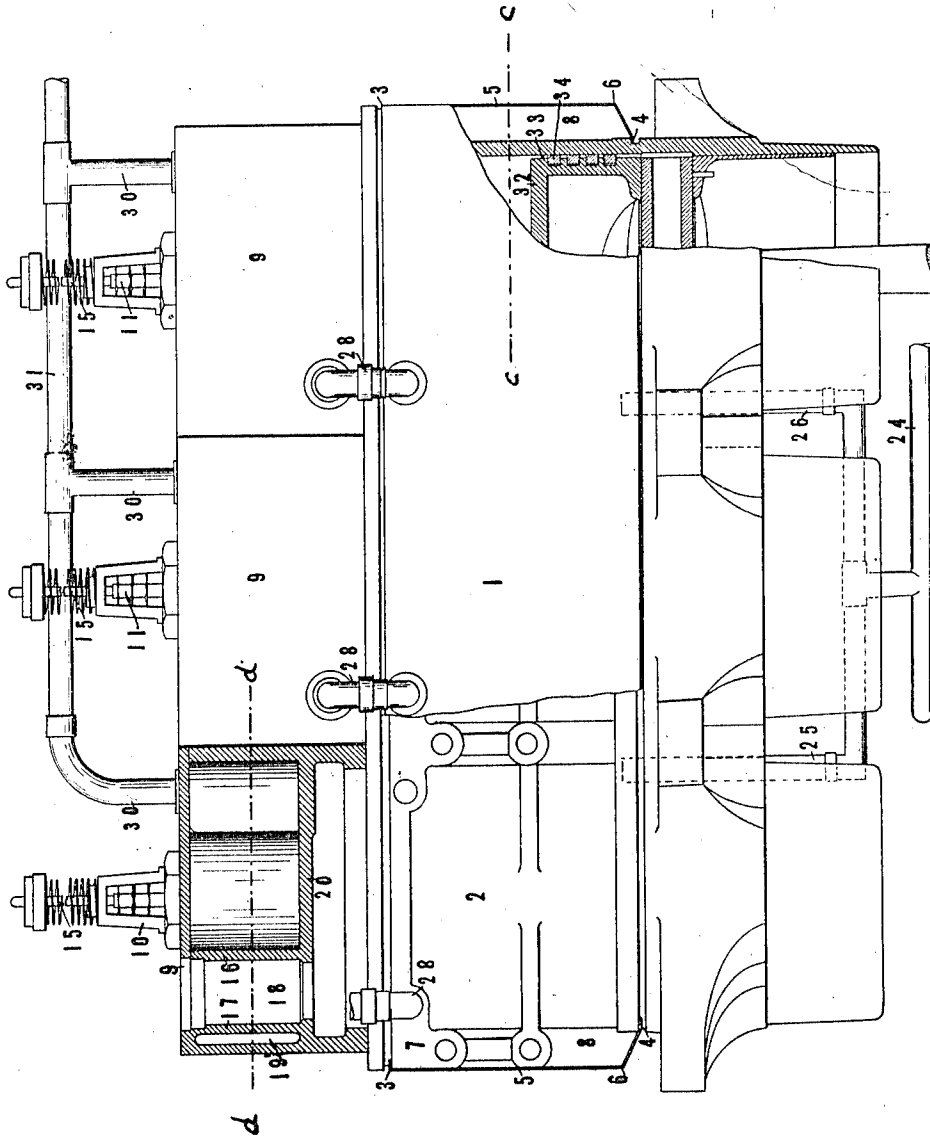


W. R. McKEEN, JR.
INTERNAL COMBUSTION ENGINE.
APPLICATION FILED AUG. 13, 1907.

1,079,255.

Patented Nov. 18, 1913.

