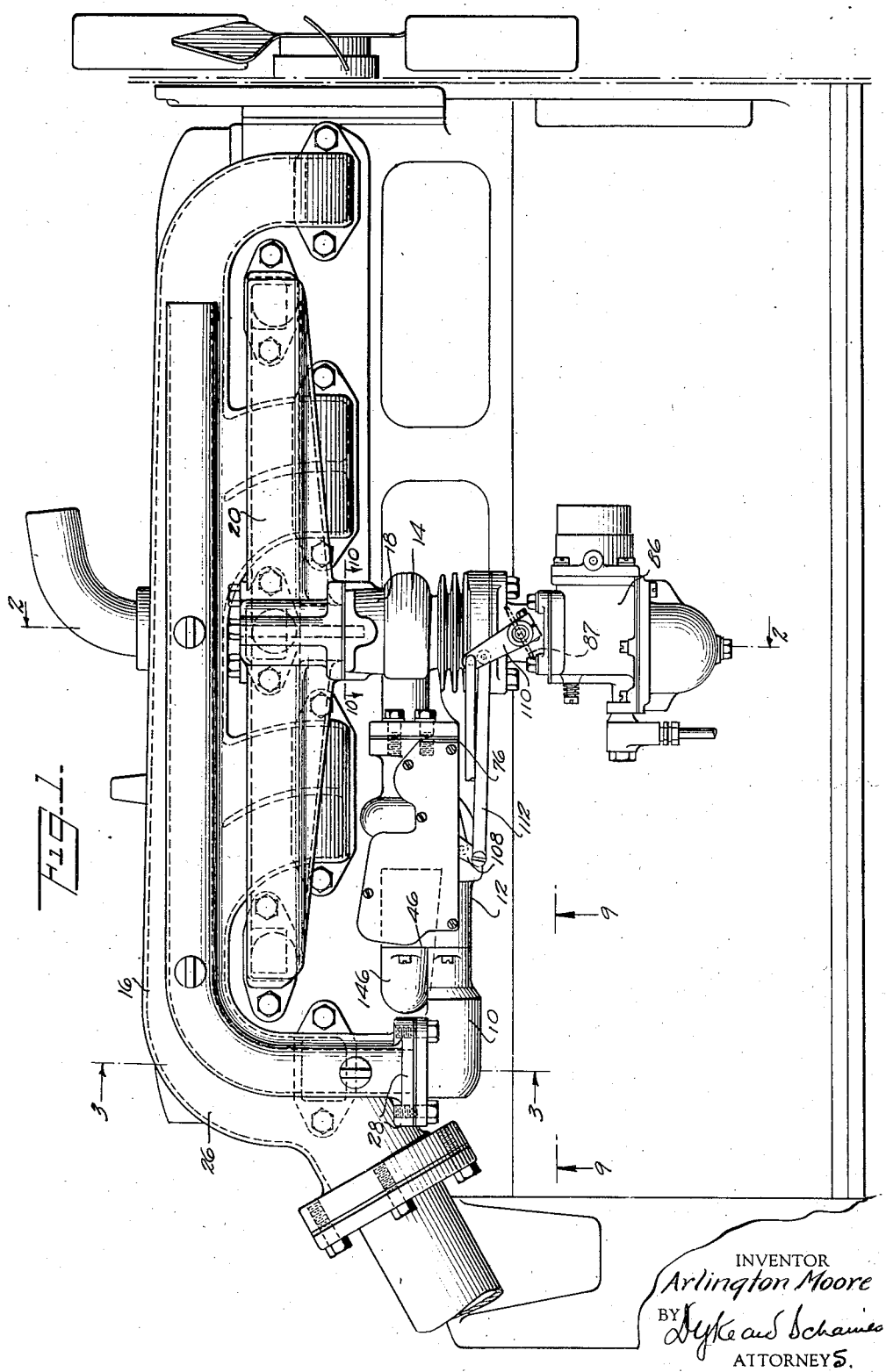
Feb. 24, 1931. A. MOORE 1,793,555

CHARGE FORMING APPARATUS FOR INTERNAL COMBUSTION ENGINES

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CHARGE FORMING APPARATUS FOR INTERNAL COMBUSTION ENGINES

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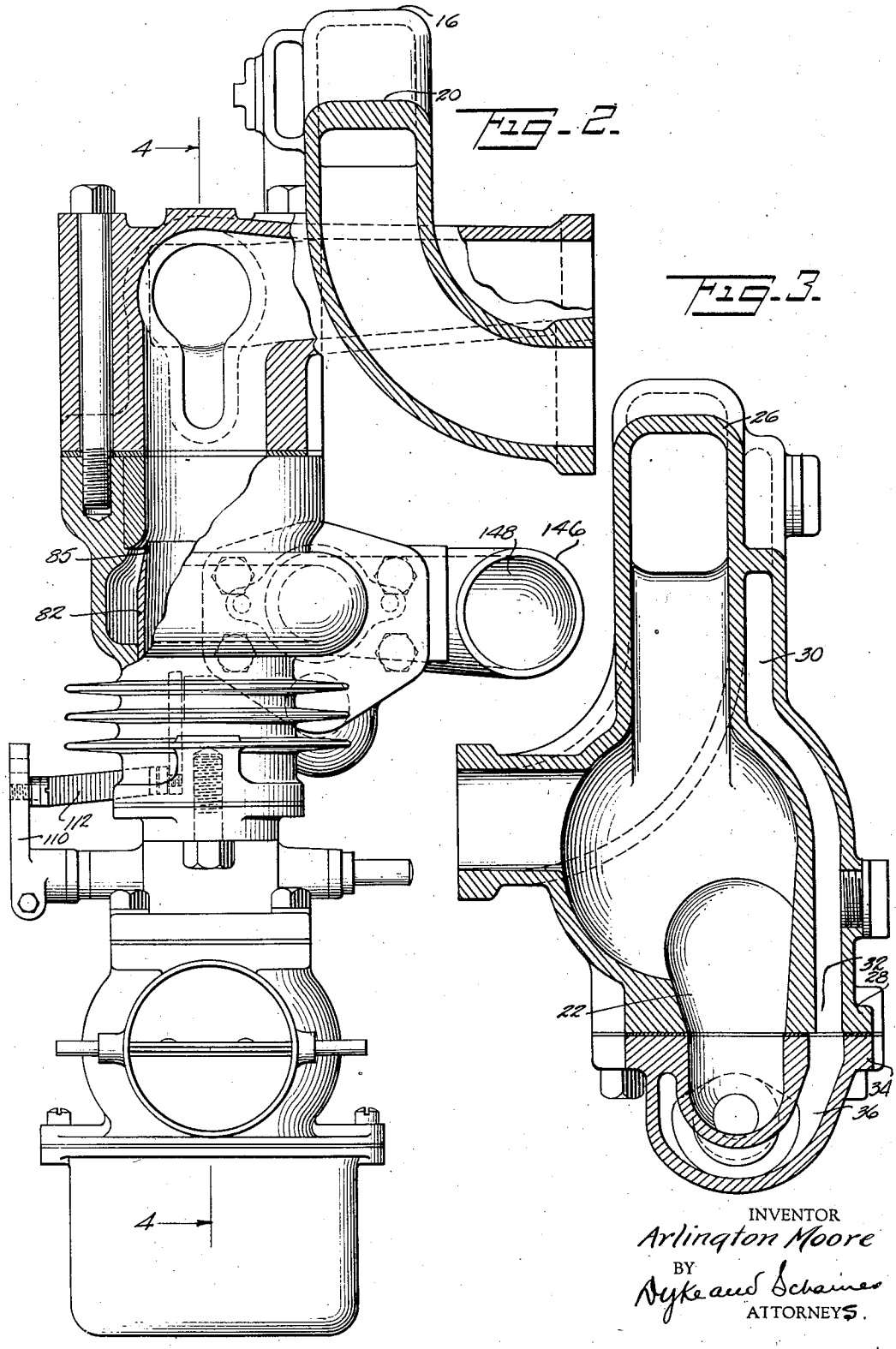


FIG. 2.

FIG. 3.

