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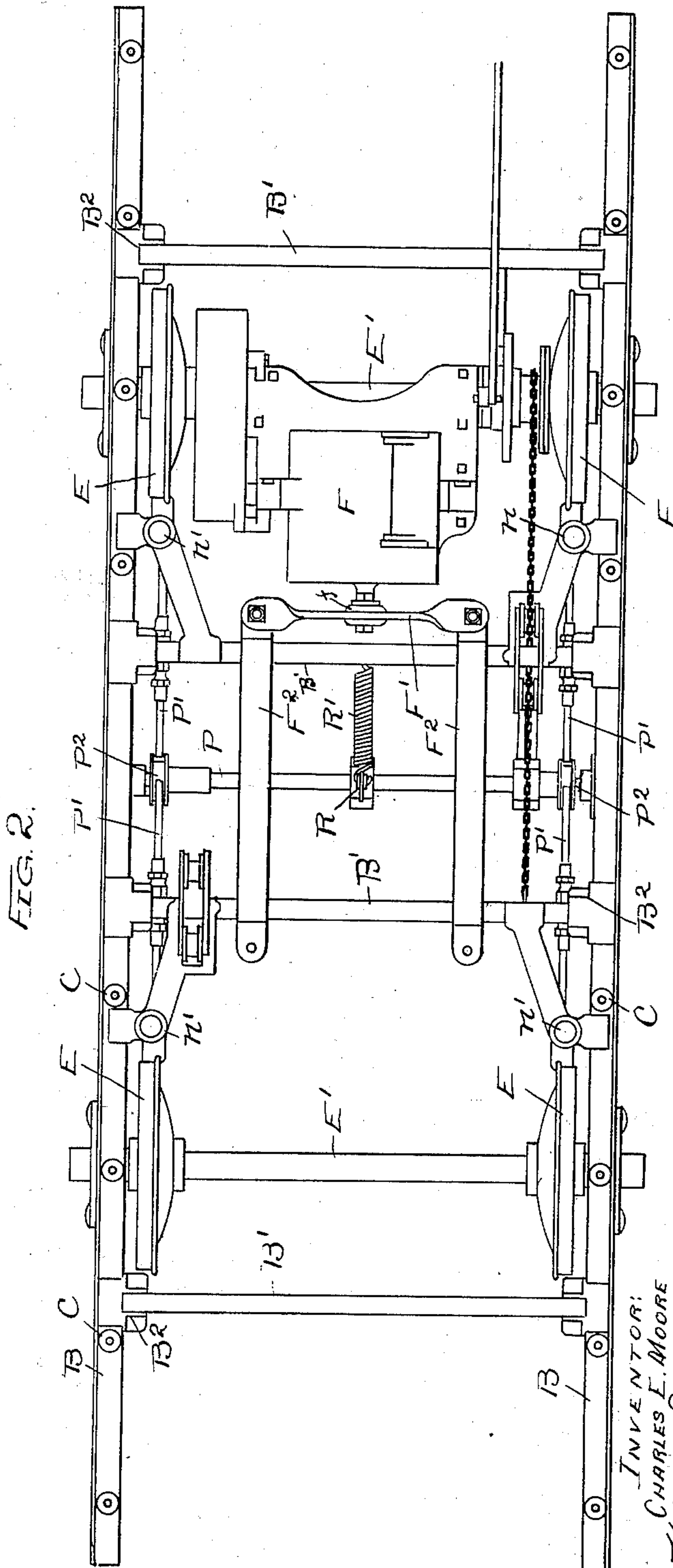
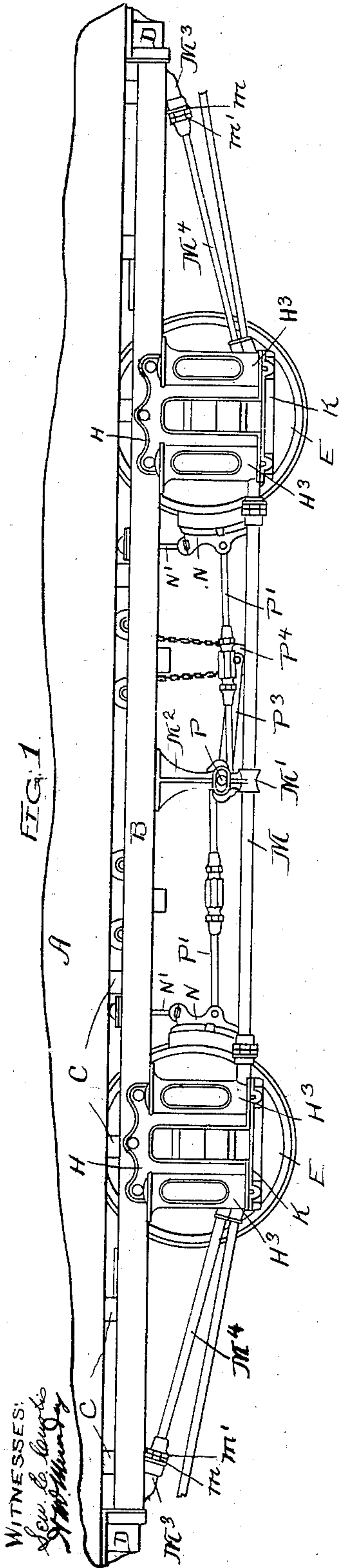
Patented Aug. 21, 1900.

C. E. MOORE.
MOTOR CAR TRUCK.

(Application filed Jan. 26, 1899.)

5 Sheets—Sheet 1.

(No Model.)



INVENTOR:
CHARLES E. MOORE
BY *Wendley, Evans & Adcock*
HIS ATTORNEYS.

No. 656,606.

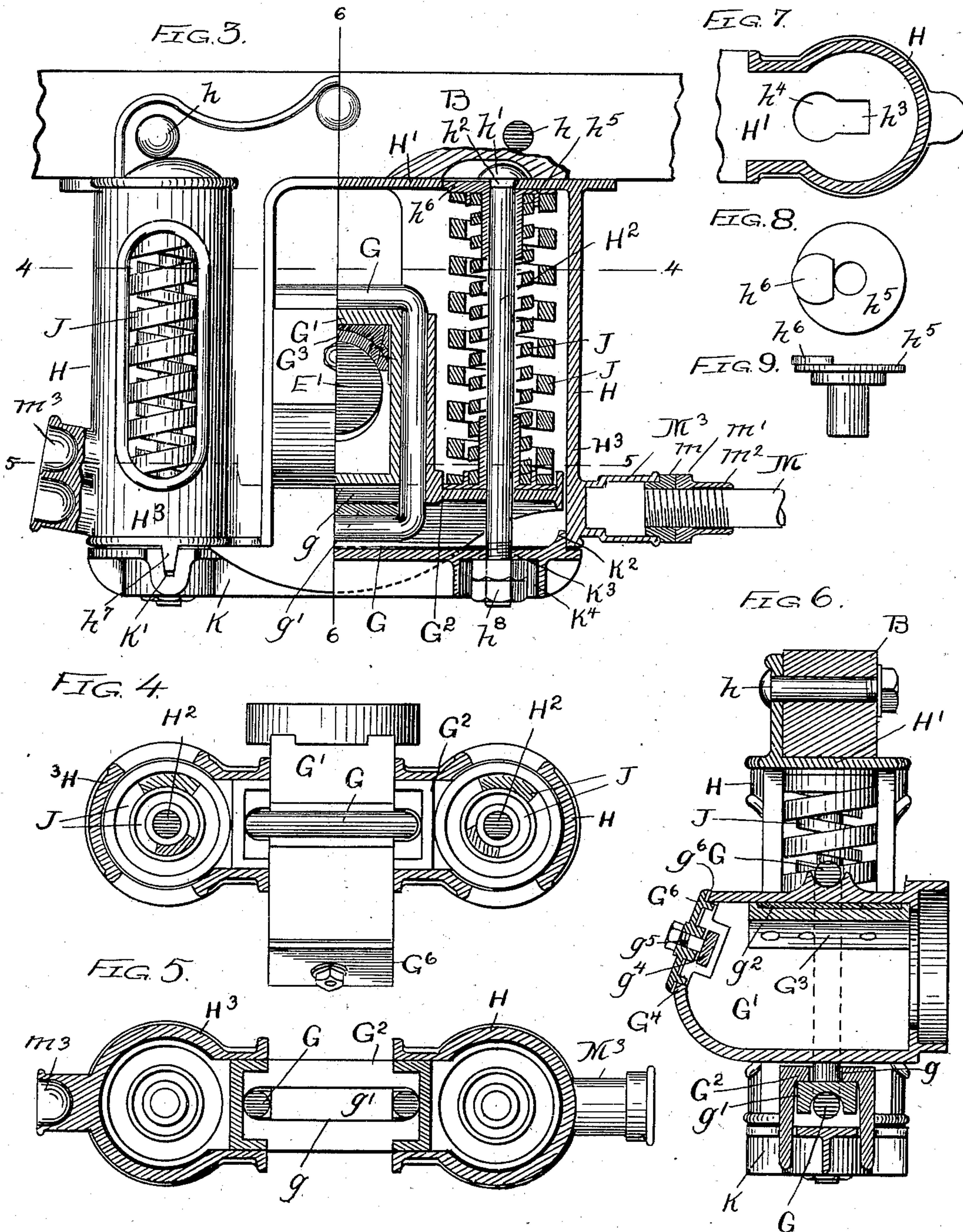
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5 Sheets—Sheet 2.



WITNESSES:

Sec. C. Curtis
H. W. Munday

INVENTOR:

CHARLES E. MOORE

BY Munday, Curtis & Adcock

HIS ATTORNEYS,

No. 656,606.

