

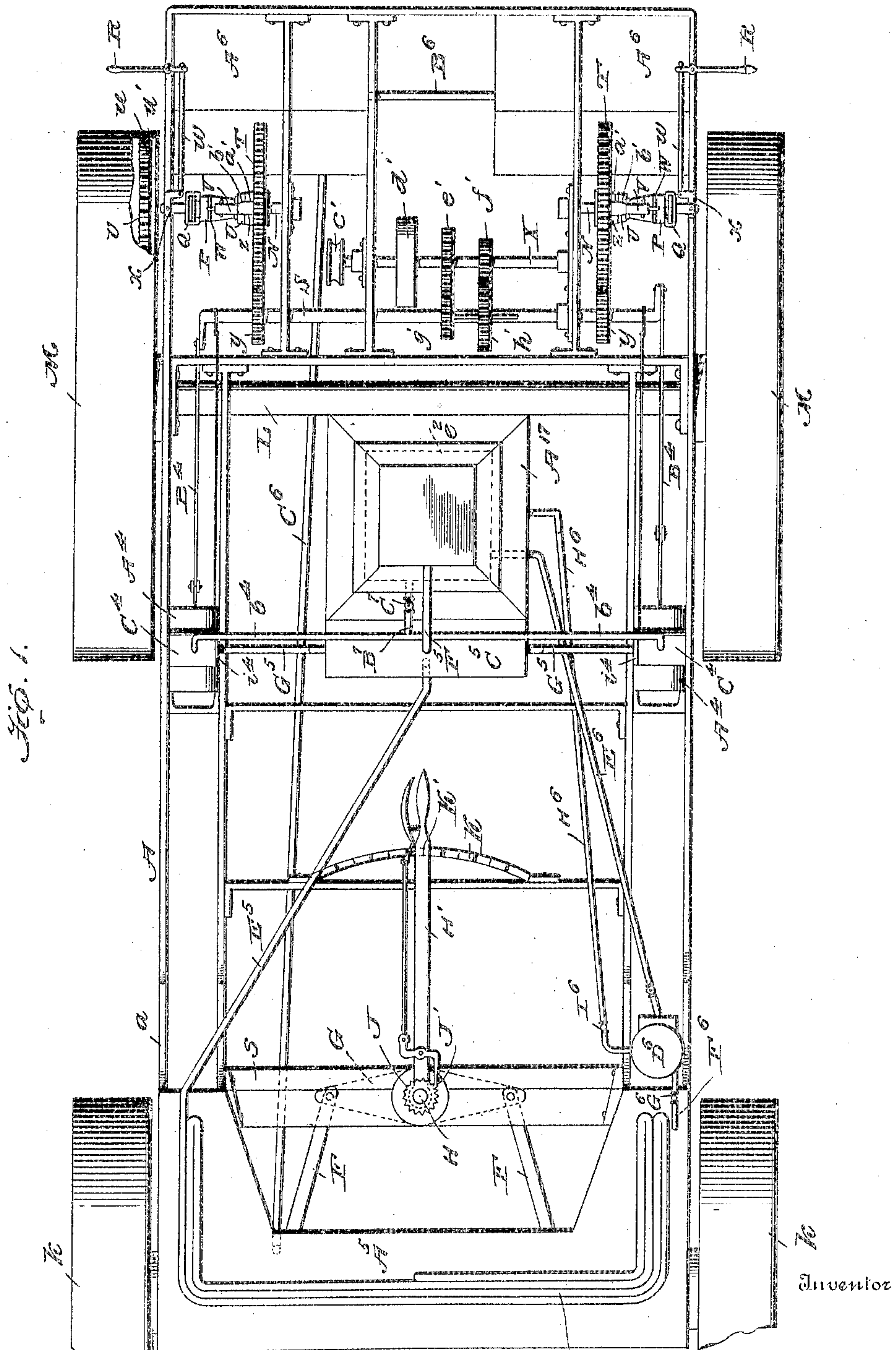
No. 793,817.

PATENTED JULY 4, 1905.

J. H. BECKNER.
TRACTION ENGINE.

APPLICATION FILED AUG. 29, 1904.