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CHARGE FORMING APPARATUS FOR INTERNAL COMBUSTION ENGINES

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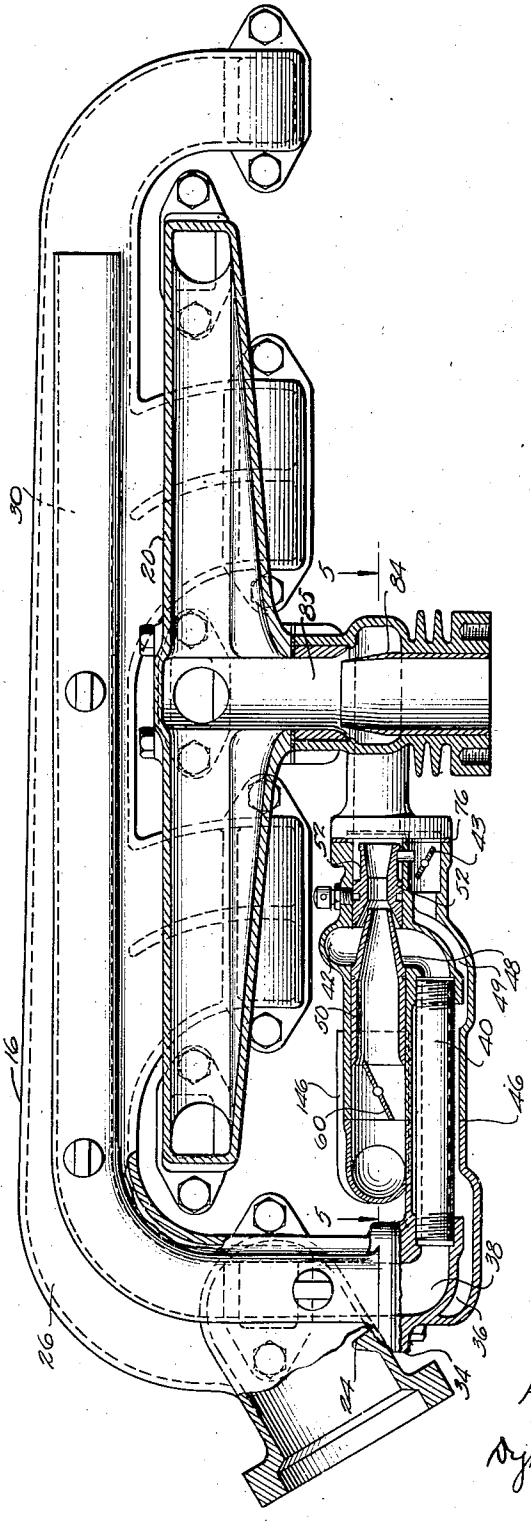


Fig. 4.

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CHARGE FORMING APPARATUS FOR INTERNAL COMBUSTION ENGINES

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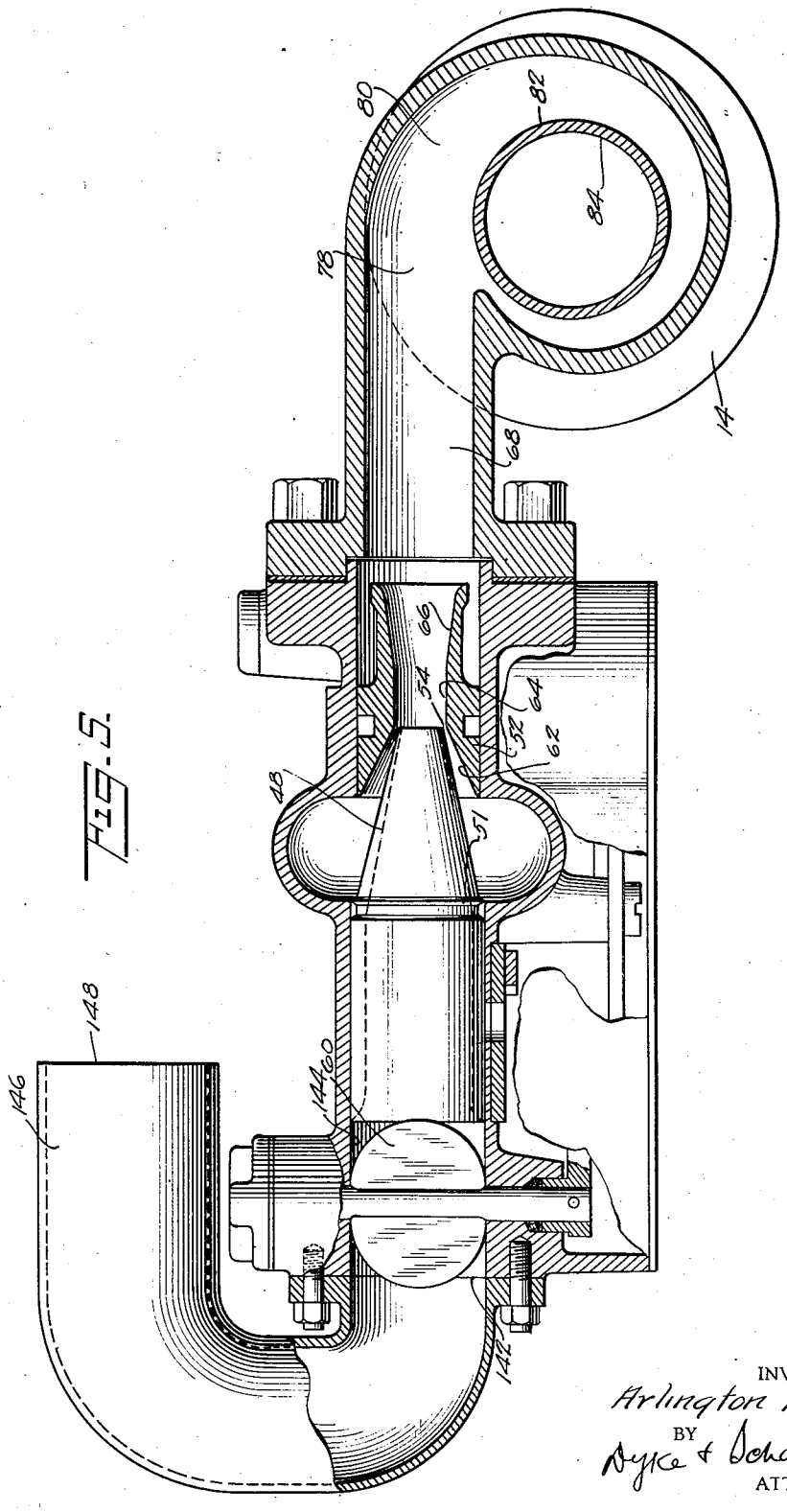


FIG. 5.

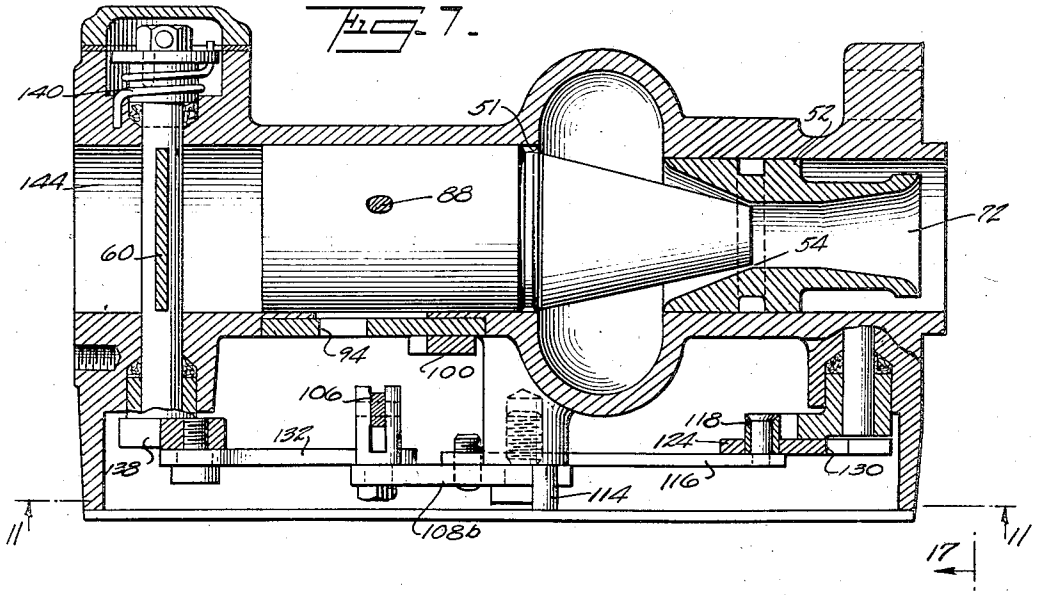
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CHARGE FORMING APPARATUS FOR INTERNAL COMBUSTION ENGINES

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FIG. 7.