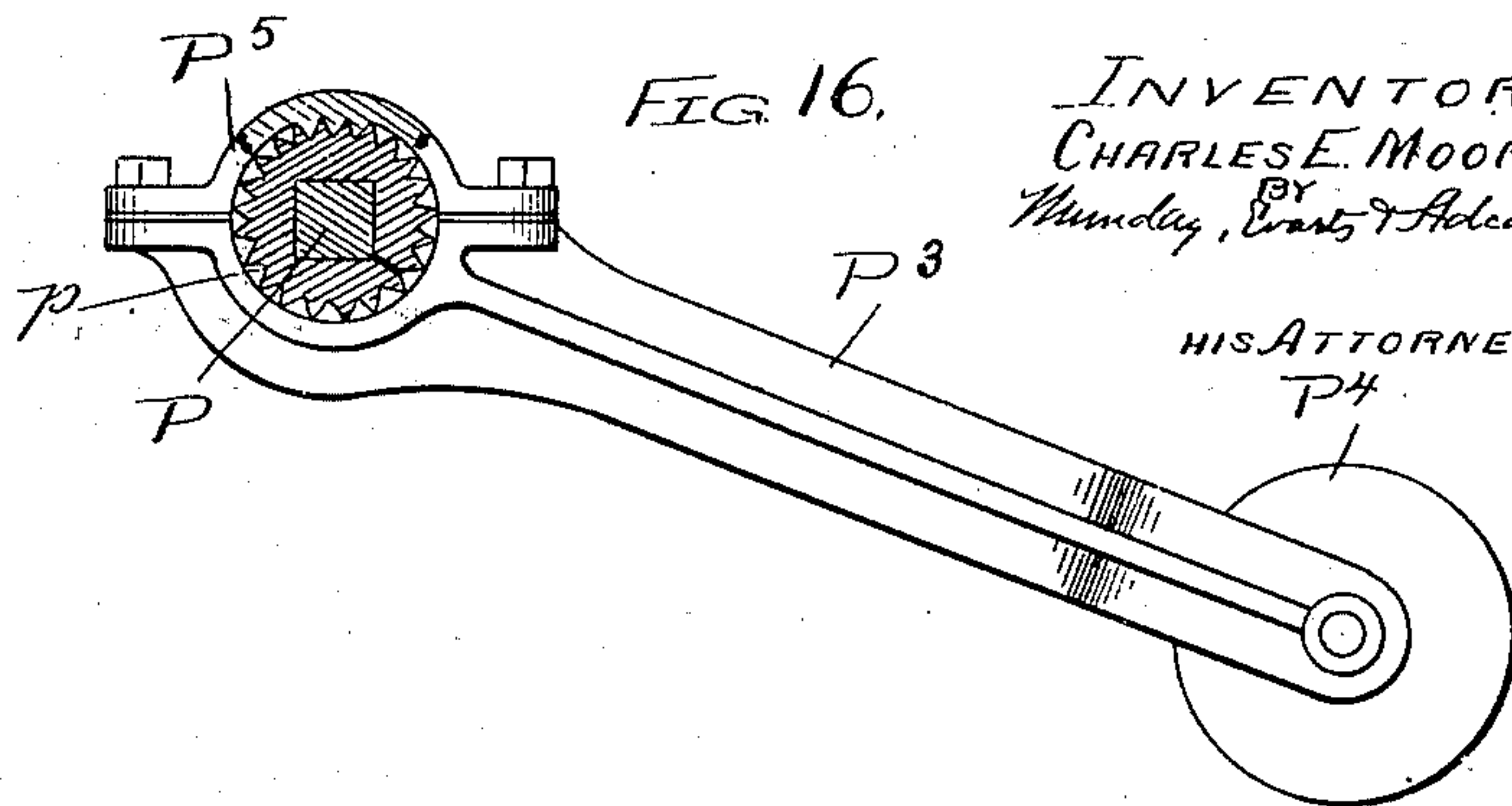
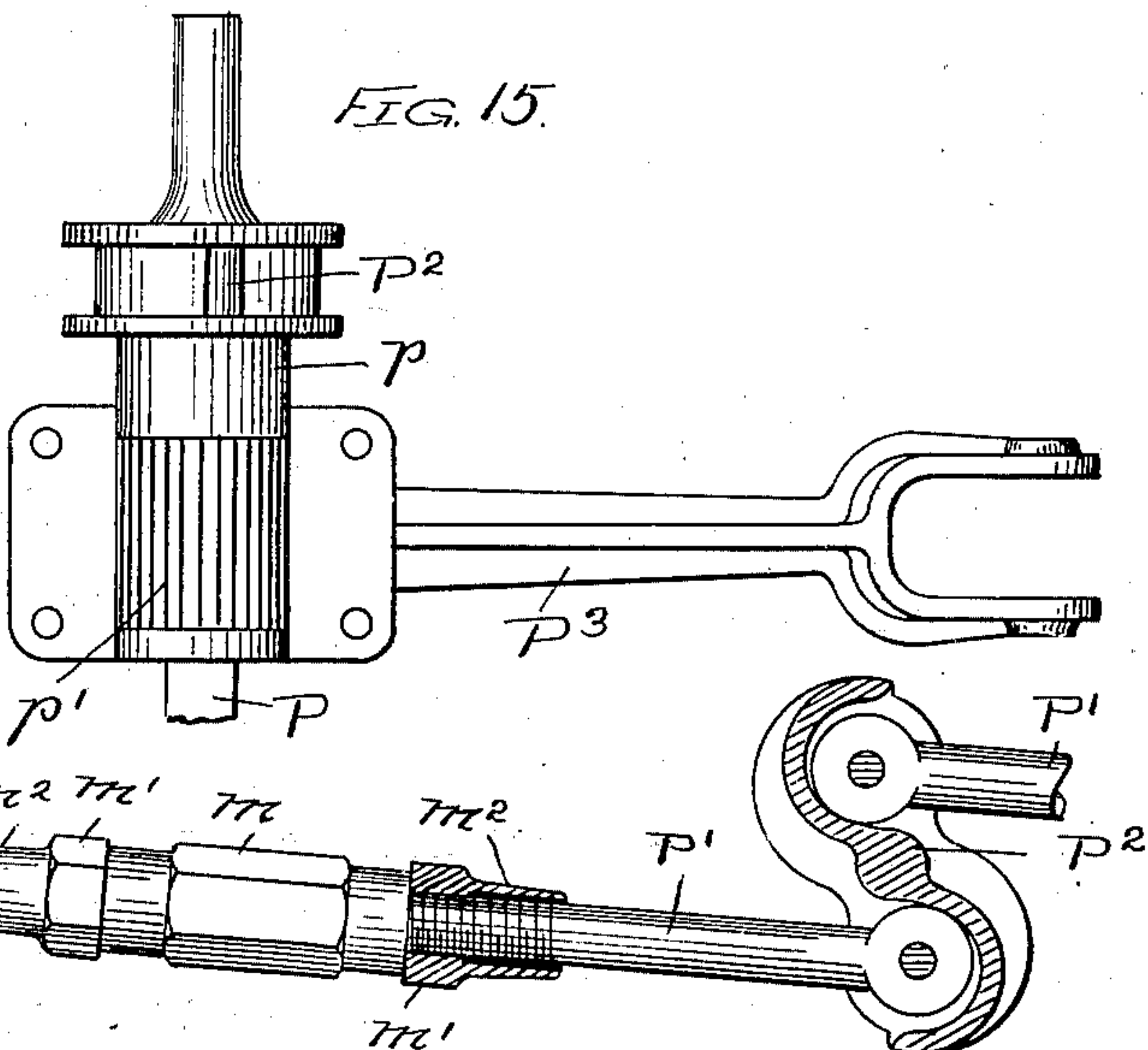
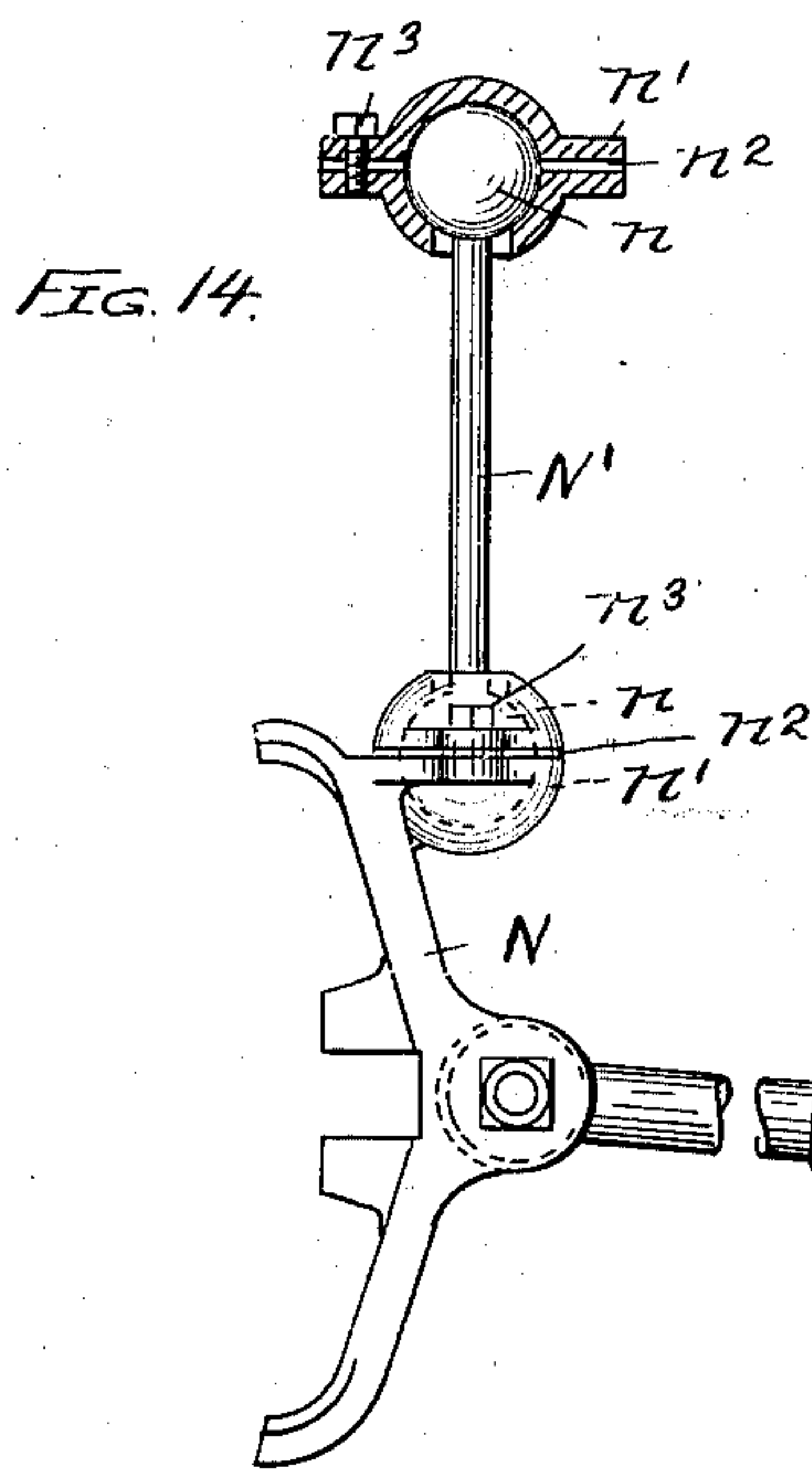
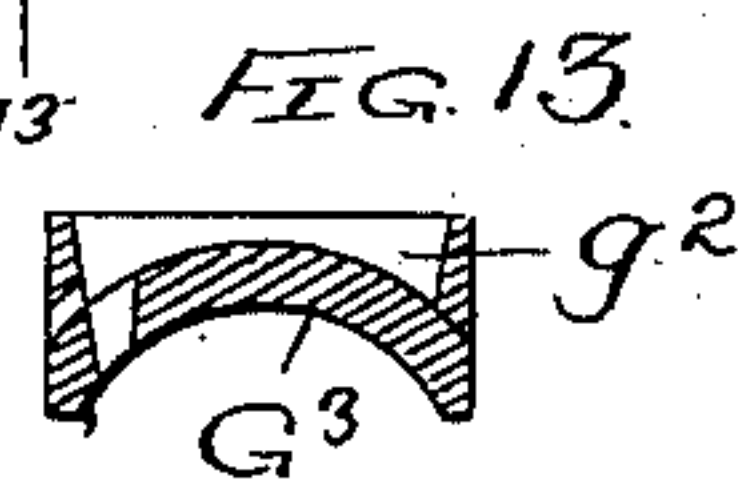
