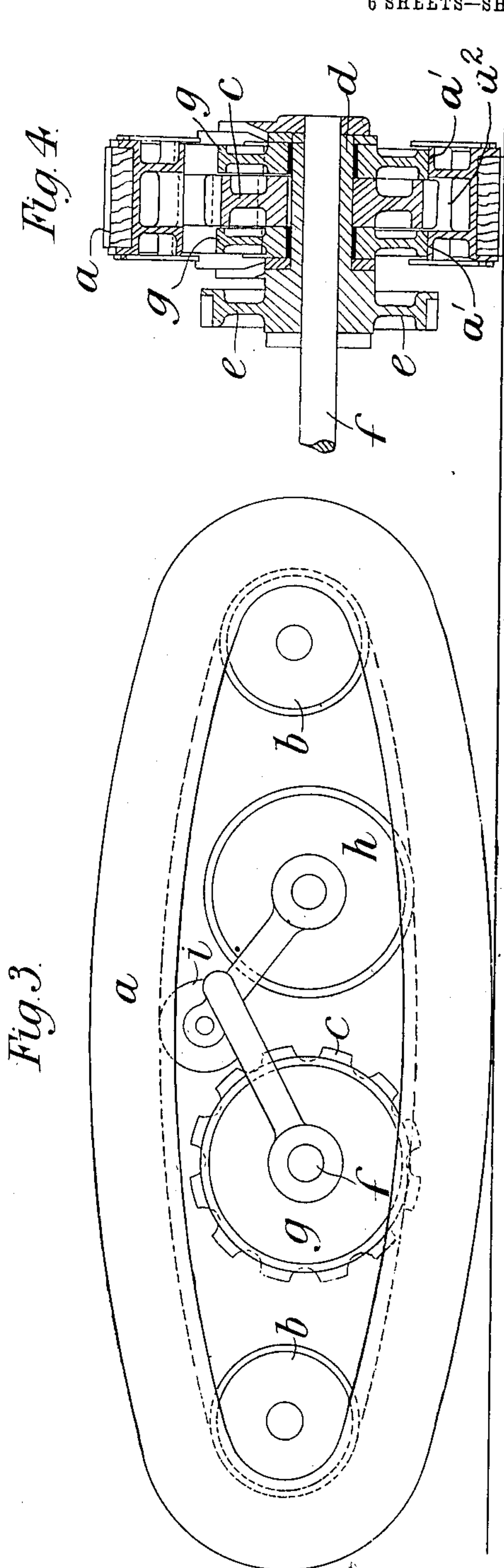
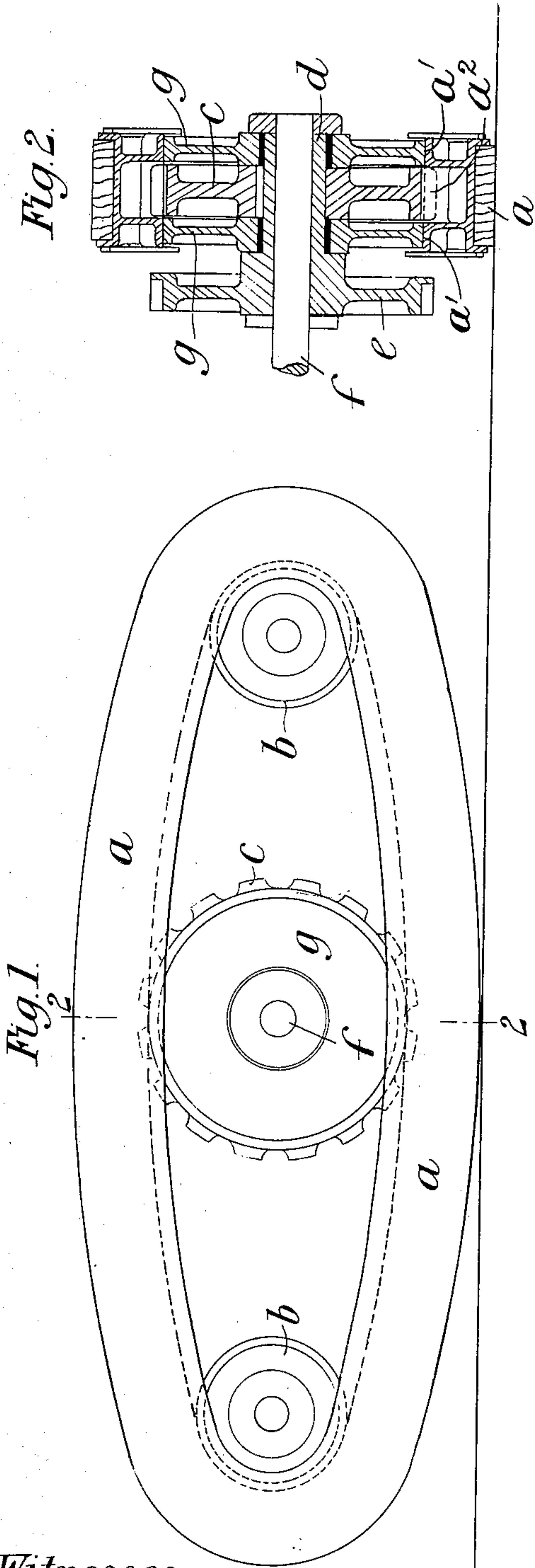


D. ROBERTS & C. JAMES.
TRACTION ENGINE.
APPLICATION FILED MAR. 14, 1908.

916,601.

Patented Mar. 30, 1909.

6 SHEETS—SHEET 1.



Witnesses.
J. H. Moore
R. E. Barry.