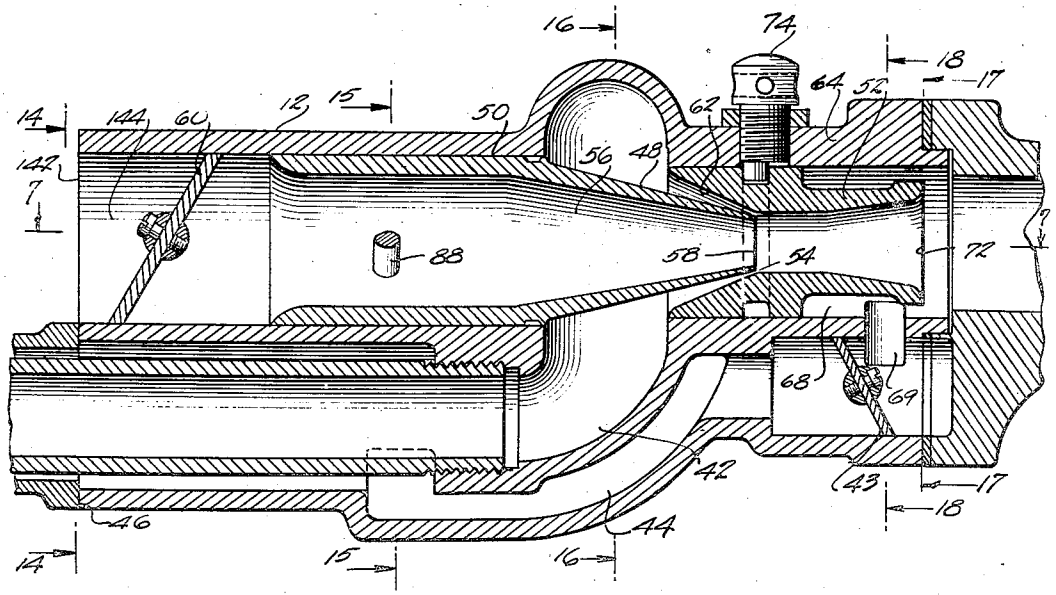


FIG. 6.

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CHARGE FORMING APPARATUS FOR INTERNAL COMBUSTION ENGINES

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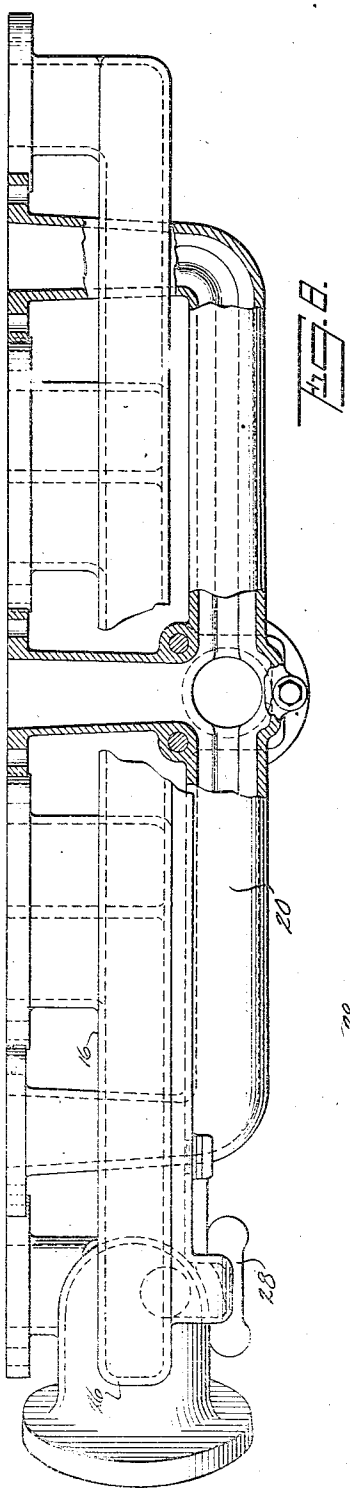


Fig. 8.

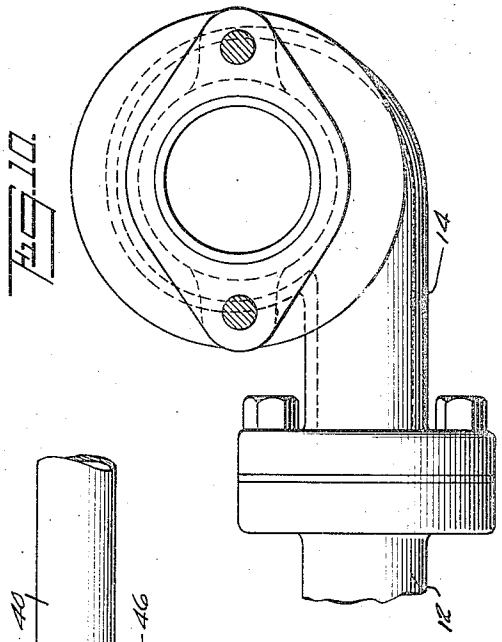


Fig. 10.

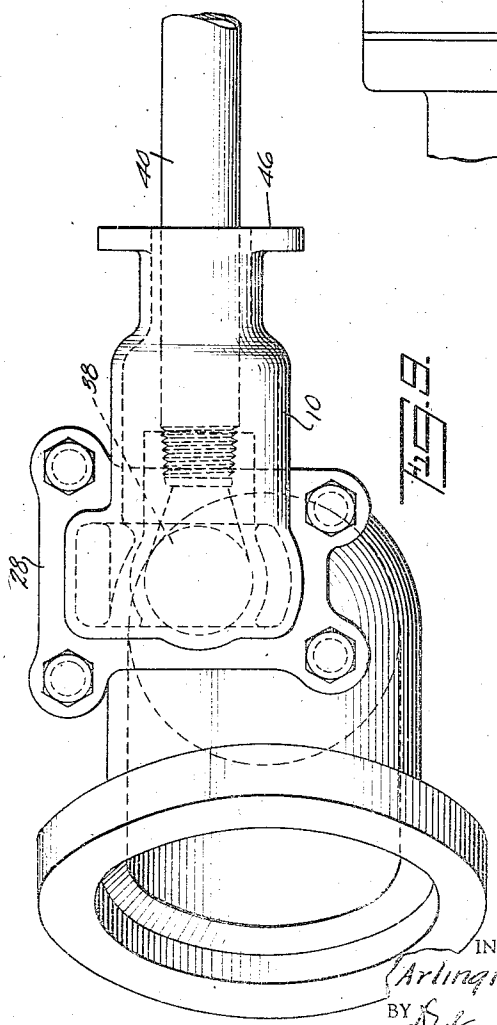


Fig. 9.

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CHARGE FORMING APPARATUS FOR INTERNAL COMBUSTION ENGINES

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Fig. 11.