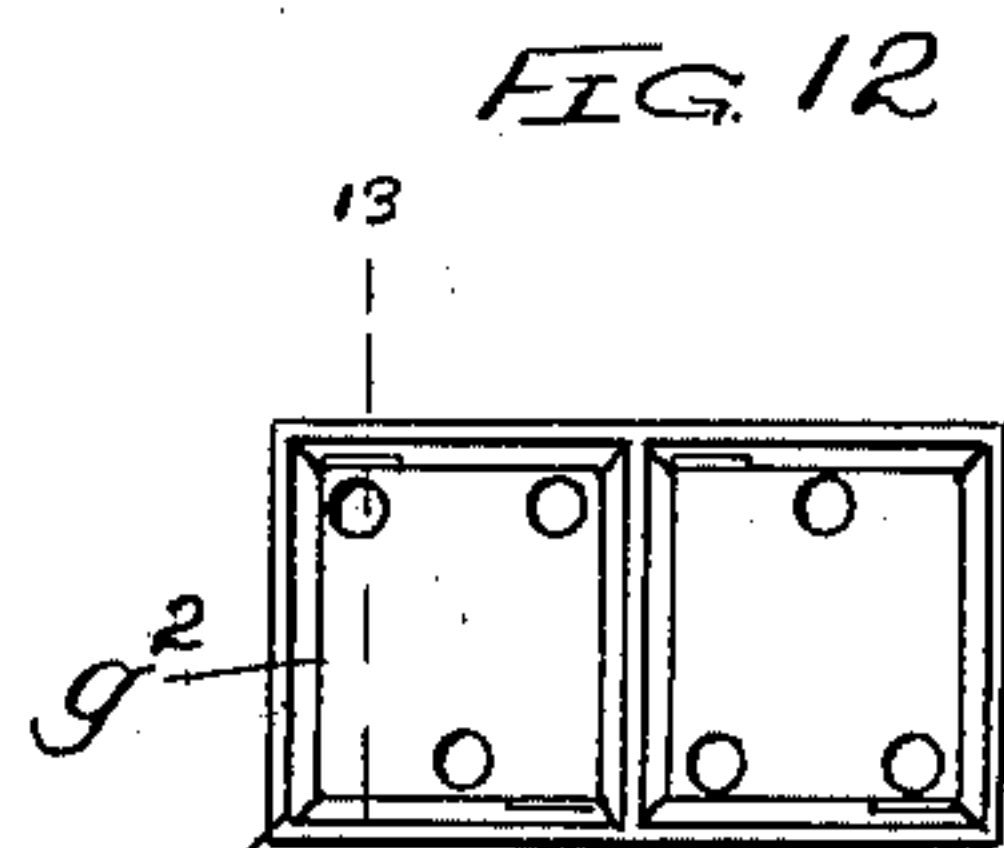
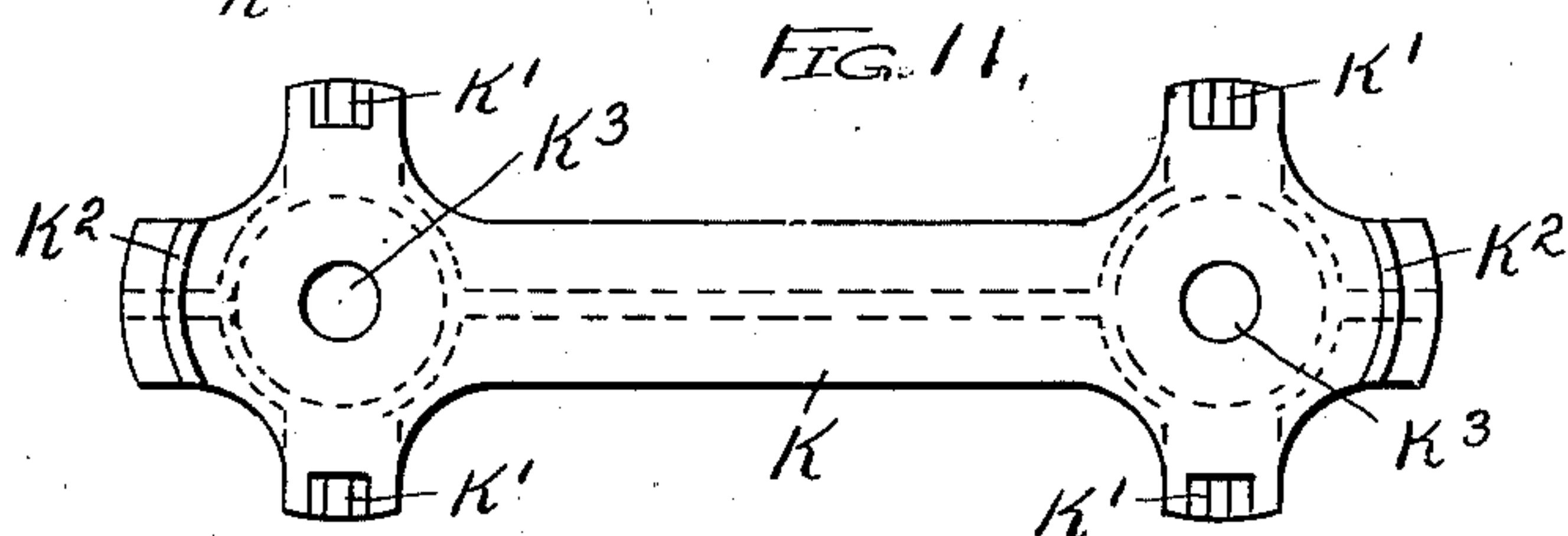
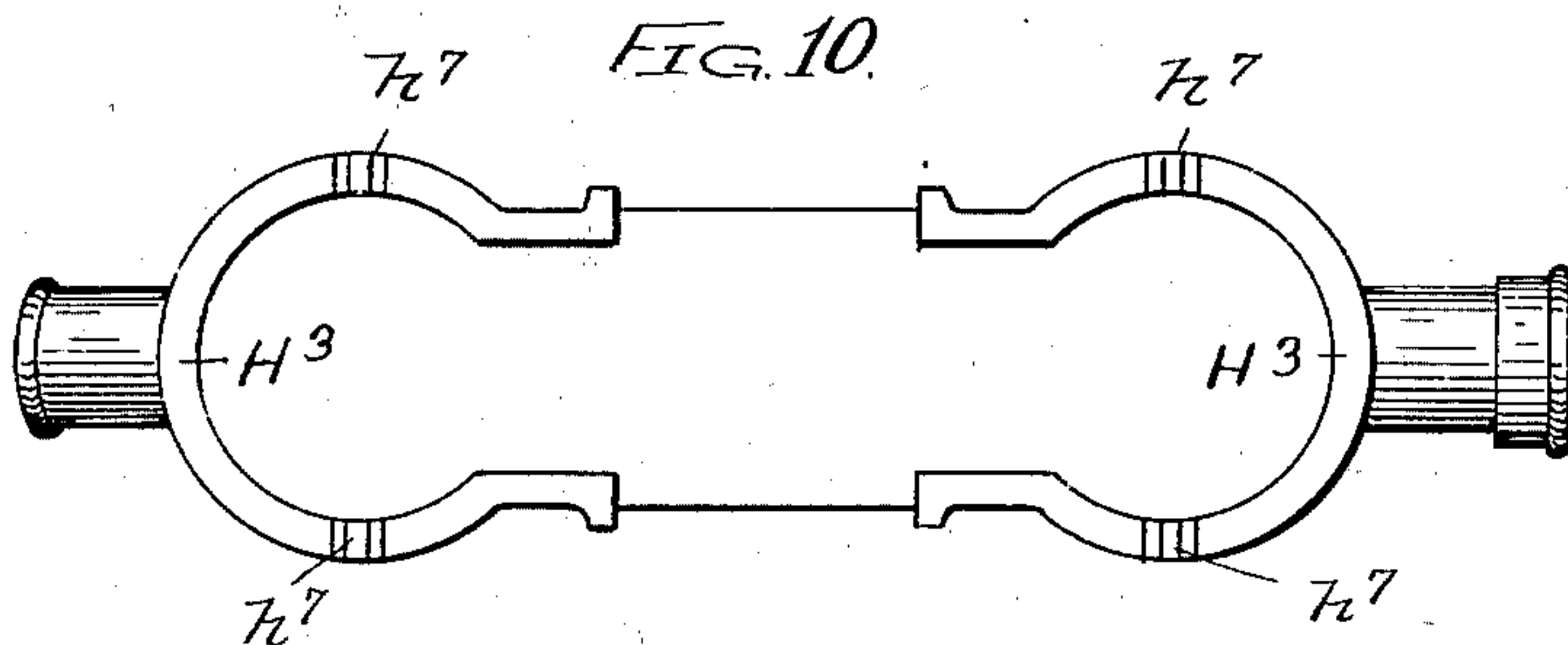
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(No Model.)

