

May 13, 1930.

E. L. GILBERT

1,758,829

INTERNAL COMBUSTION ENGINE

Filed April 15, 1929

3 Sheets-Sheet 1

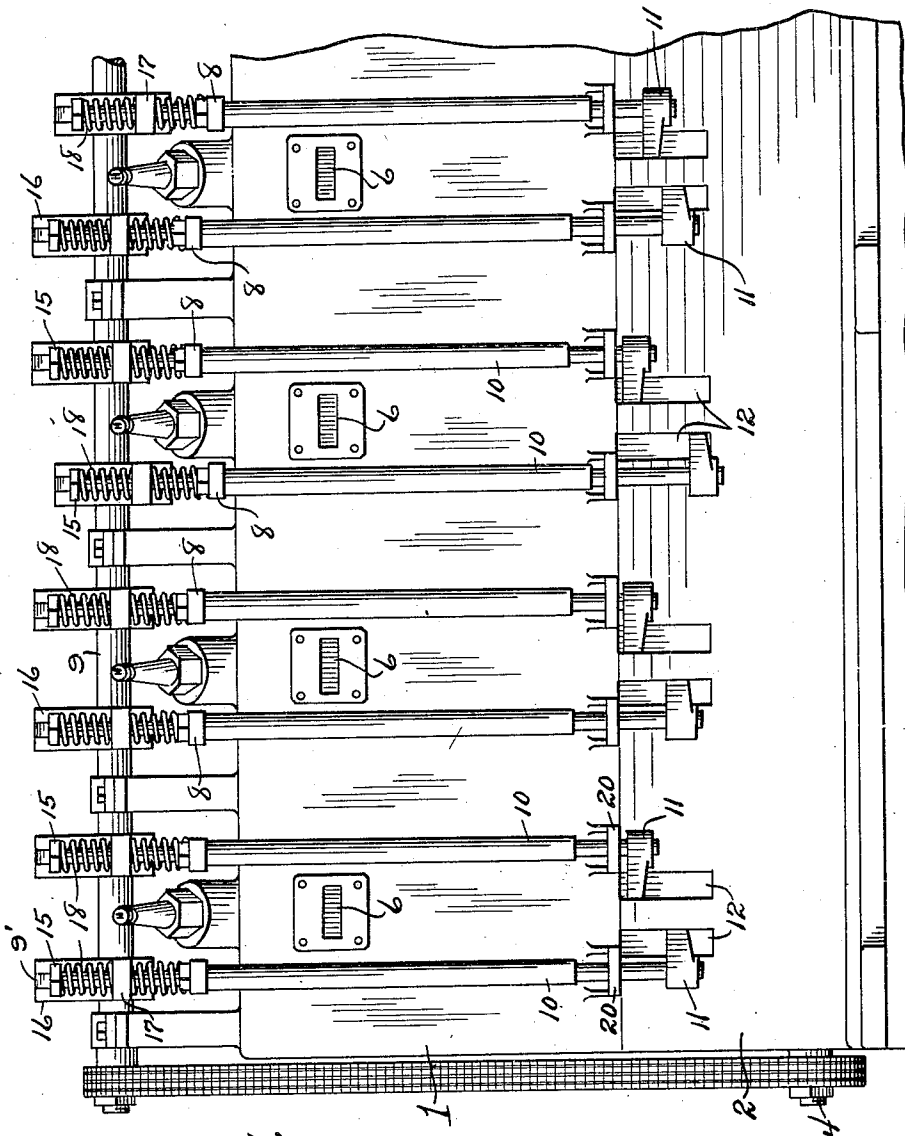


Fig. 1.

