

996,076.

T. J. GEE.
COMPOUND STEAM ENGINE.
APPLICATION FILED DEC. 10, 1909.

Patented June 27, 1911.

2 SHEETS—SHEET 1.

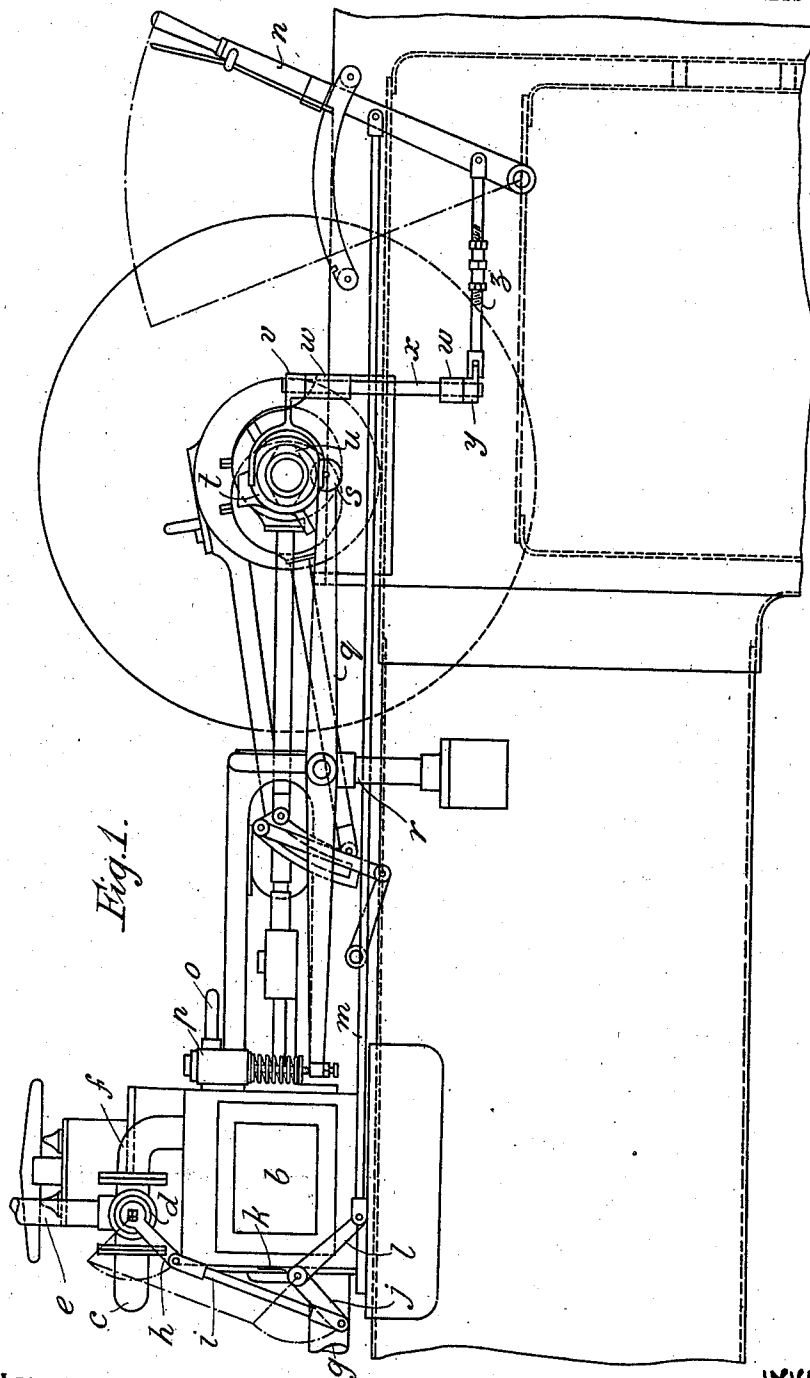


Fig. 1.

WITNESSES:
J. H. Derrigan
John H. Hoving

INVENTOR,
THOMAS JOHN GEE,
by *Ivan O'Sullivan*
Attorney.