5 Sheets—Sheet 3.



INVENTOR:
CHARLES E. MOORE
BY
Munday, Evans & Adcock

HIS ATTORNEYS
P^4

WITNESSES:

Sew. E. Lewis
J. W. Munday

No. 656,606.

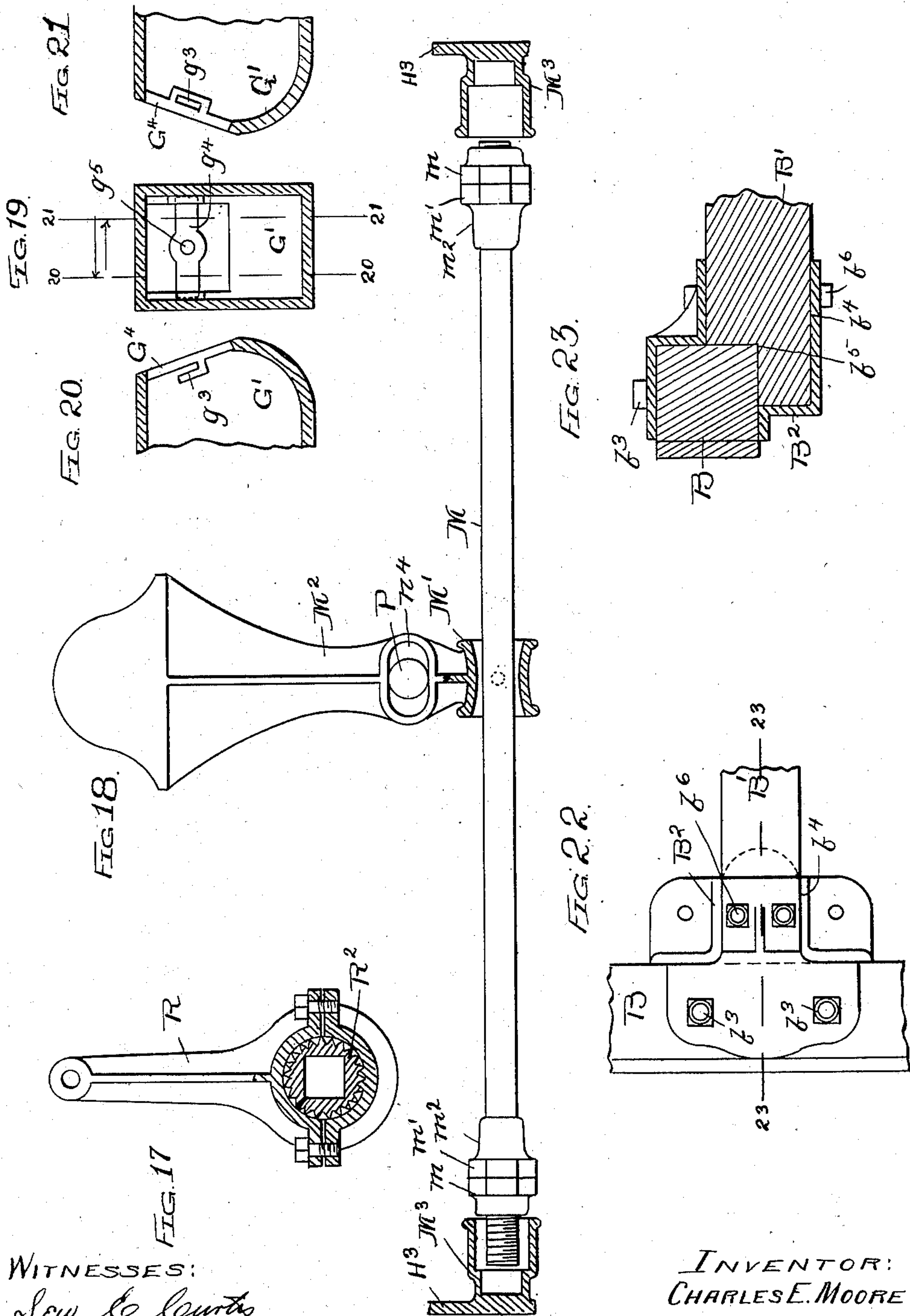
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(Application filed Jan. 26, 1899.)

(No Model.)

5 Sheets—Sheet 4.



WITNESSES:

Sec. E. Lewis
A. W. Munday

INVENTOR:
CHARLES E. MOORE

BY *Munday, Everts & Adams*

HIS ATTORNEYS.

No. 656,606.

