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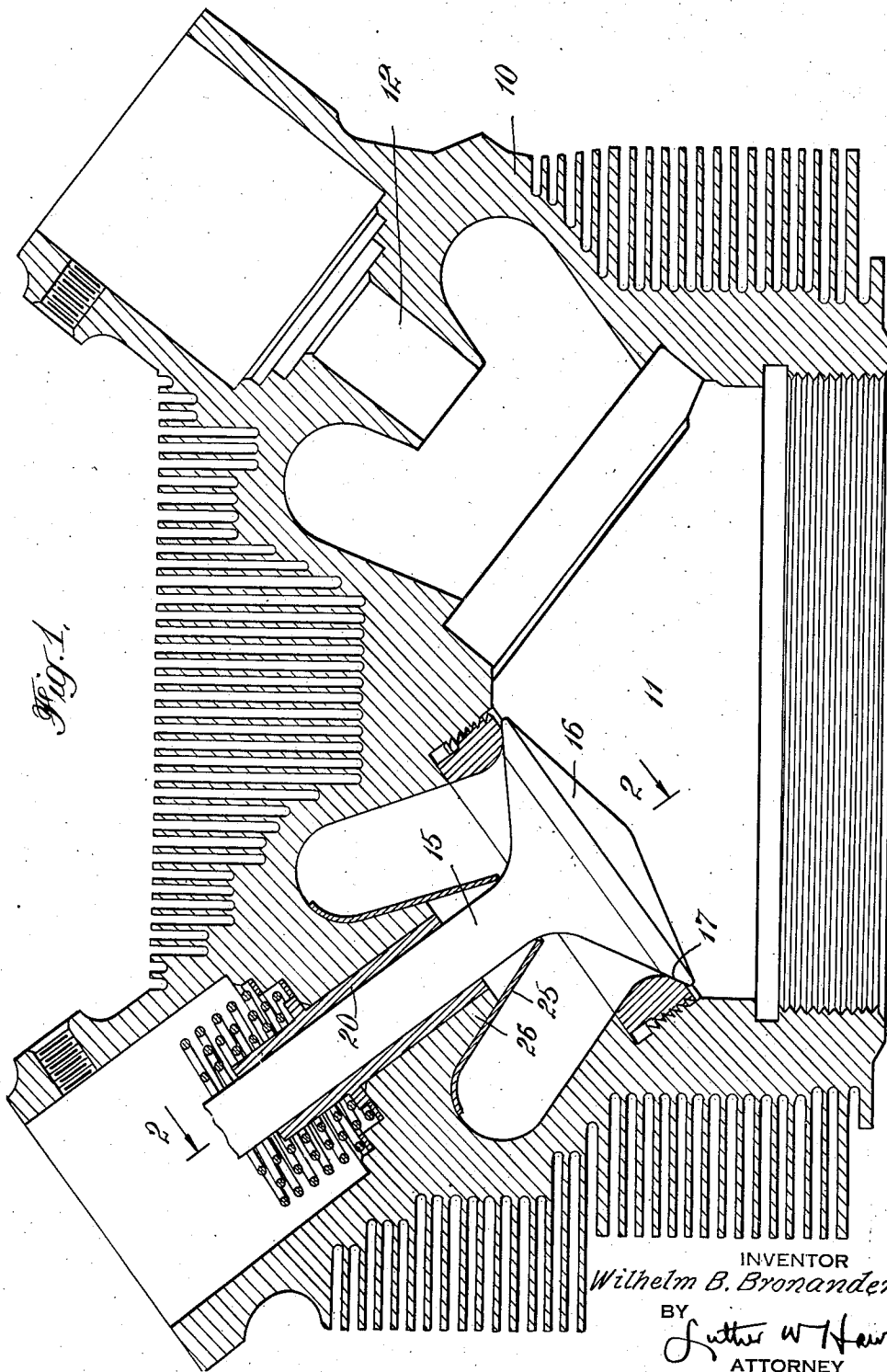
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2,387,052

HEAT DEFLECTING MEANS FOR INTERNAL-COMBUSTION ENGINES

Filed Oct. 2, 1943

2 Sheets-Sheet 1



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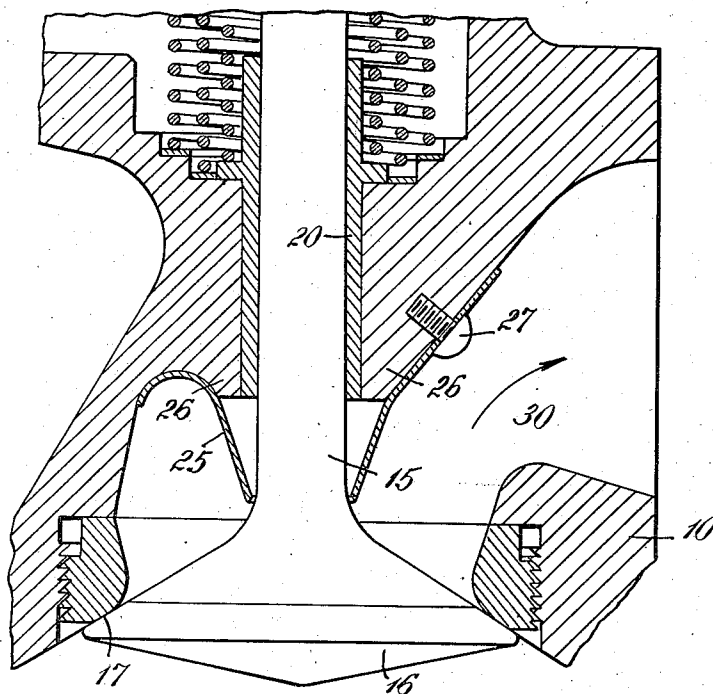
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Fig. 2.



