

(No Model.)

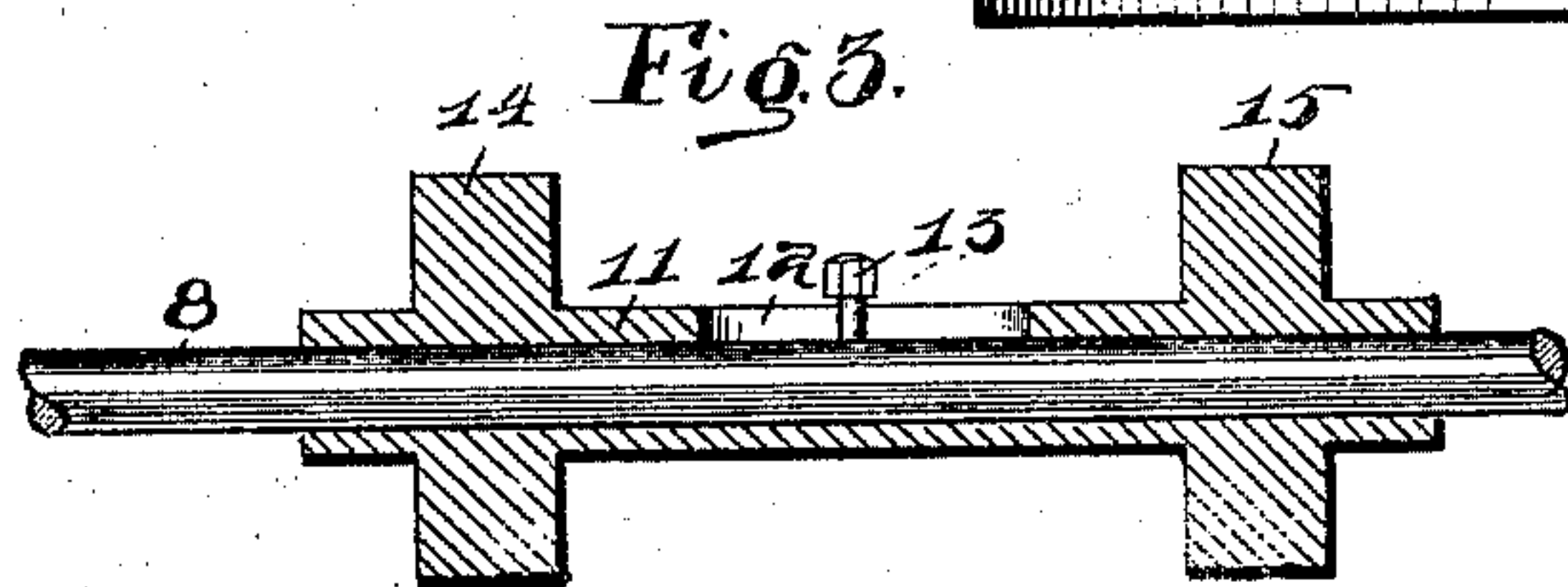
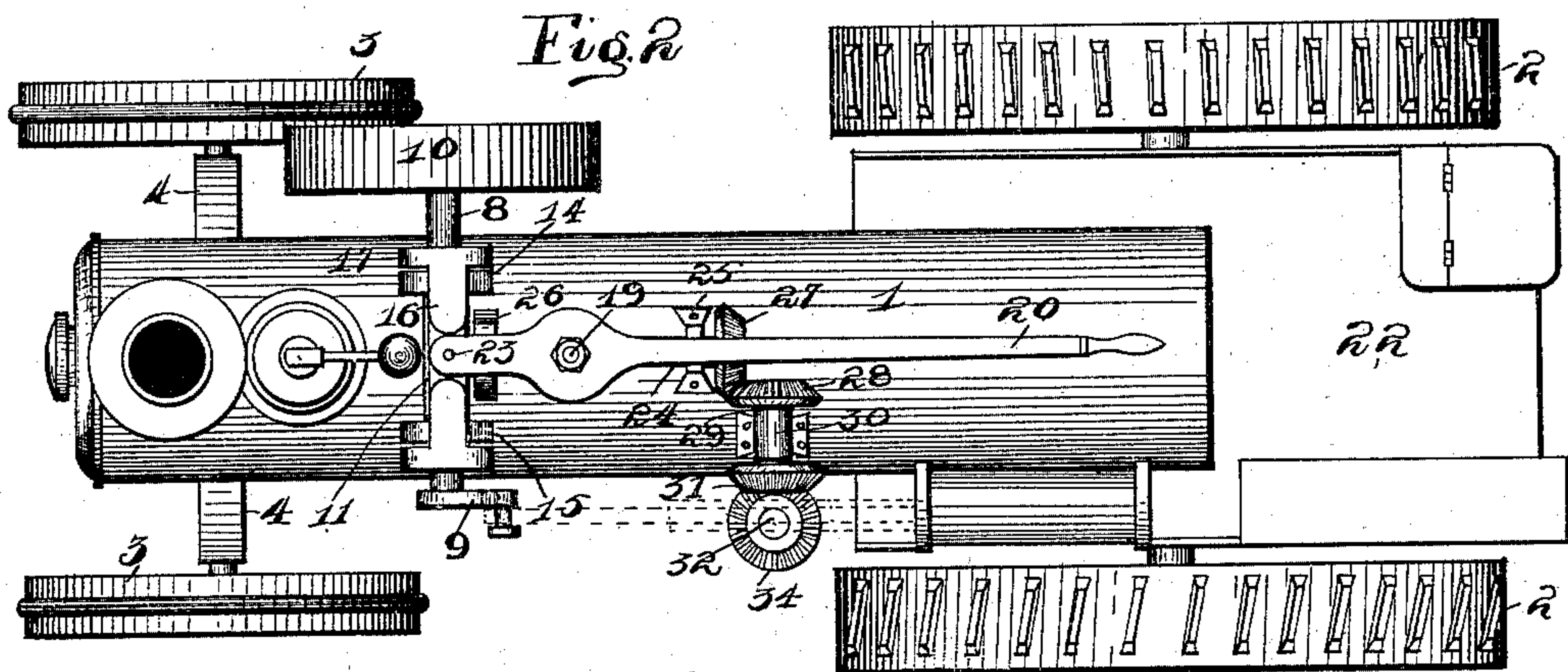