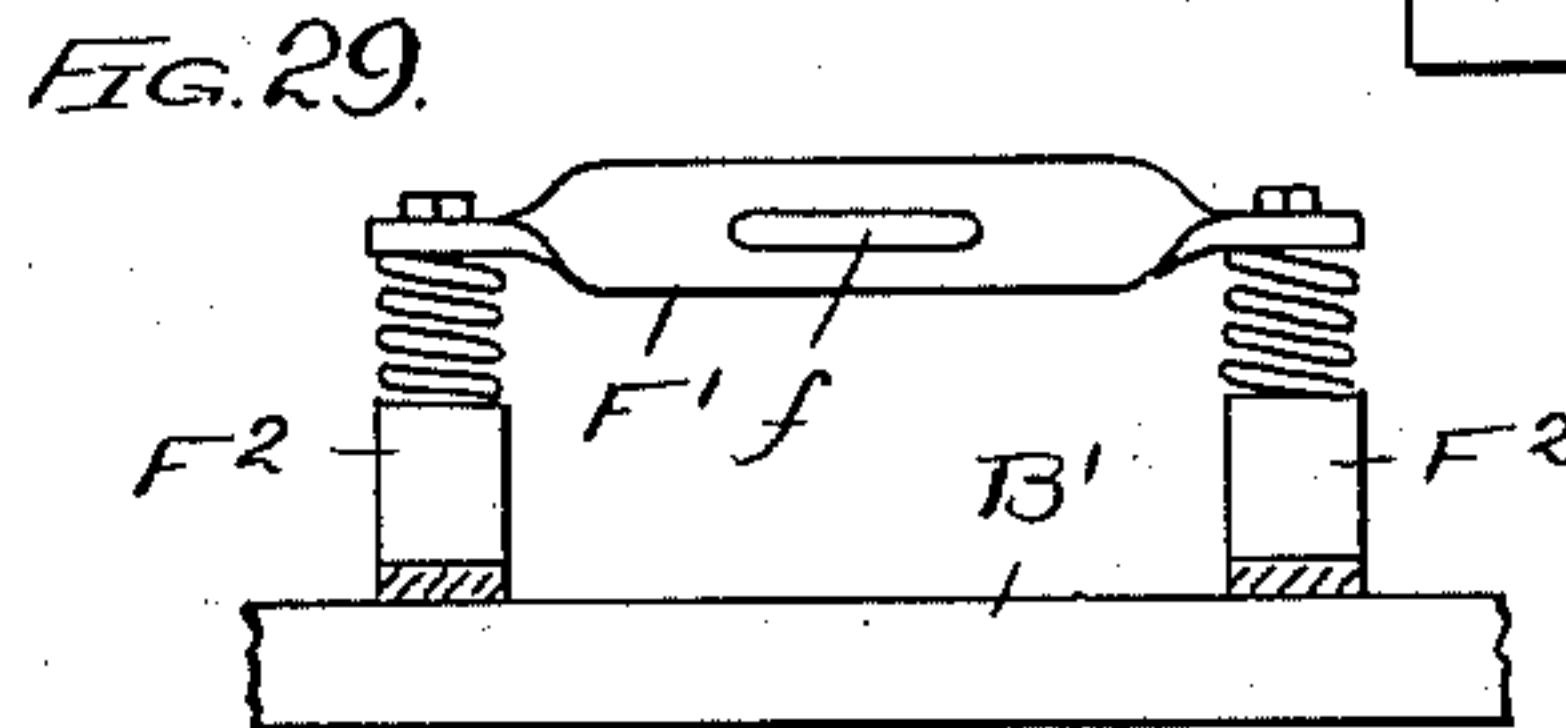
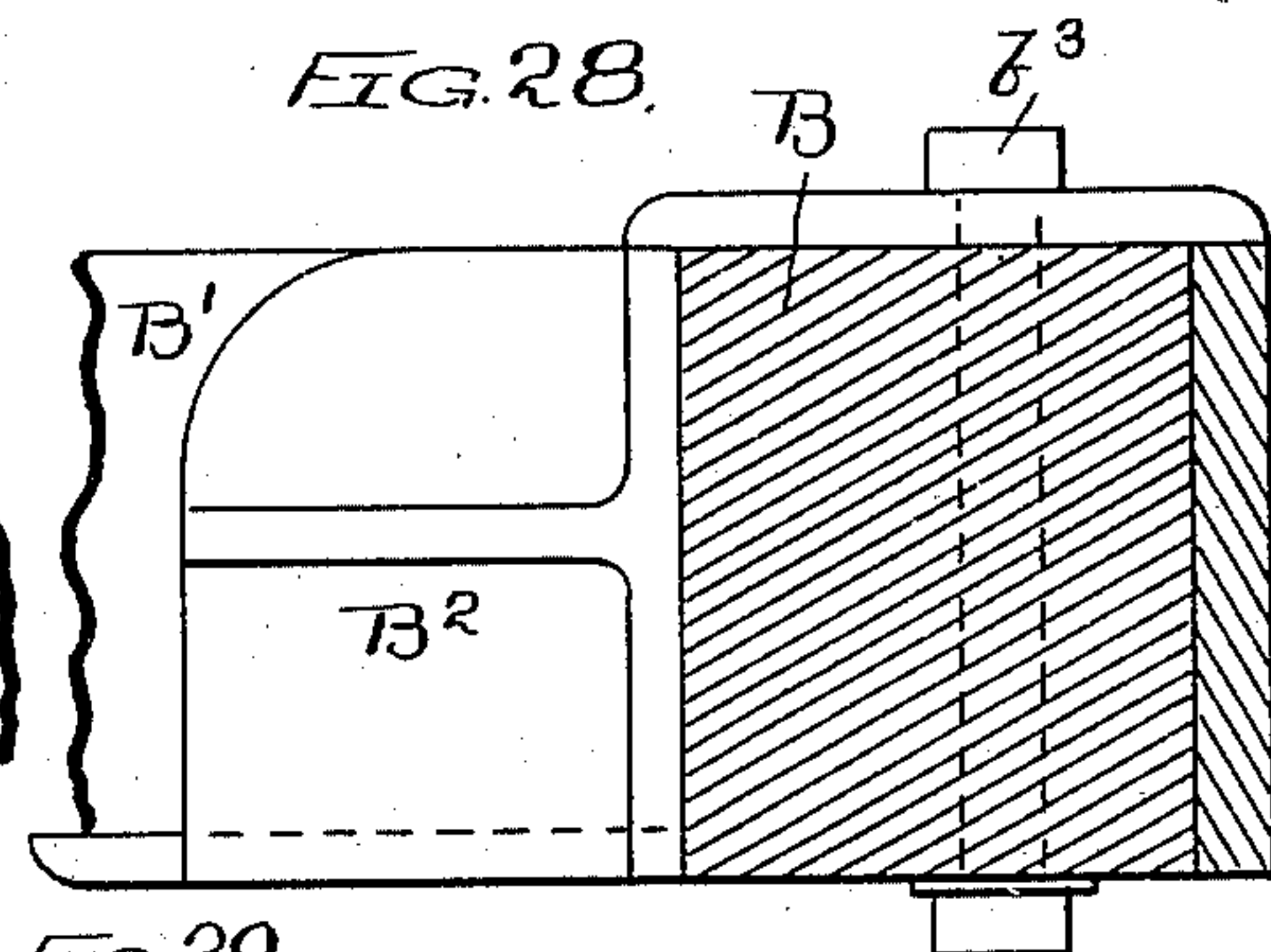
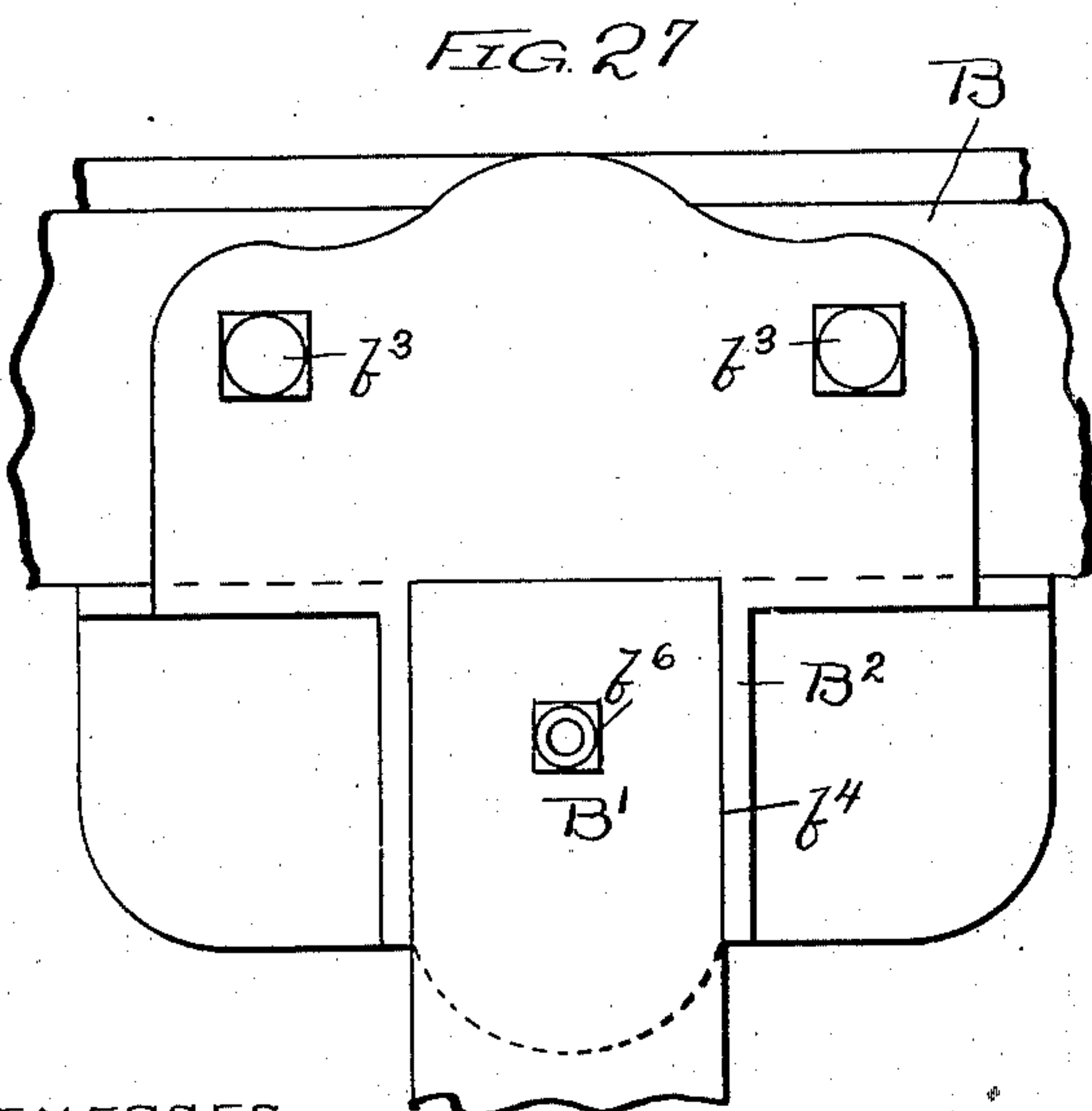
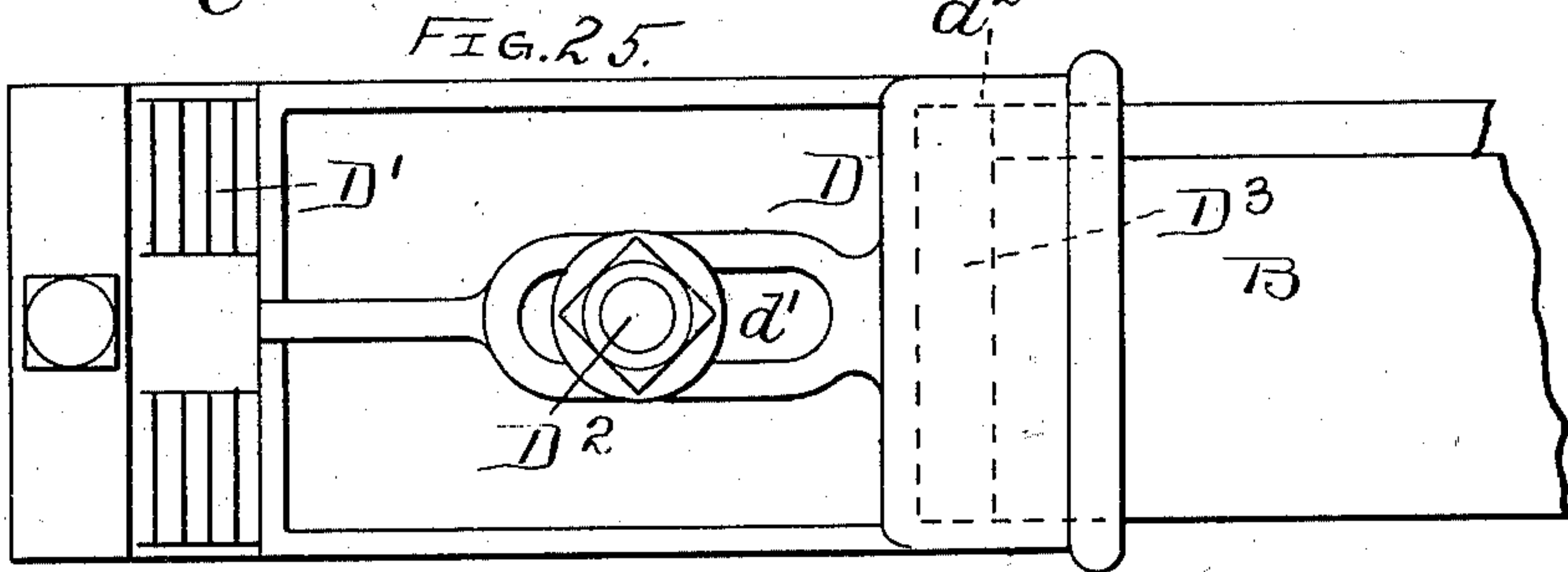
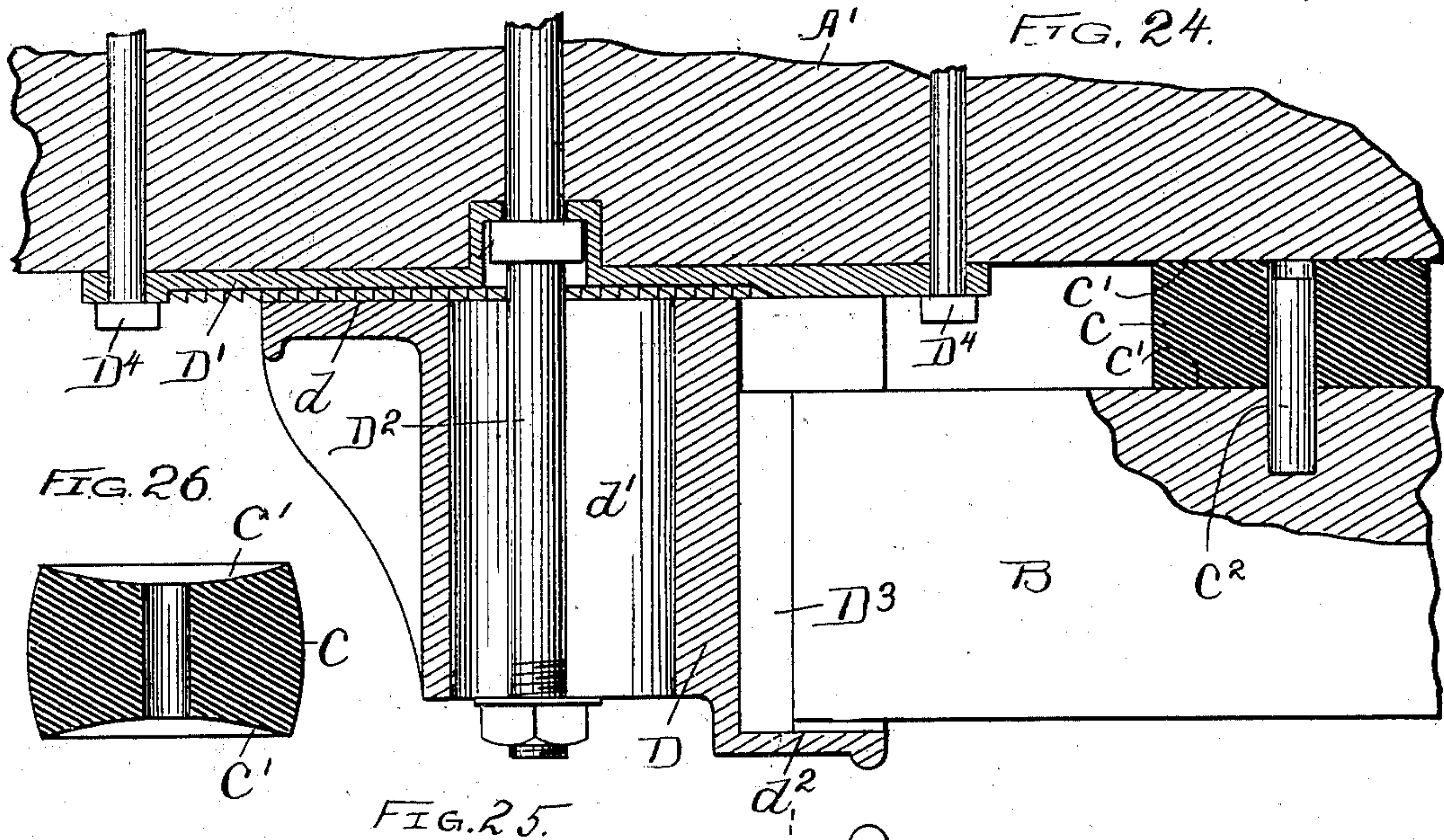
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(Application filed Jan. 26, 1899.)