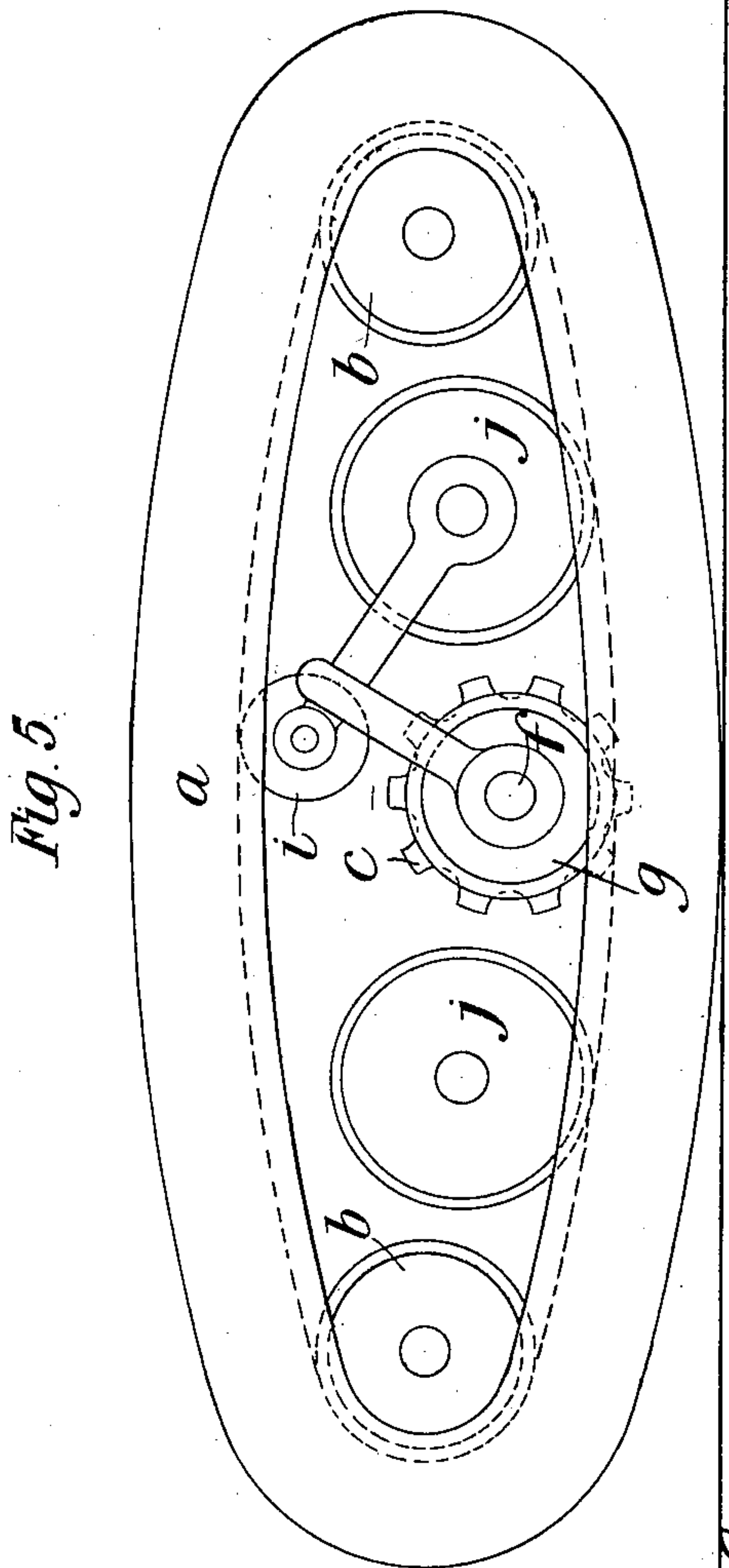
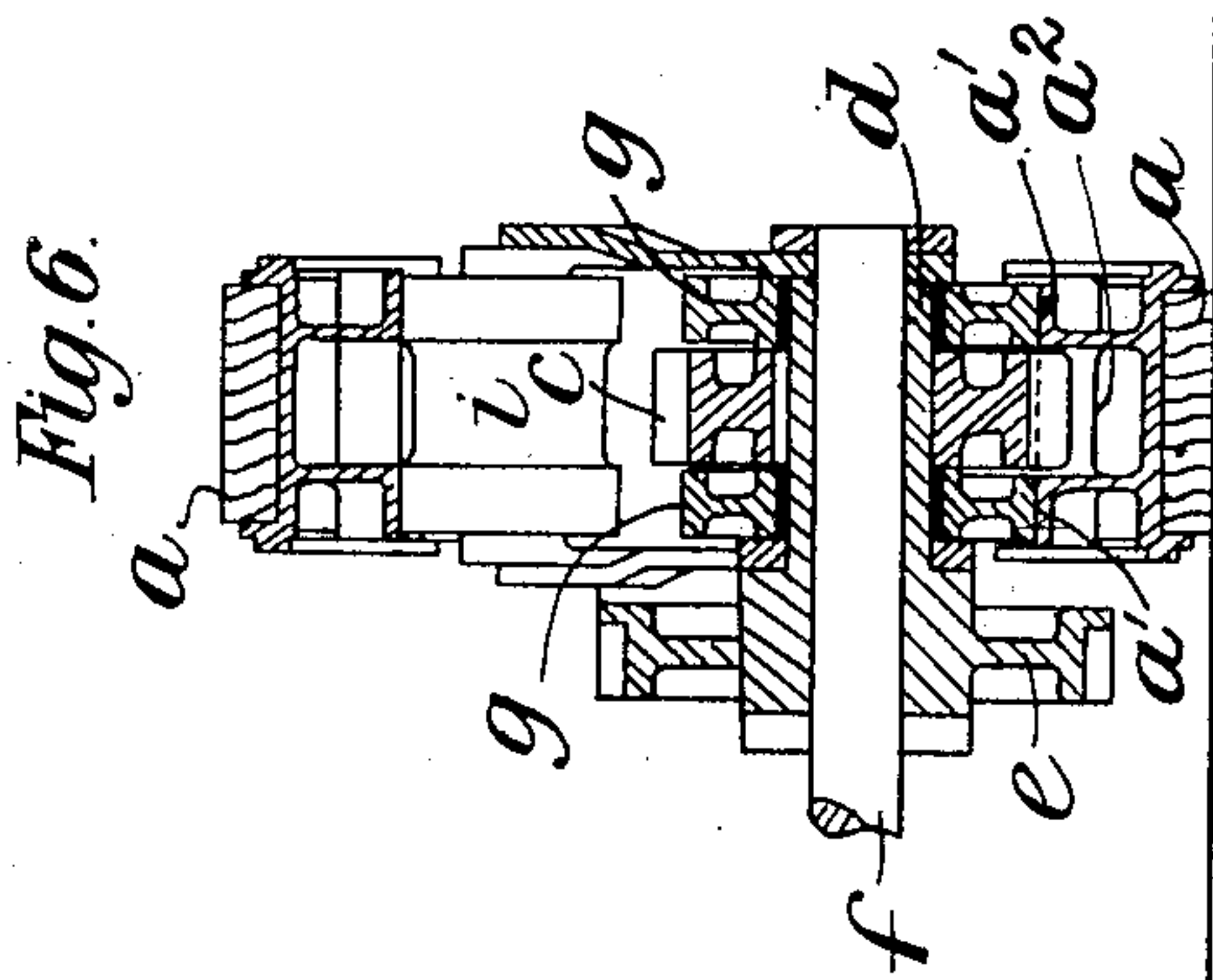
Inventor.
David Roberts and Charles James
By
Whitaker & Trower
Attys

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6 SHEETS—SHEET 2.