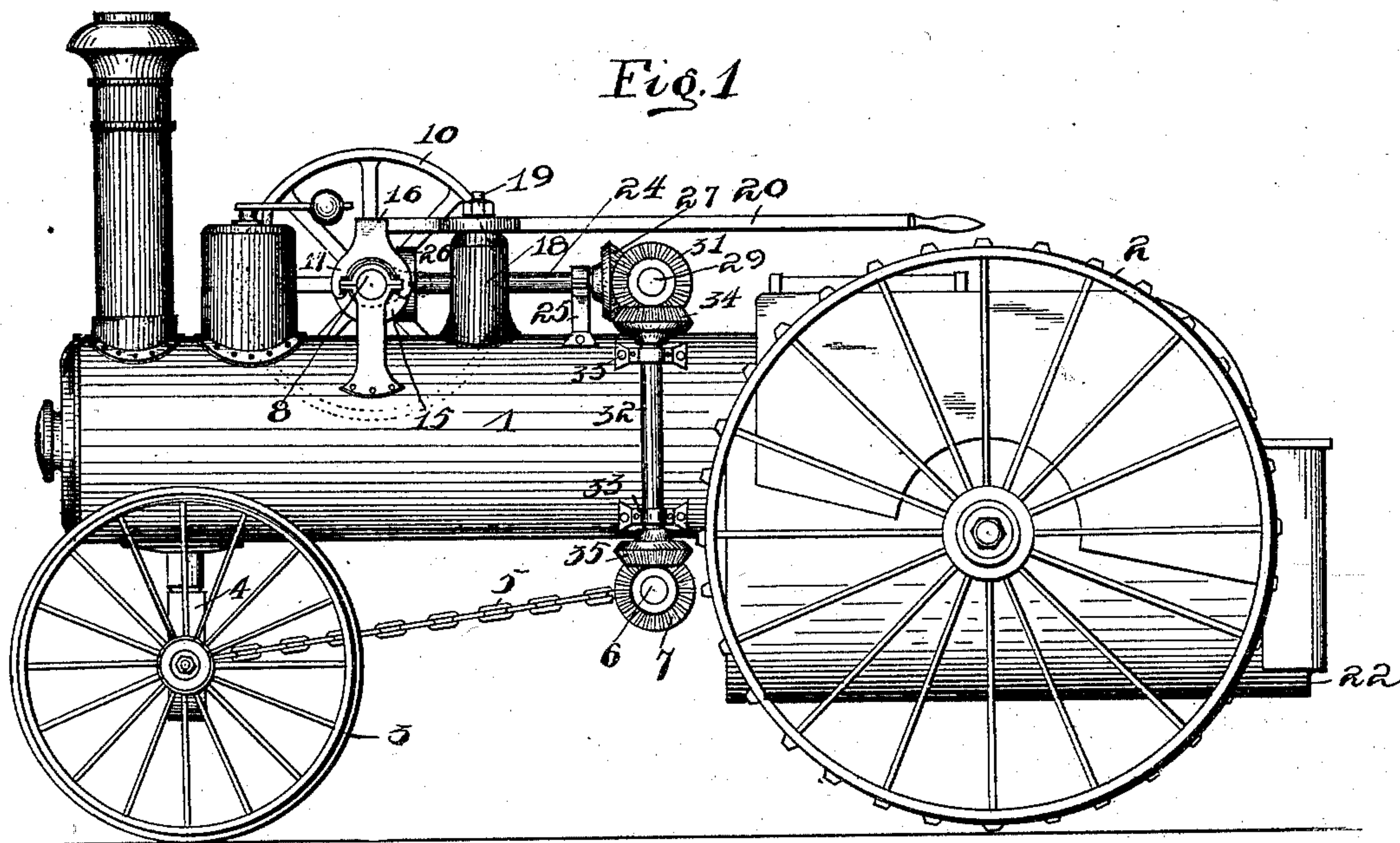
2 Sheets—Sheet 1.