3 SHEETS—SHEET 1.



WITNESSES
Samuel L. Albert

FILED

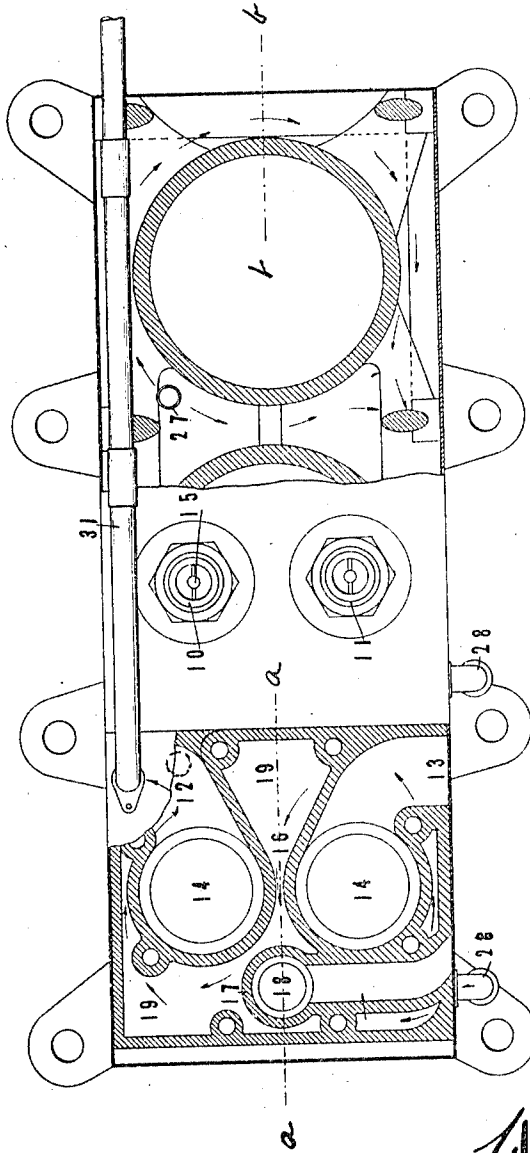
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3 SHEETS—SHEET 2.

Fig. 2-



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3 SHEETS—SHEET 3.

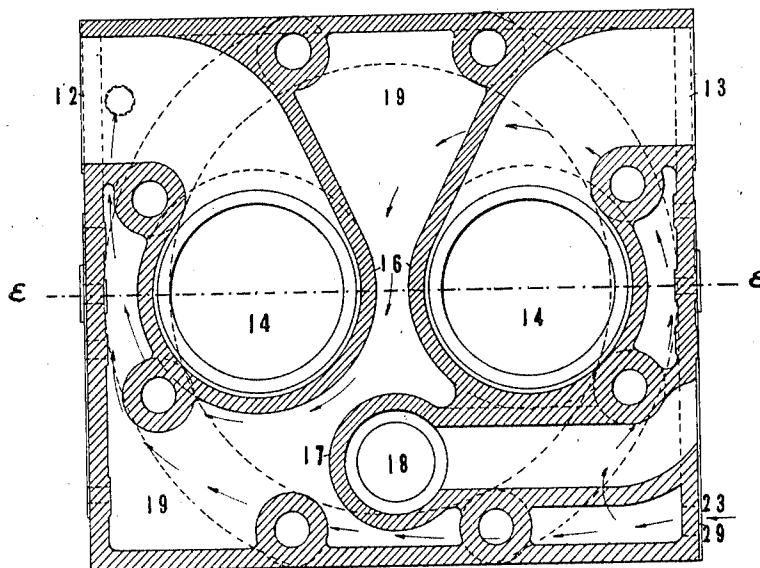


Fig. 3.

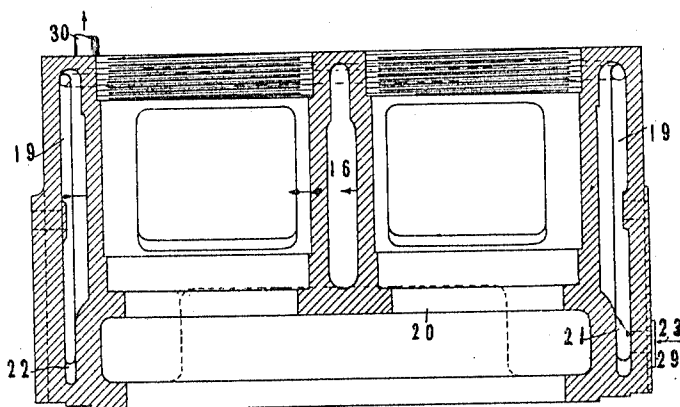


Fig. 4.

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UNITED STATES PATENT OFFICE.

WILLIAM R. McKEEN, JR., OF OMAHA, NEBRASKA, ASSIGNOR TO McKEEN MOTOR CAR COMPANY, OF OMAHA, NEBRASKA, A CORPORATION OF NEW JERSEY.

INTERNAL-COMBUSTION ENGINE.