Witnesses.
J. K. Moore
R. E. Barry.

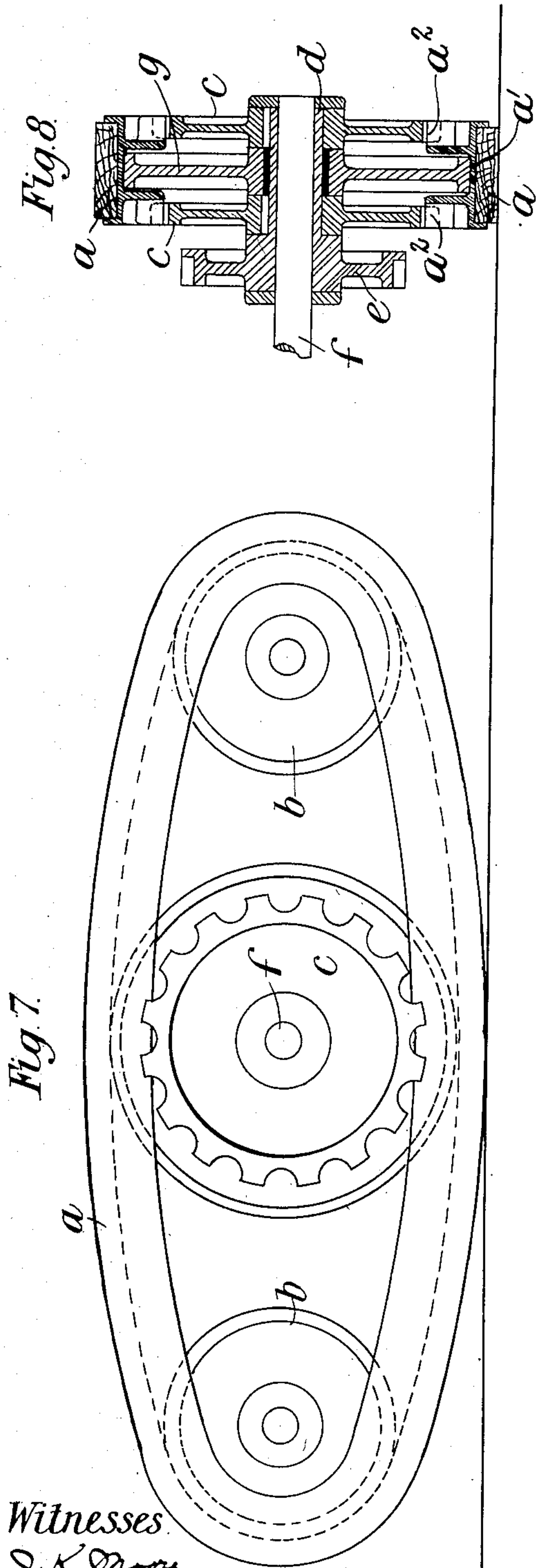
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By Whitaker & Trowell Attys

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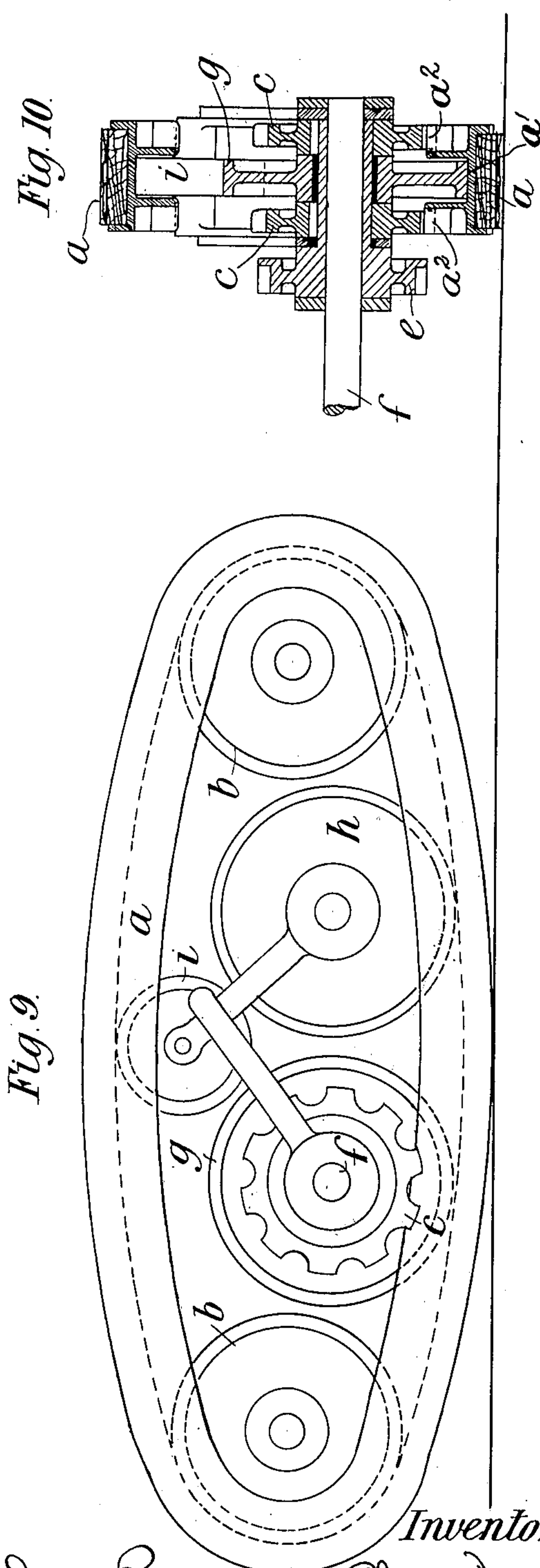
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6 SHEETS—SHEET 3.



