J. WILKINSON.

AIR COOLING SYSTEM FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED NOV. 16, 1911.

1,159,633.

Patented Nov. 9, 1915.

3 SHEETS—SHEET 1.

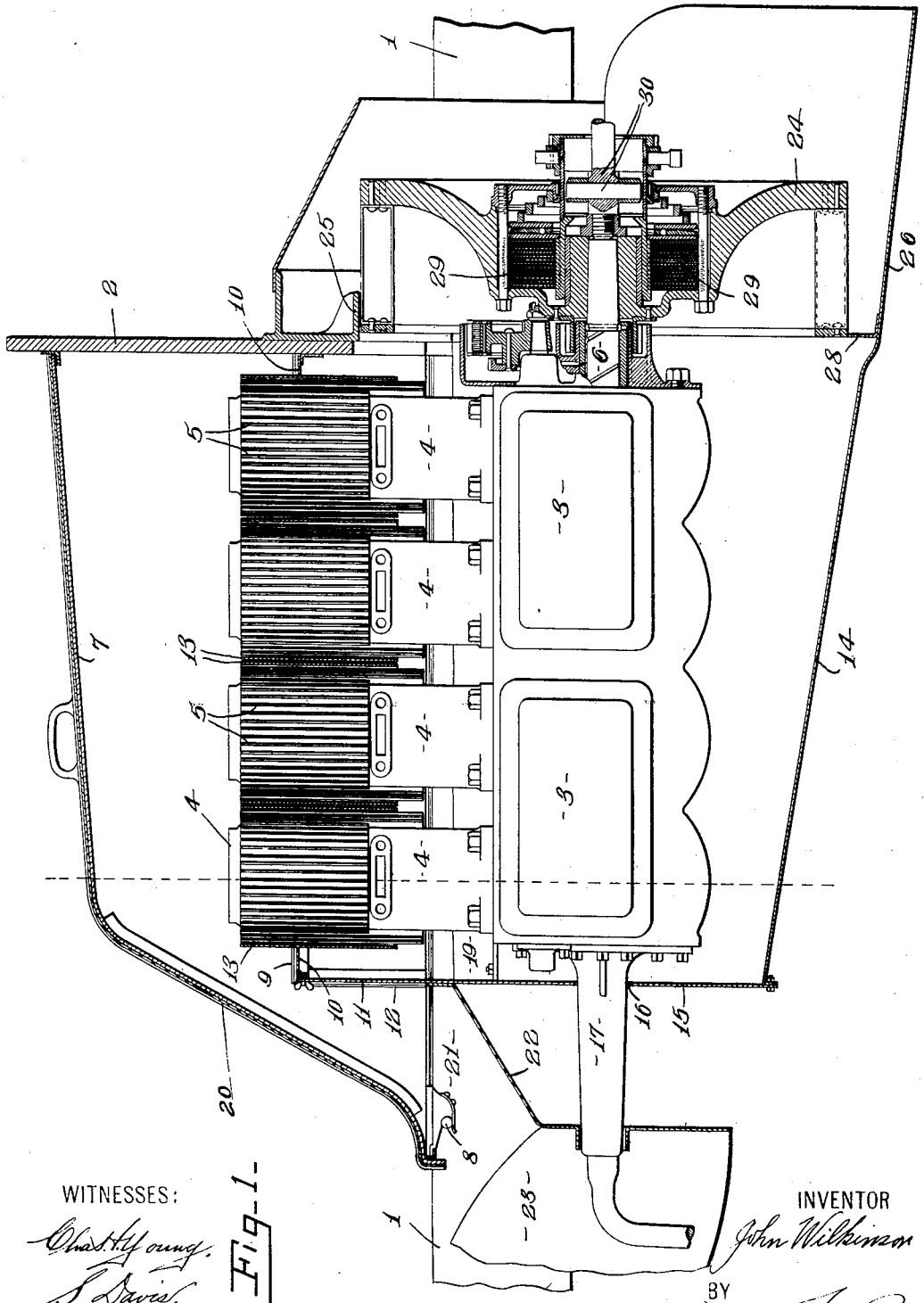

Fig. 1.

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3 SHEETS—SHEET 2.

Fig. 2.