Edward Leslie Gilbert
INVENTOR

BY Victor J. Evans
ATTORNEY

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E. L. GILBERT

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3 Sheets-Sheet 2

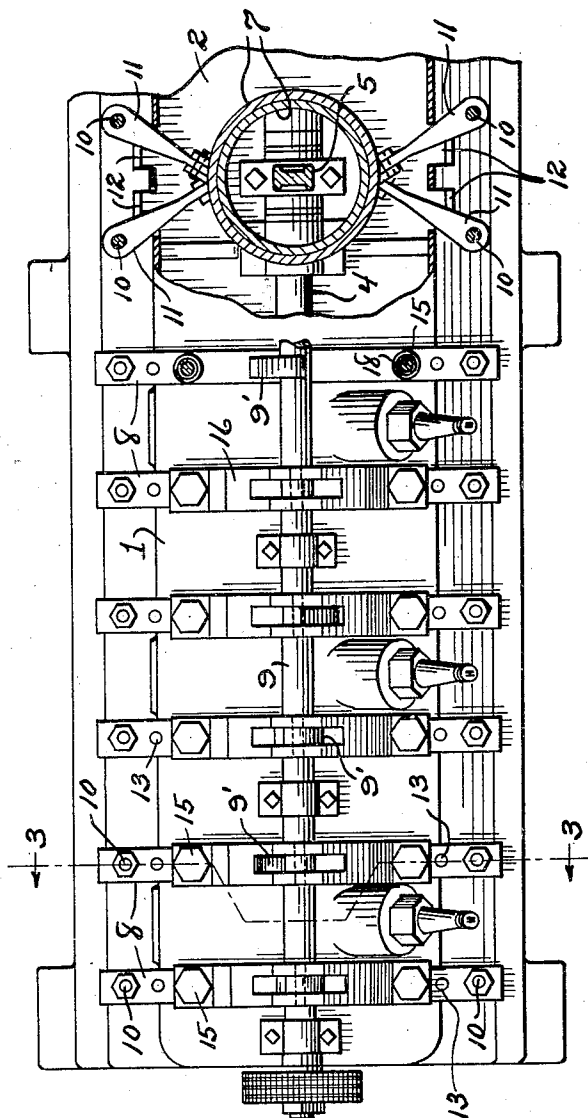


Fig. 2.

Edward Leslie Gilbert
INVENTOR

BY Victor J. Evans
ATTORNEY

May 13, 1930.

E. L. GILBERT

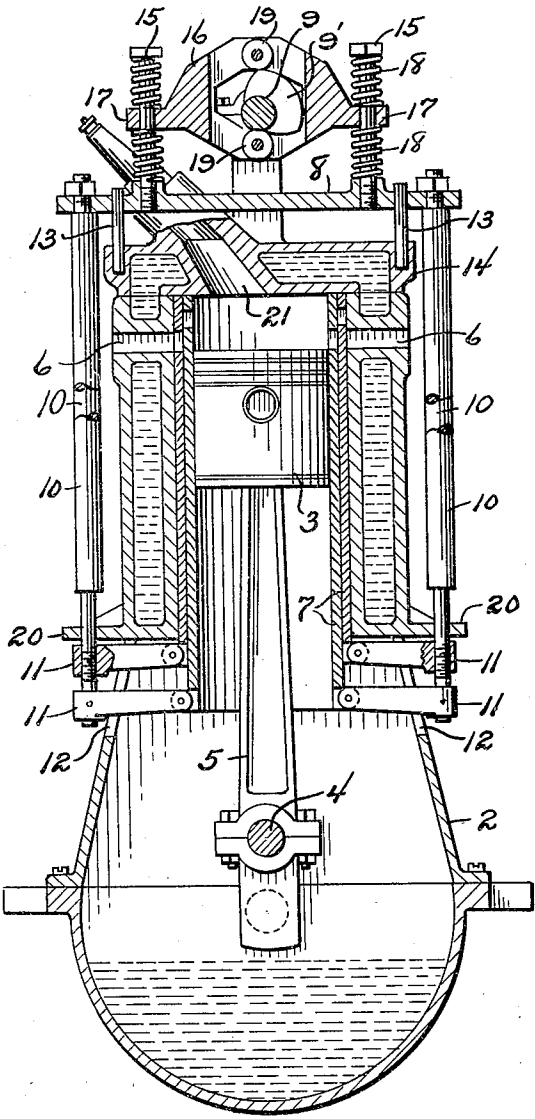
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Fig. 3.



Edward Leslie Gilbert
INVENTOR

BY Victor J. Evans
ATTORNEY

UNITED STATES PATENT OFFICE

EDWARD LESLIE GILBERT, OF FORT BAYARD, NEW MEXICO

INTERNAL-COMBUSTION ENGINE

Application filed April 15, 1929. Serial No. 355,325.