Witnesses.
J. K. Moore
R. E. Barry.



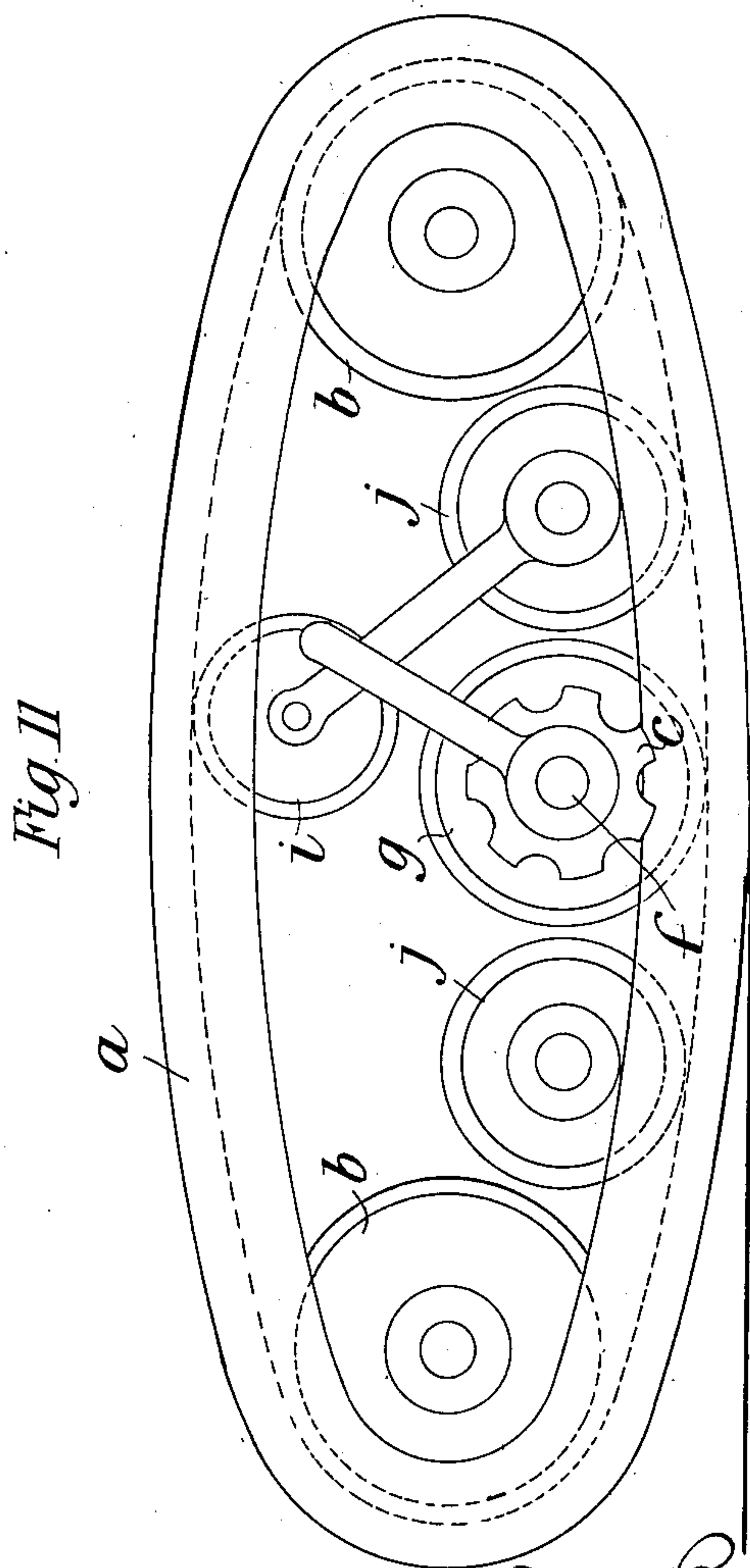
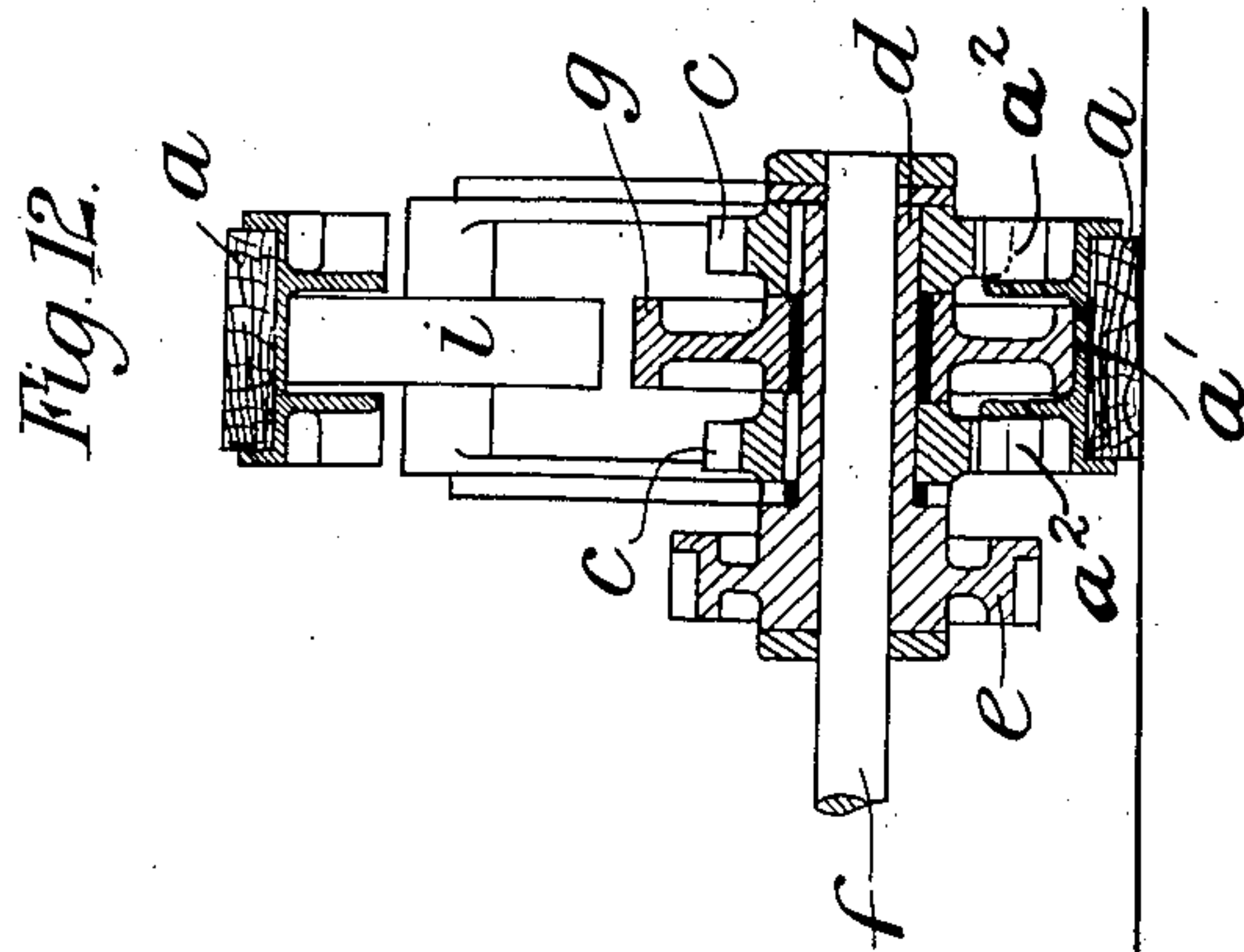
Inventors
David Roberts & *Charles James*
By Whitaker & Brewster Atty