3 SHEETS—SHEET 1.



Witnesses

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By

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Attorney

Inventor

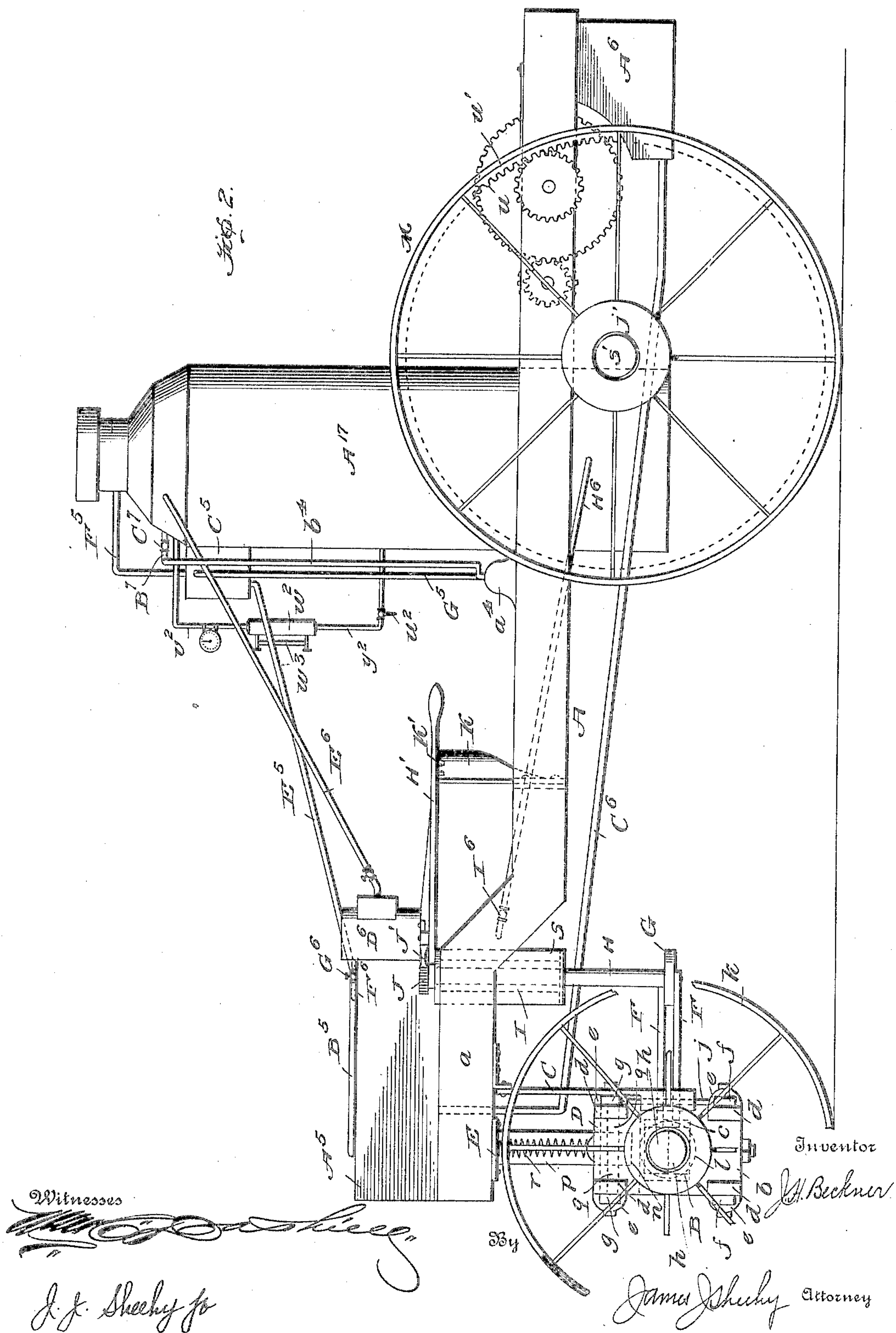
