To all whom it may concern:

Be it known that I, Thomas R. Blanchard, of Minneapolis, in the county of Hennepin, and State of Minnesota, have invented certain new and useful Improvements in Gas Burners for Heating Plants, of which the following is a specification.

My invention relates to gas burners for heating plants, and one of the objects of the invention is to provide a device of this character which is convenient to install in furnaces and stoves already in use. Other objects are to provide a device which will be safe, efficient, fool proof and economical, which requires no complicated adjustment and which will consume only a small amount of gas for effective heating.

The full objects and advantages of my invention will appear in connection with the detailed description thereof and the novel features embodied in my inventive idea will be particularly pointed out in the claims.

In the accompanying drawings, which illustrate the application of my invention,—

Fig. 1 is a view in vertical section showing the burner in place in a furnace. Fig. 2 is a top plan view of the burner. Fig. 3 is a view in horizontal section on the line 3-3 of Fig. 1. Fig. 4 is a view in horizontal section on the line 4-4 of Fig. 1. Fig. 5 is a view partly in section on the line 5-5 of Fig. 1.

The burner is shown applied to a furnace F of well-known construction having a grate G. The burner includes a casing 10 which rests in vertical position upon the grate, and the upper end of the casing has a horizontal wall 12 provided with five equally spaced rows of radially-extending perforations 14.

Between the top 12 and the open bottom of the casing there is a horizontal partition 16 between which and the top 12 is a mixing chamber 18. The partition 16 contains a central opening surrounded by a depending ring-like flange 20 which is internally threaded to receive external threads upon the upper end of a pipe section 22 whose lower end is screwed threaded to fit internal screw threads formed at the upper end of a union 24. A hollow plug 26 is screw-threaded into the lower end of this union. The plug 26 is internally threaded and the lower end of a tube 28 extends up into the lower end of the pipe section 22 and is sufficiently smaller so as to be located concentrically therein. The upturned end of a horizontal pipe 30 is secured to the lower end of the hollow plug 26. Secured to the rear end of the pipe 30 is a hollow outwardly flaring member 32 having air admission openings surrounding a central internally threaded ring portion 34 into which is screwed the externally threaded end of a tubular member 36 containing a plunger 38 to which a lever 40 is pivotally attached in such manner that the plunger may be moved back and forth by cables 42 and 44 to regulate the size of the opening leading from the tubular member 36 into the pipe 30. A gas supply pipe 46 leads into the tubular member 36 and a tube 48 for supplying a pilot light leads from the pipe 46 to a position adjacent the burner. A pipe 50 is connected with an opening in the side of the union 24 and this pipe is also connected with a blower casing 52 operating in any suitable manner. A check valve 54 is placed in the pipe 50. The wall of the casing 10 above the partition 16 is tapped at five equally spaced points directly below the perforations 14 to receive tubes 56 having perforations 58 in their upper sides. The tubes 56 are closed at their outer ends in suitable manner as by screw plugs 60. Directly beneath the tubes 56 are similar perforated tubes 62 tapped into the casing below the partition 16. Above the casing 10 there is a plate 64 which has lugs 66 resting upon the top wall 12. The periphery of the plate 64 is provided with five side ways 68 which receive the inner ends of the flat bars 70 located directly above the perforated tubes 56. The grate outside of the casing 10 is made substantially airtight by a layer of heat resisting material 72, such as asbestos.

The operation and advantages of my invention will be readily understood in connection with the foregoing description. Gas may be readily supplied to the burner by connecting the pipe 46 with a gas pipe of the city supply. The gas passes from the pipe 46 into the tubular member 36, from which it passes the plunger 38 in regulated amount, determined by the setting of the plunger, and enters the pipe 30, at the same time drawing in air through the air-
admission openings of the flaring member 32. The mixture of gas and air passes through the reduced tube 28 and enters the pipe section 22, where it encounters a large supply of air delivered by the blower through the pipe 50. All of this air and gas passes into the mixing chamber 18 where it is mixed and delivered under pressure through the perforations 14 and the perforations of the tubes 56 and is burned under the flat bars 70 which become highly heated. These bars not only serve to spread out the flames but become highly heated and aid in maintaining the heat in the firebox of the furnace. The entire draft of air for the furnace passes through the central portion of the grate into the lower portion of the casing 10 from which it escapes through the perforations in tubes 62 directly below the tubes 56 so that this portion of the air is highly heated before it mixes with the combustible mixture which is being burned. When the supply of combustible mixture to the tube is cut off a small flame is maintained at the upper end of the tube 48 so that the combustible mixture will be ignited when again turned on. The device may be conveniently applied to different sized fire boxes, since the tubes 56 and 62 and the flat bars 70 may be readily cut to the proper length. The provision of a burner which is supplied with a large amount of air under pressure for mixing with the gas results in the production of a very hot flame with the consumption of a comparatively small amount of gas.

I claim:

1. A gas burner for heating plants comprising a casing, a horizontal partition dividing said casing into upper and lower portions, a pipe leading from below said casing thru said partition for supplying gas to the upper portion of said casing, a plurality of perforated tubes leading out radially from the upper portion of said casing, and a plurality of perforated tubes leading out radially from the lower portion of said casing and located so as to deliver air directly below said first mentioned perforated tubes.

2. A gas burner for heating plants comprising a casing, a horizontal partition dividing said casing into upper and lower portions, a pipe leading from below said casing thru said partition for supplying gas to the upper portion of said casing, a plurality of perforated tubes leading out radially from the upper portion of said casing, a plurality of flat bars located respectively over said tubes, and a plurality of perforated tubes leading out radially from the lower portion of said casing and located so as to deliver air directly below said first mentioned perforated tubes.

3. A gas burner for heating plants comprising a casing having a lower open end, a horizontal partition dividing said casing into upper and lower portions, a pipe leading from below said casing thru said partition, a union connected to the lower end of said pipe, a pipe for supplying gas extending up thru the lower end of said union and having its upper end spaced concentrically within the lower portion of said first pipe, a pipe for supplying air connected with the side of said union, a plurality of perforated tubes leading out radially from the upper portion of said casing, and a plurality of perforated tubes leading out radially from the lower portion of said casing and located so as to deliver directly below said first mentioned perforated tubes the air which is drawn in thru the lower open end of said casing.

In testimony whereof I hereunto affix my signature.

THOMAS R. BLANCHARD.