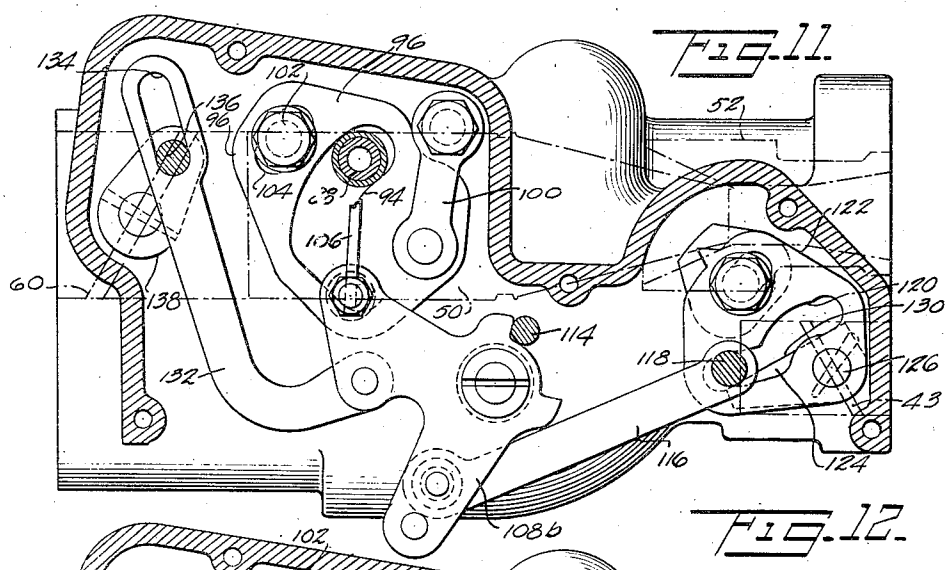


Fig. 12.

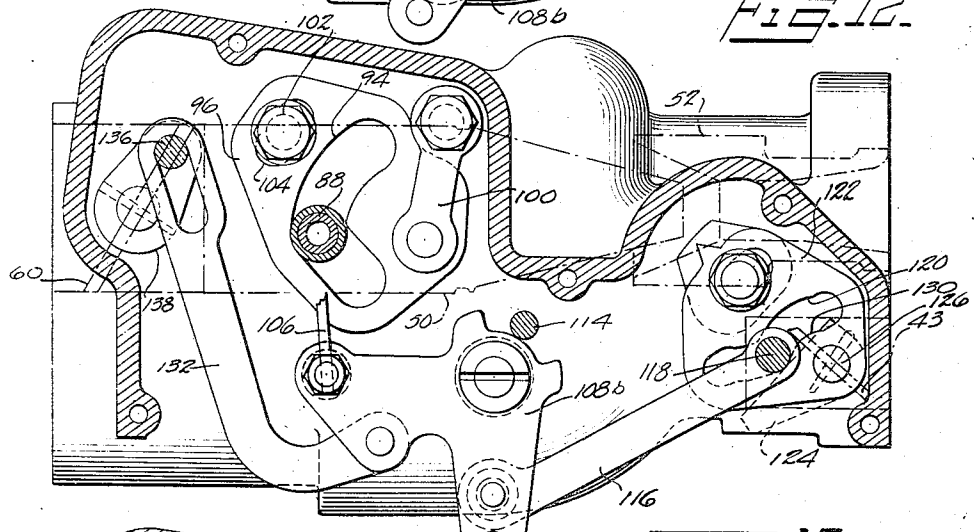
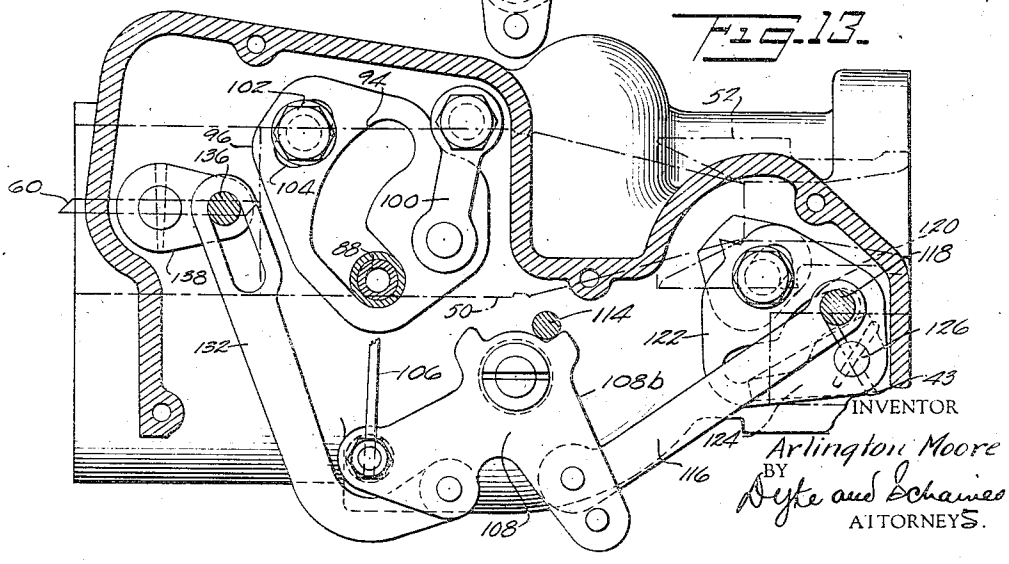


Fig. 13.



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CHARGE FORMING APPARATUS FOR INTERNAL COMBUSTION ENGINES

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Fig. 14.

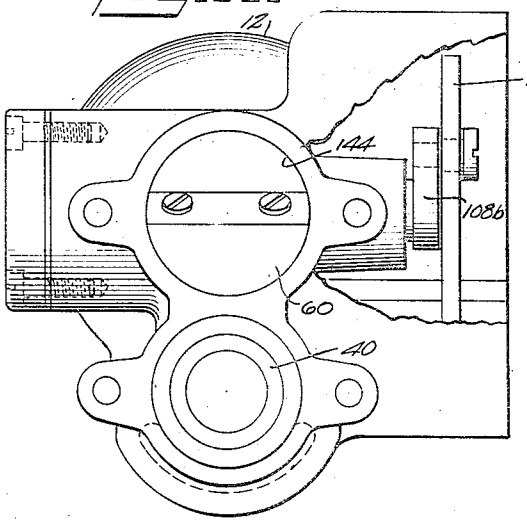


Fig. 15.

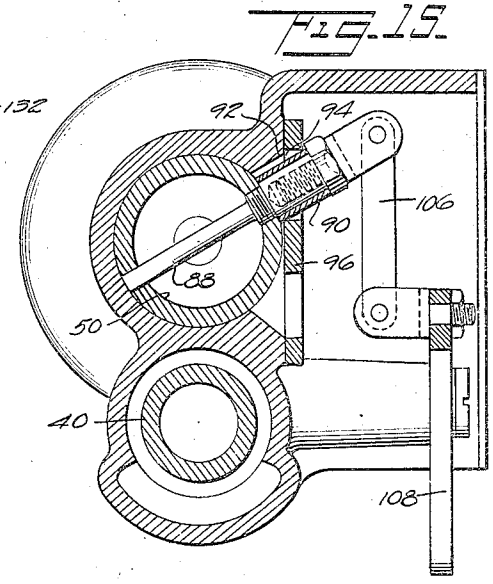


Fig. 16.

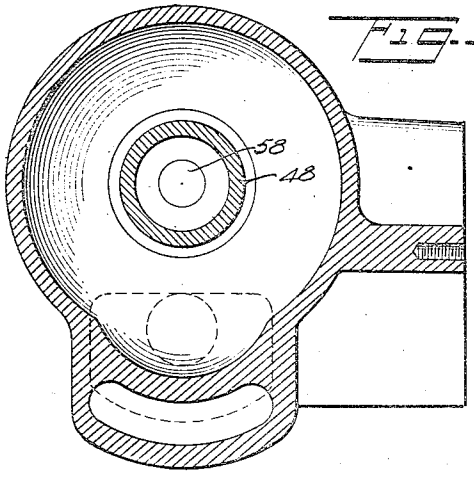


Fig. 17.

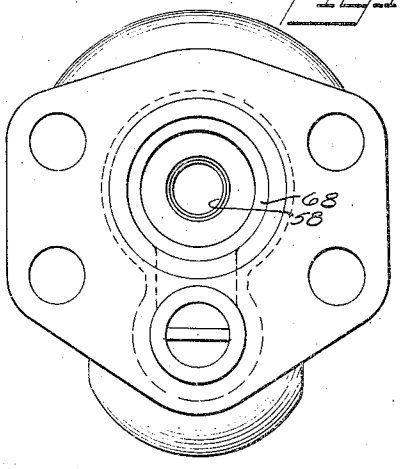
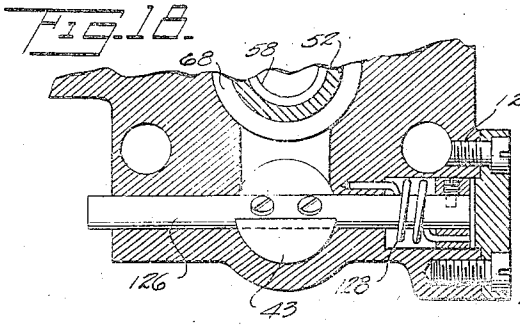


Fig. 18.