1,079,255.

Specification of Letters Patent.

Patented Nov. 18, 1913.

Application filed August 13, 1907. Serial No. 388,285.

To all whom it may concern:

Be it known that I, WILLIAM R. McKEEN, Jr., residing at Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Internal-Combustion Engines, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to engines.

One of the objects thereof is to provide a simple and reliable engine of the internal combustion type in which the cylinders, valves and other parts are maintained cool and in condition for efficient action.

Another object is to provide an engine of the above type in which any tendency of the piston to bind or become otherwise inefficient is done away with.

Other objects will be in part obvious and in part pointed out hereinafter.

The invention accordingly consists in the features of construction, combinations of elements and arrangement of parts which will be exemplified in the construction hereinafter set forth, and the scope of the application of which will be indicated in the following claims.

In the accompanying drawings, wherein is shown one of various possible embodiments of my invention, Figure 1 is a side elevation thereof, certain parts being broken away upon lines *a-a* and *b-b* of Fig. 2, in order to show the construction more clearly; Fig. 2 is a sectional plan, the sectional portions thereof being taken substantially on the lines *c-c* and *d-d* of Fig. 1; Fig. 3 is a sectional plan of a cylinder-head on a somewhat larger scale than Fig. 2; Fig. 4 is a sectional elevation taken substantially on the line *e-e* of Fig. 3.

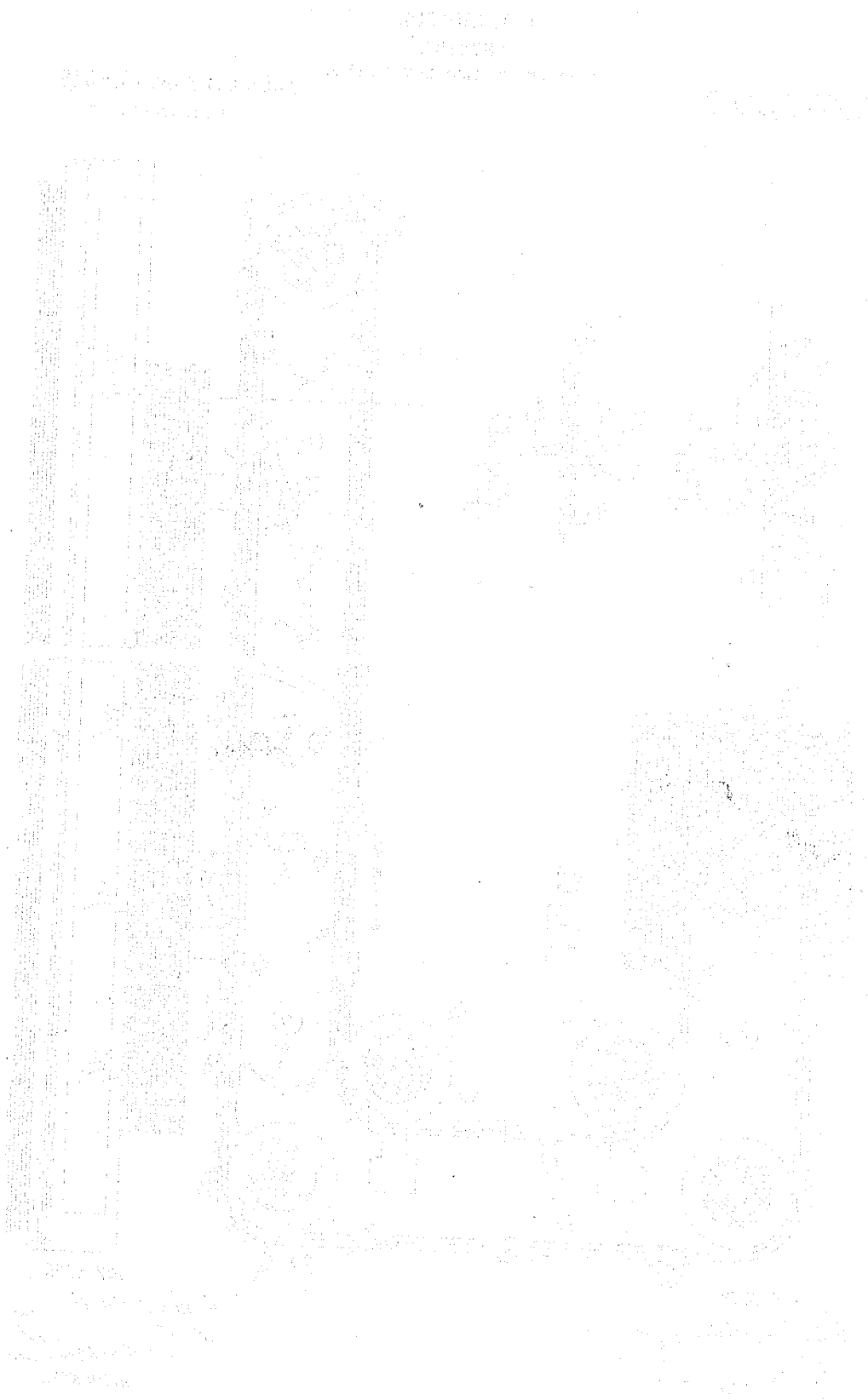
Similar reference characters refer to similar parts throughout the several views of the drawings.

