

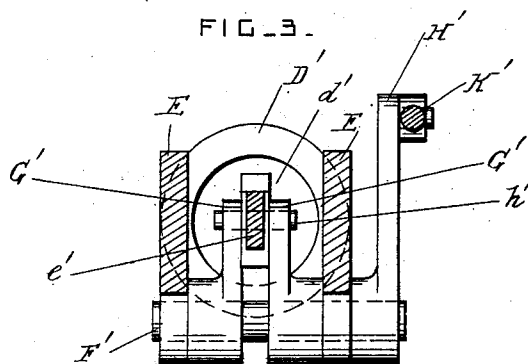
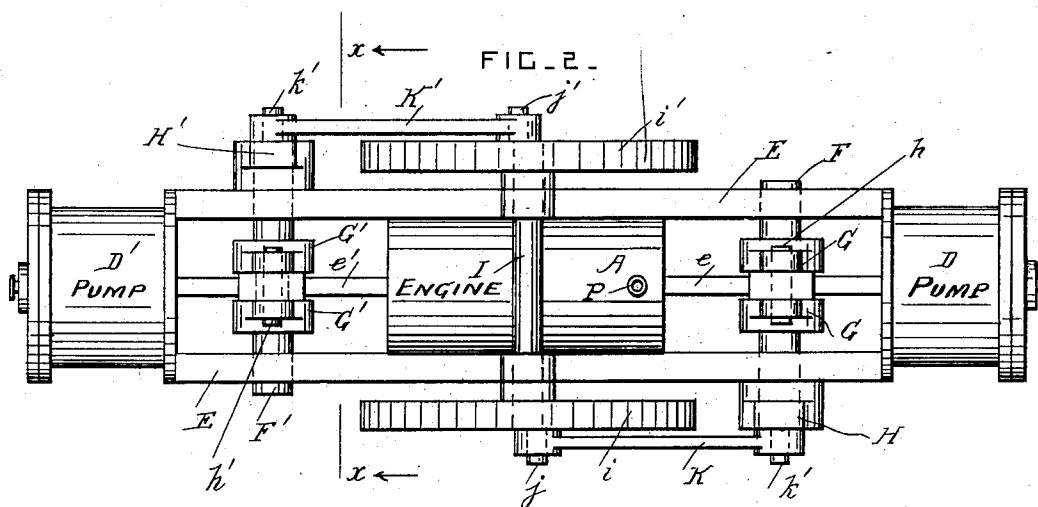
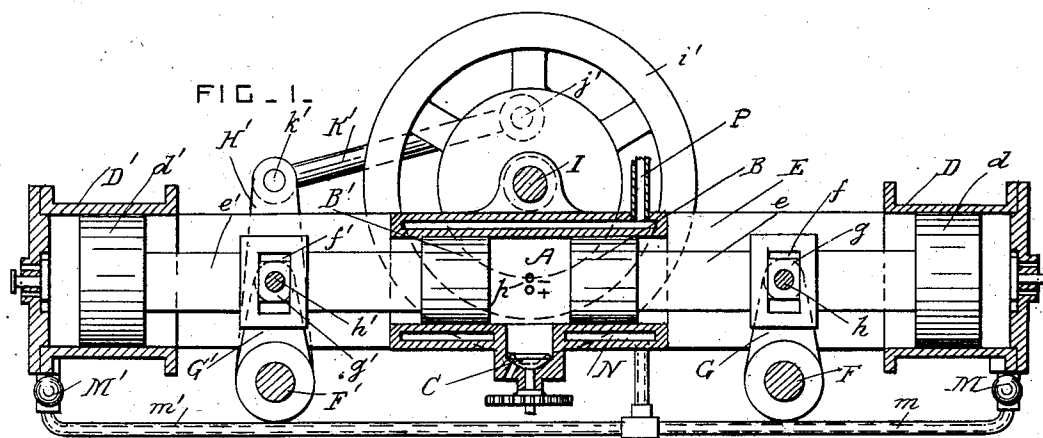
No. 753,787.

PATENTED MAR. 1, 1904.

C. S. DEAN.
AIR COMPRESSOR.

APPLICATION FILED APR. 21, 1903.

NO MODEL.



WITNESSES

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UNITED STATES PATENT OFFICE.

CYRUS S. DEAN, OF BUFFALO, NEW YORK.

AIR-COMPRESSOR.

SPECIFICATION forming part of Letters Patent No. 753,787, dated March 1, 1904.