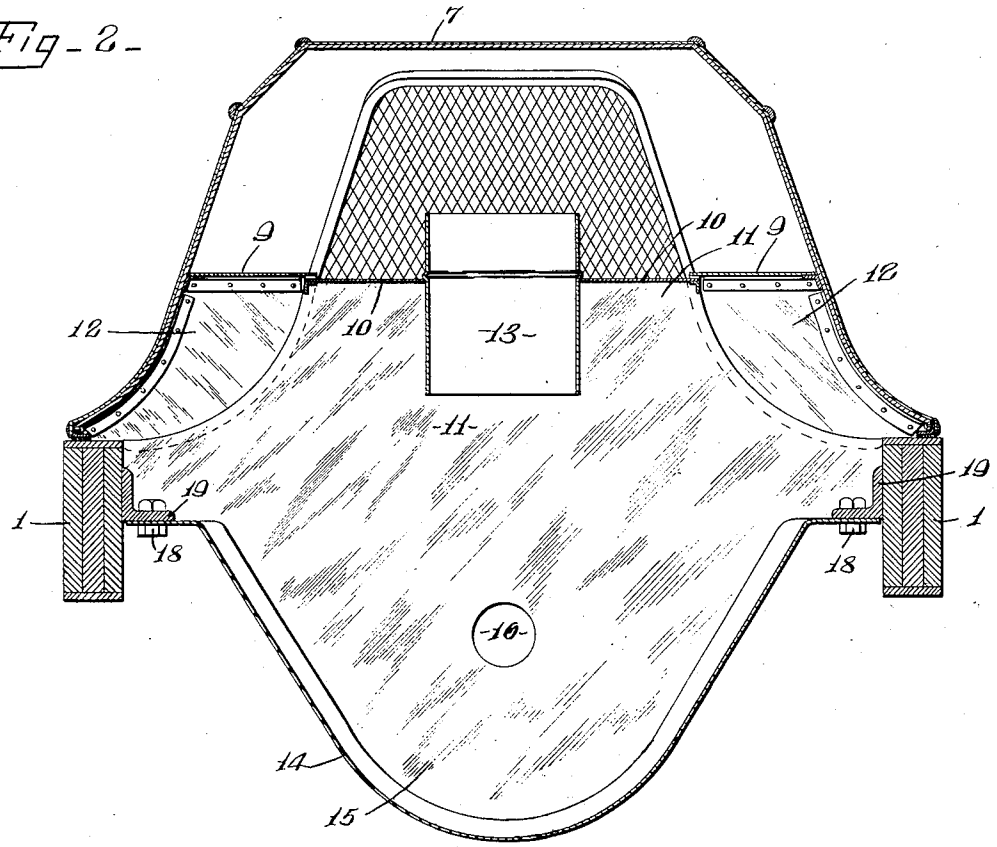
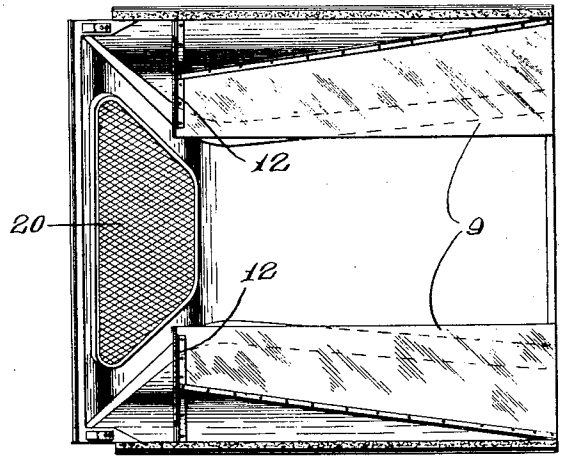


Fig. 3.



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3 SHEETS—SHEET 3.

Fig. 4.

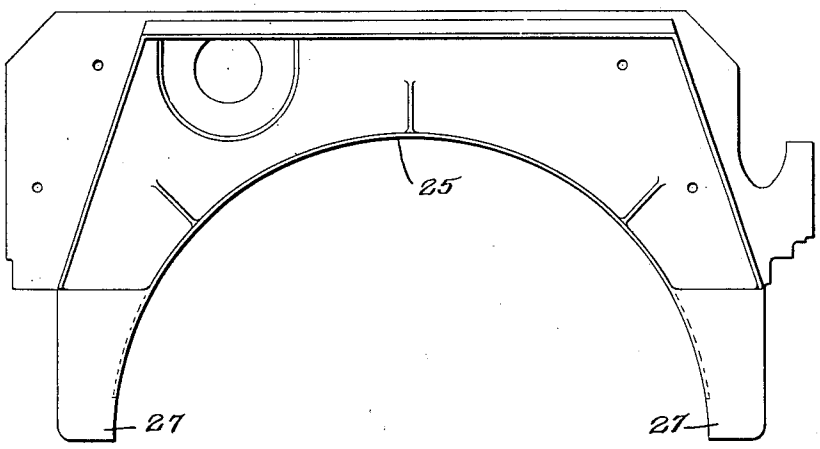
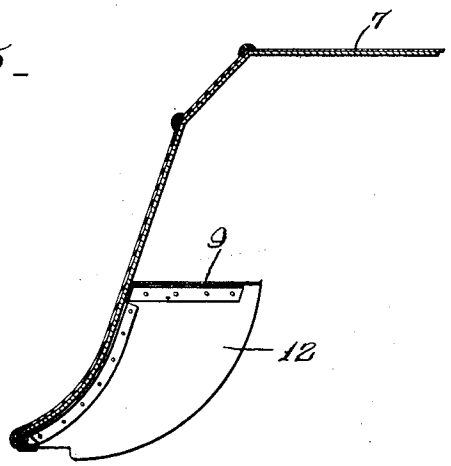


