J. G. DUNGAN.

STOVE.

APPLICATION FILED AUG. 17, 1914.

1,154,747.

Patented Sept. 28, 1915.

2 SHEETS—SHEET 1.

Fig. 1.

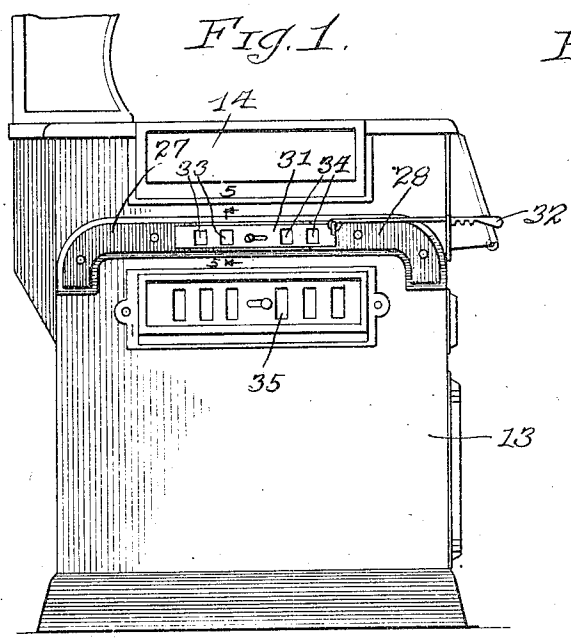
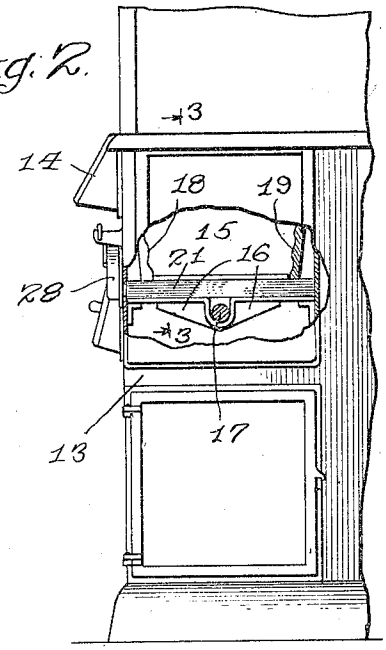


Fig. 2.



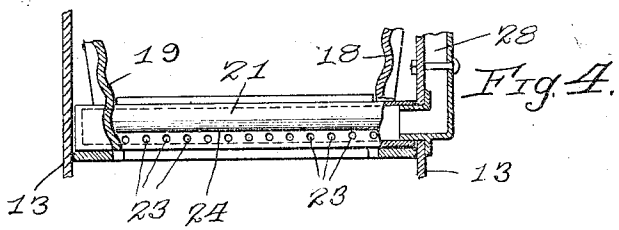


Fig. 4.

Fig. 5

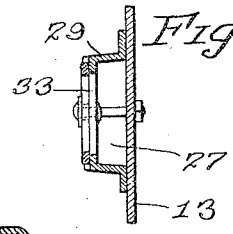
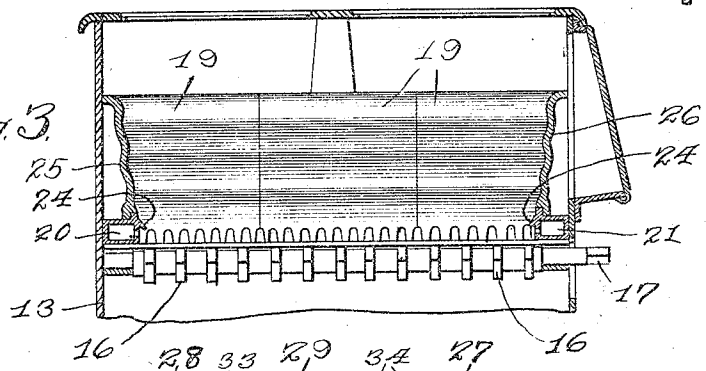


Fig. 3.



