

No. 721,019.

PATENTED FEB. 17, 1903.

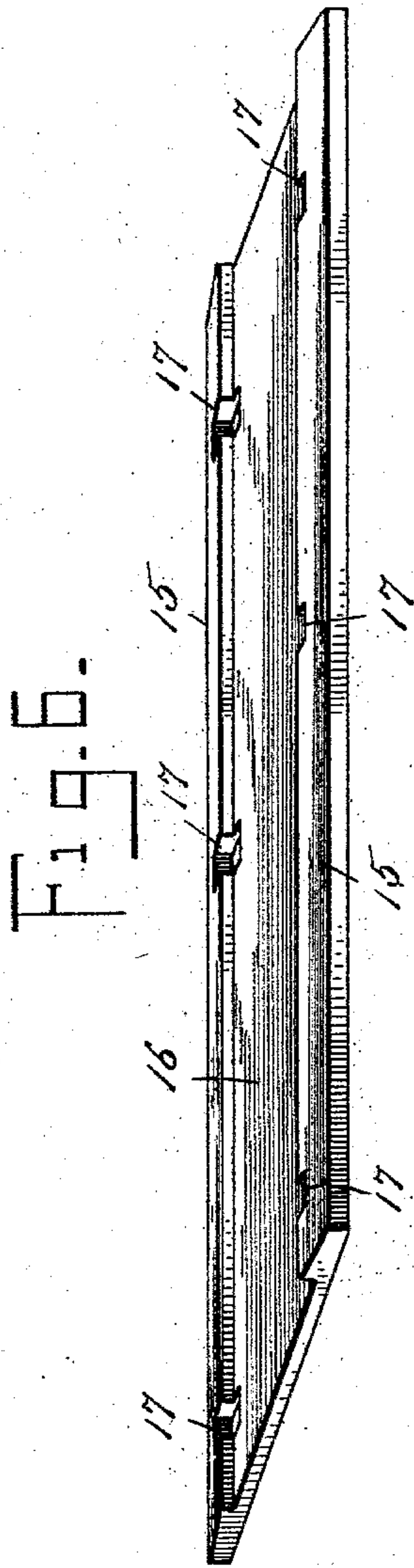