Fig. 5.



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UNITED STATES PATENT OFFICE.

JOHN WILKINSON, OF SYRACUSE, NEW YORK, ASSIGNOR TO H. H. FRANKLIN MANUFACTURING COMPANY, OF SYRACUSE, NEW YORK, A CORPORATION OF NEW YORK.

AIR-COOLING SYSTEM FOR INTERNAL-COMBUSTION ENGINES.

1,159,633. Specification of Letters Patent. Patented Nov. 9, 1915.

Application filed November 16, 1911. Serial No. 660,542.

To all whom it may concern:

Be it known that I, JOHN WILKINSON, of Syracuse, in the county of Onondaga and State of New York, have invented a new and useful Air-Cooling System for Internal-Combustion Engines, of which the following is a specification.

This invention has for its object the production of a particularly simple and efficient air cooling system for the internal combustion engines of motor vehicles; and it consists in the combinations and constructions hereinafter set forth and claimed.

In describing this invention reference is had to the accompanying drawings in which like characters designate corresponding parts in all the views.

Figure 1 is a transverse sectional view of a portion of a vehicle embodying my invention, parts of the engine being omitted. Fig. 2 is a transverse sectional view of the casing for the engine, contiguous parts of the frame of the vehicle being also shown. Fig. 3 is an inverted plan of the hood. Fig. 4 is a detail view of the arch around the upper portion of the fan. Fig. 5 is a fragmentary view of the hood, looking forwardly, illustrating one of the depending flanges carried by the hood.

1 are the sills; 2 designates the dash board, and 3 the engine of a motor vehicle, the engine comprising a plurality of cylinders 4 arranged one behind the other or tandem, and having lengthwise flanges 5.

6 is the crank shaft of the engine.

This air cooling system for internal combustion engines comprises, generally, a casing inclosing the engine, such casing including a removable hood and means dividing the casing into upper and lower compartments, and means as a fan for circulating the air through the casing.

7 is the removable hood which normally rests at the lower edges of its side walls on the sills 1, and which is pivoted at 8 near its front end to the sills 1 and is movable about its axis into and out of its operative position.

The means for dividing the casing into upper and lower compartments includes partition sections as wings or flanges 9 within the hood and extending lengthwise thereof on opposite sides of the engine, the wings extending horizontally in a plane cutting the cylinders between the upper and lower ends thereof, and being secured at their outer margins to the inner faces of the side walls of the hood 7. Said means also preferably includes in addition to the wings or partition sections 9, a horizontally extending partition section 10 of which the wings 9 are extensions, the section 10 being fixed to the dash board 2 at its rear end and supported at its inner end by an upright wall 11, the side edges of which are spaced apart from the side walls of the hood 7. The spaces between the side edges of the wall 11 and the side walls of the hood are closed by flanges or wings 12 carried by the hood and extending downwardly from the front edges of the wings or partition sections. The partition section 10 is formed with passages through which the cylinders 4 project, and preferably these passages are confined by cylindrical shells 13 supported in openings in the partition 10 and surrounding the flanged portions of the cylinders.

14 is a boot, or pan, constituting the bottom and portions of the side walls of the casing. The boot, or pan, is closed at its front end by the upright wall 11 which is provided with an axial opening 16 through which extends a bearing 17 for the crank shaft 6. The boot or pan 14 is suitably supported by the sills 1 and is here shown as secured thereto in any suitable manner as by bolts 18 engaging with the horizontal flanges of angle irons 19 secured to the inner faces of the sills 1.

The hood is usually provided with a screened air inlet opening 20 at its front end and also such front end overhangs the front wall 11, and is open at 21 for permitting the inlet of air, and a deflector 22 is located below the opening 21 for directing the air upwardly through such opening 21. Additional side deflectors, as the deflector 23, are also provided between the sills and in front of the deflector 22.