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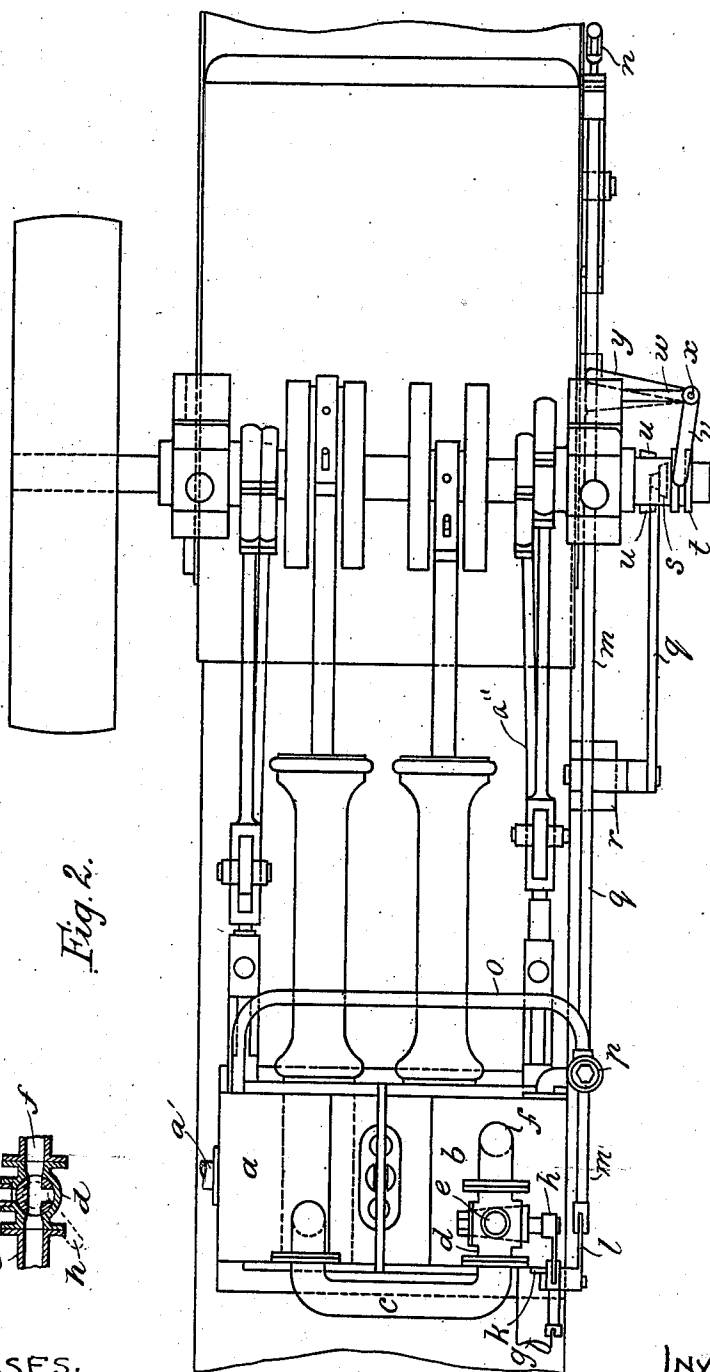


Fig. 2.

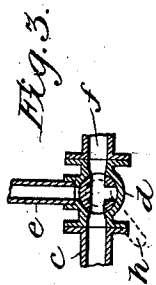


Fig. 3.

WITNESSES:
W. H. Berrigan
John A. Hoving

INVENTOR,
THOMAS JOHN GEE,
by *Frank S. Darnell*
Attorney.

UNITED STATES PATENT OFFICE.

THOMAS JOHN GEE, OF BUENOS AIRES, ARGENTINA, ASSIGNOR TO AGAR CROSS & COMPANY LIMITED, OF LONDON, ENGLAND.

COMPOUND STEAM-ENGINE.

996,076.

Specification of Letters Patent. Patented June 27, 1911.

Application filed December 10, 1909. Serial No. 532,450.

To all whom it may concern:

Be it known that I, THOMAS JOHN GEE, a subject of the King of the United Kingdom of Great Britain and Ireland, residing at Buenos Aires, Argentina, have invented a certain new and useful Improvement in Compound Steam-Engines, of which the following is a specification.

This invention relates to improvements in compound steam engines of the kind in which a three-way cock is provided to prevent the compounding action of the steam and in which the low pressure cylinder is adapted to receive steam at high pressure in addition to the high pressure cylinder so that the engine may be converted from a compound engine into a high pressure engine or vice versa.