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6 SHEETS—SHEET 4.



Witnesses.
J. K. Moore
R. E. Barry.

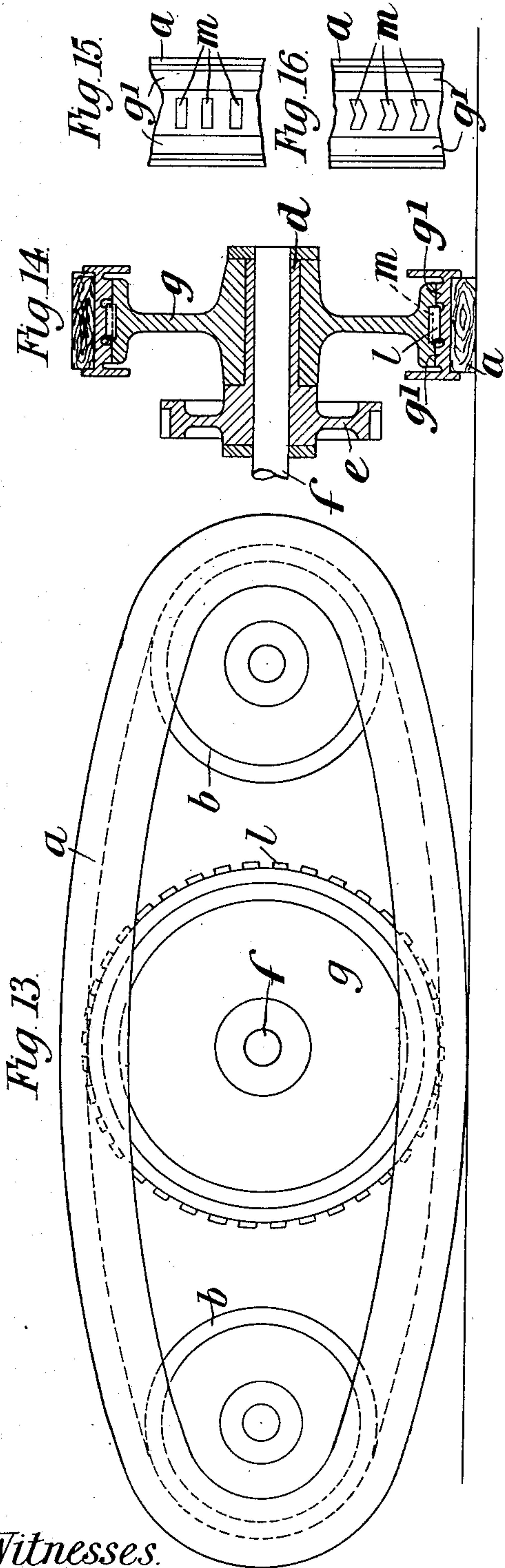
Inventors
David Roberts & Charles James
By Whitaker & Moore
Attys.

D. ROBERTS & C. JAMES.
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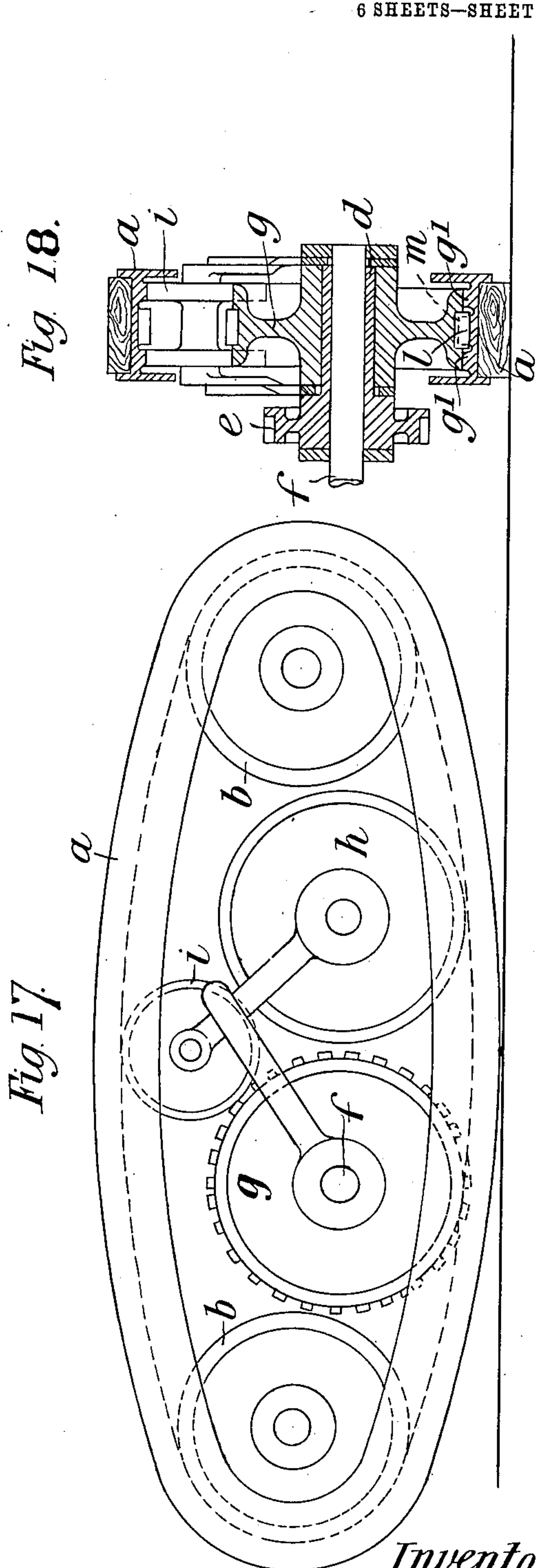
916,601.