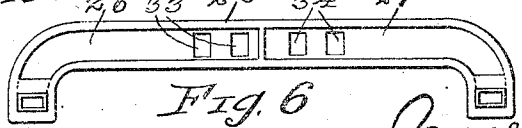


Fig. 6

Witnesses!
L. B. Graham
H. A. Adams.

Inventor:
James G. Dungan
By Adams & Jackson.
Att'ys.

J. G. DUNGAN.

STOVE.

APPLICATION FILED AUG. 17, 1914.

1,154.747.

Patented Sept. 28, 1915.

2 SHEETS—SHEET 2.

Fig. 7.

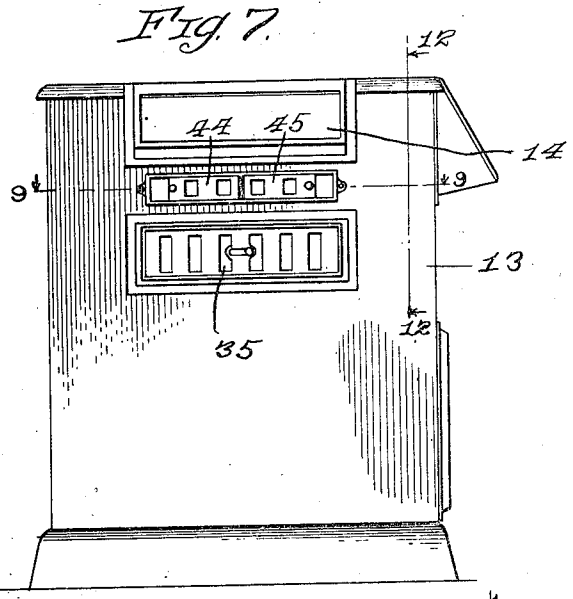
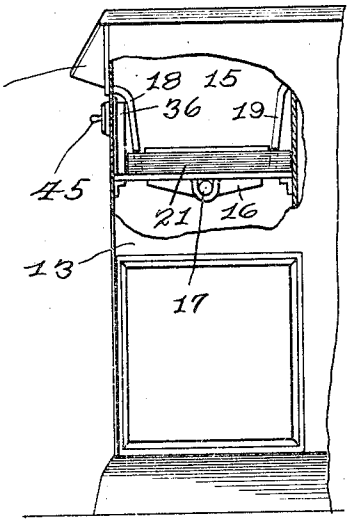


Fig. 8



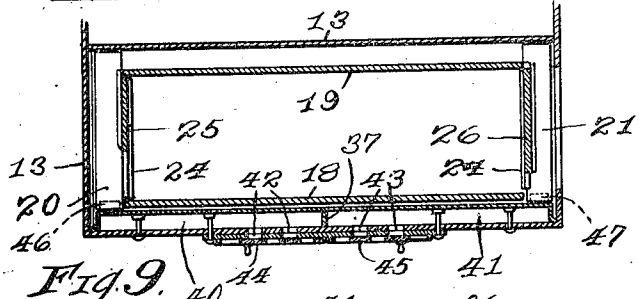


Fig. 9.

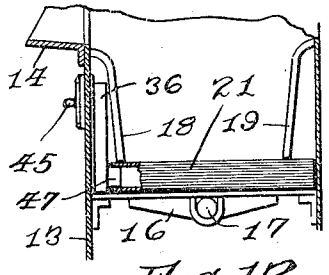


Fig. 12

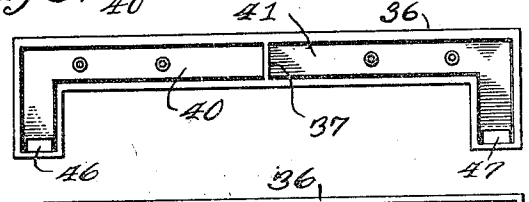


Fig. 10

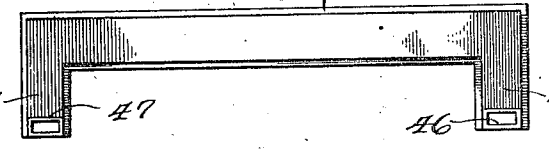


Fig. 11

Witnesses:
L. B. Graham.
H. A. Adams

Inventor
James G. Dungan
By Adams & Jackson
Att'ys.