Application filed April 21, 1903. Serial No. 153,681. (No model.)

To all whom it may concern:

Be it known that I, CYRUS S. DEAN, residing at Buffalo, in the county of Erie and State of New York, have invented certain new and useful Improvements in Air-Compressors; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to air-compressors specially intended for use in running automobiles; and it consists in the novel construction and combination of the parts hereinafter fully described and claimed.

In the drawings, Figure 1 is a longitudinal section through the air-compressor. Fig. 2 is a plan view of the air-compressor. Fig. 3 is a cross-section taken on the line *xx* in Fig. 2.

A is the power-cylinder, arranged at the middle part of the machine.

B and B' are two pistons which slide in the power-cylinder A in opposite directions.

C is the inlet-valve, arranged between and below the pistons and operated by any approved valve-gear.

This engine is preferably operated by gas, oil, or other hydrocarbon, which is ignited between the two said pistons, so that they are propelled in opposite directions. The means for admitting, igniting, and exhausting the charge of air and hydrocarbon are of any approved kind and do not form a part of the present invention.

D and D' are two air-compressing cylinders secured at the opposite ends of a frame E of any approved construction, the power-cylinder A being secured to the middle part thereof.

The cylinders D and D' are provided with pistons *d* and *d'* and also have suitable inlet and outlet valves. A bar *e* connects the pistons B and *d*, and a bar *e'* connects the pistons B' and *d'*, the three said cylinders being axially in line with each other. The bar *e* has a guide-slot *f*, and *g* is a block which slides vertically in the said slot. The bar *e'* has a guide-slot *f'*, and *g'* is a block which slides vertically in the slot *f'*.

F is a rock-shaft journaled in the frame and arranged under the bar *e*, and F' is a similar rock-shaft arranged under the bar *e'*.

G represents two arms secured on the rock-shaft F and provided with a pin *h*, which is journaled in the block *g*.

G' represents two arms secured on the rock-shaft F' and provided with a pin *h'*, which is journaled in the block *g'*. An arm H is secured on the rock-shaft F at one side of the frame, and an arm H' is secured on the rock-shaft F' on the other side of the frame from the arm H.

I is a driving or crank shaft journaled in bearings on the frame and arranged between the compressor-cylinders over the power-cylinder A, and *i* *i'* are two fly-wheels secured on the end portions of the crank-shaft one on each side of the frame and provided with crank-pins *j* *j'*, which are arranged at an angle of one hundred and eighty degrees.

K is a connecting-rod which couples the crank-pin *j* with the pin *k* at the free end of the arm H, and K' is a connecting-rod which couples the crank-pin *j'* with the pin *k'* at the free end of the arm H'.

The air is compressed at each outstroke of the pistons *d* and *d'*, and the compressed air is used to drive the engine or motor of an automobile or for any other purpose.

The efficiency of the compressed air is increased by passing it through a heater of approved construction which is preferably heated by the exhaust from the power-cylinder A or in any other manner.

M M' are the outlet-valves of the compressor-cylinders, and *m* *m'* are the delivery-pipes. These pipes are connected to an air jacket or heater N, which encircles the power-cylinder A and which forms a means for heating the air and cooling the said power-cylinder.

P is the outlet-pipe for hot air from the air-jacket N, and *p* is the igniter of the gas-engine cylinder.

What I claim is—

1. The combination, with a power-cylinder, and two compressor-cylinders arranged at its ends; of pistons slidable in the said cylinders, piston-rods connecting the said pistons together in pairs and having guide-slots at their middle parts between the said pistons, guide-blocks slidable vertically in the said slots, a

crank-shaft, pivoted arms operatively connected with the said guide-blocks, and driving connections between the said arms and the crank-shaft.

- 5 2. The combination, with a single power-cylinder, and two compressor-cylinders arranged at its ends; of pistons slidable in opposite directions in the said cylinders, bars
10 provided with guide-slots and connecting the said pistons together in pairs, blocks sliding vertically in the said guide-slots, rock-shafts mounted under the said bars, two arms secured on the middle parts of each of the said
15 rock-shafts and provided at their free ends with pins which engage with the said blocks,

two arms provided with driving-pins at their free ends and secured on the end portions of the said rock-shafts upon opposite sides of the said cylinders, a crank-shaft journaled between the said compressor-cylinders, a fly-wheel secured on the said crank-shaft, and connecting-rods between the said driving-pins and the crank-shaft. 20

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

CYRUS S. DEAN.

Witnesses:

HERBERT W. T. JENNER,
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