J. H. STEVENSON.

STEERING MECHANISM FOR TRACTION ENGINES.

No. 504,894.

Patented Sept. 12, 1893.



Witnesses

Alfred O. Bickel

Herbert S. Robinson

Inventor.

James H. Stevenson

By Higdon & Higdon & Lougau Attorneys

(No Model.)

2 Sheets—Sheet 2.

J. H. STEVENSON.

STEERING MECHANISM FOR TRACTION ENGINES.

No. 504,894.

Patented Sept. 12, 1893.

Fig. 4

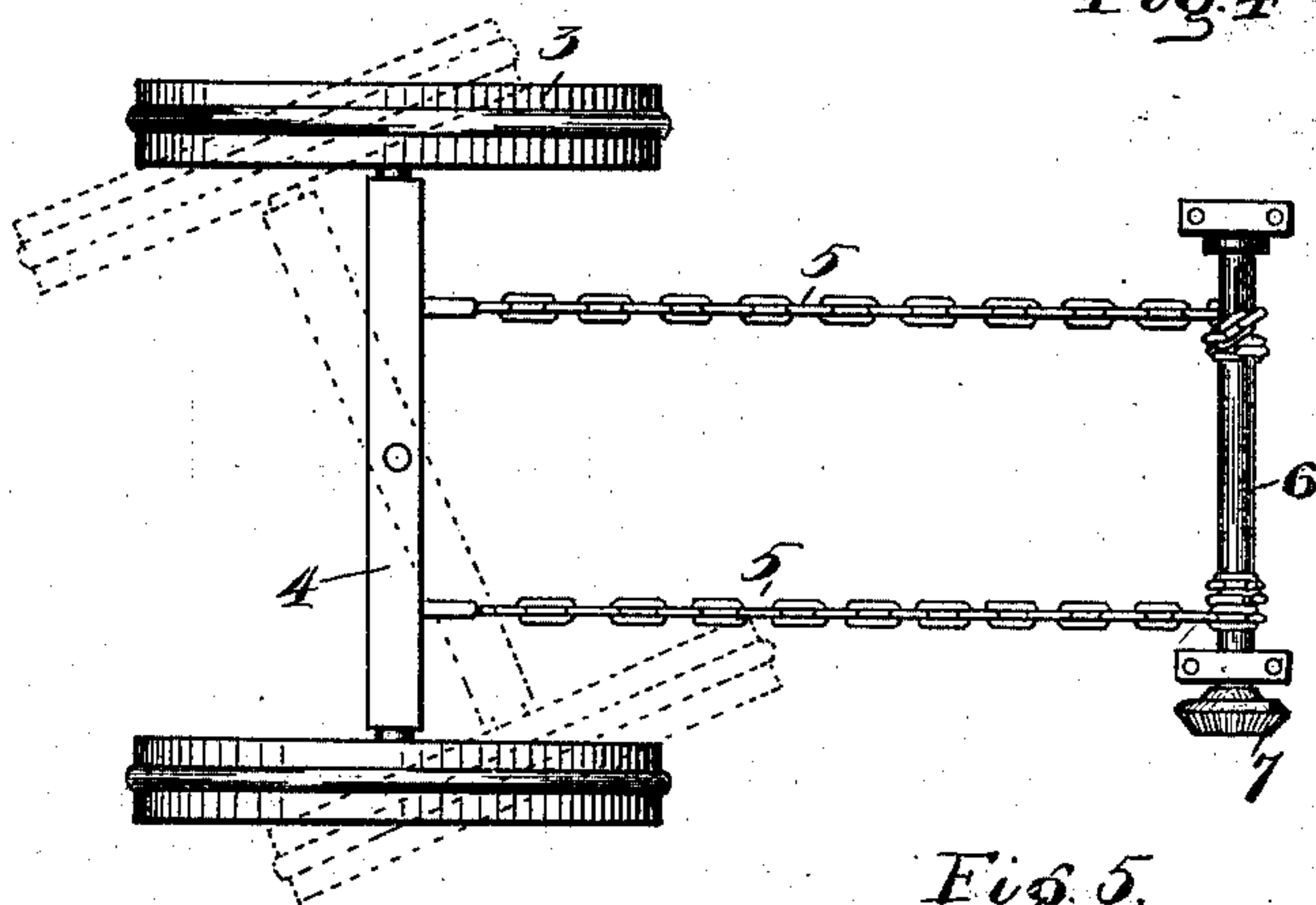


Fig. 5

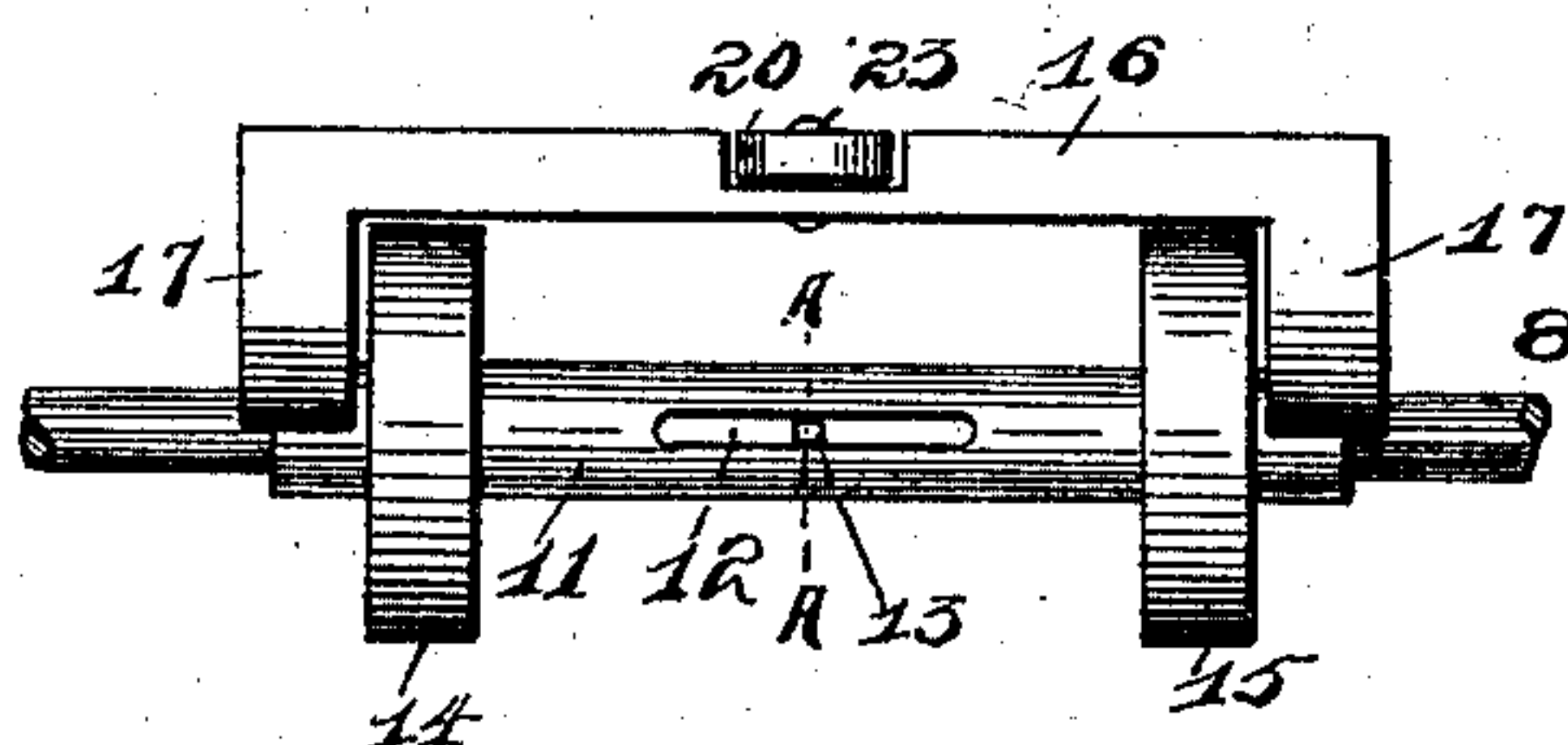


Fig. 6

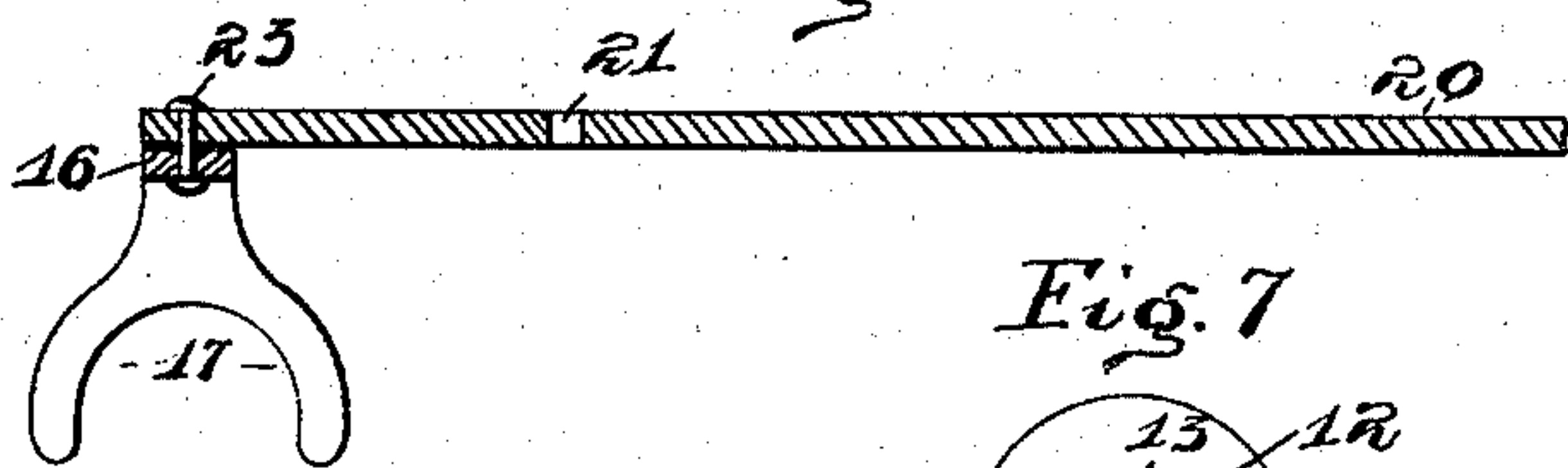


Fig. 7

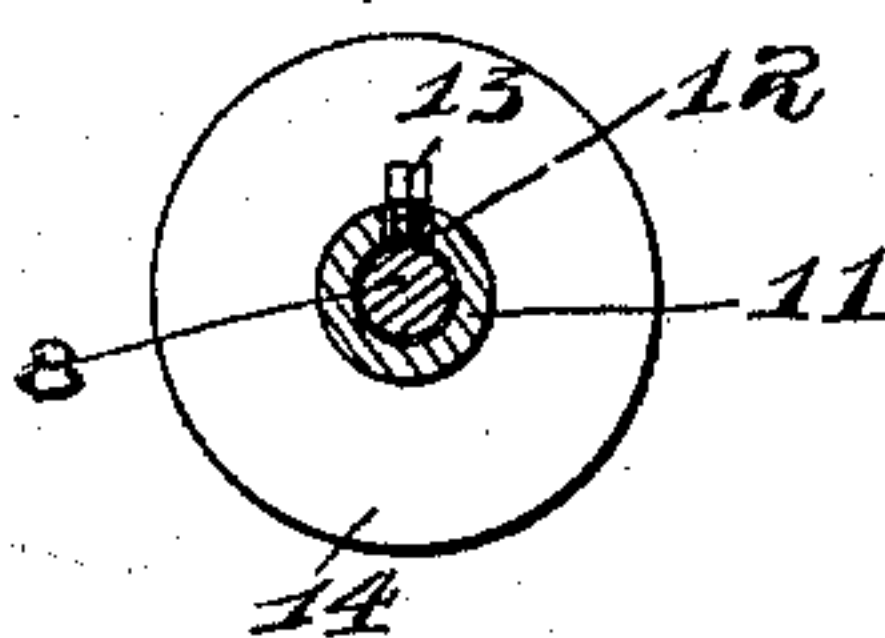
