

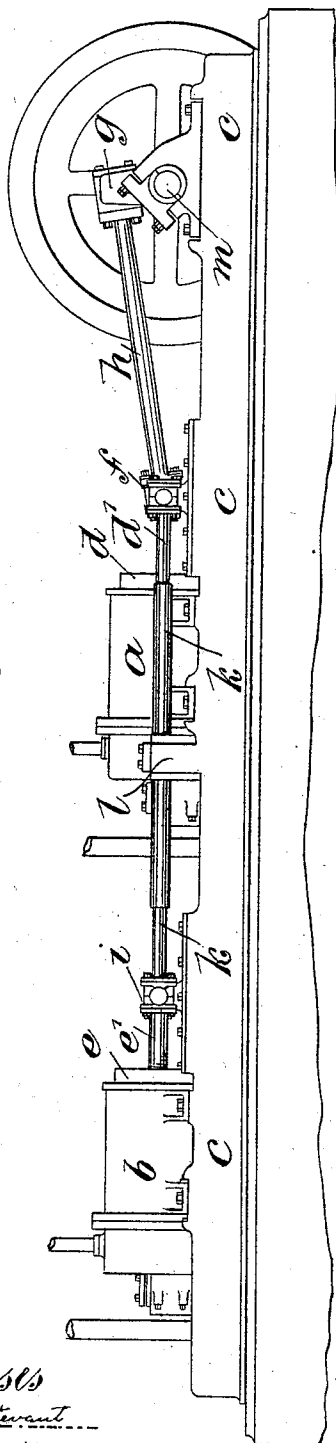
(No Model.)

A. R. BELLAMY.
GAS OR SIMILAR MOTOR ENGINE.

No. 536,997.

Patented Apr. 9, 1895.

FIG 1

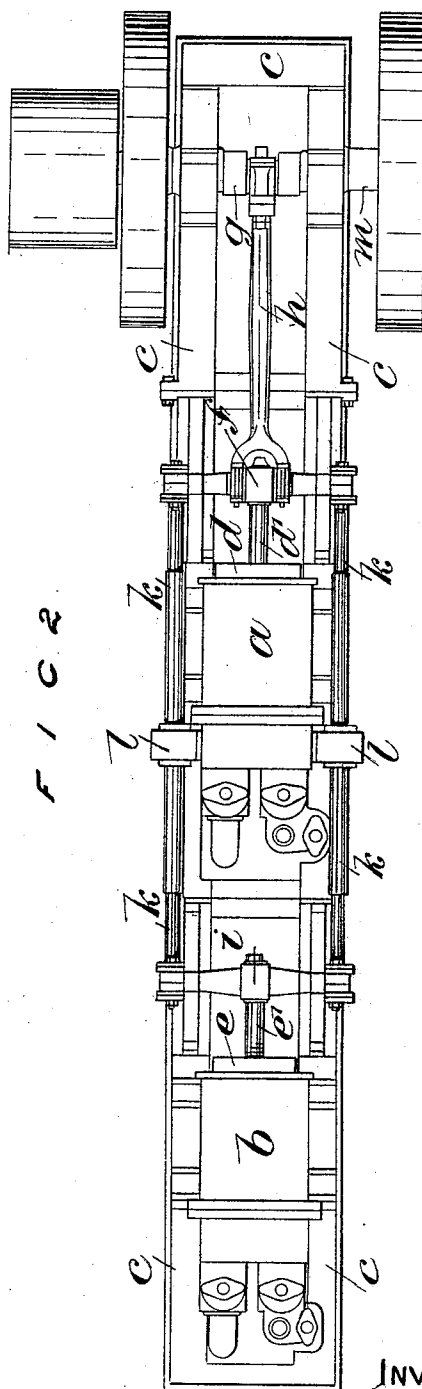


Witnesses

G. H. Stewart

E. A. Scott

FIG 2



INVENTOR

Alfred Rowe Bellamy
By his attys. Richard A.

UNITED STATES PATENT OFFICE.

ALFRED ROWE BELLAMY, OF STOCKPORT, ENGLAND.

GAS OR SIMILAR MOTOR ENGINE.

SPECIFICATION forming part of Letters Patent No. 536,997, dated April 9, 1895.