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CHARGE FORMING APPARATUS FOR INTERNAL COMBUSTION ENGINES

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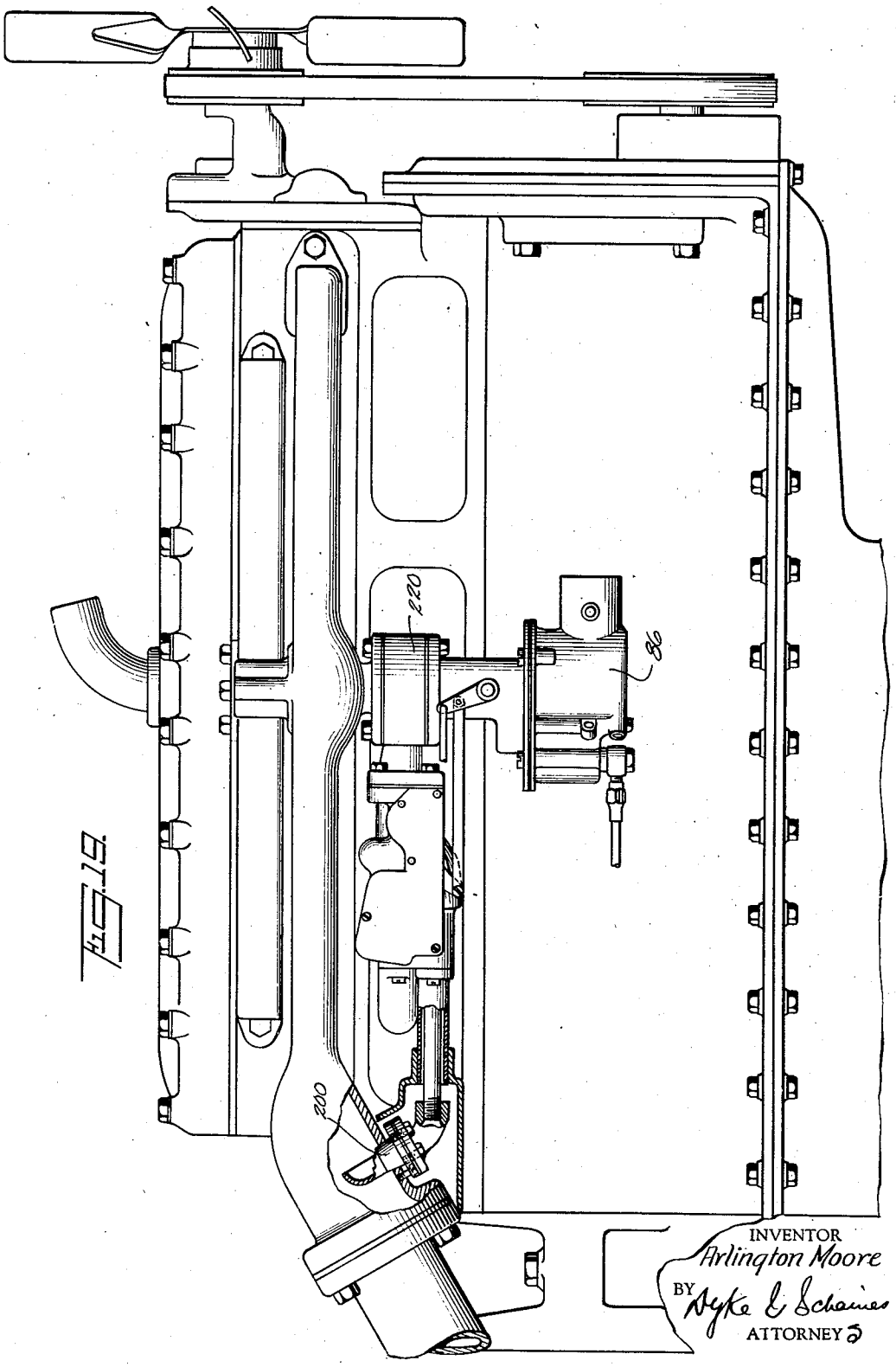


FIG. 54

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CHARGE FORMING APPARATUS FOR INTERNAL COMBUSTION ENGINES

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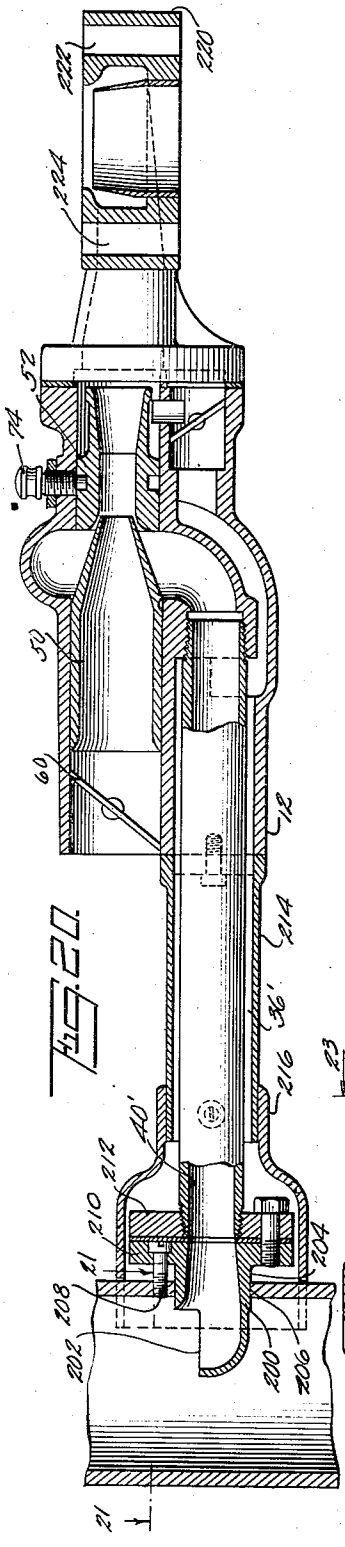


Fig. 20.

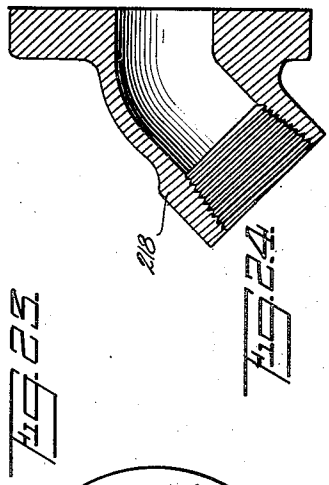


Fig. 23.

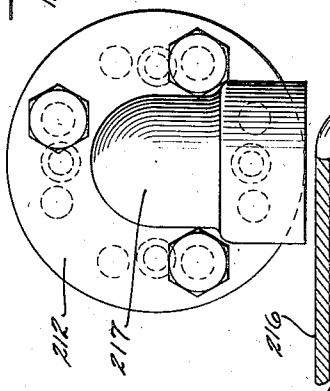


Fig. 24.

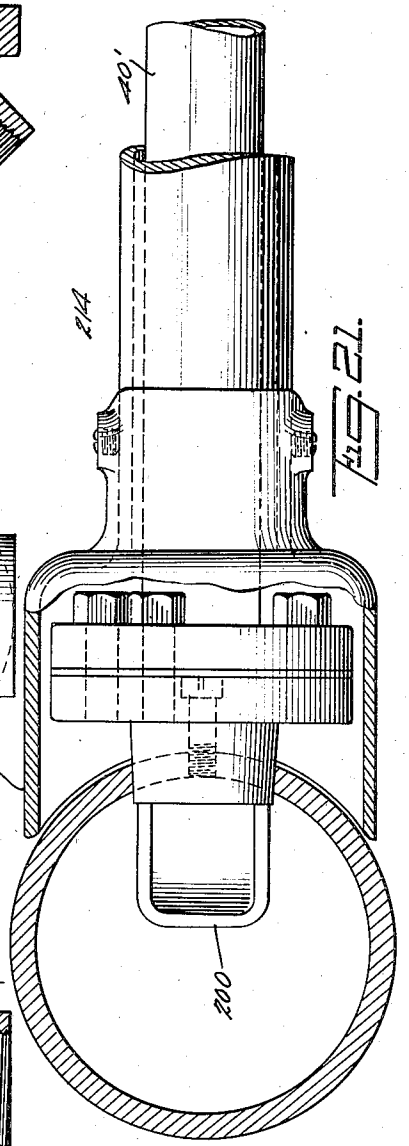


Fig. 21.