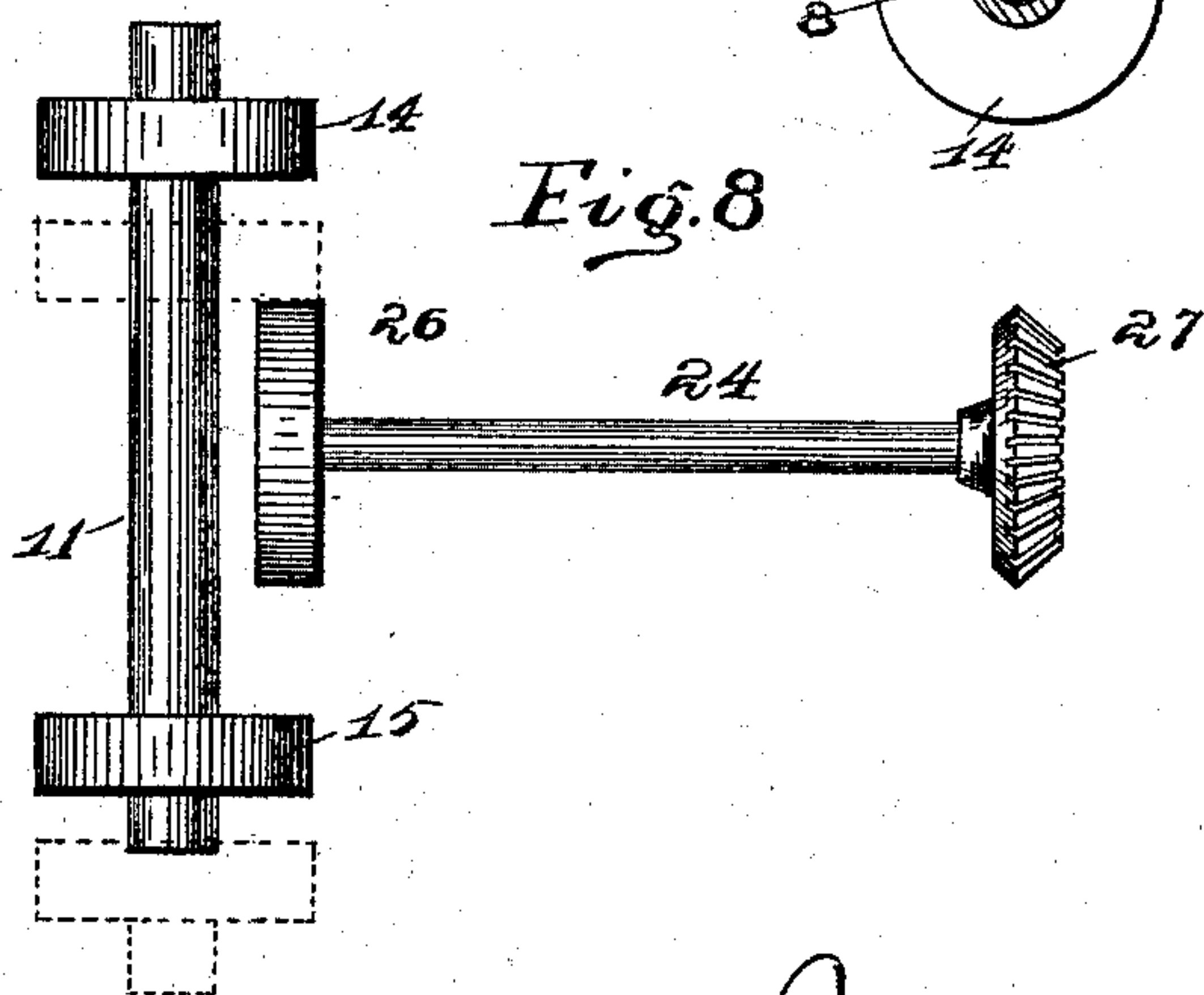


Fig. 8



Witnesses

Alfred O. Eichs

Herbert S. Robinson

Inventor

James H. Stevenson

By Frederick W. Logan Attorneys



# UNITED STATES PATENT OFFICE.

JAMES HENRY STEVENSON, OF ALLIANCE, MISSOURI.

## STEERING MECHANISM FOR TRACTION-ENGINES.

SPECIFICATION forming part of Letters Patent No. 504,894, dated September 12, 1893.

Application filed April 24, 1893. Serial No. 471,618. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES HENRY STEVENSON, of the city of Alliance, Bollinger county, State of Missouri, have invented certain new and useful Improvements in Steering Mechanism for Traction-Engines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention relates to an improved "steam gear for road locomotives or traction engines," and consists in the novel construction, combination and arrangements of parts hereinafter described, and pointed out in the claims.

The object of my invention is to provide an improved friction steam power friction gear for engines of this class, which shall readily permit forward and reverse movements of the locomotive upon the road and turning of the steering-axle while the locomotive is standing.

Heretofore in most locomotives or engines of this class the operation of steering had to be performed by toothed gearing and by comparatively hard manual labor on the part of the operator, and in contradistinction to such arrangements my invention permits the power of the main or traction engine itself to be applied to the steering-wheels of the locomotive, with the expenditure of very slight manual effort on the part of the operator.