Patented Mar. 30, 1909.

6 SHEETS—SHEET 5.



Witnesses.
J. K. Moore
R. E. Barry.



Inventors
David Roberts and
Charles James
By Whitaker & Trewartha Attys

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6 SHEETS—SHEET 6.

Fig. 20.

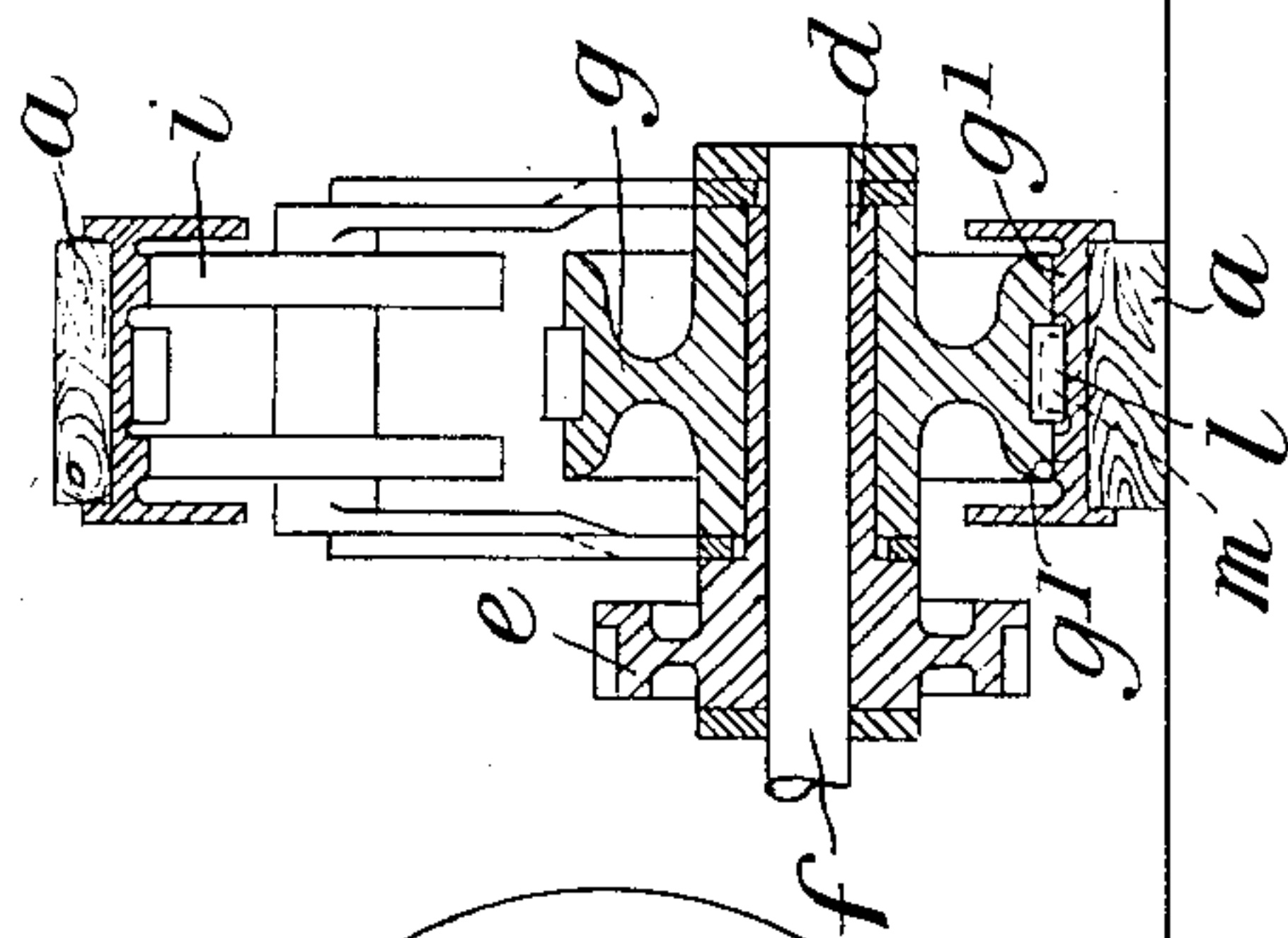
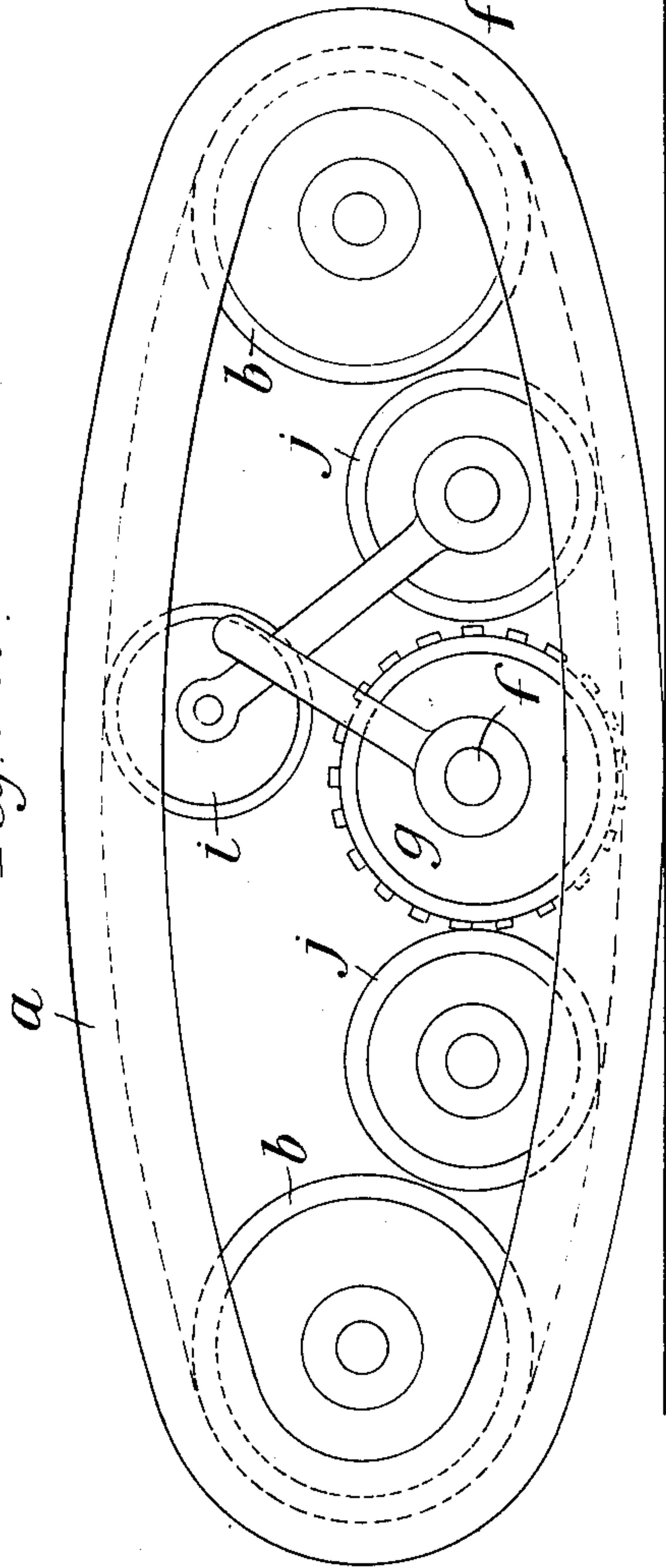