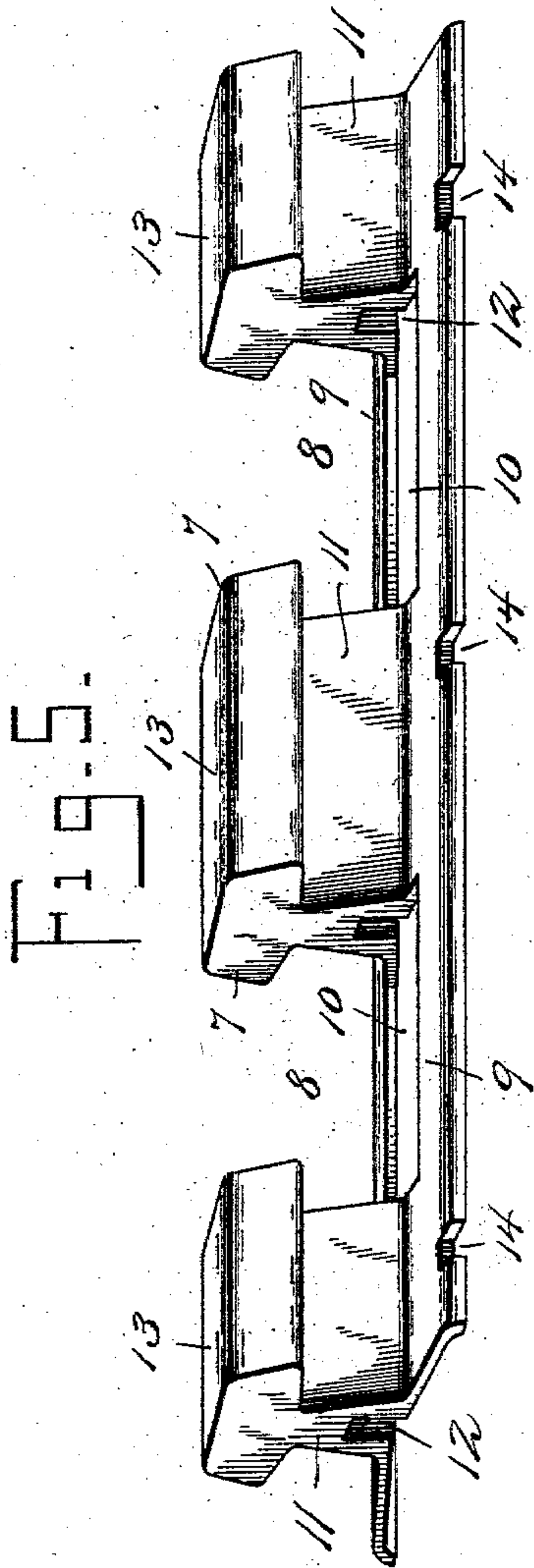
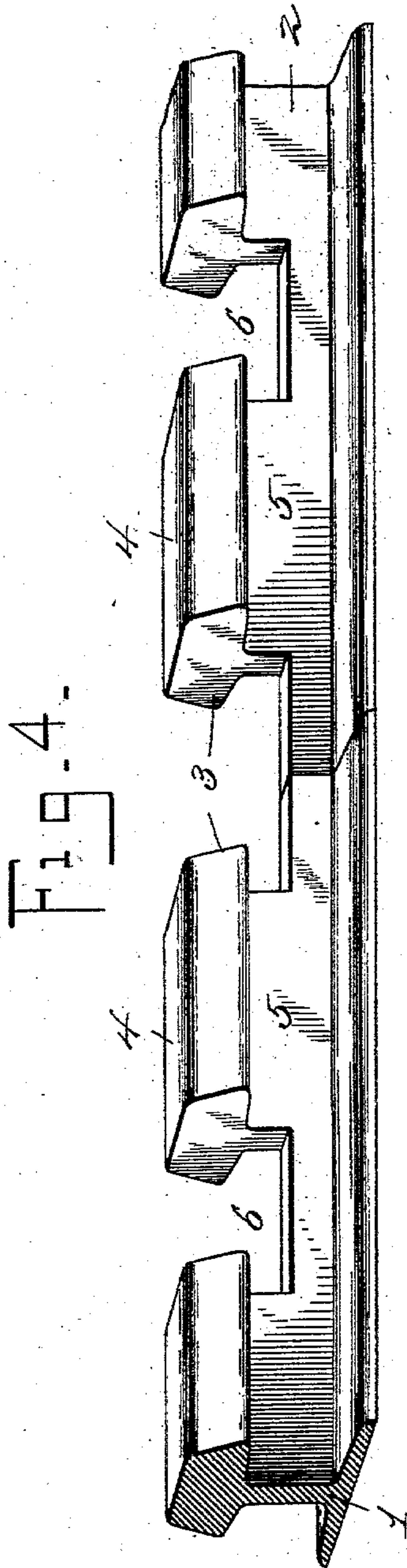
R. P. CLOVER & J. L. JOHNSTON.