In the drawings: Figure 1 is a side elevation of a traction-engine having my invention applied thereto. Fig. 2 is a plan view of same. Fig. 3 is a detail sectional view showing a portion of the main shaft of the engine having a shipping sleeve applied thereto. Fig. 4 is a detail plan view of the steering wheels, axle and winding-shaft detached. Fig. 5 is a detail elevation of the main shaft of the engine having the shipping sleeve applied thereto, and a clutch applied to said shipping-sleeve. Fig. 6 is a sectional side elevation of the clutch and clutch lever, with a part of the lever broken away. Fig. 7 is a transverse section on the line A—A of Fig. 5. Fig. 8 is a detail plan view of the shipping sleeve and a longitudinal shaft carrying a friction-wheel or pulley, detached from the other parts.

As the engine connections for imparting

movement to the driving wheels of the locomotive, form no part of my invention, I have deemed it unnecessary to show or describe the same.

1 indicates the usual boiler of the engine, 2 the driving-wheels, and 3 the steering-wheels. These parts may be of any ordinary construction. I have here shown the steering-wheels mounted upon a swiveling-axle 4, yet my invention may be applied to a locomotive having but a single steering-wheel.

As is usual in this class of engines, the front or steering-axle 4 is mounted beneath the boiler so as to have a pivotal or swiveling movement, as indicated by dotted lines in Fig. 4, and a steering chain 5 is connected at one end to said swiveling axle at one side or some distance from its pivotal point. Another chain 5 identical with the first is likewise secured at one end to said axle on the opposite side of said pivotal point, so that when one chain is drawn upon with sufficient force, said axle will be turned in one direction, and when the opposite chain is drawn upon and the first chain is slackened said axle will be moved in an opposite direction, and vice versa. The ends of the chains 5 which are opposite the ends which are connected to the axle 4, are connected to a winding shaft 6, and arranged to be reversely wound thereon and unwound therefrom during operation. This shaft 6 is properly journaled in suitable bearings beneath the boiler some distance in the rear of the steering axle 4, and fixed upon it is a bevel gear wheel 7.

8 indicates the main shaft of the engine, which is provided with the usual crank 9 and fly or band wheel 10, and said main shaft is to be revolved in either direction by means of the usual steam engine and its common reversing gear, &c. A shipping sleeve 11 is loosely mounted upon the main shaft 8 to revolve therewith, but to slide longitudinally to a limited distance thereon. These movements of this sleeve may be accomplished in any known manner, although I prefer the manner which I shall now describe. The sleeve 11 is provided with a longitudinal slot 12 intermediate of its length and a pin or bolt 13 is fixed to the shaft 8 so as to project radially and be engaged by the sides and



ends of said slot. I thus provide said shaft with a sleeve which is axially revoluble and longitudinally reciprocative.

Rigidly mounted upon or secured to the sleeve 11 at a point adjacent one end thereof, is a friction wheel 14, and rigidly secured to or fixed upon said sleeve at a point adjacent the end thereof which is opposite the first mentioned end is another friction-wheel 15 which is preferably identical in dimensions with said wheel 14. The friction wheels 14 and 15 are thus secured upon the sleeve 11 at a distance apart, so as to leave a space between their opposite inner faces.

A clutch yoke 16 is provided with two forked or clutch arms 17, which project therefrom at about a right angle to the body thereof, and engage over the sleeve 11 and the opposite outer faces of the wheels 14 and 15, or it may be that they engage the said sleeve only, to longitudinally reciprocate said sleeve upon said shaft during the operation hereinafter mentioned.

18 indicates a stand or support fixed upon some part of the boiler 1 or the frame of the machine and provided with a projecting pin or bolt 19.

20 indicates a shipping lever or a hand lever, fulcrumed upon or otherwise secured to the standard 18, preferably, by the pin or bolt 19 engaging in a hole or bearing 21 formed in said lever at a point adjacent its front end, so that said lever may be oscillated or vibrated upon its pivotal support. The rear end of this hand lever extends rearward above the boiler to a point within reach of the operator standing upon the platform 22 or foot board of the engine, and its forward end is pivotally secured to the clutch yoke 16 by means of a pin or bolt or the like 23.

24 indicates a shaft extending at right angles to the main shaft 8 and mounted upon a boiler in suitable bearings such as 25. Upon the forward end of this shaft a friction wheel or disk 26 is fixed so as to be located in the space between the friction wheels 14 and 15, and upon the rear portion of said shaft a bevel gear 27 is fixed.