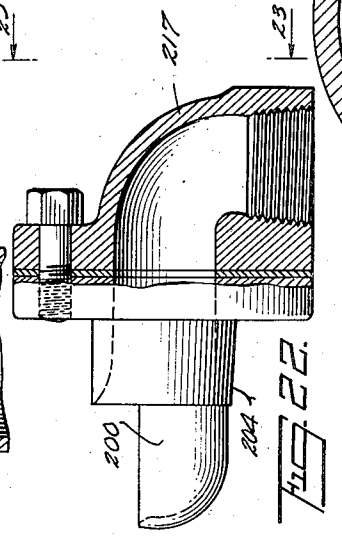


Fig. 22.

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UNITED STATES PATENT OFFICE

ARLINGTON MOORE, OF NEW YORK, N. Y., ASSIGNOR, BY MESNE ASSIGNMENTS, TO MAXMOOR CORPORATION, OF NEW YORK, N. Y., A CORPORATION OF DELAWARE

CHARGE-FORMING APPARATUS FOR INTERNAL-COMBUSTION ENGINES

Application filed December 30, 1927. Serial No. 243,616.

My invention relates to charge forming apparatus for internal combustion engines, using volatile or practically volatile liquid fuel of which so-called gasoline is a typical present day example.

With apparatus of my invention, the usual charge forming device, as a carburetor, for example, comprising a principal air and fuel stream supply means, and provided with throttling means for controlling the power output of the engine, is supplemented by charger means for delivering additional gases into direct admixture with the main fuel and air stream on its way to the engine cylinders. These include means for supplying exhaust gas, means for supplying preheated air, and means for supplying air at atmospheric temperature, herein referred to as cold air, these three supplementary supply means being each provided with metering means. These several supply and metering means are arranged to be operated in consonance with the throttling of the principal fuel and air stream so that during the lower part of the power range of the engine, say up to approximately three-quarters of maximum compression pressure, in which range fuel economy and thorough fuel vaporization are of much greater consequence than weight of charge, preheated air is supplied with the exhaust gas; and throughout the remaining upper part of the power range of the engine, in which the getting of full weight of charge, and particularly of oxygen, into the engine cylinders for production of full power and full volumetric efficiency is paramount, the hot air supply is replaced by cold air, the exhaust gas supply means being arranged to deliver the cold air by aspiration, and the cold air serving in its turn to cool the exhaust gas.

An important feature of the apparatus of the present invention resides in combining the means for metering the exhaust gas with the air supplying and aspirating means so that the full presure and kinetic energy at which the exhaust gas is available can be utilized for aspirating air and delivering it to the intake conduit, and shrinkage of the exhaust gas and especially of its H_2O content upon being mixed with the cold air can be utilized for securing the aspiration of a maximum supply of cold air.

Another feature of the present invention resides in so constructing the apparatus that the by-passed exhaust gas travels the shortest and most direct path from the exhaust conduit to the intake conduit.

The apparatus herein disclosed and claimed is but one of many forms of apparatus which can be used to practice my improved process of forming charges for internal combustion engines, covered and to be covered in separate process applications.

The present invention will be best understood from the following description of preferred embodiments thereof applied to a four-cycle engine, which are shown in the accompanying drawings and in which:

Fig. 1 is an assembly view of an internal combustion engine comprising an inbuilt charger with special manifolding.

Fig. 2 is an enlarged part sectional view, the sectional part taken approximately on line 2—2, Fig. 1.

Fig. 3 is a section on approximately the line 3—3, Fig. 1.

Fig. 4 is a vertical sectional view of the assembly shown in Fig. 1.

Fig. 5 is a horizontal section on line 5—5, Fig. 4.

Fig. 6 is an enlargement of a part of Fig. 4.

Fig. 7 is a section on approximately the line 7—7, Fig. 6.

Fig. 8 is a top plan view of the manifolding of Fig. 1 partly in section.

Fig. 9 is a bottom plan view looking upward from line 9—9, Fig. 1.

Fig. 10 is a section on line 10—10, Fig. 1.

Figs. 11, 12 and 13 are sections on approximately the line 11—11, Fig. 7, and showing respectively portions of the charger operating mechanism for idling, part power and full power.

Fig. 14 is an end view looking in the direction of the arrows from line 14—14, Fig. 6.

Fig. 15 is a section on approximately the line 15—15, Fig. 6.

Fig. 16 is a section on approximately the line 16—16, Fig. 6.

Fig. 17 is an end view looking from line 17—17, Fig. 6.

Fig. 18 is a part sectional view on approximately the line 18—18, Fig. 6.

Fig. 19 is a view similar to Fig. 1, but showing an accessory charger equipment, without special manifolding.

Fig. 20 is a schematic section showing the relation of the charger parts in accessory equipments such as shown in Fig. 19.

Fig. 21 is a section on approximately the line 21—21, Fig. 20.

Fig. 22 is a section similar to a part of Fig. 21, but showing a Pitot tube for eduction of exhaust gases from the exhaust manifold, with an elbow fitting in order to provide a more universal adaptation for accessory equipment.

Fig. 23 is a side view looking from line 23—23, Fig. 22, and

Fig. 24 is a sectional view of a 45 degree fitting for the Pitot exhaust gas eduction tube.

The charger apparatus takes exhaust gas from the exhaust conduit in a manner adapted to get the full benefit of the pressure and kinetic energy of the exhaust gas, meters the exhaust gas, meters the preheated air, and aspirates and meters the cold air, mixes the air with the exhaust gas and delivers the mixture to the intake conduit, means for performing these several functions being added to the usual parts of the internal combustion engine.

The means for effecting these functions are connected together in the order stated, and form a bypass conduit from exhaust to intake, supplied in its course from exhaust to intake, with valved admission ports for preheated air and cold air. The bypass is preferably arranged to take the shortest and most direct path from exhaust to intake.

The bypass conduit shown is comprised in three principal castings 10, 12 and 14 connecting the exhaust manifold 16 with the riser 18 of the intake manifold 20, said castings 10, 12 and 14 being arranged end to end in substantially straight line relation, and preferably substantially parallel to and under the main or header parts of the engine manifold. (See assembly view, Fig. 1.)

The arrangement shown in Fig. 1 is a preferred construction where the charger is built into the engine or when special manifolds are supplied therewith.

The exhaust manifold serves for supplying exhaust gas and for preheating the air used at partial engine load. The exhaust gas is preferably taken from the exhaust manifold near the rearmost exhaust gas port, as through passage 22, into which the gas is directed by the baffle 24. The mouth of passage 22 is directed upstream in the exhaust conduit and, with the inbuilt construction, can be arranged opposite the elbow 26 by which the exhaust gas is sent directly into the mouth of passage 22. Passage 22 from the exhaust manifold preferably terminates in a substantially horizontal flange 28, to which the casting 10 of the bypass structure can be conveniently connected so as to permit expansion and contraction without injury to or strain on the parts. The passage 30 for preheating air may be cored or otherwise formed in the wall of the exhaust manifold, and has its mouth 32 in flange 28 arranged to substantially surround the exhaust gas passage 22.

The casting 10 is preferably in the nature of an elbow conduit for the exhaust gas and preheated air, and preferably comprises the substantially horizontal flange 34 to be bolted to the exhaust conduit flange 28 on a substantially horizontal parting line.