RAIL JOINT.

APPLICATION FILED AUG. 16, 1902.

NO MODEL.

2 SHEETS—SHEET 2.



Witnesses

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No. 721,020.

PATENTED FEB. 17, 1903.

G. F. CONNER.
STEERING GEAR FOR TRACTION ENGINES.

APPLICATION FILED FEB. 10, 1902.

NO MODEL.

3 SHEETS—SHEET 2.

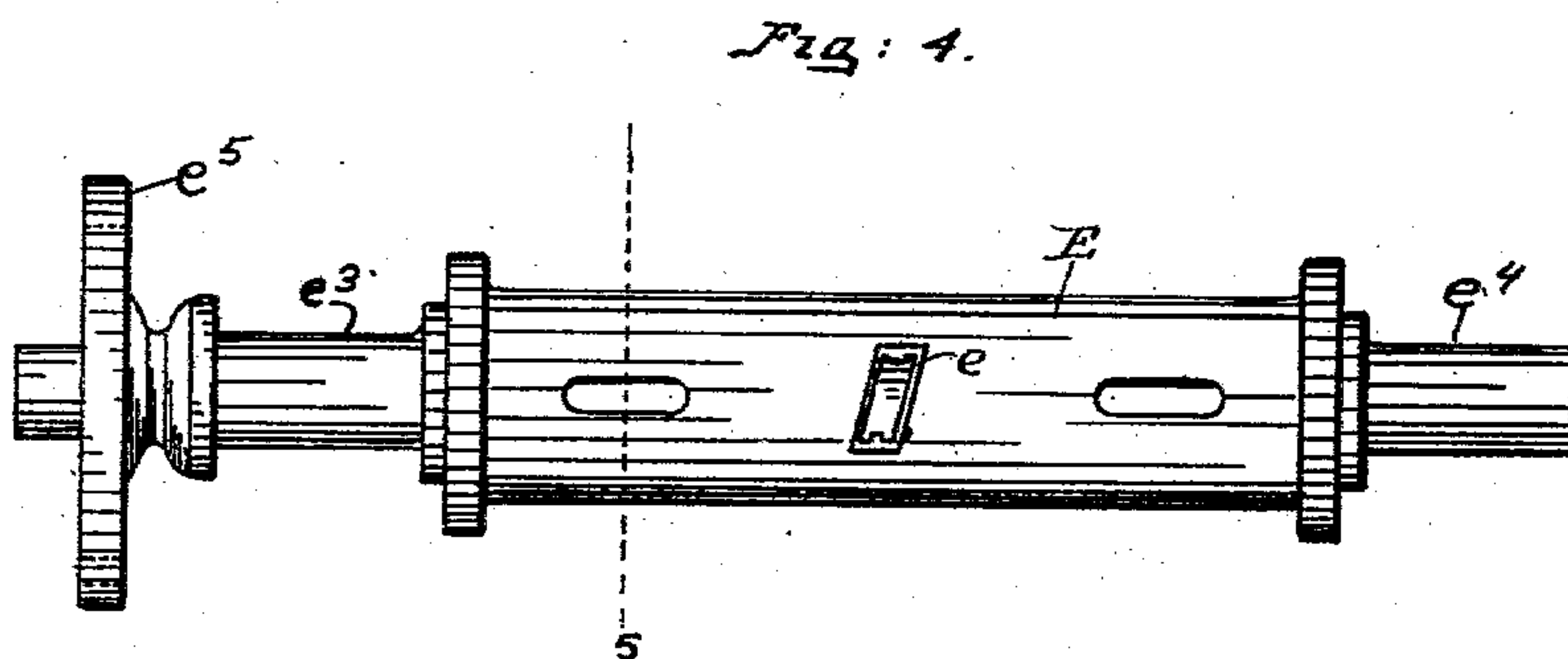
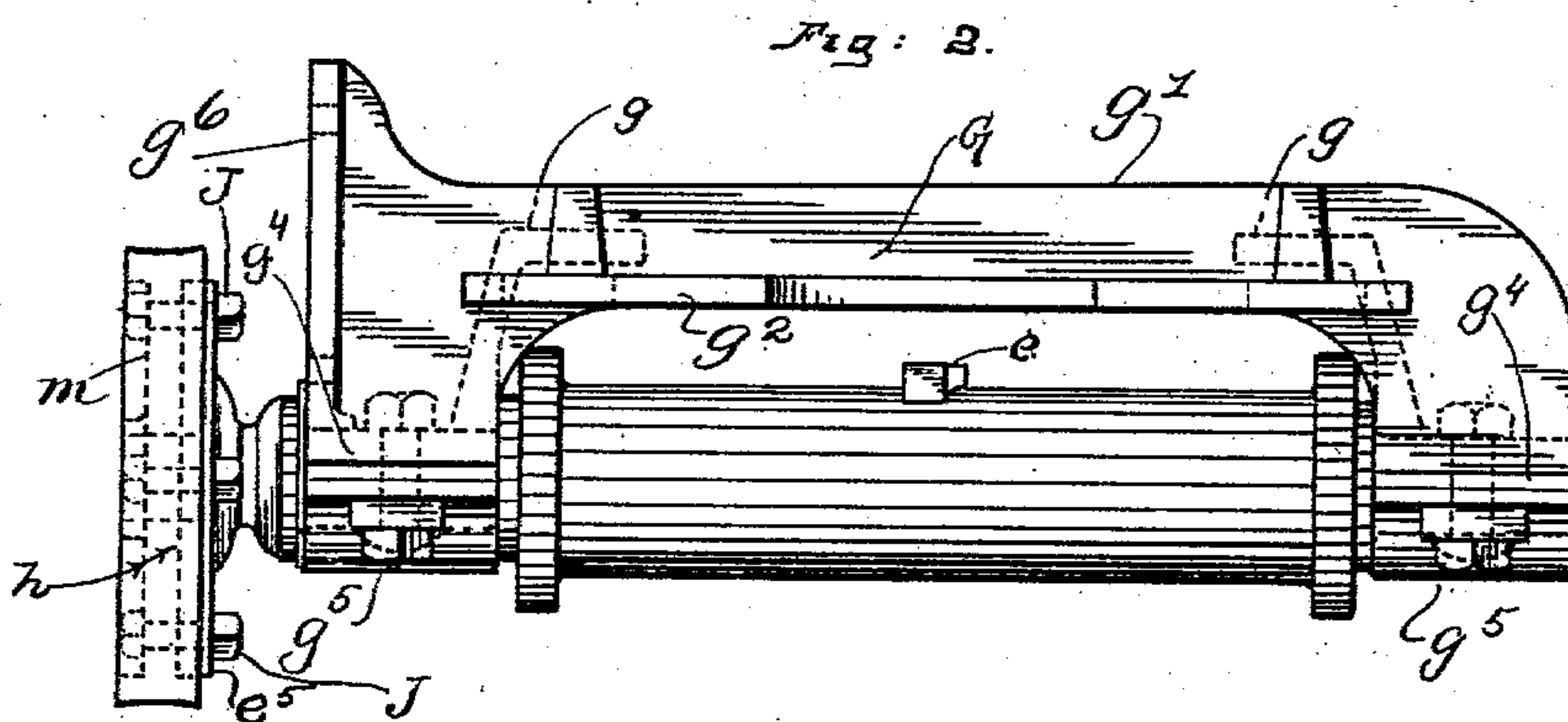
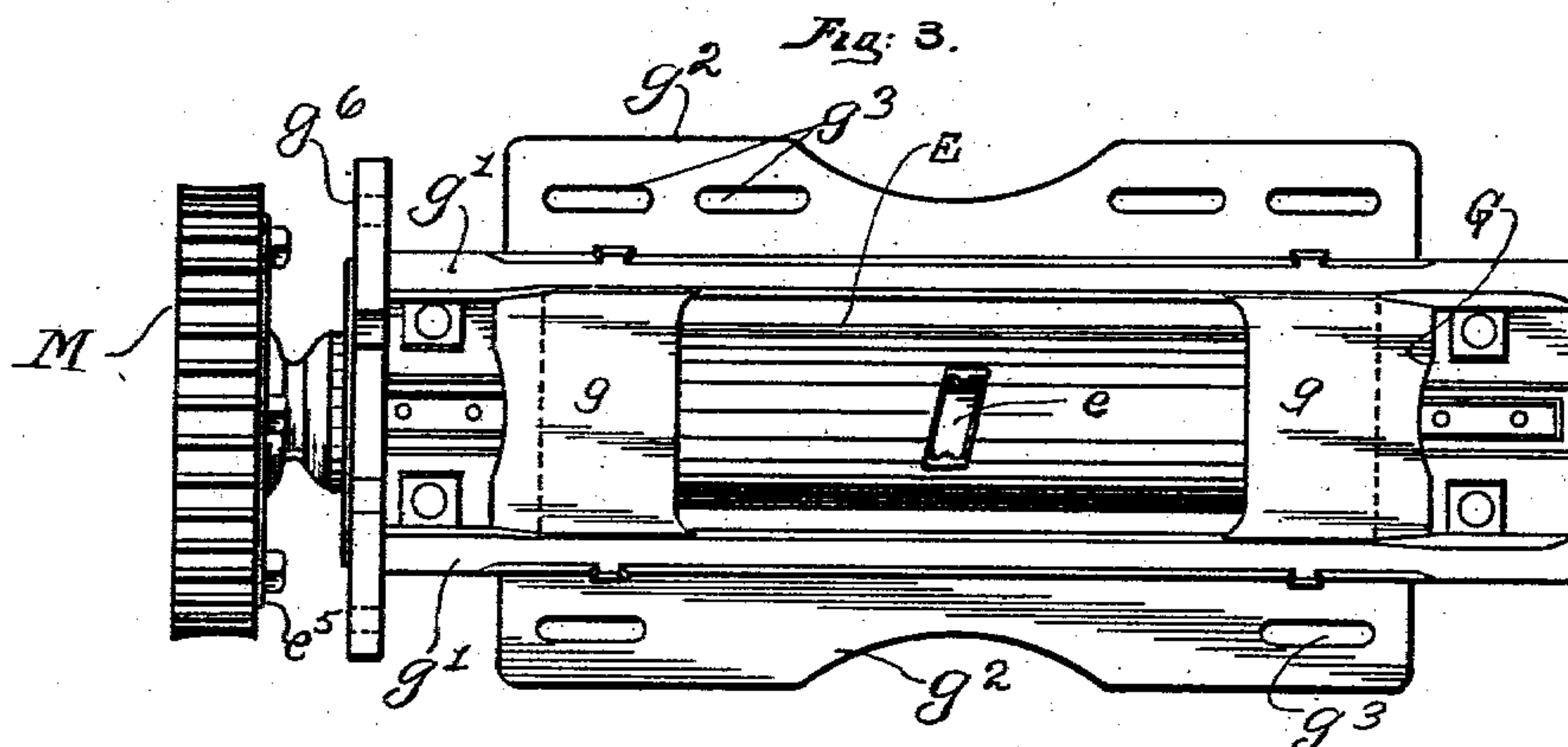
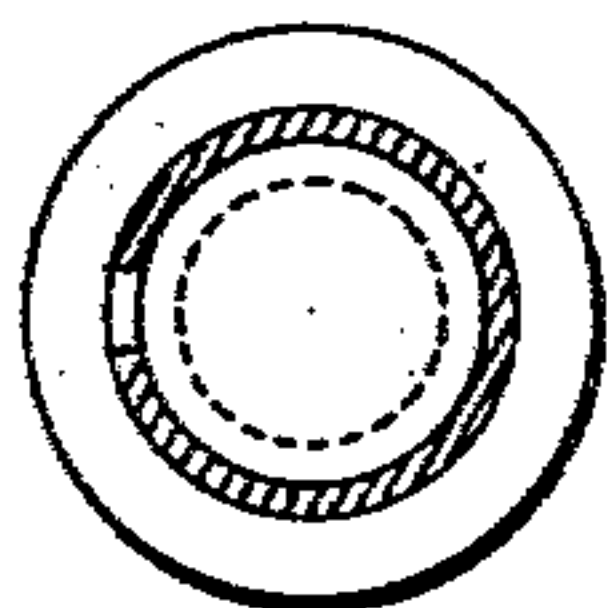