Fig. 19.



Witnesses.
J. K. Moore
R. E. Barry

Inventors.
David Roberts & Charles James
By Whitaker & Trench
Attys.

UNITED STATES PATENT OFFICE.

DAVID ROBERTS AND CHARLES JAMES, OF GRANTHAM, ENGLAND.

TRACTION-ENGINE.

No. 916,601.

Specification of Letters Patent.

Patented March 30, 1909.

Application filed March 14, 1908. Serial No. 421,176.

To all whom it may concern:

Be it known that we, DAVID ROBERTS and CHARLES JAMES, both subjects of the King of Great Britain, and residing at Spittlegate Iron Works, Grantham, Lincolnshire, England, have invented new and useful Improvements in Traction-Engines, of which the following is a specification.

Our invention relates to traction engines, road locomotives and the like and to that class of such vehicles which are provided with portable or self-laid tracks and are described, for example, in the specification of David Roberts' former British Patent No. 16345 of 1904.

In the said former specification there is described a construction of locomotive in which the self-laid tracks are driven by means of sprocket wheels one of which is arranged at each end of the said track and the teeth of which engage with bosses formed upon the chain tracks. It is found, however, in practice that with this method of drive when the vehicle is being propelled in one direction the lower portion of the chain track bearing upon the ground is in tension and is maintained taut whereas when the direction of motion of the vehicle is reversed the lower part of the chain is put in compression and is liable to buckle both vertically and horizontally to an extent which varies with the nature of the ground over which the vehicle is moving and the amount of wear in the hinges of the chain links, thereby increasing the power necessary for propelling the vehicle.

Now, the present invention has for its object to overcome this disadvantage and to this end in lieu of employing a sprocket wheel at each end of the continuous self-laid track we provide in connection with each track a single driving sprocket wheel which is arranged at or about the center of its length, by which means the length of chain, which is alternately put in tension or compression according to the direction in which the vehicle is traveling, is materially reduced.

While the track is of course an endless structure, we have considered it in the specification and claims as it appears when in use in connection with the vehicle, and by its "length" we refer to the longitudinal distance between the portion engaging the foremost roller and that portion engaging the rearmost roller, and the portions engaging the said foremost and rearmost rollers we

have considered and termed the "ends" of the track.

To enable the invention to be fully understood we will describe it by reference to the accompanying drawings, in which:—

Figure 1 is a side view of a self-laid or portable track of the kind described in the specification of David Roberts' former British Patent No. 16345 of 1904, and having the improvements applied thereto. Fig. 2 is a section on the line 2—2, Fig. 1. Figs. 3 and 4 are views similar to Figs. 1 and 2 respectively of a slightly modified form of the invention. Figs. 5 and 6 are views similar to Figs. 1 and 2 respectively of a further modification. Figs. 7 and 8 are views similar to Figs. 1 and 2 respectively showing the invention applied to a self-laid track of the kind described in the specification of our application for Letters Patent of the United States, filed of even date herewith Serial No. 421,175. Figs. 9 and 10 are views similar to Figs. 7 and 8 respectively of a modified construction thereof, and Figs. 11 and 12 are also views similar to Figs. 7 and 8 respectively of a further modification. Fig. 13 is a view similar to Fig. 7 showing a further construction of self-laid track according to the invention. Fig. 14 is a vertical section of the same. Figs. 15 and 16 are respectively plan views of portions of modified forms of the track proper. Figs. 17 and 18 are views similar to Figs. 13 and 14 respectively illustrating a further form of the self-laid track, and Figs. 19 and 20 are views similar to Figs. 17 and 18 respectively of another construction of the improved self-laid track.