UNITED STATES PATENT OFFICE.

JAMES G. DUNGAN, OF OMAHA, NEBRASKA, ASSIGNOR OF ONE-HALF TO HIMSELF, AND ONE-HALF TO CHARLES H. COOK, OF OAK PARK, ILLINOIS.

STOVE.

1,154,747. Specification of Letters Patent. Patented Sept. 28, 1915.

Application filed August 17, 1914. Serial No. 857,117.

To all whom it may concern:

Be it known that I, JAMES G. DUNGAN, a citizen of the United States, residing at Omaha, in the county of Douglas and State of Nebraska, have invented certain new and useful Improvements in Stoves, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to stoves and ranges, and has for its object to provide certain improvements by which the combustion of the fuel, whether coal or wood, will be promoted, and by which the fire will be more evenly distributed throughout the fire-box and the heat units consequently more uniformly distributed throughout the stove or range at the points where they are most effective, and by which, also, the burning out of the center sections of the fire-back and other parts of the stove, which in constructions heretofore employed have been unequally subjected to intense heat, will be avoided.

To this end, my invention consists primarily in providing means for introducing air into the lower portion of the fire-box at both ends. The air may be introduced at the level of the grate surfaces or slightly above or slightly below them, and it is so introduced as to be distributed across the width of the fire-box so that the combustion of the fuel in all parts of the fire-box is uniformly promoted.

My invention further contemplates a construction by which the air will be heated by the heat of the stove as it passes toward the points at which it is to be admitted into the fire-box, and consequently it is delivered to the fire-box in a heated condition and will not chill the fire, but, on the contrary, will promote combustion.

In the accompanying drawings I have illustrated two forms of apparatus in which my invention may be embodied, but it will be understood that various other embodiments thereof may be made; and it is equally well adapted to a great variety of stoves and ranges.

In the accompanying drawings,—Figure 1 is a front view of a range illustrating the air inlet ducts and the damper by which the admission of air is controlled; Fig. 2 is an end view of the range shown in Fig. 1, some parts being broken away to show one end of the fire-box; Fig. 3 is a vertical section on line 3—3 of Fig. 2; Fig. 4 is an elevation of one of the perforated heads which are provided at the ends of the fire-box and through which the air is discharged into the fire-box; Fig. 5 is an enlarged detail, being a vertical cross-section on line 5—5 of Fig. 1; Fig. 6 is a view showing the inside of the air inlet ducts; Fig. 7 is a front elevation of a range showing a modified arrangement of the air ducts; Fig. 8 is an end view of the range shown in Fig. 7, partly broken away; Fig. 9 is a partial horizontal section on line 9—9 of Fig. 7; Fig. 10 is a front elevation of the casting which is fitted against the front wall of the range shown in Figs. 7 and 8 and forms the air inlet ducts; Fig. 11 is a view of the opposite side of the casting shown in Fig. 10; and Fig. 12 is a partial vertical cross-section on line 12—12 of Fig. 7.

Referring first to the construction shown in Figs. 1 to 6,—13 indicates the outer wall or casing of a range, having a door 14 for the admission of fuel to the fire-box 15. The fire-box 15 is of the usual rectangular shape and is provided with grate-bars 16, which may be of any approved type. In the construction shown they are carried by a shaker-rod 17 which is pivoted at its ends so that it may be rocked in the usual way. 18—19 indicate the usual front and rear linings of suitable refractory material. 20 and 21 indicate two headers or conduits, of suitable material, disposed transversely of the length of the fire-box at the ends thereof, and in the construction shown they are placed immediately above the rod 17. The headers 20—21, in the construction illustrated, are shown as having perforations 23 on their inner faces near their lower margins, to discharge into the lower portion of the fire-box but they may be otherwise arranged as desired. 24 indicates projecting lips, which overlie the perforations 23, to protect them from ashes, as shown in Fig. 3. 25—26 indicate end linings of the fire-box, which rest upon the headers 20—21, respectively. The headers 20—21, therefore, form extensions downward of the linings 25—26. 27—28 indicate air pipes or ducts, which connect, respectively, with the headers 20—21, being preferably telescoped therewith, as shown at the right in Fig. 4. The ducts 27—28 extend through suitable openings in the front of the range, as shown in