Fig. 5.



Witnesses.
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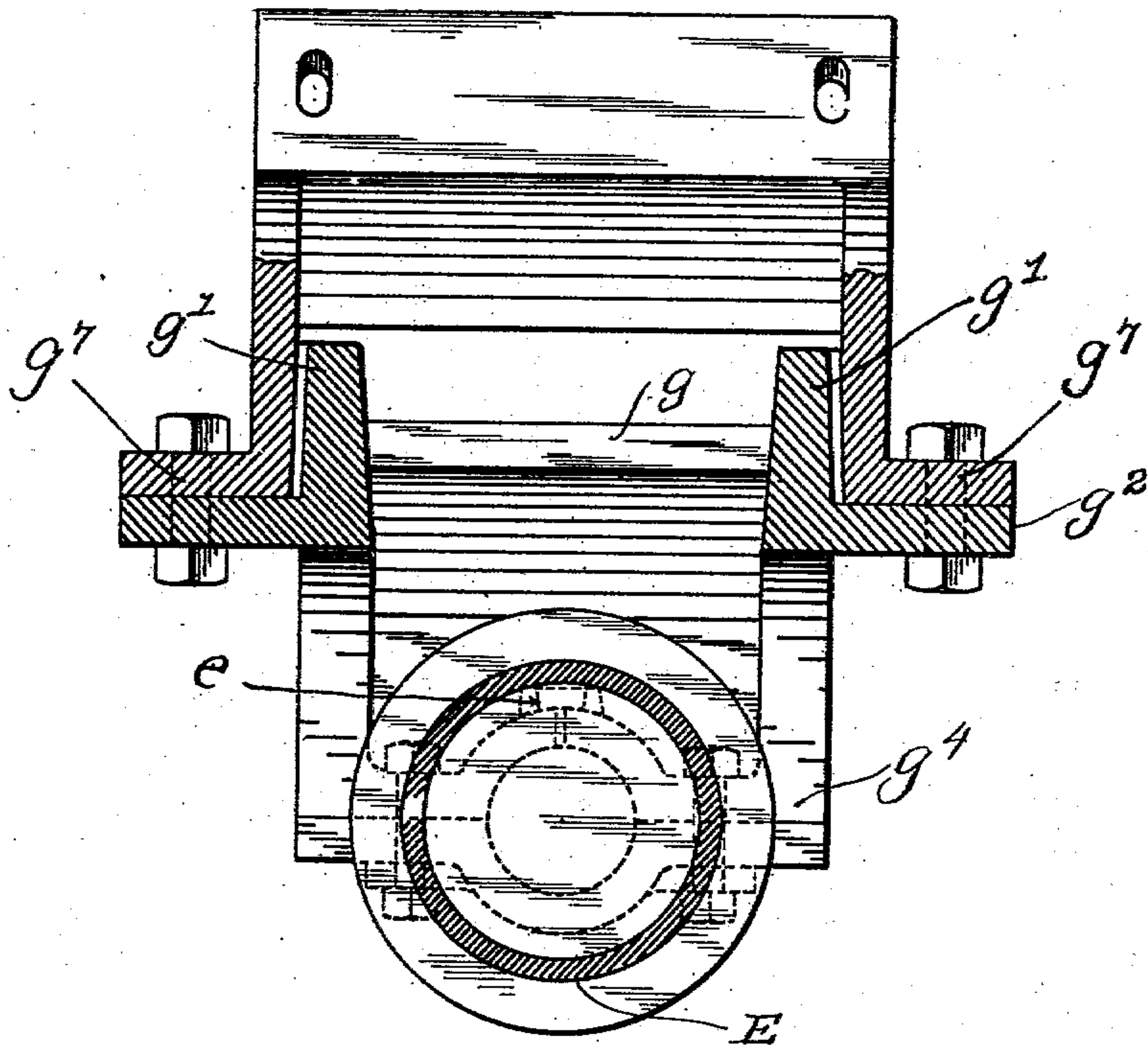
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STEERING GEAR FOR TRACTION ENGINES.

APPLICATION FILED FEB. 10, 1902.

NO MODEL.

3 SHEETS—SHEET 3.

Fig. 6



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UNITED STATES PATENT OFFICE

GEORGE F. CONNER, OF PORT HURON, MICHIGAN.

STEERING-GEAR FOR TRACTION-ENGINES.

SPECIFICATION forming part of Letters Patent No. 721,020, dated February 17, 1903.

Application filed February 10, 1902. Serial No. 93,333. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. CONNER, a citizen of the United States, residing in the city of Port Huron, county of St. Clair, and State of Michigan, have invented certain new and useful Improvements in Steering-Gears for Traction-Engines, of which the following is a full, clear, and exact specification.

This invention relates to improvements in steering-gears for traction-engines.

The usual steering-gear for the purpose specified consists of a drum secured to the engine frame or boiler in rear of the steering-wheels and a cable or chain fastened at its ends to either end of the forward axle, its middle portion being given a wrap or turn around the drum. The drum is usually rotated as desired by a hand-wheel near the operator's station appropriately geared to the drum-shaft. The shock and tremor imparted to this type of steering-gear by the forward wheels of the engine as they traverse an ordinary road tend to loosen the keys, set-screws, and other interlocking parts of the device and frequently to shear them off completely.

The object of this invention is to eliminate the possibility of any loosening of the parts from vibration or shock and to provide a perfectly secure connection between the chain-drum and its hand-wheel gear.

A further object of the invention is to make the parts in such a manner that they can be adapted readily to different sizes of boilers or engines without change of design.

The invention consists in the matters hereinafter set forth, and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a view in front elevation of a traction-engine fitted with a steering-gear embodying the features of my invention, parts being broken away to give a clear view. Fig. 2 is a view in side elevation of a drum mounted in its bearing-frame and fitted with a worm-gear. Fig. 3 is a plan view of the drum, drum-frame, and gear. Fig. 4 is a view in detail of the drum. Fig. 5 is a view in section on line 5 5 of Fig. 4. Fig. 6 is a view in detail in cross-section, showing the drum-frame and cradle-block in engagement.