The means for circulating the air through the casing is here shown as a peripherally discharging suction fan 24 mounted on the rear end of the crank shaft 6, the upper portion of such fan running close to an arch 25 carried by the dash board 2 of the vehicle, and the lower portion of the fan running within an extension 26 of the boot or pan 14. Said arch 25 is provided with flanges 27 at its ends, which depend between the sills 1 and meet the upper ends of a

semi-annular flange 28 within the rear end of the boot or pan 14. The parts 25 and 28 form an outlet opening for the casing through which the air is drawn by the fan 24 located in the rear of said opening.

The fan 24 is here shown as containing a suitable disk clutch 29 and a universal joint 30 through which power is transmitted to the driving wheels of the vehicle.

In operation the air is drawn through the openings 20 and 21 to the portion of the hood above the partition sections 9 and 10 and is drawn downwardly through the passages 13 into the boot or pan 14 and is discharged through the rear end of the pan 14 The air is prevented from entering below the partition sections 9 and 10 by the front wall 11 and the wings 12.

This air cooling system is particularly advantageous in that upon the removal of the hood, portions of the casing are removed therewith so that parts and appurtenances of the engine within the boot or pan or below the partitions 9 and 10, are easily accessible.

What I claim is:

1. In a motor vehicle, the combination with an internal combustion engine having a plurality of cylinders arranged tandem and a crank shaft, of a casing inclosing the engine and including a hood displaceable for exposing the cylinders, and a partition dividing the casing into two compartments, said partition having passageways therein about the cylinders, one of said compartments having an inlet opening, and the other an outlet opening, means for causing the passage of air from one compartment to the other through the passageways in the partition, said partition including parts displaceable for exposing the engine, said displaceable parts being carried by the hood, substantially as and for the purpose described.

2. In a motor vehicle, the combination with an engine including a plurality of upright cylinders arranged in tandem formation and a crank shaft, of a casing inclosing the engine and including a transverse partition dividing the casing into upper and lower compartments, and provided with passageways about the cylinders leading from one compartment to the other, said casing having an inlet passage leading into one of its compartments, and an exit passage leading from its other compartment, means for causing the air admitted through the inlet passage to pass through the passageways of the partition and be discharged through the exit passage, said casing including a displaceable hood, and said partition comprising a fixed section and a section displaceable with the hood, substantially as and for the purpose specified.

3. In a motor vehicle, the combination with an engine including a plurality of upright cylinders arranged in tandem formation and a crank shaft, of a casing inclosing the engine and including a transverse partition dividing the casing into upper and lower compartments, and provided with passageways about the cylinders leading from one compartment to the other, said casing having an inlet passage leading into one of its compartments and an exit passage leading from its other compartment, means for causing the air admitted through the inlet passage to pass through the passageways of the partition and be discharged through the exit passage, said casing including a displaceable hood, and said partition comprising a fixed section extending lengthwise of the engine and on opposite sides of the cylinders thereof, the side edges of said section being spaced from the adjacent sides of the hood, and sections carried by the hood for closing the spaces between the edges of the fixed section and the sides of the hood, substantially as and for the purpose set forth.

4. In a motor vehicle, the combination with an engine including a plurality of upright cylinders arranged in tandem formation and a crank shaft, of a casing inclosing the engine and including a transverse partition dividing the casing into upper and lower compartments, and provided with passageways about the cylinders leading from one compartment to the other, said casing having an inlet passage leading into one of its compartments and an exit passage leading from its other compartment, means for causing the air admitted through the inlet passage to pass through the passageways of the partition and be discharged through the exit passage, said casing including a displaceable hood, and said partition comprising parts carried by the hood and displaceable therewith, substantially as and for the purpose described.

5. In a motor vehicle, the combination with an engine including a plurality of upright cylinders arranged in tandem formation and a crank shaft, of a casing inclosing the engine and including a transverse partition dividing the casing into upper and lower compartments and provided with passageways about the cylinders leading from one compartment to the other, said casing having an inlet passage leading into one of its compartments and an exit passage leading from its other compartment, means for causing the air admitted through the inlet passage to pass through the passageways of the partition and be discharged through the exit passage, said casing including a displaceable hood, and said partition comprising a fixed section having its side edges spaced from the contiguous side walls of the hood, and sections carried by the hood and having their inner edges adapted to overlap the side edges

of the fixed section, substantially as and for the purpose specified.