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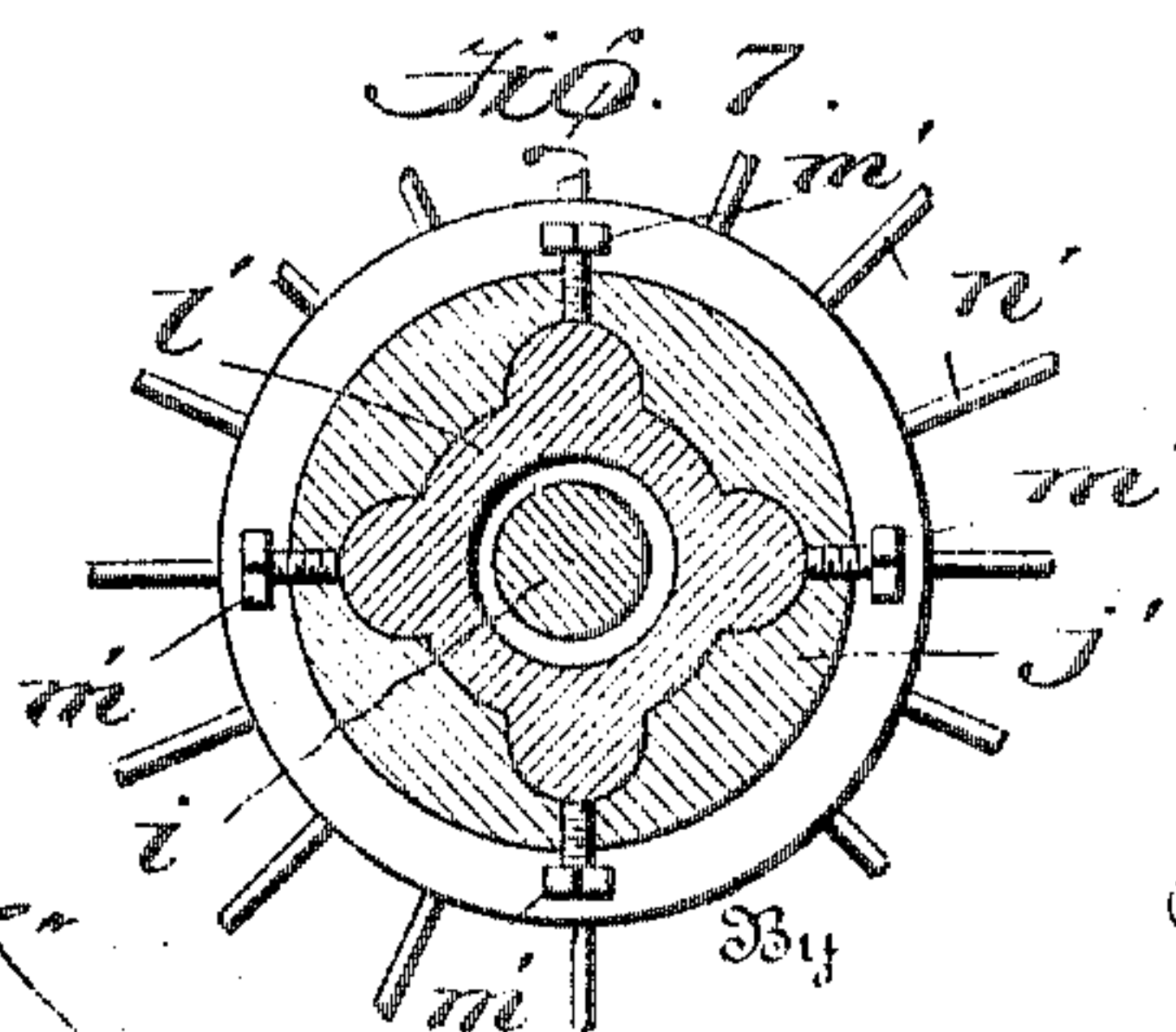
