotted lug and a loose nut having threaded opening, in combination with a lid the lower edge of which fits into said recesses, and having at its upper edge a screw
45 or bolt for engagement with said nut, substantially as set forth.

3. A curved axle-box lid having at its lower edge a loose interlocking engagement with the axle-box, a spring-metal plate, b^{44} , on its in-
50 ner side, and a bolt-and-nut fastening device for the top of the lid, substantially as set forth.

4. A curved axle-box lid having on its inner side a spring-metal plate or sheet gasket riv-
55 eted or secured to the lid, and having free or flap edges, and pressure devices for said edges, which devices also fasten the lid to the box, substantially as set forth.

5. A car-axle-box lid curved from top to

bottom and having on its inner side a spring- 60 metal plate provided with free or flap edges, a loose interlocking engagement between the lower edge of the lid and axle-box, and a bolt-and-nut fastening for the upper end of the lid, substantially as set forth. 65

6. The combination, with a car-axle box having an open rear end, of two separate dust-shields located in said open end, and a collar rigidly affixed to the car-axle, impinging against one of said shields, and having a pe- 70 ripheral flange which extends into said open end of the box and impinges against the remaining shield, substantially as set forth.

7. An axle-box having in its rear side a recess, c^2 , lugs c^4 in said recess, a plate, F, hav- 75 ing peripheral notches f , fitting lugs c^4 , and a pressure or spring ring between the box and plate F, substantially as set forth.

8. The combination, with a car-axle box hav- ing an oil-well, i , and false bottom I, provided 80 with opening v^3 , of an oiling device, K, having upwardly-diverging sides or flaps k^5 , provided with a lining of fibrous material for contact with the sides of the axle-journal, substantially as set forth. 85

9. An axle or journal oiling device com- posed of a metal frame having top k , sides k^2 , and ends k^3 , upwardly-projecting side flaps or 90 plates, k^5 , fibrous material L, secured to flaps k , and springs H, substantially as set forth.

10. An oiling device composed of a metal frame, K, having top plate, k , with slots k' , upwardly-projecting flexible sides k^3 , and T- 95 shaped layers or strips of fibrous material tacked or secured to said sides, substantially as set forth.

11. An oiling device for car-axle boxes, com- posed of the open-bottom metal frame K, hav- ing pins m , springs M, and sides k^5 , lined with 100 fibrous material L, substantially as set forth.

12. An oiling device composed of a metal frame, K, having sides or wings k^5 , provided with openings b^4 , and layer of fibrous material L, stitched to said sides through openings b^4 , 105 substantially as set forth.

13. The car-axle brass P, having contracted or tapering ends p and vertical corner beads or ribs p' , substantially as set forth.

14. A car-axle box having brass P, provided with contracted or tapered ends p and verti- 110 cal corner beads or ribs p' , in combination with key m' , substantially as set forth.

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

GEORGE M. BRILL.

Witnesses:

JOHN RODGERS,

S. J. VAN STAVOREN.