No. 778,425. PATENTED DEC. 27, 1904.

H. J. MUNTZ.

HEAT RADIATING DEVICE FOR INTERNAL COMBUSTION MOTORS.

APPLICATION FILED JAN. 6, 1904.

Fig. 1.

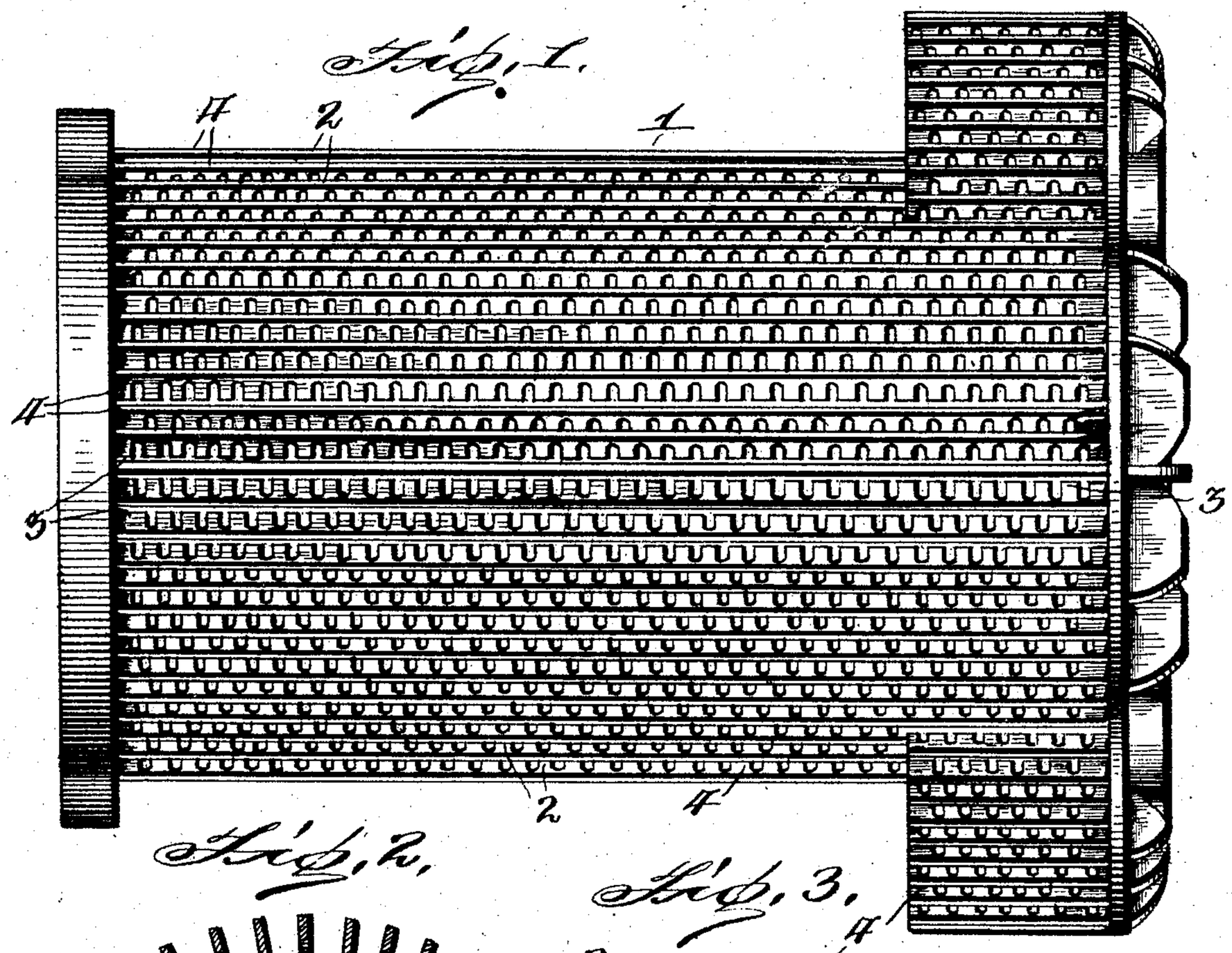


Fig. 2.