(No Model.)

5 Sheets—Sheet 5.



WITNESSES
Sew E. Curtis
H. W. Munday.

INVENTOR:
CHARLES E. MOORE.
BY Munday, Davis & Adcock
HIS ATTORNEYS.

UNITED STATES PATENT OFFICE.

CHARLES E. MOORE, OF CHICAGO, ILLINOIS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO ELMYR A. LAUGHLIN, OF SAME PLACE.

MOTOR-CAR TRUCK.

SPECIFICATION forming part of Letters Patent No. 656,606, dated August 21, 1900.

Application filed January 26, 1899. Serial No. 703,445. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. MOORE, a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Motor-Car Trucks, of which the following is a specification.

My invention relates to improvements in electric-motor cars.

In electric-motor cars heretofore generally in use serious difficulties and objections have been experienced in practical operation from the sound and other vibrations communicated to the car-body from the motor-truck; from the tilting or teetering of the cars in rapid motion, owing to the limited base or distance between the wheels of the truck necessary to enable the truck to travel on the customary short curves; from the strain, friction, and side thrust upon the truck in passing around curves or from irregularities of the track; from the great amount of time and labor required in removing the car-body from the truck and changing car-bodies; from the time and labor necessarily involved in removing or changing the wheel-axles and other parts of the truck; from the difficulty in keeping the brakes and other parts of the truck in proper adjustment for efficient operation, and in preventing the journals from wearing, cutting, and heating, owing to the unavoidable conditions of mud and dust in which the cars are frequently or generally operated.

The object of my invention is to provide a motor-car truck of a simple, efficient, and durable construction which may be cheaply manufactured and which will at once overcome or obviate all these objections or difficulties, the truck being constructed and designed and combined with the car-body, so as to unite in itself in a coöperative manner efficient means for at one and the same time preventing sound or other vibrations being communicated to the car-body from the motor-truck; efficient means for preventing the tilting or teetering of the car in rapid motion on uneven or irregular tracks; efficient means for preventing binding, side thrust, and wear and strain when the car is passing around curves or over irregular tracks; efficient

means for quickly and easily removing the car-body from the truck, for quickly and easily removing wheel-axles, truss-rods, and other parts of the truck, for readily keeping all the parts of the truck, including brake-shoes, in proper adjustment for efficient operation, and for preventing all danger of the journals wearing or heating, the means or mechanisms for said purposes being all arranged and combined together in such manner that the means employed for accomplishing one result does not interfere or prevent the successful fulfilment of the other conditions necessary to produce a thoroughly-efficient, durable, and practical street-railway electric-motor car.

My invention consists in the novel construction of parts and devices and in the novel combinations of parts and devices herein shown and described and which I employ to accomplish the object or result above set forth.

To at once secure the car-body and truck-frame together in such manner that the car-body can be quickly and easily removed from the truck and so that the sound and other vibrations may be prevented from being transmitted from the truck to the car-body, I combine with the car-body and truck-frame cupped rubber cushions, which are placed between and pressed between the car-sills and truck-sills, the cup shape of the cushions causing a vacuum when compressed, and thus securing the car-body and truck-frame together by atmospheric pressure or suction, thereby doing away with bolt connections between the car-body and truck-frame, which serve to transmit sound and other vibrations and require to be removed and occasion time and trouble in removing or changing the car-bodies from one truck-frame to another, and retaining-castings adjustably secured to the car-body and having recesses to receive the ends of the truck-sills with rubber insulation between serve to retain the truck and car-body in perfect square, while at the same time not interfering with the sound insulation between car-body and truck or the quick removal of the car-body from the truck, the longitudinal movement or adjustment of the

retaining angle-casting permitting it to be freed from the end of the truck-sill. The slotted or adjustable connection between the retaining-casting and the car-body also allows
 5 for any variation in length of the longitudinal truck-sills or other variation which might interfere with the quick and easy adjusting or positioning of any car-body to any truck. To at once prevent tilting or teetering of the car
 10 and all unnecessary side thrust, jar, strain, friction, and wear of the truck in passing around curves, I combine with the car-body a truck with a long wheel-base, one having a sufficient distance between the wheels to pre-
 15 vent tilting or teetering of the car when in rapid motion, a truck-frame having a swing motion in respect to the axles to prevent side thrust on the rails in going around curves, and a motor having a swinging or side motion
 20 in respect to the truck-frame. This also tends greatly to prevent unnecessary jar and sound or other vibrations in the car itself.

In the accompanying drawings, forming a part of this specification, Figure 1 is a side
 25 elevation of an electric-motor car embodying my invention, only a small portion of the car-body being shown to enable the truck and the means connecting the truck with the car-body to be drawn on a larger scale. Fig. 2
 30 is a plan view of the motor-truck, the motor on one of the axles, however, being omitted. Fig. 3 is an enlarged side elevation, partly in section, showing the pedestal and cooperative parts. Figs. 4 and 5 are horizontal sections
 35 on lines 4 4 and 5 5 of Fig. 3. Fig. 6 is a vertical section on line 6 6 of Fig. 3. Figs. 7, 8, and 9 are detail views of parts hereinafter to be described. Fig. 10 is a bottom view of the pedestal. Fig. 11 is a top view of the pedestal-binder. Fig. 12 is a plan view of the
 40 journal-bearing. Fig. 13 is a section on line 13 13 of Fig. 12. Fig. 14 is a detail view of the brake mechanism and hanger. Figs. 15 and 16 are details of the brake-lever and means for securing the same to the brake-
 45 shaft. Fig. 17 is a detail view showing the means for securing the brake-kick-back lever to the brake-shaft. Fig. 18 is a detail view showing the manner of securing and releasing the truss-rod between the pedestals. Fig. 19 is
 50 a vertical section of the oil-box, showing the manner of securing the oil-box cap. Figs. 20 and 21 are sections on lines 20 20 and 21 21 of Fig. 19 looking, respectively, in the di-
 55 rections indicated by the arrows. Fig. 22 is a plan view of the pocket for securing the car-sill, from which the motor is supported. Fig. 23 is a section on line 23 23 of Fig. 22. Fig. 24 is a detail longitudinal vertical section showing the connection between the car-
 60 body sills and truck-sills. Fig. 25 is a bottom view of same. Fig. 26 is a detail view of one of the cupped rubber cushions. Fig. 27 is a plan view showing the pocket or means
 65 for connecting the longitudinal and end cross-sills. Fig. 28 is an end view, partly in sec-

tion, showing the longitudinal truck-sill in section; and Fig. 29 is a detail view showing the slotted or sliding connection between the motor and the truck-frame.