Referring to the drawings, A represents the shell of a boiler of the type commonly em-

ployed in traction-engines. The forward end of said boiler is carried by the usual axle B and wheels C C, turning on a king-bolt of any preferred design. Between the traction-wheels D' at the rear end of the boiler and the forward wheels C C a chain-drum E is situated, which is connected by a chain F in the usual manner to the forward axle B. Said chain-drum E is adjustably secured to the boiler in the following manner: A cradle-block H, which may be of any preferred design, is rigidly attached in the usual manner to the boiler-shell, its lower face being horizontal to afford a bearing. A drum-frame G, comprising a casting suitably ribbed and flanged to insure strength and lightness, is bolted or otherwise suitably secured to this horizontal face. As shown herein, said frame comprises two parallel depending ribs g' , connected near either end by two horizontal ribs g . Lateral flanges g^2 extend outwardly from the ribs g' and are provided with longitudinal bolt-slots g^3 . Their upper faces are in horizontal alinement and may be clamped against the bearing-face of the cradle by bolts g^7 , which extend through the slots g^3 . Said drum-frame G is provided at either end with downwardly-extending pillow-blocks g^4 , having the usual split bearings and removable pillow-caps. A vertical flange g^6 , extending upwardly from one of the pillow-blocks integrally with the ribs g' , affords a convenient bearing-surface against which to bolt the worm-gear bracket I.

The drum E comprises a hollow cylinder, preferably of cast-iron, flanged at either end. A radially-projecting lug e is formed on the periphery of the cylinder between its ends slightly oblique to the drum-axis, and adapted to receive a link of a chain F. The obliquity of the lug aids in giving a proper lead to the chain when the drum is revolved and prevents any clogging or crowding of the chain upon the drum. Said drum E is provided at either end with trunnions $e^3 e^4$, integral with the drum, adapted to revolve in the bearings of the pillow-blocks g^4 . The flanged ends of the cylinder form shoulders which abut against the proximate sides of the pillow-blocks g^4 and prevent any lateral movement of the drum in the bearings. The trunnion e^3 of the drum, which engages the vertically-

flanged pillow-block, projects beyond its bearings, and a flange e^5 is formed integrally thereon between the outer end and the bearing. A gear M is secured on the outer end of the said trunnion e^3 , the face of its web m abutting against the proximate face of the flange e^5 , the latter being of sufficient diameter to extend nearly to the gear-rim. A plurality of bolts J pass through the web m of the gear M and the flange e^5 and hold them firmly together. As shown herein, said gear M is in mesh with a worm K, which is keyed or otherwise secured to a spindle K', rotating in a bearing-bracket I, secured to the vertical flange g^6 on the pillow-block. One end of said spindle extends back a suitable distance to the operator's station and is provided with a hand-wheel L. The great advantage of this form of construction is the elimination of keys and set-screw between the parts. The lug on the drum which interlocks with the chain is integral with the drum periphery. The drum and its trunnions are in one piece. The drum-gear is bolted to a flange integral with the drum, and the bolts which secure these together pass through the web of the gear, thereby being close to the point of application of power by the worm, so that any possibility of shearing is greatly diminished. The mounting of the drum-frame upon the boiler allows one size of the frame to be adapted to different sizes and styles of boilers, the cradle between the boiler and the base being the only part which has to be changed. The drum and its bearings may be shifted longitudinally to bring the drum-gear in the proper relation to the engine mechanism, and the whole can be quickly and readily secured upon an engine of the type described.

Obviously motion may be transmitted to the drum-gear by any preferred means, and other details of construction may be varied without departing from the spirit of the invention.

I do not care to limit myself to any particular form of construction except as set forth in the appended claims.

I claim as my invention—

1. A steering-gear for traction-engines comprising a revoluble drum transversely and adjustably secured to the engine-boiler, a gear secured to said drum by means engaging the gear-web and drum and means for operating the gear.

2. A steering-gear for traction-engines comprising a drum rotating in a bearing-frame adjustably secured transverse to the boiler-axis, a worm-gear secured to said drum by means engaging its web and the drum-flange, and means for operating the gear.

3. A steering-gear for traction-engines comprising a drum-frame adjustably secured on the engine-boiler transverse to the boiler-axis, a drum rotating in said frame, a gear secured to said drum by means engaging the drum-flange and the gear-web, and means for operating the gear.