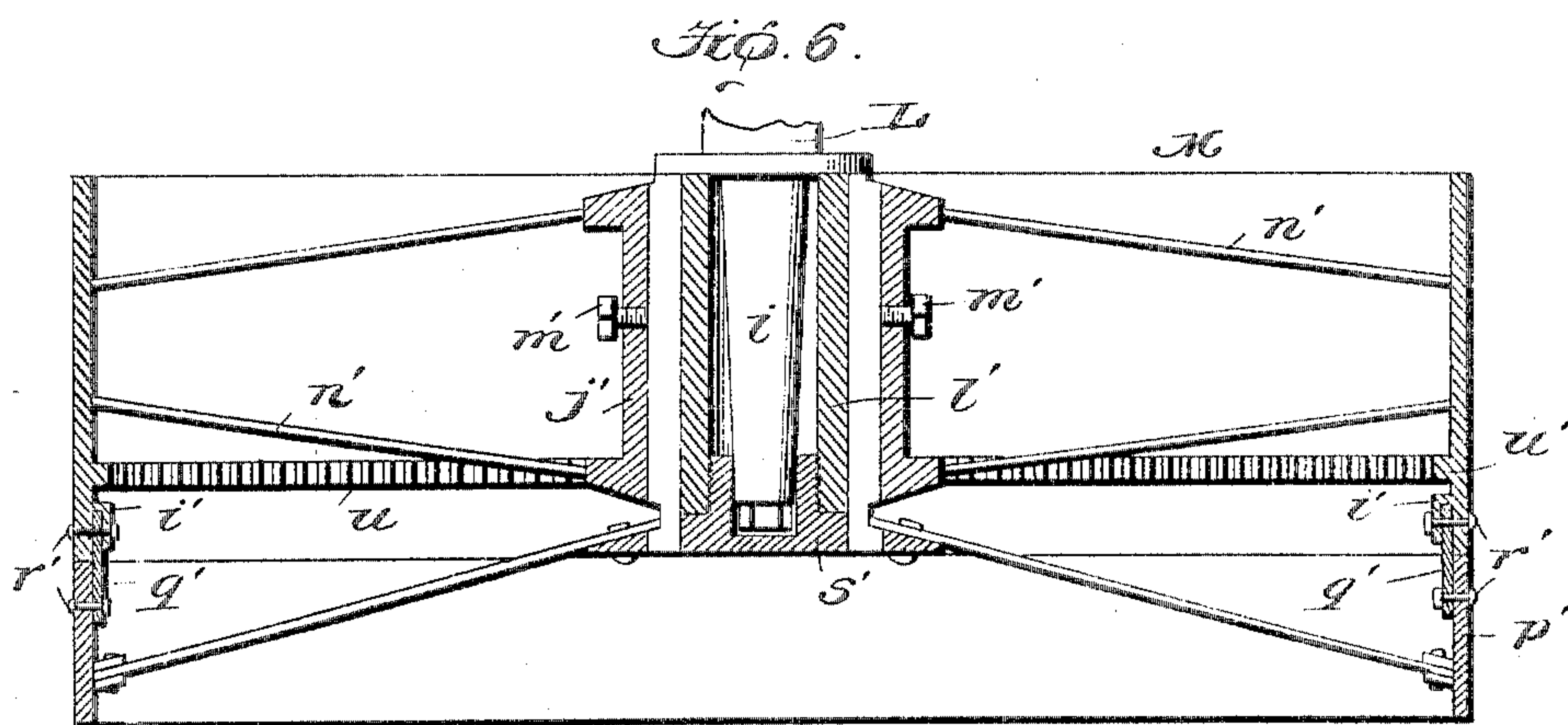
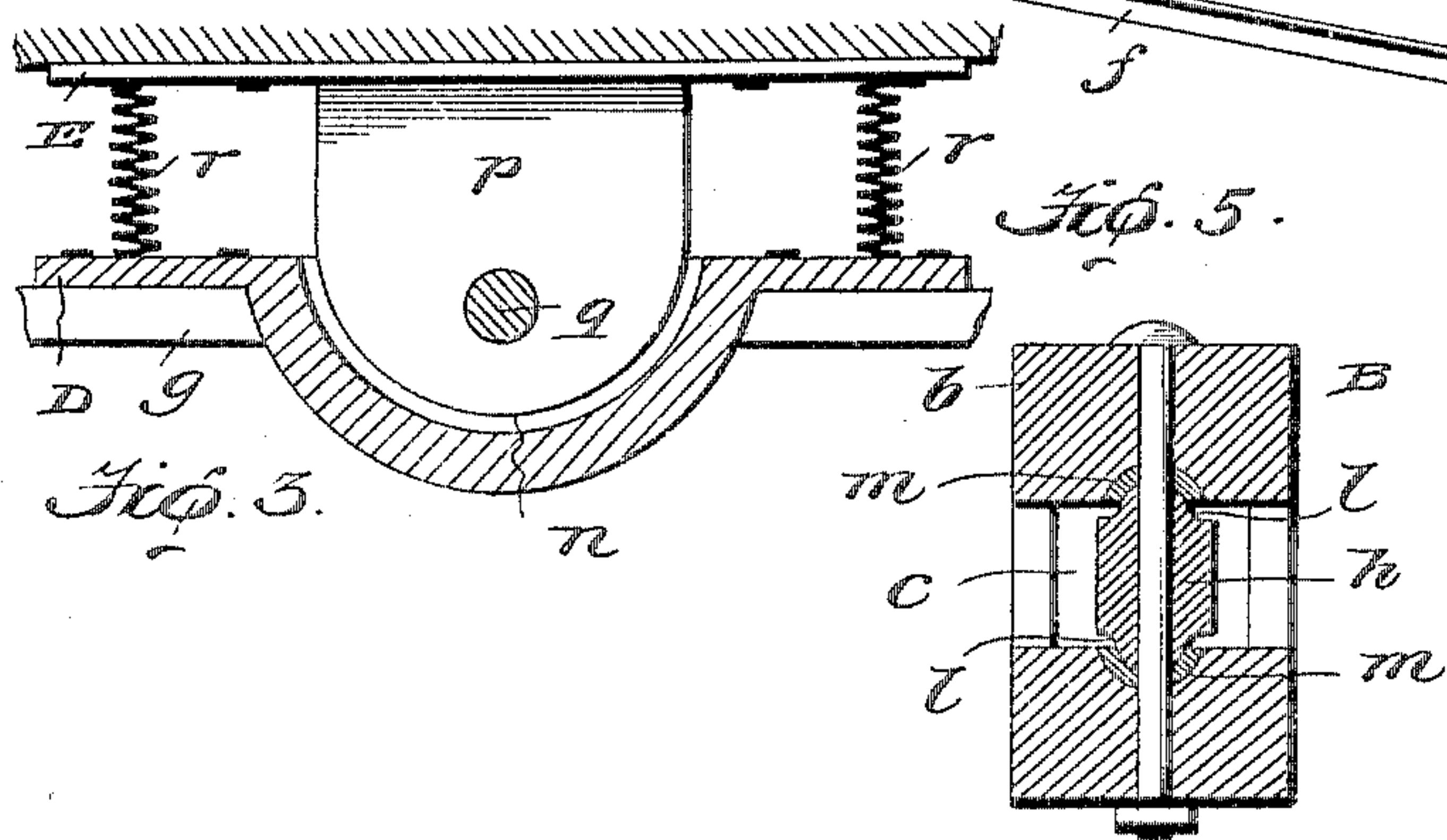
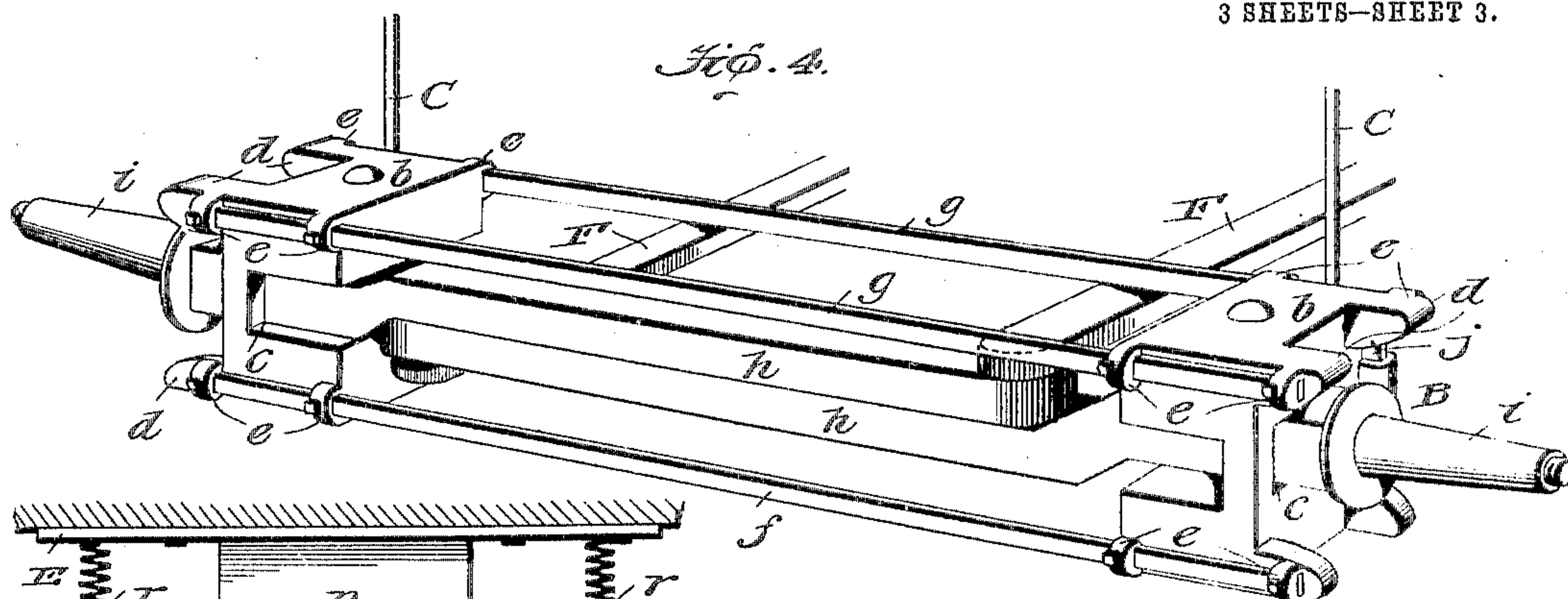