28 indicates a bevel gear wheel mounted upon one end of a short shaft 29 extending at a right angle to the shaft 24 and in a horizontal direction, and mounted in a suitable bearing 30.

31 indicates another bevel gear mounted upon the outer end of the short shaft 29.

32 indicates a short vertical shaft mounted in suitable bearings 33, so that its upper end will lie adjacent the short shaft 29 and its lower end adjacent the end of the winding shaft 6 which carries the bevel gear 7. A bevel gear 34 is fixed to the upper end of the shaft 32 so as to mesh with the gear 31 on the short shaft 29 and another bevel gear 35 is fixed to the lower end of said shaft 32 so as to engage the teeth of the bevel gear 7.

The operation is as follows: From the above description, taken in connection with the

drawings, it will be observed that the power transmitting connection is made between the main shaft 8 of the engine and the swiveling steering wheels of the locomotive. When the operator desires the locomotive to travel in a given direction, he throws the rear end of the hand lever 20 either to the right or to left, and thereby causes the clutch yoke 16 to slide the sleeve 11 in one direction or the other upon the main shaft 8 until the inner face of either of the friction wheels 14 or 15 engages the periphery of the friction wheel 26, and if the engine be running, said wheel 26 will be revolved in a corresponding direction. The construction is such that if the clutch yoke 16 be moved in one direction the wheel 14 will engage the wheel 26, while if said clutch yoke be moved in an opposite direction a sufficient distance the wheel 15 will engage the wheel 26 and revolve said wheel in an opposite direction, for the reason that I provide a friction wheel upon opposite sides of the shaft 24 to alternately engage the periphery of the friction wheel common to each of the wheels carried by said sleeve. The manual exertion necessary to move the hand lever 20 is very slight, and may even be accomplished by a boy. It will thus be seen that I provide a friction steam power steering gear for traction engines, in which the power of the main engine itself is utilized to effect the steering operation.

Only the steam-cylinder of the main engine is made use of for transporting the locomotive, steering the same, and running thrashing-machines and other mechanisms which a portable engine is usually employed in driving. The steering-axle may be turned while the engine is standing upon the road, by admitting steam to the main cylinder, and arranging the common clutch-mechanism thereof so that the power-shaft and fly-wheel will revolve without moving the locomotive, and thus direction may be given to the locomotive from the moment it starts, and also its direction can be quickly changed while it is in motion.

I am aware that a separate or auxilliary cylinder has been applied to a traction-engine for the purpose of steering the same independent of the movements of the main motor thereof; also that toothed-gearing connecting the steering axle with the main engine, has been employed for the purpose of steering the locomotive, and I therefore do not claim such, as my improved friction-gearing above specified possesses the advantage of permitting the main engine to run continuously, and the steering-axle to be turned in either direction by said engine without stopping the same. This result could not be accomplished with toothed-gearing, as the sudden impact of the teeth of one gear-wheel with those of another would produce fracture of one or the other.

What I claim is—

1. In a traction-engine, the combination



with the steering-wheel or wheels, of the main shaft of the engine, a sleeve axially revolvable and longitudinally reciprocative upon said shaft, friction-wheels 14 and 15 secured upon  
5 said sleeve a distance apart so as to leave a space between them, an additional friction-wheel mounted in the space between said wheels which are carried by said sleeve, a manually-controlled device for sliding said  
10 sleeve and the friction-wheel which it carries upon said shaft to engage said additional friction-wheel alternately at diametrically opposite points, and gearing which connects said additional friction-wheel to the steering-wheel  
15 or wheels of the machine, whereby when said additional wheel is revolved in one direction the machine will be steered in a given direction, and when said friction gear-wheel is revolved in an opposite direction the machine  
20 will be steered in a corresponding direction, substantially as herein specified.

2. In a traction-engine, the combination of a steering-axle 4, steering-chains 5 connected at one end of said axle, one at each side of

its pivotal point, a winding shaft 6 to which  
25 the opposite ends of each of said chains is connected and arranged to be reversely wound thereon and unwound therefrom, the main shaft 8, a shipping sleeve 11 axially revolved  
30 with and longitudinally reciprocative upon said main shaft, friction wheels 14 and 15 rigidly secured to said sleeve a distance apart, a clutch yoke provided with a clutch arm which loosely engages said sleeve, a stand or support  
35 fixed at a point adjacent said sleeve, a hand lever fulcrumed upon said support with one end extending rearward within reach of the operator, and its opposite end pivotally secured to said clutch yoke, and operative connections between said sleeve and said steering shaft, substantially as herein specified. 40

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

JAMES HENRY STEVENSON.

Witnesses:

JOHN H. STEVENSON,  
FRANK ANTHONY.