Application filed October 6, 1894. Serial No. 525,102. (No model.) Patented in England April 6, 1893, No. 7,064.

To all whom it may concern:

Be it known that I, ALFRED ROWE BELLAMY, engineer, a subject of the Queen of Great Britain and Ireland, residing at Algoa Lodge, Adswold Lane, Stockport, in the county of Chester, England, have invented an Improvement in Gas or Similar Motor Engines, (for which I have obtained Letters Patent in England, No. 7,064, dated April 6, 1893,) of which the following is a specification.

My invention relates to gas and similar motor engines in which more than one cylinder are used, and the object of my invention is to improve the construction of such motors and especially to remedy certain defects which exist in large gas engines having more than one cylinder.

Multiple cylinder gas engines, when such are made, usually adhere to one of two types, viz., the tandem cylinder arrangement and the arrangement in which two cylinders are placed face to face, the crank shaft lying between. Both of these as now made, are open to objections. The vis-a-vis type tends to throw angular and reverse strains on the sole plate, frame and moving parts, which are trying, and require the use of heavy castings. In addition, with this type of engine, it is impossible to obtain an explosion at each revolution. In the tandem arrangement, the piston rod of the hindmost engine cylinder as at present constructed passes through a packed gland in the rear of the front cylinder. The excessive dry heat generated by the explosions, makes this an almost impracticable arrangement as the piston rod and gland are both greatly over-heated and never work satisfactorily.

My invention is directed more particularly to the tandem type of engine and the gist of the improvement lies in this that I connect the rear piston rod to the front piston rod by external side attachments and thus avoid requiring to use the prolonged piston rod and packing gland to the disadvantages of which I have just referred.

The accompanying sheet of drawings illustrates my invention.

Figure 1 is a side elevation of a gas engine made in accordance with my invention. Fig. 2 is a plan.

The front cylinder is marked *a* and the

rear cylinder *b*, the two cylinders being arranged in tandem. The whole of the parts of the engine is supported upon the bed plate or sole *c*. The two trunk pistons *d e* are in the same relative positions. The piston rod *d'* of the leading cylinder *a* is connected to the cross head *f*; and the cross head *f* to the crank *g* by means of the connecting rod *h* as clearly shown in the drawings. The piston rod *e'* of the rear cylinder *b* is similarly connected to the cross head *i*, and the cross head *i* is connected to the leading cross head *f* by sliding tie-rods *k* which firmly brace the two cross heads together. The rods *k* are partly supported by and slide in bearings *l* so as to steady and stiffen the rods while the engine is at work. By thus externally connecting the cross heads and pistons of the two cylinders *a* and *b*, I am enabled to avoid prolonging the rear piston rod *e'* through the back of the front cylinder *a* and thus escape the disadvantages attendant upon such an arrangement. The ordinary arrangement of valves at the back of the front cylinder is allowed to remain undisturbed as my invention enables me to carry the parts for connecting the pistons quite clear of existing obstructions. The valves are of the ordinary type and are worked in the usual manner by a side shaft operated from the crank shaft *m*. It is therefore unnecessary particularly to describe or illustrate the said valves and valve operating mechanism. I would however here remark that to prevent the severe shock which might occur by having both explosions simultaneously behind the two pistons, I so time or set the valves that the explosions shall take place alternately, thus giving an impulse at each revolution.

The drawings show two cylinders only in line but it will be understood that more than two cylinders might be used.

I declare that what I claim is—

1. In combination in a gas motor or the like, the two cylinders arranged tandem, the pistons and piston rods, the crank shaft common to both pistons, the pitman *h* connecting the crank shaft with one piston rod, the cross heads on the piston rods and the connections between the cross heads said connections between the piston rods being external to the cylinders and extending along the forward

cylinder from front to rear thereof substantially as described.

2. In combination in a gas or similar motor, the cylinders arranged tandem, the pistons
5 and piston rods, the crank shaft common to both pistons and connected to the rods thereof and valve mechanism for the two cylinders operating alternately to effect an explosion for each revolution, said valve mechanism
10 being arranged at the rear of each cylinder

whereby the piston will act in the same direction in drawing the charge and compressing the same substantially as described.

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

ALFRED ROWE BELLAMY.

Witnesses:

ANNIE M. BELLAMY,
ROLAND BELLAMY.