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3 SHEETS—SHEET 3.



Witnesses

[Signature]

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UNITED STATES PATENT OFFICE.

JAMES H. BECKNER, OF SEATTLE, WASHINGTON

TRACTION-ENGINE.

SPECIFICATION forming part of Letters Patent No. 793,817, dated July 4, 1905.

Application filed August 29, 1904. Serial No. 222,584.

To all whom it may concern:

Be it known that I, JAMES H. BECKNER, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented new and useful Improvements in Traction-Engines, of which the following is a specification.

My invention pertains to motor-vehicles, more particularly motor-vehicles of the traction-engine type; and it has for its general object to provide a highly efficient traction-engine calculated to meet the requirements of varying conditions and adapted to be handled and guided with facility and with but a minimum amount of effort on the part of the attendant or attendants.

The invention will be fully understood from the following description and claims when taken in connection with the accompanying drawings, forming part of this specification, in which—

Figure 1 is a plan view of the engine; Fig. 2, a side elevation of the same; Fig. 3, an enlarged detail section of the connection between the main frame and the front axle; Fig. 4, a detail view of the front axle; Fig. 5, a detail section of one axle-lever and axle-box; Fig. 6, a diametrical section of one traction-wheel, and Fig. 7 a transverse section taken through the hub of the said wheel.

Similar letters designate corresponding parts in all of the views of the drawings, referring to which—

A is the main frame of the traction-engine constituting the present and preferred embodiment of my invention. The said main frame is provided with a raised forward portion *a* in order to enable the front wheels presently described to work under the same, but may otherwise be of any construction compatible with the purposes of my invention.

B is the front axle of the engine. This front axle preferably comprises boxes *b*, having transverse openings *c* and also having outwardly-reaching arms *d* and lower and upper transversely-disposed loops *e* on their opposite sides, lower bars *f*, connecting the boxes *b* and secured by bolts or other means in the lower loops *e* thereof, comparatively large upper bars *g*, connecting the boxes *b* and se-

cured in the upper loops *e* thereof, levers *h*, arranged to lap each other and extending through and fulcrumed in the boxes, so as to swing horizontally and terminating at their outer ends in spindles *i* and plates *j*, carried at the rear sides of the boxes *b*. On the spindles *i* are mounted front traveling wheels *k*, and in order to hold the axle-levers true and also to hold lubricant the said levers are provided with convex portions *l*, which work in complementary cups *m*, arranged in the boxes *b*. In virtue of the construction described it will be observed that the weight of the engine is centered on the shoulder of the axle-levers *h* near the wheels *k* instead of on the center of the axle. This obviously facilitates guiding of the engine and enables the driver thereof to readily handle the engine with but a minimum amount of effort.

C C are braces slidably engaging the plates *j* on the boxes *b* and hinged to the frame A and designed to hold the axle B against forward movement when the engine is backing and against rearward movement incident to the forward travel of the engine.

D is a plate secured on the upper bars *g* of axle B and having a semicircular socket *n*; E, a plate fixedly connected to the under side of the main frame and having a semicircular lug *p* disposed in and connected, through the medium of a pivot-pin *q*, to the socket *n*, and *r r* springs interposed between the end portions of the plates D and E. In virtue of this construction it will be observed that the axle B is free to rock vertically in a transverse plane, so as to adapt either of the front wheels *k* to pass over uneven places or obstructions without cramping or straining the main frame A.

F F are bars pivotally connected to the inner ends of the axle-levers *h* and extending rearwardly therefrom.

G is a cross-bar pivotally connected to the rear ends of the bars F; H, an upright shaft fixed to the cross-bar G at the center thereof and extending upwardly through a vertically-disposed boxing *s* in the main frame and having a loose handle-bar H' at its upper end; I, a casing fixed to the main frame and surrounding the portion of the shaft above said frame;

J, a ratchet on the upper end portion of the shaft H; J', a pawl carried by the handle-bar H' and arranged to engage the ratchet J, and K a fixed segmental rack arranged to be engaged by a detent K' on the handle-bar H'.
 5 In virtue of this construction it will be observed that the axle-levers *h* may be moved a considerable distance without the necessity of moving the handle-bar H' a great distance,
 10 also that the handle-bar and the axle-levers may be readily fixed in the position desired. It will further be observed that the driver of the engine is enabled to lock and unlock the handle-bar—*i. e.*, engage the detent with
 15 and disengage the detent from the segmental rack—without taking his hand off of the handle-bar, and this with little or no effect on his part.