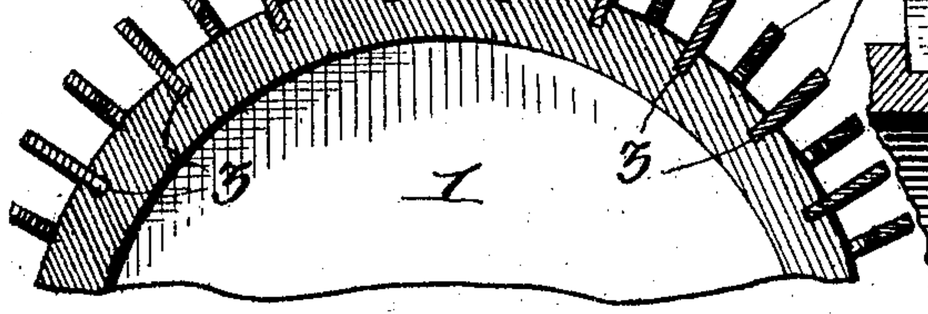


Fig. 3.

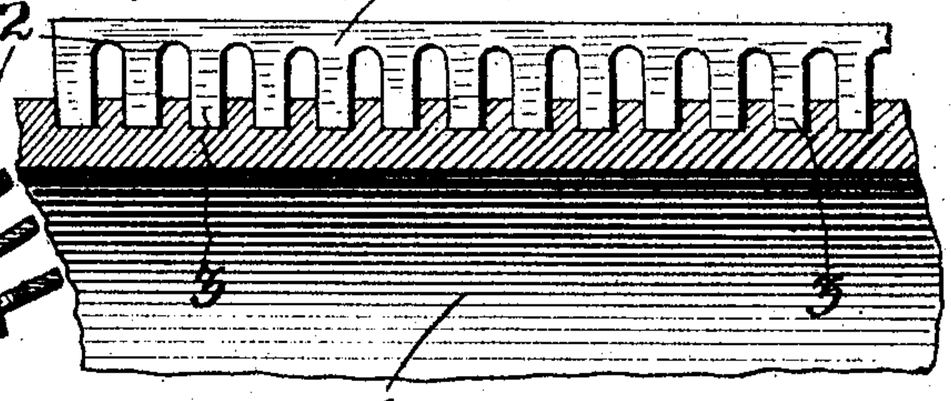


Fig. 4.

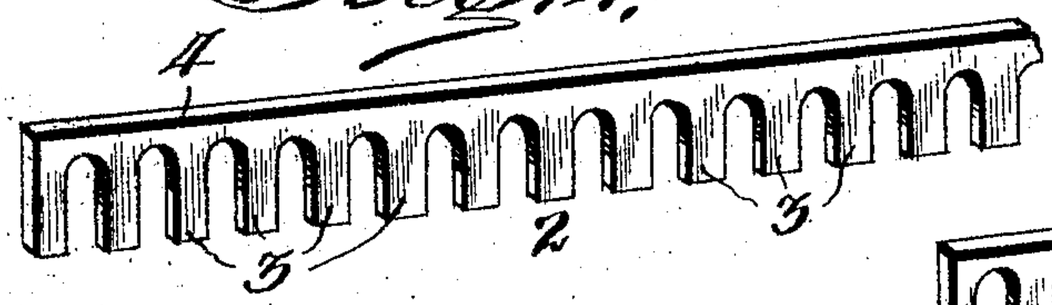


Fig. 5.

Fig. 7.

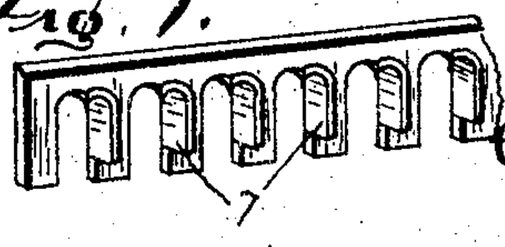
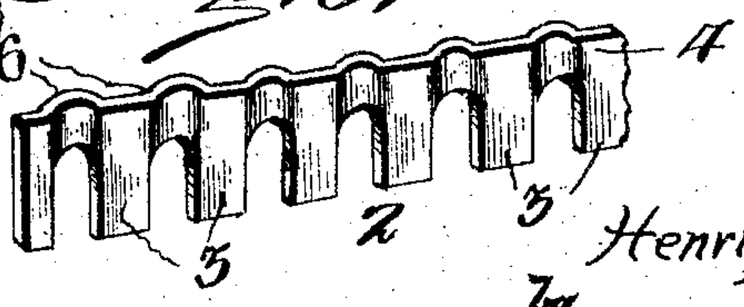


Fig. 6.



Witnesses,
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No. 778,425. Patented December 27, 1904.

UNITED STATES PATENT OFFICE.

HENRY J. MUNTZ, OF POUGHKEEPSIE, NEW YORK.

HEAT-RADIATING DEVICE FOR INTERNAL-COMBUSTION MOTORS.

SPECIFICATION forming part of Letters Patent No. 778,425, dated December 27, 1904.