Referring first to the construction of track illustrated in Figs. 1 and 2 *a* is the track which is, as above stated, of a construction similar to that described in the specification of British Patent No. 16345 of 1904 and which passes around two guide rollers *b, b* at its ends. *c* is the sprocket-wheel which, as is clearly seen, is arranged at the center of the length of the track *a* and is keyed upon the boss *d* of the driving wheel *e* which is mounted upon the axle *f* held in the frame of the locomotive. The sprocket wheel *c* engages both at the top and bottom with the usual bosses formed upon the chain-track so as to drive the same. *g, g* are wheels or rollers which are loosely mounted upon the boss *d* of the driving wheel *e* on either side of the sprocket-wheel *c*. These wheels form the track-

wheels through the medium of which the weight of the vehicle is supported upon the track, the said wheels also supporting the upper part of the chain which bears upon them. The weight supporting wheels engage bearing surfaces a' a' on the track formed or provided preferably at each side of the bosses a^2 of the track which are engaged by the driving or sprocket wheel c , as shown. In other words the track is provided with longitudinal bearing and traction surfaces arranged in different vertical planes transversely of the track, the traction surface or surfaces having interlocking portions for engaging the driving wheel and the bearing surfaces engaging the supporting wheels or rollers, thus taking the weight of the vehicle entirely off of the driving or propelling mechanism.

Figs. 3 and 4 show a construction of track which is similar to that illustrated in Figs. 1 and 2 but wherein the sprocket-wheel c is arranged to one side of the center of the length of the track and engages with the lower part of the chain-track only. It is also provided on either side with the track-wheels g , g . In this case a track-wheel h without a driving sprocket is arranged on the other side of the center of the length of the track from the sprocket-wheel c and at the same distance from the center as the latter. This track-wheel engages the bearing surfaces a' of the track and serves to carry the weight of the vehicle at that part. i is the usual jockey-wheel serving as a guide-wheel for the center of the track at the upper part.

In Figs. 5 and 6 we have shown a construction of self-laid track in which the driving sprocket-wheel c is exactly at the center of the length of the track but engages with the lower part of the said track only, the upper part being supported by means of the jockey-wheel i as in the last described construction. In this case also a track wheel g is arranged upon either side of the driving sprocket c and additional track-wheels j , j are arranged at equal distances on either side of the driving sprocket c and engage the bearing surfaces a' a' .

Figs. 7 and 8, 9 and 10 and 11 and 12 show constructions of self-laid tracks the mode of driving of which is similar to that shown respectively in Figs. 1 and 2, 3 and 4 and 5 and 6 but in which the self-laid track is of the kind described in our application for Letters Patent of the United States, filed of even date herewith and given Serial No. 421,175, that is to say, in which the said track is formed with trough or U-shaped links. In all these cases the driving sprocket is divided into two parts c , c each of which is keyed upon the boss d of the driving wheel e and which are arranged on either side of the track-wheel g which in these constructions is made in one piece and bears upon the single

bearing surface a' at the bottom of the U-shaped links forming the chain track as is clearly shown, the driving sprockets c , c gearing with the bosses a^2 a^2 upon the outside faces of the said links.

The construction shown in Figs. 7 and 8 is similar to that shown in Figs. 1 and 2 except that the modified form of track is employed; the arrangement illustrated in Figs. 9 and 10 corresponds with that shown in Figs. 3 and 4 while that illustrated in Figs. 11 and 12 corresponds with that shown in Figs. 5 and 6.

Figs. 13 to 16 illustrate the invention as applied to a self-laid track, the links of which are of the U shape as shown in Figs. 7 to 12 and in which the drive is central as illustrated in Fig. 7. In this case, however, the peripheral surface of track-wheel g is divided, the links of the chain being formed with a divided bearing surface or track g' , g' and the teeth l constituting the driving sprocket being formed between the divided track of the wheel g and engaging teeth m formed in the space between the divided track g' . The said teeth l and m may be either straight as shown, for example, in Fig. 15 or helical as illustrated in Fig. 16.

Figs. 17 and 18 represent a form of self-laid track similar to that shown in Figs. 9 and 10 but in which the track is divided as shown in Figs. 14 to 16.

Figs. 19 and 20 illustrate a track of the kind shown in Fig. 11; illustrating the adaptation to the said track of the construction shown in Fig. 14.

Having now particularly described and ascertained the nature of our said invention and in what manner the same is to be performed, we declare that what we claim is:—

1. In a traction engine, the combination with a self laid track provided with longitudinal bearing and traction surfaces located in different vertical planes transversely of the track, of rotary weight supporting means secured to the vehicle and engaging the bearing surfaces of the track, and rotary driving means engaging the traction surface of the track between the ends of the same, substantially as described.

2. In a traction engine, the combination with a self laid track provided with longitudinal bearing portions and longitudinal traction portions disposed laterally of the bearing portions, of weight supporting wheels secured to the vehicle and engaging the bearing surfaces of the track, and a driving wheel disposed substantially centrally of the length of the track, said driving wheel and the traction portions of the track being provided with interlocking portions, substantially as described.

3. In a traction engine, the combination with a self laid track having longitudinal bearing and traction portions in different

vertical planes transversely of the track, of a supporting and driving shaft, a driving wheel mounted on said shaft and engaging the traction surface of said track intermediate its ends, and a supporting wheel mounted on said shaft and engaging the bearing surface of said track, substantially as described.

4. In a traction engine, the combination with a self laid track provided with a longitudinal central traction portion and longitudinal bearing surfaces disposed laterally of said traction portion, of a driving shaft, a rotary traction device connected with said shaft and engaging the traction surface of the track intermediate its ends, and rotary bearing devices at each side of said traction device engaging the bearing surface of the track, substantially as described.

5. In a traction engine, the combination with a self laid track provided with a longitudinal central traction portion and longitudinal bearing surfaces disposed laterally of said traction portion, of a driving shaft, a driving sprocket wheel connected with said shaft and engaging the traction surface of the

track between the end portions of the track and laterally disposed loosely mounted weight supporting wheels engaging the bearing surface of the track, substantially as described.

6. In a traction engine, the combination with a self laid track provided with a longitudinal central traction portion and longitudinal bearing surfaces disposed laterally of said traction portion, of a driving shaft, a driving sprocket mounted on said shaft and engaging the traction surface of the track substantially centrally of the length of the track, and loosely mounted bearing wheels on said shaft, laterally of the driving sprocket engaging the bearing surfaces of the upper and lower portions of the track for taking the weight of the vehicle off of the traction mechanism and supporting the upper portion of the track, substantially as described.

DAVID ROBERTS.
CHARLES JAMES.

Witnesses:

WALTER WAGNER,
SAMUEL WILLIAM PAYNE.