The invention consists in the arrangement of devices hereinafter particularly described and pointed out in the claim.

In the accompanying drawings which illustrate the invention Figure 1 is a side elevation showing the improved arrangement as applied to the boiler of a compound traction engine; Fig. 2 is a plan of the same, and Fig. 3 shows a detail.

As shown, *a* is the high pressure cylinder; *b* is the low pressure cylinder; *a''* is the valve gear; *c* is the receiver pipe which connects these two cylinders; *d* is the three-way cock; *e* is an exhaust pipe to the atmosphere and is fitted to the cock *d* and may be used for the high pressure exhaust when both cylinders are working with high pressure steam; *f* is a branch pipe for conducting the exhaust steam to the low pressure cylinder when working as a compound engine; *g* is the exhaust pipe to the chimney from the low pressure cylinder; *h* is a lever connected by the rod *i* to a lever *j* attached to a spindle carried by a bracket *k* which spindle has also secured to it a lever *l* connected by a rod *m* to the control lever *n* which is so located that it can be operated from the foot-plate of the engine; *o* is a steam pipe connecting the valve chests of the high and low pressure cylinders; *p* is a steam valve which admits live steam intermittently from the valve chest of the high pressure cylinder *a* into the valve chest of the low pressure cylinder when the engine is working as a double high pressure engine, said live steam being admitted to the valve chest of the cyl-

inder *a*, as at *a'*. The valve *p* is operated from the crankshaft of the engine by means of a lever *q* provided with a roller *s* and pivoted on a bracket *r*, and actuated by cams *u*, *u*, on a sliding clutch *t* on the crankshaft.

v is the clutch arm which moves the sliding clutch *t* either into or out of action; *w*, *w* are the supports which carry the mechanism for the clutch arm *v*; *x* is a vertical spindle carried by the supports *w*, *w*; *y* is the lower lever which operates the clutch arm *v*; *z* is a short connecting rod which is made adjustable so as to vary the amount of steam to be admitted to the valve chest of the low pressure cylinder.

The operation of the apparatus is as follows:—The high pressure cylinder *a* and the low pressure cylinder *b* are connected by the receiver pipe *c* which receives the exhaust steam from the high pressure cylinder *a*. In this receiver pipe *c* is fitted the three-way cock *d*, which latter controls the distribution of the exhaust steam from the high pressure cylinder *a*, so that the said exhaust steam can either be sent to the low pressure cylinder, as in the case when the engine is used as a compound engine, or on the other hand, when the engine is used as a double high pressure engine, the exhaust steam from the high pressure cylinder can be sent direct to the atmosphere by means of the pipe *e*, and live steam from the valve chest of the cylinder *a* admitted to the cylinder *b* by means of the branch pipe *o* and valve *p*. When the engine is working as a compound engine, the steam is sent through the branch pipe *f* to the low pressure cylinder, and when it has completed its work it is passed to the chimney by the pipe *g*. The roller *s* and the cams *u*, *u*, are, as shown in Fig. 2, disposed at an inclination to the crank-shaft, so that the movement of the valve *p* can be varied according to the will of the operator, and as the said valve *p* is operated direct from the crank-shaft the steam is intermittently admitted to the valve chest of the cylinder *b*. The sliding clutch *t* is put into and out of action by the mechanism consisting of the clutch arm *v*, the vertical spindle *x*, the lever *y*, the rod *z* and the hand lever *n*. The hand lever *n* controls both the independent steam admission to the low pressure cylinder and the exhaust from the high pressure cyl-

inder, and in this manner converts the engine from a compound engine into a high pressure engine and vice versa.

Having now described my invention what
5 I claim and desire to secure by Letters Patent of the United States is:—

In a compound steam engine the combination with low and high pressure cylinders and separate valve gears therefor, of an
10 auxiliary pipe connecting the cylinders, a steam admission valve in said pipe, and manually controlled connections whereby said valve is operated intermittently, said

connections including a slidable clutch, a manually actuated device for sliding said 15 clutch, a cam on said clutch and a lever operated by the cam and serving to actuate the valve, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of 20 two subscribing witnesses.

THOMAS JOHN GEE.

Witnesses:

BERTRAM CHARLES BROOME,
REGINALD CHAMBERS BOLTON.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."