Application filed January 6, 1904. Serial No. 187,869.

To all whom it may concern:

Be it known that I, HENRY J. MUNTZ, a citizen of the United States of America, residing at Poughkeepsie, in the county of Dutchess and State of New York, have invented certain new and useful Improvements in Heat-Radiating Devices, of which the following is a specification.

This invention relates to improvements in heat-radiating devices for internal-combustion motors and other objects exposed to high temperatures.

The object of this invention is to improve and simplify the construction of devices of this character, and thereby render them more effective and durable in use and less expensive to produce.

With this and other objects in view, which will appear as the nature of the invention is better understood, the same consists of certain novel features of construction, combination, and arrangement of parts, as will be more fully described, and particularly pointed out in the appended claims.

In the accompanying drawings, which illustrate one application of the invention, Figure 1 is a side elevation of the cylinder of an internal-combustion motor or engine constructed in accordance with this invention. Fig. 2 is a transverse section through the same. Fig. 3 is a detail longitudinal section through a portion of the cylinder. Fig. 4 is a perspective view of a portion of one of the heat-radiating strips or blades. Figs. 5, 6, and 7 are similar views of modified forms of heat-radiating strips or blades.

In the embodiment of my invention illustrated in the drawings the numeral 1 denotes a motor or engine cylinder having a plurality of heat-radiating devices or projections 2 cast in its outer surface. The said devices or projections 2 may be of any suitable construction, but are preferably in the form of strips of some sheet metal which has a high coefficient of conductivity. Said strips are stamped or otherwise cut in the form of combs, the teeth 3 of which are united along one of their ends by a rib or back 4 and have their opposite or free ends cast in the outer surface of the cylinder or other object. The teeth 3 instead of being straight throughout their length, as seen in Fig. 3, may have their ends flared or slightly hook-shaped, as shown at 5 in Fig. 5, to permit them to be held more securely by the metal into which they are cast. The strips may be arranged upon the cylinder longitudinally, transversely, spirally, or in any desired manner, and they may project radially or at any desired angle from the surface in which they are cast; but in practice I prefer to dispose them longitudinally in parallel relation and have the teeth of each strip opposite the spaces or openings between the teeth of the two adjacent strips, so that air-currents passing through said openings in one strip will strike the teeth of the next strip. Instead of making straight strips they may be corrugated longitudinally or transversely, as shown at 6 in Fig. 6, in order to provide a greater heat-radiating surface and to allow for the difference in the expansion and contraction between the cylinder and strips and for shrinkage in casting, or they may be partly punched out and the punched piece bent out at an angle, as shown in Fig. 7 at 7. By casting the toothed edge of the comb-strips in the cylinder due allowance is made for shrinkage in the casting, since the spaces between the teeth will prevent the buckling which usually occurs when a solid strip of one kind of metal is cast in another, and, furthermore, the completed casting will be relieved of all strain which would be present should the back 4 of the combs instead of their teeth 3 be cast in the surface of the cylinder. By having the backs 4 upon the outside a practically smooth ribbed surface is provided for the cylinder, which will enable it to be readily handled, and, moreover, by this arrangement of the backs 4 the greatest amount of heat-radiating surface is more directly exposed. As previously stated, this surface may be increased by corrugating the backs 4 between the teeth, as seen in Fig, 6, or by partly punching out the space between the teeth and bending this punched part at an angle to the strip, thereby retaining all of the metal, which will give the greatest surface.

Heretofore it has been common to cut grooves or recesses in the surface of the cylinder and then secure heat-radiating comb

strips or pins by pressing them or screw-threading them into said grooves or recesses; but these means for securing the heat-radiating devices are both ineffective and expensive. By casting them in the surface in accordance with the present invention they become a part of the cylinder, and the great saving in cost of production is obvious.

From the foregoing description, taken in connection with the accompanying drawings, it is thought that the mode of using the invention and the many advantages thereof will be readily understood without a more extended explanation.

Various changes in the form, proportion, and the minor details of construction may be resorted without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination with a cylinder for internal-combustion motors, of metal comb-strips having the flaring ends of their teeth cast in said cylinder, substantially as described.

2. The combination with a cylinder for internal-combustion motors, of a series of comb-strips disposed in parallel relation with the teeth of each strip opposite the spaces in the adjacent strips and having the ends of their teeth cast in said cylinder, substantially as described.

3. The combination with a cylinder for internal-combustion motors, of comb-strips of sheet metal, having the metal between the teeth cut and punched only on one side, and bent at an angle with the strips, and having the ends of their teeth cast in said cylinder, substantially as described.

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Witnesses:
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