The outer annular passage 36 in the casting 10 for preheated air communicates with the similarly formed supply passage having its mouth at 32, and the elbow-shaped inner passage 38 communicates with the mouth 22 of the exhaust gas supply passage. The elbow passage 38 for exhaust gas communicates through the concealed pipe 40 with the exhaust gas chamber 42 in the second casting member 12. It will be seen that the passage 36 for preheated air surrounds the pipe 40 for supplying exhaust gas and the air is heated thereby. Passage 36 communicates with the hot air passage 49 in the casting 12 extending beyond the exhaust gas chamber 42 therein, and passage 49 is provided with a valve, as the butterfly valve 43, for metering the preheated air. Castings 10 and 12 are preferably bolted together on the substantially vertical parting line indicated at 46.

The casting 12 also contains means for supplying cold air, and as has been stated, the cold air supply means is used for metering the exhaust gas. The exhaust gas chamber 42 in casting 12 is preferably of annular formation and is crossed by the tapered nozzle 48 of the cold air supply tube 50, which can be moved in and out with respect to the throat member 52 to meter the quantity of exhaust gas passing from chamber 42 through the annular passage 54 surrounding the end of tapered nozzle 48. The nozzle tube 50 has a clearance groove cut around it behind the cutting or scraping ring part 51, which serves as the tube is rotated and so moved lengthwise to keep the end of the bore in which the tube works free from any accumulation of carbon or the like deposits and so prevent any possibility of tube 50 sticking or binding in use.

The cold air coming in through the bore of tube 50 is aspirated by and mixed with the surrounding annular stream of exhaust gas coming through the annular passage 54. The cold air supply is controlled by suitable valve

means, such as the butterfly valve 60, which is opened when the throttle approaches full load position.

Throat member 52 is preferably removable and replaceable, permitting quick and simple interchange to be made of throat members having different size passages. The portion 62 of the passage in throat member 52 on the side adjacent to the exhaust gas chamber 42 is widest at its mouth and tapers down therebeyond. Thus the opening around the mouth 58 of the nozzle 48 for passage of exhaust gas is narrowed as the tubular member 50 is moved back, and decreases as the member 50 is moved forward. Such tapering portion 62 merges into the central throat portion 64, which is preferably substantially cylindrical and extends without material enlargement a substantial distance from the mouth 58 of the tubular member 50. This throat portion 64 of the passage in said throat member 52 merges into the tapering expansion portion 66 which increases in area as the distance from throat portion 64 increases, and serves for discharging the mixture of exhaust gas and air into the expansion conduit passage 68.

Preheated air which passes the metering valve 43 passes into the annular passage 68 through port 69 located behind the mouth 72 of the throat member 52 and is aspirated by the exhaust gas passing out through the mouth 72 of throat member 52 to a sufficient extent to obviate any possible tendency toward the blowing back of the exhaust gas through the passage provided for the entrance for preheated air.

Throat member 52 is adjustable to and away from exhaust gas chamber 42, as by means of the eccentric screw 74. The valves for preheated air and cold air and the tube 50 for metering exhaust gas are operated by actuating means working in consonance with the opening and closing movement of the throttle and to be described later.

The mixture of exhaust gas and air supplied through the conduit 68 is delivered to the intake conduit leading to the engine cylinders through an annular orifice surrounding the main fuel and air stream. Such delivery means is embodied in a third casting 14, which is bolted to the central casting 12 along the vertical parting lines 76. The passage 78 in this third casting member 14 affords an extension of the expansion conduit 68 and delivers the mixture of exhaust gases and air substantially tangentially into an annular chamber 80 surrounding a thimble 82, through the bore 84 whereof the main fuel and air stream passes from the carburetor, and out through the annular orifice 85 into swirling turbulent and thorough admixture with the main fuel and air stream, which moves in the same direction as the gases coming through orifice 85, and is supplied from the carburetor 86 past the throttle 87, and thence to the engine cylinders through the manifold 20 as a part of the cylinder charge material.

The metering means shown herein for the exhaust gas, for the preheated air, and for the cold air, are separate and distinct and capable of individual adjustment, so that adjustment, replacement or change of any thereof will in no way interfere with the proper adjustment, change or replacement of any of the other of such means.

Endwise movement of the tubular air supply member 50 to meter the exhaust gas is preferably obtained by imparting rotational movement thereto in such a way that as it is rotated it is also moved longitudinally, whereby its relation to throat member 52 and the opening therebetween and the quantity of exhaust gas metered can be altered as desired.

In the construction shown such operating means comprises crank pin 88 which extends entirely through and across the tube 50 (Fig. 15) and roller 90 surrounding the projecting portion of the crank pin 88, which crank pin and roller come out through an opening 92 in the side of the casting 12 and project through a cam slot 94 which is preferably formed in the replaceable and adjustable cam piece 96, and is of a shape to impart suitable longitudinal movement to tube 50 as the latter is rotated. To adjust cam-piece 96 and vary the relation of cam slot 94 to crank pin 88, said cam-piece 96 is preferably pivoted at 94 to an arm 100 bolted to the casting 12, and the second fastening of cam-piece 96 is by means of a bolt 102 passing through a slot 104 and thus permitting adjustment of the cam-piece 96 and consequently adjustment of the relation of the cam slot 94 therein with respect to the crank pin 88. By removing cam-piece 96 and replacing it with another, any desired shape of slot and resulting movement of tube 50 can be obtained.

Tube 50 is turned by suitable means such as the universally articulated link 106 connected to crank pin 88 and actuated from the elbow lever 108. Elbow lever 108 is connected to the throttle arm 110 by means of link 112, and serves for actuating the air metering means as well as the means for metering the exhaust gas bypassed. Stop means such as a stop pin 114 serves to limit the movement of the elbow lever 108. It will be seen from Figs. 11–13 that with the parts proportioned as shown, upon partial opening of the throttle the passage 54 for exhaust gas is first enlarged reaching a maximum in the position of the parts shown in Fig. 2, and is then partially closed off upon still further opening movement of the throttle, the position shown in Fig. 13 being that corresponding to wide open throttle position.

To operate the valve 43 for metering pre-

heated air, a link 116 is provided pivoted to arm 108B of the elbow lever 108. Said link 116 is provided with a stud 118 extending through a slot 120 in the adjustable and replaceable cam slot piece 122. Said stud 118 guided by cam slot 120 turns a crank 124 fixed on the shaft 126 of the preheated air valve 43 and thereby serves to open said valve 43 against the closing action of the coil return spring 128 (Fig. 18). Substantially any desired movement of valve 43 can be obtained by suitable choice of cam slot.

As will be seen from Fig. 11, on moving from the idling position of Fig. 11 to the part throttle position of Fig. 12, the valve 43 is opened by the engagement of stud 118 with the surface 130 of the crank member 124, and upon further opening of the throttle as to the position of Fig. 13, the preheated air valve 43 is closed by its return spring 128. By adjusting or replacing cam slot piece 122, the motion of the preheated air valve can be regulated as desired. The means for operating the cold air valve 60 comprises a lost motion connection to the elbow lever 108, so that the cold air valve 60 does not begin to open until the preheated air valve 43 is about to close. In the form shown, this connection comprises link 132 having an elongated slot 134 to receive the pin 136 of the crank 138. Link 132 serves to open the valve 60 against the closing action of the coil return spring 140 (Fig. 7). Link 132 can readily be removed and replaced by another of suitable formation to give any desired movement of the cold air valve 60.

Where the opening 142 of the bore 144 of the casting 12, containing the cold air tube 50 and the cold air metering valve 60, is so arranged or pointed that exterior means are required for directing cold air into such port, suitable directing means such as the U-shaped casting 146 can be bolted thereto as shown in Fig. 5, and the mouth 148 of casting 146 directed toward the engine fan or otherwise arranged to receive a suitable supply of cold air.

In cases where the charger cannot be inbuilt or special manifolds supplied therewith, the connections to the exhaust manifold and other intake conduit can be modified so as to be adapted to be used with existing manifolds, and such arrangement is shown in Figs. 19–24. The accessory equipment for connection to the exhaust manifold comprises an impact tube 200 having an opening 202 directed against the flow of the gas in the exhaust passage, and with a tapered neck 204 adapted to fit a taper hole 206 which can be readily formed in the exhaust manifold, and secured in place by bolts 208 passing through the flange 210 with which the taper neck portion 204 of impact tube member 200 is supplied. This flange can be connected with the exhaust gas pipe 40', as by means of a coupling 212, which is preferably provided with several extra bolt holes to enable connections to be made as desired. With such arrangement the preheated air passage 36' can be formed in a sleeve 214 adapted to be bolted to the central casting member 12 and the wide mouthed shell 216 being telescopically arranged upon sleeve 214 and adapted to be extended toward the exhaust manifold over the flange connection, 210, 212 after the latter has been made up.