This invention relates to improvements in sleeve valve types of engines, the general object of the invention being to provide an overhead cam shaft for operating the valves, with yieldable means for imparting the movement of the cams of the shaft to the cross heads, whereby damage to the parts will be prevented if the valves should stick or be prevented from moving for any other reason.

This invention also consists in certain other features of construction and in the combination and arrangement of the several parts, to be hereinafter fully described, illustrated in the accompanying drawings and specifically pointed out in the appended claims.

In describing the invention in detail, reference will be had to the accompanying drawings wherein like characters denote like or corresponding parts throughout the several views, and in which:—

Figure 1 is an elevation of an engine constructed in accordance with this invention.

Figure 2 is a top plan view, with parts in section.

Figure 3 is a section on line 3—3 of Figure 2.

In these views, the numeral 1 indicates the cylinder block, 2 the crank case, 3 the piston in each cylinder and 4 the crank shaft which is connected with the pistons by the rods 5. The inlet and exhaust ports 6 of each cylinder are controlled by a pair of sleeve valves 7 and a pair of cross heads 8, actuated from the overhead cam shaft 9, operates each set of valves as each cross head is connected with one valve of each set by a pair of rods 10 having arms 11 at their lower ends which are pivotally connected with the lower end of each valve. Each arm passes through a slot 12 formed in the upper part of the crank case. Each cross head is guided for vertical movement by the guiding pins 13 extending upwardly from the head 14 of the block and passing through holes in the cross head.

A pair of bolts 15 is attached to each cross head and a cam housing 16 has a flange 17 at each end thereof through which each bolt 15 passes and a pair of springs 18 is arranged on each bolt, with their adjacent ends bearing against each flange so that when the hous-

ing is moved by a cam 9' of the cam shaft, the movement of the housing will be communicated to the cross head by said springs. The housing is provided with the upper and lower rollers 19 with which the cam engages.

From the foregoing it will be seen that the cams of the cam shaft will impart a reciprocatory vertical movement to the housing 16, which movement is imparted to the cross heads 8 by the springs and the movement of the cross heads is imparted to the sleeve valves by the rods 10 and their arms, the rods being guided by having their lower ends passing through holes in flanges 20 at the lower end of the cylinder block. Thus the sleeve valves are actuated from an overhead cam shaft and if said valves should stick for any reason, the parts will not be damaged, as the springs 18 will give and permit movement of the cam housing without imparting their movements to the other parts.

The spark plug passages 21 are offset and are of considerable length so as to form a gas pocket which acts to slow down combustion and allows for a higher compression and thus enables the engine to produce more power without knocking.

It is thought from the foregoing description that the advantages and novel features of the invention will be readily apparent.

It is to be understood that changes may be made in the construction and in the combination and arrangement of the several parts, provided that such changes fall within the scope of the appended claims.

What I claim is:—

1. In a sleeve valve motor provided with a pair of valves for each cylinder, a cam shaft arranged above the head of the motor, a plurality of cams on said cam shaft, means for rotating the cam shaft from the movable part of the motor, cross heads guided for vertical movement at the top of the motor, a pair of rods connecting each cross head with one of the valves and resilient means for imparting movement of the cams of the cam shaft to the cross heads.

2. In a sleeve valve motor, a cam shaft journaled in supports on the head of the motor, means for rotating the cam shaft from a

movable part of the motor, a housing reciprocated by each cam of the cam shaft, a cross head arranged under each housing, uprights on each cross head slidably receiving portions of each housing, upper and lower springs on said uprights having their adjacent ends engaging portions of the housing whereby the movement imparted to the housing by its cam is resiliently imparted to the cross head and means for connecting each cross head to a valve.

3. In a sleeve valve motor, a cam shaft journaled in supports on the head of the motor, means for rotating the cam shaft from a movable part of the motor, a plurality of cams on said cam shaft, a housing reciprocated by each cam of the cam shaft, a cross head arranged under each housing, uprights on each cross head slidably receiving portions of each housing, upper and lower springs on said uprights having their adjacent ends engaging portions of the housing whereby the movement imparted to the housing by its cam is resiliently imparted to the cross head, means for connecting each cross head to a valve and rollers in each housing with which the cam engages.

In testimony whereof I affix my signature.

EDWARD LESLIE GILBERT.

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