L is the rear axle of the engine. M M are
 20 traction-wheels mounted on the spindles of the said rear axle and having internal gears *u*; N N, counter-shafts journaled in suitable bearings on the main frame and having pinions *v* at their outer ends intermeshed with
 25 the internal gears *u*; P P, slides keyed or feathered on the counter-shaft, so as to turn therewith and move longitudinally thereon; Q Q, forked levers fulcrumed on the main frame and engaging circumferential grooves
 30 in the slides P; R R, hand-levers connected to the forked levers through the medium of links *w* and bell-cranks *x*; S, a crank-shaft journaled in suitable bearings in the main frame in position to be connected to the pis-
 35 tons of the engine presently described and bearing pinions *y*; T T, spur-gears loosely mounted on the counter-shafts N and in mesh with the pinions *y* and having hubs *z* provided in their perimeters with pockets *a*'.

40 U U are disks fixed on the counter-shafts N and having pockets *b*' in their perimeters, V V dogs of angular form, fulcrumed in the pockets of the disks U and adapted to be thrown into and out of the pockets in the gear-
 45 hubs *z*, and W W rings loosely mounted in circumferential grooves in the slides P and connected by links with the inner arms of the angular dogs.

By reason of the construction just de-
 50 scribed it will be observed that when either one of the hand-levers R is thrown in one direction the dog V complementary to said hand-lever will be placed in a pocket in the hub of one of the spur-gears T, and hence the said
 55 spur-gear will be fixed to its respective counter-shaft N, and the said counter-shaft will transmit motion to the traction-wheel M with which it is connected, while when the said hand-lever is thrown in the opposite direction
 60 the dog V will be disengaged from its complementary spur-gear T, and said spur-gear will turn loose on its counter-shaft, leaving the said counter-shaft and the traction-wheel connected therewith idle. From this it fol-

lows that at the will of the operator either 65 one of the traction-wheels may be quickly and easily stopped with a view of facilitating the short turning of the engine, also that when the engine is on the straight course desired the said traction-wheel may as readily be 70 again connected with the crank-shaft S.

In addition to the crank-shaft S and the counter-shafts N the main frame A bears a counter-shaft X. This latter counter-shaft is provided with a spool or windlass *e*' and 75 a band-pulley *d*' and is also provided with large and small spur-gears *e*' and *f*'. These spur-gears are keyed or feathered on the shaft X, and hence may be adjusted laterally. From this it follows that the gear *e*' may be 80 engaged with and disengaged from a gear *g*' on the crank-shaft S, and the gear *f*' may likewise be engaged with and disengaged from a gear *h*' on the crank-shaft S, according to the speed at which it is desired to rotate the 85 shaft X.

In addition to rims *u*', which bear the internal gears *u*, the traction-wheels M comprise laterally-disposed pockets *i*' on the rims *u*', a hub made up of a body *j*', having lon- 90 gitudinal grooves in its inner side, a boxing *l*', having ribs fitting in said grooves, set-screws *m*', fixing the boxing in the body, spokes *n*', interposed and connecting the rim *u*' and the hub-body, an auxiliary rim *p*', hav- 95 ing lateral straps *q*', let into the pockets *i*' on the rims *u*', and bolts *r*', extending through and connecting the said straps *q*', the rim *u*', and the pockets *i*'. The auxiliary rims of the wheels are designed to increase the width 100 of the tread of the wheels when the engine is to be used on soft or marshy ground, and when it is not necessary to employ the said auxiliary rims, as when the engine is traveling on a highway, they may be removed and stored 105 away in a barn or other place for future use. The wheels M are secured on the spindles of the rear axle L by nuts, and they are provided at the outer ends of their hubs with caps 110 *s*' for excluding sand, dirt, and the like.

On the main frame A in front of the crank-shaft S is located the boiler or steam-generator A¹⁷, which *per se* may be of any construction compatible with the purpose of my inven- 115 tion.

A⁴ A⁴ are the working cylinders of the engine, which cylinders are arranged on the main frame adjacent to the sides thereof and contain pistons the rods of which are connected by pitmen B⁴ to the cranks of the shaft 120 S, and C⁴ C⁴ are valves for controlling the passage of steam to and from the said working cylinders. The plugs of the two valves C⁴ are rolled on their axes by the crank-shaft S through the medium of suitable valve-gear- 125 ing, such as shown.

A⁵ is a hot-water tank arranged on the forward raised portion of the main frame.

B⁵ is a condensing-coil arranged on top of the hot-water tank and connected at one end thereto.

C⁶ is an exhaust-steam box arranged on the upper portion of the boiler-casing.

E⁵ is a pipe connecting the bottom of the exhaust-box and the opposite end of the condensing-coil with reference to that connected to the hot-water tank.

F⁵ is a pipe leading from the top of the exhaust-box to the smoke-pipe of the boiler-casing and designed to conduct a portion of the exhaust-steam to the latter, and G⁵ G⁵ are pipes leading from the caps of the valves C⁴ to the opposite ends of the exhaust-box, as shown.