Fig. 21 shows an arrangement adapted to be used when a portion of the exhaust pipe to which impact tube 200 is connected is substantially parallel to the intake riser. When the angular relation between the exhaust pipe and the intake riser is otherwise, as for example, at right angles or an angle of 45 degrees, the elbow fitting 217 of Fig. 22, or the 45 degree fitting 218 of Fig. 24, can be used in place of the simple pipe flange, as will be readily understood.

In the case of accessory equipment, such as shown in Figs. 19–24, the most convenient arrangement for inserting the delivery connection from the charger apparatus in the intake line is to be obtained by lowering the carburetor and inserting a suitable delivery means between the carburetor flange and the flange of the intake riser.

In Fig. 19, I have shown such a member 220 of substantially minimum height, so that the lowering of the carburetor may not be too great. Bolt openings 222, 224, are provided for receiving long bolts to replace the usual short carburetor flange bolts.

It will be seen that the described apparatus is simple and efficient in operation, and that the several controls are each capable of independent adjustment, enabling any necessary changes to be made readily and without disturbing other parts or the adjustments of such other parts.

By supplying the proper mixture of exhaust gas and air to the main fuel and air stream above the throttle and in the direction of its flow toward the engine cylinders, the intake manifold pressure and the initial cylinder pressure are materially raised without adversely affecting the fuel lifting and metering capacity of the principal air stream. The delivery of air by the aspirator arrangement substantially as shown gives a source of air supply during the range at and toward maximum cylinder compression much in excess of that available when dependence is placed entirely on engine cylinder induction.

I claim:

1. In charger apparatus for internal combustion engines, an exhaust gas bypass from exhaust to intake, and an air conduit for bringing air into admixture with the exhaust gas supplied to the intake, said air conduit comprising a movable tubular discharge end portion extending into the bypass, and con-

trol means connected thereto for actuating the same from a distance to meter the exhaust gas supply.

2. In a charger for internal combustion engines, an exhaust gas bypass from exhaust to intake, longitudinally movable tubular metering means for exhaust gas bypassed, said metering means serving to supply air through its tubular bore and out of the end thereof into admixture with the exhaust gas, and a connection to said metering means for actuating the same.

3. In a charger for internal combustion engines, an exhaust gas bypass from exhaust to intake, and an air conduit extending in substantially the same direction, the end of the air conduit extending into and terminating in an annular part of the exhaust gas bypass whereby air is aspirated by exhaust gas without substantial deflection or change in the direction of travel of each.

4. In a charger for internal combustion engines, an exhaust gas bypass from exhaust to intake, an air conduit extending in substantially the same direction as the exhaust gas bypass, an air valve in said conduit, and an air aspirating junction between the exhaust gas passage and air conduit so arranged that air is aspirated by the exhaust gas without material deflection or change in the direction of movement of each.

5. In a charger for internal combustion engines, a substantially right line bypass from exhaust to intake having provision for preserving kinetic energy of the exhaust gases, an air conduit joining the exhaust gas bypass while extending in substantially the same direction as said bypass, and an aspirator junction between the exhaust gas and air passages comprising a movable section of the air conduit, said section serving as a metering means for metering the exhaust gas passing through said bypass.

6. In a charger for internal combustion engines, an exhaust gas bypass from exhaust to intake, an air conduit, a valve therein, and said air conduit having a portion beyond the valve actuated adjunctively to throttling for metering the exhaust gas passed through said bypass.

7. In a charger for internal combustion engines, an exhaust gas bypass from exhaust to intake, an air conduit joining said exhaust gas passage and having a movable portion at the region of joinder, said movable conduit portion being actuated adjunctively to throttling to meter the exhaust gas going through the exhaust gas bypass.

8. In a charger for internal combustion engines, an exhaust gas bypass from exhaust to intake, an air conduit joining the said bypass in an aspirating junction in which the exhaust gas is metered by a movable part of the air conduit, an actuating connection thereto, and an air valve in the air conduit.

9. In a charger for internal combustion engines, an exhaust gas bypass from exhaust to intake, a chamber enlargement therein, a longitudinally movable air supply tube crossing said chamber, an actuating connection thereto, and outlet means from said chamber for mixture of air and exhaust gas.

10. In a charger for internal combustion engines, an exhaust gas bypass from exhaust to intake and enlarged into a chamber located at an intermediate point in its length, an air supply tube longitudinally movable across said chamber and confining the exhaust gas to an annular passage around said tube within the chamber, the air tube being actuated adjunctively to throttling to control its distance from the chamber outlet to meter the exhaust gas passing through said bypass.

11. In a charger for internal combustion engines, an exhaust gas bypass from exhaust to intake, and a unitary exhaust gas metering and air aspirating means actuated to effect the metering entirely at the aspirating orifice.

12. In a charger for internal combustion engines, an exhaust gas bypass from exhaust to intake, and unitary exhaust gas metering and air aspirating means comprising a longitudinally movable air supply nozzle constituting the sole exhaust gas metering means.

13. In a charger for internal combustion engines, an exhaust gas bypass from exhaust to intake, and unitary air aspirating and exhaust gas metering means comprising an axially movable air supply nozzle with a surrounding passage for the exhaust gas and a relatively stationary throat member into which the air nozzle is directed and an actuating connection to the air nozzle.

14. In a charger for internal combustion engines, an exhaust gas bypass from exhaust to intake, means for introducing preheated air and cold air into admixture with the exhaust gas in the bypass, and separate valves controlling the passage of exhaust gas, preheated air and cold air.

15. In a charger for internal combustion engines, an exhaust gas bypass from exhaust to intake, and means having separate air valves for introducing preheated air and/or cold air into admixture with the exhaust gas in the bypass, the means for introducing cold air serving as the movable valve to meter the exhaust gas.

16. In a charger for internal combustion engines, an exhaust gas bypass from exhaust to intake, valved means for introducing cold air into admixture with the exhaust gas, said means comprising a movable air passage member for metering the exhaust gas, and an actuating connection thereto.

17. In a charger for internal combustion engines, an exhaust gas bypass from exhaust to intake, valved means for introducing cold air into admixture with the exhaust gas in the

bypass, and unitary cold air aspirator and exhaust gas metering means actuated to effect the metering of exhaust gas entirely at the aspirator orifice.

18. In an internal combustion engine, means comprising a combined meter and injector for utilizing kinetic energy of the exhaust gas of the engine to inject air into the intake conduit, said meter and injector being movable to control the metering of the exhaust gas, the exhaust gas passage to the said injector being free and open and the passage from said injector to the intake conduit being free and open, and the metering being accomplished at the injector passage.

19. In an internal combustion engine, a bypass conduit from exhaust to intake, a combined air injector and exhaust gas metering member longitudinally movable in said bypass, a throat member with which said member coacts, and means interlinked with the engine throttle for moving said metering member with respect to said throat member so that at very low and substantially wide open throttle positions it is closer to the throat member than at intermediate throttle positions.

20. An internal combustion engine comprising an exhaust gas bypass from exhaust to intake, means for introducing preheated and cool air into said bypass, and means for controlling the passage of exhaust gas and air including a longitudinally movable tubular member disposed in said bypass for controlling the extent of opening thereof and having a passage for the discharge of air into the bypass from certain of said air introducing means, said controlling means serving to admit preheated air at certain of the positions of said tubular member and cool air at other of the positions thereof.

21. An internal combustion engine comprising an exhaust gas bypass from exhaust to intake, means for introducing air into said bypass, and means for controlling the passage of exhaust gas and air including a longitudinally movable tubular member disposed in said bypass for controlling the extent of opening thereof and having the bore thereof for the discharge of air into the bypass from said air introducing means.

In testimony whereof, I have signed my name hereto.

ARLINGTON MOORE.