4. A steering-gear for traction-engines comprising a drum-frame adjustably secured on the engine-boiler transverse to the boiler-axis, a drum, trunnions integral with said drum rotatively secured in said drum-frame, a flange on one of said trunnions integral therewith, a gear concentric with the drum secured to said flange, and means for operating said gear.

5. A steering-gear for traction-engines comprising a drum-frame adjustably secured on the engine-boiler transverse to the boiler-axis, a drum, trunnions integral therewith rotatively secured in said drum-frame, a flange on one of said trunnions integral therewith, a gear secured to said flange concentric with the drum, and means for operating said gear rotatively secured to said drum-frame.

6. A steering-gear for traction-engines comprising a cradle secured on the engine-boiler transverse thereto, a drum-frame secured to said cradle longitudinally adjustable thereon, a drum, trunnions integral therewith rotatively secured in said drum-frame, a flange integral with one of said trunnions, a gear secured to said flange concentric with the drum, a worm rotatively secured in said drum-frame in mesh with the gear, and means to rotate the worm.

7. A steering-gear for traction-engines comprising a drum-frame having longitudinal adjustment on a cradle transverse to the boiler, a drum, trunnions integral with the drum, journaled in said drum-frame, one of said trunnions being adapted to project beyond its bearing, a flange on said trunnion integral therewith between its end and its bearing, a gear on said flanged trunnion secured by means engaging its web and the trunnion-flange, and means for operating said gear.

8. A steering-gear for traction-engines comprising a drum-frame transverse to the engine-boiler having longitudinal adjustment on a cradle on said boiler, a drum, trunnions integral with the drum, journaled in said drum-frame, one of said trunnions being adapted to project beyond its bearing, a flange on said trunnion integral therewith between its end and the bearing, a gear on said flanged trunnion secured by means engaging its web and the trunnion-flange, a worm rotatively secured in said drum-frame in mesh with said gear, and means for rotating said worm.

9. A steering-gear for traction-engines comprising a drum-frame transverse to the engine having longitudinal adjustment on a cradle secured to said boiler, a drum, trunnions on said drum integral therewith journaled in said drum-frame, one of said trunnions being adapted to project beyond its bearing, a flange on said elongated trunnion between its end and its bearing, a worm-gear on said trunnion secured by means engaging its web and the trunnion-flange, a worm rotatively secured on said drum-frame in mesh with said gear, means for rotating said worm, and a flexible connection interlocking between its ends with a lug on the drum periphery.

riphery, extending in opposite directions therefrom, and secured at either end to either end of the forward engine-axle.

5 10. A steering-gear for traction-engines comprising a drum-frame whose upper face is adapted to bear against a cradle secured on the boiler and which is provided with lateral horizontal flanges extending in opposite directions, longitudinal slots in said flanges, 10 bolts passing through said slots engaging said cradle, a drum journaled in said frame and trunnions integral with the drum, a flange integral with one of said trunnions beyond the trunnion-bearing, a gear on said 15 flanged trunnion and means securing the gear-web to said flange.

11. In a steering-gear for traction-engines, a drum, trunnions on either end thereof integral with the drum, a flange on one of said 20 trunnions mediate its inner end and the drum-head, integral with the trunnion, and a gear on the outer end of said flanged trunnion whose web member abuts against and is secured to said flange.

25 12. In a steering-gear for traction-engines a drum, trunnions on either end thereof integral with the drum, a radial lug on the periphery of said drum oblique to the axis of

the drum, adapted to interlock with a chain-link, a flange on one of said trunnions mediate its inner end and the drum-head, integral with the trunnion, and a gear on the outer end of said flanged trunnion whose web abuts against and is secured to said flange. 30

13. In a steering-gear for traction-engines 35 a drum-frame having two parallel depending ribs, horizontal flanges extending from said ribs adapted to bear against the under surface of said cradle, longitudinal slots in said flanges, bolts passing through said slots engaging the boiler-cradle, pillow-blocks on 40 said frame, a drum journaled on trunnions integral therewith in said pillow-blocks, a flange integral with one of said trunnions beyond the adjacent pillow-block, a worm-gear 45 on said flanged trunnions whose web member abuts against and is secured to the flange, a worm-bracket secured to the outer face of one of said pillow-blocks and a worm rotatively secured in said bracket in mesh with said 50 gear.

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Witnesses:

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