In the drawings similar letters of reference indicate like parts throughout all the figures.

In said drawings, A represents the car-body; A', the longitudinal sills of the car-body; B, the longitudinal sills of the truck-
 75 frame, and B' the transverse sills or beams of the truck-frame.

C C are the cupped rubber cushions, which are interposed and compressed between the car-sills A' and the truck-sills B and which,
 80 by reason of their cup-shaped upper and lower surfaces C' C', produce when compressed between the car-body and truck a vacuum or atmospheric pressure or suction connection
 85 between the car-body and truck, which serves to firmly connect the two together and at the same time produce an effectual sound and vibration insulation between the car-body and truck, as all bolts or direct connections be-
 90 tween the car-body and truck are thus dispensed with. This also, in connection with the retaining or angle castings about to be described, enables the car-body to be readily and quickly removed from the truck. The
 95 cupped rubber cushions C are preferably provided with a central hole to receive a wooden pin C², which fits in a hole in the truck-sill B to retain the rubber cushions in position.

D D are the retaining-castings, by which the truck-frame is held in perfect square with
 100 the car-body. These retaining-castings are of an angle shape and are rigidly but adjustably secured to the car-body sills A' by means of a notched plate D' and bolt D², the retain-
 105 ing-casting D having a notched upper surface d to engage the notches of the plate in any position desired and said retaining-casting having a slot d', through which the bolt
 110 D² passes, to enable the retaining-casting to be slipped longitudinally when the nut on the bolt D² is loosened. The notched plate D' is secured to the car-body sill A' by bolts D⁴, and the retaining-casting D, which is of an
 115 angle shape, has a recess or socket d² to receive the end of the longitudinal truck-sill B, a rubber cushion or insulation D³ being inserted between the truck-sill B and the retain-
 120 ing-casting D at the end of the sill, which is the only place where the truck-sill has any necessary contact with the retaining-casting when the car-body compresses the cupped
 125 rubber cushion C. The truck and car-body are thus held in perfect square with each other without interfering with the sound and vibration insulation between the car-body and truck produced by the rubber cushion C, be-
 130 fore described, and at the same time by simply loosening the nut on the bolt D² and slipping the adjustable retaining-casting D lengthwise of the car-body sill, as permitted
 by the slot d', the socket or recess of the retain-
 ing-casting may be freed from the end of

the truck-sill, thus permitting the car-body and truck to be readily detached without delay, trouble, or inconvenience.

The cross-sills B' of the truck are secured to the longitudinal sills thereof by box-shaped or angle castings B², secured by bolts b³ to the longitudinal sills B and having each a box-shaped recess or pocket b⁴ to receive the end of the cross-sill, which is furnished with a slight notch b⁵ to fit the longitudinal sill, thus avoiding the necessity of mortising and providing a very rigid joint without impairing the strength of the longitudinal sill in the least. Bolts b⁶ connect the cross-sills and the box-shaped castings B². As will be understood from Fig. 23, the box-shaped castings B² thus embrace and connect the longitudinal and cross sills of the truck.

The truck is one having a long wheel-base, the pairs of wheels E E and E' E' and the axles E' E' thereof being sufficiently far apart to prevent tilting or teetering of the car when in rapid motion and much farther apart than would be practicable in the old constructions of electric-motor cars heretofore in use, owing to the necessity or requirement that these motor-cars shall be capable of passing around the sharp curves at street-corners. To practically combine this long-wheel-base truck with the car-axles and the motor, one end of the frame of which motor is supported on the car-axles and the other upon the truck-frame, I provide the truck-frame with a swing-motion connection with the car-axles—that is to say, the truck-frame has a swing or transverse motion in the direction of the length of the car-axles sufficient to permit the long-wheel-base truck to pass around the sharpest curves, and I also provide a swing connection between the motor-frame and the truck-frame. By this combination of the long-wheel-base truck with a swing-motion truck-frame in respect to the axles, said truck-frame having also a swing motion in respect to the motor-frame, I am enabled to at once effectually prevent disagreeable tilting or teetering motion of the car when running rapidly and also avoid all strain, side thrust, friction, and wear occasioned by the cars passing around sharp curves or over irregular tracks and also avoid the shocks, jars, and vibrations of the car-body which have been incident to the motor-cars heretofore in use and wherein the motor-frame is rigidly connected at one end to the truck-frame.

F represents an electric motor of any suitable construction. Its frame is supported at one end on the car-axle E', the motor-frame moving transversely with the car-axle in respect to the truck-frame. The motor-frame has a slotted or sliding connection f' at its opposite end, with the motor-supporting bar F', attached to the bars F², secured to the cross-sills B' of the truck-frame, and the necessary swing motion of the truck-frame in respect to the axles is secured by links G, con-

necting the axle-boxes G' with the spring-seats G², carried by the pedestals H, which are secured by bolts h to the longitudinal sills B of the truck-frame. The upper plate H' of the pedestal is provided with a round hole for receiving the pedestal-bolt H², which has a round head h', with a square shoulder h². The round hole h⁴ in the pedestal-plate H' has a square slot h³ leading off from it large enough to admit the square shoulder h² of the pedestal-bolt H². The top spring-washer h⁵, which rests up against the under side of the pedestal-plate H' and surrounds the pedestal-bolt, has a tip or projection h⁶ reaching over and fitting into the round hole h⁴ in the pedestal-plate H' for receiving the pedestal-bolt H². When the pedestal-bolt H² is entered in the round hole h⁴ and shifted over into the square slot h³ and spring-washer h⁵ placed over it, with the tip or projection h⁶ of same placed in the round hole h⁴, the pedestal-bolt H² is held firmly in place and cannot be removed without first removing the washer. This enables the pedestal-bolt to be readily removed without serious inconvenience or lifting of the car-body.

K is the pedestal-binder. It has four V-shaped recesses K', which fit up and engage four wedge-shaped projections h⁷ on the bottom of the pedestal-jaws H³ H³, thereby preventing the binder from working loose and assisting the pedestal-bolts H² in securing a more perfect union and rigidity between the pedestal jaws and binder. The wedge on the binder never bottoms in recess of jaw. Consequently the wedge action is always maintained. The binder K has a lug or projection K² at each end reaching up into either side of the pedestal-jaw, thereby preventing the pedestal-jaws from being crushed together and insuring a perfect free action of the oil-boxes. The hole K³ at each end of the binder K, through which the bolt H² passes, is cast with a recess K⁴ or of a cup shape for receiving the nut h⁸ of the pedestal-bolt, so that in case the lower part of the pedestal strikes an obstruction the nut and thread of the pedestal-bolt are protected from bruising or injury. This construction also enables the binder to be readily removed without interfering with any truck truss or pedestal.

J J are the springs, the same being compressed between the upper plate H' of the pedestal and the spring-seat plate G². The spring seat or plate G² is provided with a slot g, through which the link G may be passed, and a shoe g' is then inserted between the link and the spring-seat plate G², as will be readily understood from Fig. 6 of the drawings.

The forward and rear pedestals H H are connected together by a truss-rod M, which passes through a bell-shaped or flaring sleeve M' in the center support M² for the truss-rod. The ends of the truss-rod fit in sockets or sleeves M³, cast upon the pedestal-jaws to receive the truss-rod. The truss-rod is pro-

vided at each end with a pair of threaded nuts $m m'$, the former adapted to fit in and abut against the sleeve or socket M^3 and the latter, m' , serving as a jam-nut. The nut m' is cast with a sleeve on its back or rear portion large enough to pass over the threads on the truss-rod and form a receptacle for a thick mixture of plumbago and tallow or other material to protect against rust. This sleeve m^2 on the nut protects the threads of the truss-rod from bruising, rust, or dirt and makes the nut easy to turn or adjust when necessary, effectually preventing the nut becoming rusted fast on the rod. The bell-shaped sleeve M' is large enough and the threads on the ends of the truss-rod long enough to permit sufficient longitudinal movement of the truss-rod and sufficient tilting of the truss-rod to enable one end of it to be cleared from the socket M^3 to remove the truss-rod without loosening or disturbing the pedestal or the support M^2 for the truss-rod and tumbling-shaft of the brake mechanism mounted in said support M^2 .

M^4 is the truss-rod, extending from the lower end of the pedestal-jaw to the truck-frame. The lower end of this truss-rod fits in a socket m^3 , with which the pedestal is provided for this purpose, and its upper end is provided with nuts $m m'$, the same as before described, and fits in a socket M^3 , similar to the socket M^3 , before described.

The journal-bearing G^3 is provided with a cup or cavity g^2 at its top, which can be filled with a mixture of plumbago and tallow. Small holes or rents extend through the bearing from top cavity or cup to the journal. In case the journal becomes abnormally heated from lack of oil or other causes the heat will melt the tallow compound and cause it to run down through the holes or rents and lubricate the journal, thus reducing temperature of the same and preventing heating of journals and bearings. The rim G^4 of the oil-box G' is provided with slots g^3 , into which a bar g^4 with a bolt g^5 in the center slips. The lid or cover G^6 of the oil-box has a hole in the center, through which said bolt passes, and the lid is held firmly by this bolt, a leather washer or lining g^6 around the edge or contact-points securing a perfectly-tight fit between the cover and oil-box rim, as the cover is held from the center and not at the sides, as in hinged lids. This prevents oil from escaping and dirt and dust from entering the oil-box. This construction will be readily understood from Figs. 6, 19, 20, and 21 of the drawings.