Fig. 2, and then extend along the front of the range. These ducts are provided with a slide or damper 31, and an adjusting-rod 32, so that the damper may be readily adjusted to regulate the air admitted to the ducts 27—28. It will be apparent that as the ducts 27—28 are secured against the front of the range, when the damper ports 33—34 are open the air passing into said ducts will come in contact with the hot front of the range and will be subjected to heat as it passes through the ducts 27 or 28 to the headers with which the ducts are respectively connected; consequently, the air when discharged into the fire-box will be heated to a greater or less extent, which promotes combustion of the fuel. By adjusting the damper in the ducts 27—28, the volume of air admitted at either or both ends of the fire-box may be accurately controlled, and consequently the combustion of fuel may be regulated so that it will be uniform throughout the fire-box. I contemplate, also, employing the usual direct draft, controlled by dampers 35, as shown in Fig. 1, through which air is supplied intermediately to the fire-box; and by employing such central draft in connection with the ducts discharging into the fire-box at both ends, there is no accumulation of unconsumed fuel in any part of the fire-box, and combustion proceeds in it uniformly from end to end and from front to rear.

In the construction shown in Figs. 7 to 12, inclusive, instead of locating the air ducts for the end headers outside of the range and against the front wall thereof, I locate the ducts inside the front of the range by employing a casting 36 which is divided centrally by a vertical partition 37, so that by fitting the casting against the inner face of the front wall of the range two ducts 40—41 are formed. The front wall of the range is perforated, as shown at 42—43, so that air is admitted through such openings to the ducts 40—41. Slide dampers 44—45 control the admission of air through the openings 42—43, respectively. The ducts 40—41 communicate with the headers 20—21 through openings 46—47, as shown in Figs. 11 and 12. In this construction the incoming air is subjected to more intense heat than in the construction shown in Figs. 1 to 6, since in the latter construction the front wall of the stove does not become as highly heated as the casting 36; but in both constructions the incoming air is heated to quite a high temperature before its admission to the fire-box.

My invention is applicable to a great variety of designs of stoves and ranges, and to ranges using various kinds of fuel, such as coal, wood, coke, etc.

In the claims I have used the word "stove" in a generic sense to include all the various sorts of stoves, ranges, etc., to which my invention is applicable.

By the use of my construction and arrangement of parts I have provided for the introduction of air into the fire-box at each end thereof at the grate,—that is to say, at such a point relative to the grate that the air passes upward through the mass of fuel in the fuel bed at the ends of the fire-box thus encouraging ignition at those points. As will be readily understood, it is preferable that the air be admitted into the fire-box as nearly as possible at the level of the upper face of the grate so that it will be prevented from passing toward the center of the ash pit below the grate and so that the air will be sure to pass upward through the bed of fuel.

That which I claim as my invention, and desire to secure by Letters Patent, is,—

1. In a stove, the combination of a fire-box, a grate at the bottom of the fire-box, headers extending across the ends of the grate and opening into the fire-box at the grate below the fuel-bed, a channel-iron secured along the front wall of the firebox above the grate forming a duct along the wall communicating at its ends with the said headers, and a plate extending across said channel-iron separating the duct into two divisions, said duct being provided with ports opening to the atmosphere on opposite sides of the division plate.

2. In a stove, the combination of a fire-box, a grate at the bottom of the fire-box, headers extending across the ends of the grate and opening into the fire-box at the grate below the fuel-bed, and a channel-iron secured along the outer face of the wall of the fire-box above the grate forming a duct communicating at its ends with the said headers and opening at an intermediate point to the atmosphere.

3. In a stove, the combination of a fire-box, a grate at the bottom of the fire-box, headers extending across the ends of the grate inside of the fire-box and having a plurality of openings therefrom at the grate below the fuel-bed, a channel-iron secured to the outer face of the wall of the fire-box above the grate forming two separate ducts leading to and communicating with said headers respectively, and a damper adapted to close suitable openings leading into said ducts from the atmosphere, said damper being adapted to equalize at all times the air inlet into said two ducts.

JAMES G. DUNGAN.

Witnesses:
V. H. WEAVER,
H. A. CLARKE.