6. In a motor vehicle, the combination with an engine including a plurality of upright cylinders arranged in tandem formation and a crank shaft, of a casing inclosing the engine and including a displaceable hood, a boot, a front wall spaced apart from the front wall of the hood and having side edge portions spaced apart from the side walls of the hood, and a partition having passageways therethrough about the cylinders, said partition comprising a fixed member and flanges carried by the hood, and additional flanges carried by the hood for closing the spaces between said side edge portions of the front wall and the sides of the hood, said casing having an inlet opening in communication with the space on one side of the partition, an exit opening in communication with the space on the other side of the partition, and means for causing the air entering said inlet opening to pass through the passageways in the partition and be discharged through said exit opening, substantially as and for the purpose set forth.

7. In a motor vehicle including side sills, a dashboard, and an engine supported between the side sills and including a plurality of upright air-cooled cylinders arranged in tandem formation in advance of the dashboard, of an inclosing casing including a boot supported from the sills, a vertical wall at the front of the boot, a horizontal wall abutting at its rear end against the dashboard and connected at its front end to the upper edge of said front wall, said horizontal wall being provided with a series of vertically disposed shells, each individual to one of the cylinders and surrounding the same, and providing a passageway between the chamber on one side of the wall and that on the other side of the same, a hood pivotally connected at its front end and abutting at its rear edge against the dashboard, the sides of said hood being spaced apart from the side edges of the horizontal wall, and from the upper portion of the side edges of the vertical wall, flanges carried by the hood and coöperating with the horizontal and vertical walls, respectively, for closing the spaces between the same and the sides of the hood, said hood having an inlet opening at the front portion thereof and the boot having an exit opening at its rear end, and a fan located adjacent the last-named opening for causing the air entering the hood to pass through said shells and be discharged through said exit opening, substantially as and for the purpose described.

8. In a motor vehicle, the combination of an internal combustion engine comprising a plurality of upright cylinders arranged one behind the other, and a crank shaft; of a casing inclosing the engine including a boot or pan below the engine, a hood above the engine, and means for dividing the hood into upper and lower compartments, the lower compartment being open to the interior of the boot or pan, said means including a portion open around the cylinders and wings or flanges carried by the hood, said casing having an inlet opening leading into the upper compartment, and an exit opening leading from the lower compartment, and means for drawing the air from the upper to the lower compartment, and through the portion open around the cylinders, and for discharging the same through said exit opening, substantially as and for the purpose described.

9. In a motor vehicle, the combination with an internal combustion engine comprising a plurality of cylinders arranged one behind the other, and a crank shaft; of a casing inclosing the engine and including a horizontal partition section fixed relatively to the engine cylinders and extending transversely relatively to the cylinders and having passages through which the cylinders project, a removable hood, and means carried by the hood and coacting with said section of the partition for dividing the casing into upper and lower compartments connected by said passages, said casing having an inlet in communication with the upper compartment thereof, and an outlet leading from the lower compartment of the same, substantially as and for the purpose specified.

10. In a motor vehicle, the combination of an internal combustion engine comprising a plurality of cylinders arranged one behind the other, and a crank shaft; of a casing inclosing the engine and comprising a hood, a horizontal partition including a fixed section extending transversely of the cylinders in a plane cutting the cylinders between their upper and lower ends, the sections having passages through which the cylinders project and for placing the spaces on opposite sides of the partition into communication with each other, the partition also including wings carried by the hood on opposite sides of the engine, and forming extensions of said section and meeting the side edges thereof, said casing having an inlet in communication with the space above the partition, and an outlet leading from the space below the partition, and means for circulating the air through the casing, substantially as and for the purpose set forth.

11. In a motor vehicle, the combination with an internal combustion engine comprising a plurality of cylinders arranged one behind the other, and a crank shaft; of a casing inclosing the engine comprising a removable hood above the engine, a wall section comprising a horizontally extending wall located transversely of the cylinders

and having passages through which the cylinders project, and a front wall, the side edges of said walls being spaced apart from the sides of the hood, horizontally extending flanges carried by the hood on opposite sides of the engine for coacting with said horizontal wall, and additional flanges depending from the front ends of the horizontally extending flanges and coacting with said front wall, the flanges normally closing the spaces between the said walls and the inner faces of the side walls of the hood, and means for circulating the air through the hood and said passages into the boot or pan, substantially as and for the purpose described.

In testimony whereof, I have hereunto signed my name in the presence of two attesting witnesses, at Syracuse, in the county of Onondaga, in the State of New York, this 8th day of November 1911.

JOHN WILKINSON.

Witnesses:
R. L. STILWELL,
GILES H. STILWELL.