In order to secure an even and proper bearing of the brake-shoe against the wheel and secure efficient and reliable operation at all times, the brake-shoe hanger N is connected to its supporting-link N' by a ball-and-socket joint $n n'$, said supporting-link N' , having also a ball-and-socket joint $n n'$ at its upper end to connect it with the truck-frame. The two parts $n n'$ of each socket have a yielding washer n^2 , of rubber or other yielding mate-

rial, between them, so that in case of wear by tightening the bolts n^3 , uniting the two parts of the socket, the washer may yield enough to compensate for such wear. This ball-and-socket means of sustaining or supporting the brake-shoe hanger gives it a perfectly-free and unrestricted movement in all directions, which at all times insures a perfect uniform position of the shoes relative to the wheels, and in applying the brakes insures a perfectly-uniform wear on the contact-surface of the shoe. The brake-shoe hangers N are connected to the tumbling-shaft or brake-shaft P by the brake-rod P' and connecting-lever P^2 , the latter on the squared end of the shaft. The brake-lever P^3 , which carries the pulley P^4 , connecting with the brake-chains, is adjustably secured on the connecting-lever P^2 , this being done by providing the hub-collar or sleeve p of the connecting-lever P^2 with notches or serrations p' , around which fits a cap or collar P^5 , connected with the brake-lever P^3 , and which cap or collar has inside notches or serrations on a small section of its inner surface. By loosening the nuts uniting the two parts of the outer segmentally-notched collar secured to the brake-lever the brake-lever may be turned or adjusted to any position desired, and then by again tightening the nuts the two collars $p P^5$ will be firmly secured together by the engagement of their notched portions. This enables the brake-levers to be quickly and easily adjusted.

R is the kick-spring lever on the brake-shaft, the same being connected to the kick-spring R' and serving to free the brake-shoes from the wheels. This kick-spring lever is adjustably secured to the brake-shaft or tumbling-shaft P by an inside collar R^2 , having notches or serrations on its outer surface and an outer two-part collar having notches or serrations on a portion of its inner surface similar to the notched collars just above described for adjustably connecting the brake-lever to the lever connecting the brake-shoes with the brake-shaft. The collar R^2 is, however, a split collar to enable it to be tightened upon the shaft, and thus held in position longitudinally by the clamping action of the two parts of the outer collar. The brake-shaft or tumbling-shaft P fits in a slot n^4 in the tumbling-shaft and truss-rod support M^2 . This slotted support for the tumbling-shaft insures at all times a perfect equalization of pressure between the brake-shoes and all the wheels of the truck.

I claim—

1. In a street-railway electric-motor car, the combination with the car-body of a motor-truck frame, slotted longitudinally-adjustable retaining-castings secured to the car-body, and having recesses or sockets to receive the ends of the truck-sills, and cupped rubber cushions compressed between the car-body and truck-frame and securing the car-body and truck-frame together by suction, vacuum or atmospheric pressure without bolts

or direct connections and insulating the car-body from sound or vibration transmission from the motor-truck, and permitting the ready removal of the car-body from the truck, substantially as specified.

2. In a motor-car, the combination with a car-body, of a motor-truck and cupped rubber cushions inserted and compressed between the car-body and truck-frames to secure the same together by suction or atmospheric pressure without bolts, and insulate the car-body from sound-transmissions from the motor-truck, substantially as specified.

3. In a car, the combination with a car-body, of a truck upon which the car-body rests, rubber cushions inserted and compressed between the car-body frame and truck-frame and serving to secure said frames together by suction or atmospheric pressure without bolts and to insulate the car-body from sound-transmissions from the truck, said rubber cushions having normally or before compression cup-shaped upper and lower surfaces, substantially as specified.

4. In a motor-car, the combination with a car-body, of a motor-truck, longitudinally-adjustable retaining-castings secured to the car-body, and provided with sockets or pockets to receive the ends of the truck-sills, and permitting the car-body to be removed from the truck by loosening a bolt and slipping the retaining-casting in the direction of the car-sill, substantially as specified.

5. In a motor-car, the combination with a car-body, of a motor-truck, longitudinally-adjustable retaining-castings secured to the car-body, and provided with sockets or pockets to receive the ends of the truck-sills, and permitting the car-body to be removed from the truck by loosening a bolt and slipping the retaining-casting in the direction of the car-sill, and cushions of rubber or other material inserted between the ends of the truck-sills and the retaining-castings, substantially as specified.

6. In a motor-car, the combination with a car-body having serrated plates secured to the under faces of the car-body sills, of longitudinally-adjustable angle-shaped retaining-castings, each having a serrated upper face to engage said serrated plate, and a slot for the bolt to pass through and provided with a recess or pocket to receive the end of the truck-sill, substantially as specified.

7. In a motor-car, the combination with a car-body having serrated plates secured to the under faces of the car-body sills, of longitudinally-adjustable angle-shaped retaining-castings, each having a serrated upper face to engage said serrated plate, a slot for the bolt to pass through and provided with a recess or pocket to receive the end of the truck-sill, and cushions inserted and compressed between the car-body and truck-sills, substantially as specified.

8. In a motor-car, the combination with a car-body having serrated plates secured to

the under faces of the car-body sills, of longitudinally-adjustable angle-shaped retaining-castings, each having a serrated upper face to engage said serrated plate, a slot for the bolt to pass through and provided with a recess or pocket to receive the end of the truck-sill, cushions inserted and compressed between the car-body and truck-sills, and cushions inserted between the ends of the truck-sills and said retaining-castings, substantially as specified.

9. In a motor-car, the combination with the car-body, of a motor-truck having a long wheel-base, substantially as described, to prevent tilting or teetering motion of the car-body, and provided with a swing-motion truck-frame in respect to the wheel-axes, and with a motor-frame having a sliding or swing motion connection with the truck-frame to permit the long-wheel-base motor-truck to pass freely around sharp curves without side thrust, binding, strain or friction, said motor-truck having parallel axles and fixed pedestals secured to the truck-frame in which the journals of the axles fit to maintain the axles parallel, substantially as specified.

10. In a motor-car, the combination with a car-body, of a long-wheel-base motor-truck having a swing-motion truck-frame in respect to the axles, and a swing-motion motor-frame in respect to the truck-frame, said motor-truck having parallel axles and fixed pedestals secured to the truck-frame in which the journals of the axles fit to maintain the axles parallel, substantially as specified.

11. In a motor-car, the combination with the car-body, of a motor-truck, upon the frame of which the car-body is mounted, a pedestal secured to the under side of the truck-sill and provided with a central hole for the pedestal-bolt in its upper plate furnished with a square slot to admit the square shoulder of the pedestal-bolt, a pedestal-bolt having a round head with square shoulder and a top spring-washer resting against the upper side of the pedestal-plate, and having a projection reaching over and fitting into the round pedestal-bolt hole in the pedestal-plate, whereby the pedestal-bolt is held firmly in place and at the same time enabled to be removed without inconvenience or lifting of the car-body, substantially as specified.

12. In a motor-car, the combination with the car-body, of a motor-truck having a long wheel-base and a swing-motion truck-frame, in respect to the axles, and a swing-motion motor-frame in respect to the truck-frame, and fixed pedestals secured to the truck-frame, parallel wheel-axes, axle-boxes G' , spring-seat plates G^2 carried by the pedestals, links G , said spring-seat plates G^2 provided with slots g for links G to pass through, and a shoe g' inserted between said links and said spring-seat plates, substantially as specified.

13. In a motor-car, the combination with the car-body, of a motor-truck having a long wheel-base and a swing-motion truck-frame,

fixed pedestals secured to the truck-frame, parallel wheel-axles, axle-boxes G' , spring-seat plates G^2 provided with slots g , and links G adapted to pass through said slots, a shoe g' inserted between said links and said spring-seat plates, and a motor-frame having a swing motion in respect to said truck-frame, substantially as specified.

14. In a motor-car, the combination with the motor-truck frame with the pedestals secured thereto, and a binder secured to the pedestal-jaws, the pedestal-jaws and binder being provided with wedge-shaped projections and recesses and a pedestal-bolt securing the binder to the pedestal, said wedge-shaped projections and recesses preventing the binder from working loose and assisting the pedestal-bolt in securing a perfect union and rigidity between pedestal-jaws and binder, substantially as specified.

15. The combination with a pedestal, of a binder provided with a recess to receive and protect the pedestal-bolt and nut, substantially as specified.

16. In a truck, the combination with pedestal-jaws having sockets to receive the ends of the truss-rod, a truss-rod provided with threaded ends and furnished with nuts to bear against said sockets, and a central support for the truss-rod having a flaring or bell-shaped sleeve to receive the truss-rod and permit the same to be slipped and tilted to disengage one end of the rod from the socket on the pedestal when the nuts are properly

turned, and thus enable the truss-rod to be removed without loosening or removing the pedestal-jaws or truss-rod support, substantially as specified.

17. In a truck, the combination with the longitudinal sills of the frame, of the cross-sills, each slightly notched into the longitudinal sills, the notched ends of the cross-sills projecting under the longitudinal sills, with the shoulders of the notches abutting against the sides of said longitudinal sills, and box-shaped connecting-castings bolted to the longitudinal sills, provided with flanges fitting above and below the longitudinal sills and embracing the same and having a recess or socket to receive the end of the cross-sill, thus securing a rigid joint without impairing the strength of the longitudinal sill, substantially as specified.

18. In a car-truck, the combination with the truck-frames and pedestals provided with sockets to receive the ends of the truss-rods, truss-rods having threaded nuts m on the opposite ends thereof abutting against said sockets, and jam-nuts m' on the opposite ends of the truss-rods furnished each with a sleeve m^2 at its rear side to surround and protect the threads on the truss-rod from bruising and to receive a protecting material against rust, substantially as specified.

CHARLES E. MOORE.

Witnesses:

H. M. MUNDAY,
EDMUND ADCOCK.