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HEAT DEFLECTING MEANS FOR INTERNAL-COMBUSTION ENGINES

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3 Claims. (Cl. 123-188)

This invention relates to internal combustion engines.

In internal combustion engines, and particularly in aircraft engines which are operated under high compression and at high speed, tremendous amounts of heat are developed. This has resulted in burning out the oil or lubricant which lubricates the exhaust valve stems, thereby causing the valves to freeze.

This invention has for its object to provide in the combustion chamber of an internal combustion engine, means for deflecting the heat from the exhaust valve and valve assembly, thereby eliminating the freezing of the valves.

Another object of the invention is to provide means for and a method of deflecting the hot gases from the exhaust port to the exhaust passage or manifold, thereby preventing burning of the cylinder head.

Further objects of the invention will appear from the following specification taken in connection with the drawings which form a part of this application, and in which

Fig. 1 is a sectional elevation taken through the cylinder head of an internal combustion engine having mounted in the combustion chamber thereof deflecting means constructed in accordance with the invention; and

Fig. 2 is a sectional elevation of the exhaust valve mounting shown in Fig. 1, Fig. 2 being taken substantially at right angles to Fig. 1 and substantially on line 2-2 of Fig. 1.

In the particular embodiment of the invention illustrated, there is shown a cylinder head 10 of any suitable construction having a combustion chamber 11 into which opens the intake valve which is not illustrated but is mounted in the valve assembly unit 12 and the exhaust valve which comprises a valve stem 15 and a valve head 16. The valve head 16 seats on a valve seat 17. The valve stem 15 reciprocates in a guide 20 in the usual manner. Suitable lubricant is provided for lubricating the valve stem in its reciprocating movement. When the valve opens the lower portion of the valve stem moves out of the guide. This portion has lubricant thereon which is exposed to the heat and is burned off, causing the stem to be coated with carbon and to freeze in the guide 20.

Moreover, when the valve head and seat are coated with carbon, the valve does not seat properly and the hot gases on the combustion stroke are forced through the space and strike the lubricated exposed end of the valve stem.

In order to eliminate this action and to pre-

vent the hot gases in the combustion chamber from reaching the valve stem and guide, a deflector has been provided. This deflector has a conical portion 25 which extends around a portion 26 of the cylinder head and is secured thereto in any suitable manner, as by screws 27. It will be noted that the outer open end of the deflector is so dimensioned as to permit the reciprocation of the valve stem therein, but the deflector walls effectively prevent the hot gases in the combustion chamber from reaching the lubricated portion of the valve stem or the contacting surfaces between the guide 20 and the valve stem 15. It will be noted, particularly in Fig. 2, that the deflector 25 extends beyond the portion 26 of the cylinder head and protects the surrounding portion of the cylinder head from contact by the hot gases or flame which issue from the exhaust port. This protective and deflecting lining can be extended to any desired extent.

Attention is called to the fact that the spaced securing means 27 will not secure the deflector tightly to the inner surface of the cylinder head since the deflector of nichrome metal has a different and much lower coefficient of expansion than the coefficient of the metal of the head which is usually aluminum. Moreover, this loose connection to the head leaves a thin air space which further insulates the head from the hot flame or gases. The deflector is formed of a suitable heat resisting metal, such as nichrome, which will effectively deflect the hot gases but will not be melted or burned thereby. In Fig. 2 the exhaust passage 30 is illustrated, the hot gases passing out through this exhaust passage in the direction of the arrow.

Although one particular embodiment of the invention has been particularly shown and described, it will be understood that the invention is capable of modification and that changes in the construction and in the arrangement of the various cooperating parts may be made without departing from the spirit or scope of the invention, as expressed in the following claims.

What I claim is:

1. In an internal combustion engine, a cylinder head having a combustion chamber, an exhaust valve assembly including a cylinder head casting, a valve stem and a valve stem guide mounted in said casting, and deflecting means in said cylinder head fixed to said cylinder head casting and protecting the casting from direct contact with the hot gases and projecting beyond the casting and surrounding the valve stem and the

lower end of the guide, for deflecting hot gases from said casting exhaust valve stem and guide.

2. In an internal combustion engine, a cylinder head having a combustion chamber, an exhaust valve assembly including a cylinder head casting, a valve stem and a valve stem guide mounted in said casting, and deflecting means fixed to the cylinder head casting and protecting the casting from direct contact with the hot gases and projecting beyond the casting and converging around the inner end of the guide and valve stem for deflecting hot gases from said casting, valve stem and guide.

3. In an internal combustion engine, a cylinder head, an extension from said head for surrounding and supporting a valve stem guide, an exhaust port, an exhaust valve reciprocatably mounted in the head, and heat resistant means carried by but relatively free from contact with said cylinder head for preventing direct contact with said cylinder head by the exhaust flame and for deflecting said exhaust flame and exhaust gas to the exhaust passage from said cylinder head.

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