In order to render certain features of this invention more readily and fully understood, it may here be noted that in internal combustion engines a large amount of heat is necessarily generated in the cylinder or cylinders with a corresponding tendency to high temperatures of the cylinder walls and adjacent parts. Such temperatures are highly undesirable, not only on account of their tendency to draw the temper of the

metal, to warp the same and to cause undue expansion and binding of the parts, but by reason of the extreme difficulty of lubrication, the lubricant being, in some instances, burned out almost as rapidly as applied. I have also found in the running of internal combustion engines that under the heat conditions obtaining in general practice there is a tendency for the piston to expand within the cylinder walls and bind therein, with consequent cutting of the parts and loss of power. The above and other defects are avoided in constructions of the nature of that hereinafter described.

Referring now to the accompanying drawings, there is shown a cylinder casting 1 in which a plurality of cylinders 2 are formed in a single piece. This casting, which is provided with projecting portions to adapt it to be securely mounted upon the engine bed, is formed with grooves 3 and 4 extending entirely about the same, as best shown in Fig. 1 of the drawings. Within these grooves are peened the upper and lower edges of a metallic sheet 5, preferably of copper. This sheet is inwardly inclined at its lower portion, as at 6, and, as the portion of casting 7 in which the upper edge of the sheet rests extends outwardly from the cylinder walls, the sheet is spaced from these walls and forms a jacket space 8.

Detachably mounted upon the casting 1 are the cylinder heads 9 of which, as the same are substantially identical, one only will be described in detail. Head 9 is provided with inlet and outlet valves 10 and 11, to which passages 12 and 13 lead respectively from the carbureter and to the exhaust. These valves control ports leading downwardly into the cylinder, as at 14, being operated by a vertical movement of their stems 15. The details of this valve mechanism form in themselves no part of the present invention and are not claimed herein inasmuch as they, in common with certain other features, are shown, described and claimed in my co-pending application Serial No. 378,574, filed June 12, 1907. The walls 16 surrounding the valves 10 and 11 and walls 17 forming a third valve-chamber 18 outline a space or passage 19 through which the jacket water is adapted to pass. This jacket water space 19 is in general above the level of the lower wall 20 in which the several valve-seats and the spark-plugs



water passage leading from the lower portion of one side thereof to the upper portion of another side thereof, and means connecting said jacketing means about said cylinder with said passage in said head, said head being detachably mounted upon said cylinder and said connecting means being separable.

6. In apparatus of the class described, in combination, a plurality of cylinders cast integral one with another, jacketing means about said cylinders, a plurality of heads mounted upon said cylinders, valves mounted in said heads, said cylinders being provided with walls inclosing said valves and with means adapted to guide jacket water therethrough and over the outer surface of said walls, and connections leading from said jacketing means about said cylinders to said passages in said heads.

7. In apparatus of the class described, in

combination, a plurality of cylinders cast integral one with another, jacketing means about said cylinders, a plurality of heads mounted upon said cylinders, valves mounted in said heads, said cylinders being provided with walls inclosing said valves and with means adapted to guide jacket water therethrough and over the outer surface of said walls, connections leading from said jacketing means about said cylinders to said passages in said heads, and means adapted to lead water to the lower portion of said jacketing means and from the upper portions of said heads.

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

WILLIAM R. McKEEN, JR.

Witnesses:

CHAS. W. LOUCKS,
CHARLES L. DUNDEY.