A⁶ A⁶ are cold-water tanks arranged on the rear portion of the main frame A at opposite sides thereof and connected together by a pipe B⁶, which extends under the frame. C⁶ is a pipe connecting one of the said cold-water tanks and the hot-water tank, and D⁶ is a donkey steam-pump arranged on the main frame, preferably at the side of the hot-water tank. This donkey-pump may *per se* be of any suitable construction, and it is supplied with steam from the dome of the boiler through the valved pipe E⁶ and is connected by a pipe F⁶, having a non-return valve G⁶, with the hot-water tank and is also connected by a pipe H⁶, having a non-return valve I⁶, with the hollow fire-box of the boiler or steam-generator.

The pipes b⁴ for supplying the valves C⁴ with steam merge into a single pipe B⁷, and this latter pipe, which communicates with the steam-dome of the boiler, is provided with a suitable throttle-valve C⁷, through the medium of which the driver of the engine is enabled to start and stop the same.

I have entered into a detailed description of the construction and relative arrangement of the parts embraced in the present and preferred embodiment of my invention in order to impart a full, clear, and exact understanding of the same. I do not desire, however, to be understood as confining myself to such specific construction and relative arrangement of parts, as such changes or modifications may be made in practice as fairly fall within the scope of my invention as claimed.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a traction-engine, the combination of a main frame, a front axle connected to the main frame and comprising boxes having transversely-disposed openings, and also having transversely-disposed loops on their sides, transverse bars the end portions of which are arranged in said loops, set-screws bearing in the loops and engaging said bars, and levers fulcrumed in the transverse openings of the boxes so as to swing horizontally and terminating at their outer ends in spindles, wheels

mounted on the said spindles of the levers, and means for adjusting the levers.

2. In a traction-engine, the combination of a main frame, a front axle comprising boxes, bars fixedly connecting said boxes together, and levers fulcrumed in the boxes so as to swing horizontally and terminating at their outer ends in spindles, wheels mounted on the said spindles of the levers, means for adjusting said levers, a socket fixed on the bars of the axle and extending in the direction of the length thereof, a lug connected to the under side of the main frame and corresponding in shape to and disposed in the said socket, a pin pivotally connecting the socket and the lug, and springs arranged at opposite sides of the socket and lug and interposed between the axle and the main frame.

3. In a traction-engine, the combination of a main frame, a front axle connected to the main frame and comprising boxes fixedly connected together and having transverse openings, and levers fulcrumed in said openings of the boxes so as to swing horizontally and terminating at their outer ends in spindles, wheels mounted on the said spindles, an upright casing fixed in the main frame, an upright shaft journaled in the said casing and having a T-head at its lower end, links connecting said T-head and the axle-levers, a ratchet fixed on the shaft above the casing, a lever fulcrumed on the shaft above the casing, a detent carried by said lever and arranged to engage the ratchet, and means for adjustably fixing the said lever.

4. In a traction-engine, the combination of a main frame having a raised forward portion, a front axle comprising boxes, bars fixedly connecting said boxes together, and levers fulcrumed in the boxes so as to swing horizontally and terminating at their outer ends in spindle-wheels mounted on the said spindles of the levers, an upright shaft journaled in the main frame and having a T-head at its lower end, links connecting said T-head and the axle-levers, a socket fixed on the bars of the axle and extending in the direction of the length thereof, a lug connected to the under side of the raised forward portion of the main frame and corresponding in shape to and disposed in the said socket, a pin pivotally connecting the socket and the lug, springs arranged at opposite sides of the socket and lug and interposed between the axle and the main frame, a rear axle connected to the rear portion of the main frame, wheels mounted on said axle, at opposite sides of the frame, and having internal gears, a drive-shaft journaled on the main frame and having gears, means for rotating said drive-shaft, counter-shafts journaled on the main frame and having pinions at their outer ends intermeshed with the internal gears of the rear wheels, gears loosely mounted on the counter-shafts and intermeshed with the gears of the drive-shaft and

having hubs provided in their perimeters with one or more pockets, disks fixed on the counter-shafts, bell-crank dogs fulcrumed on said disks and arranged to enter the pockets in the
5 hubs of the gears, slides splined on the counter-shafts and connected with the dogs, levers fulcrumed on suitable supports and having bifurcated portions engaging the slides, hand-levers also fulcrumed on suitable supports,

and connections between the bifurcated levers 10 and the hand-levers.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

JAMES H. BECKNER.

Witnesses:

O. G. CHAMBERLAIN,
C. R. THOMPSON.