May 23, 1961 J. W. PETERSON ET AL 2,985,165

GRATE

Filed Feb. 24, 1958

FIG. 1.

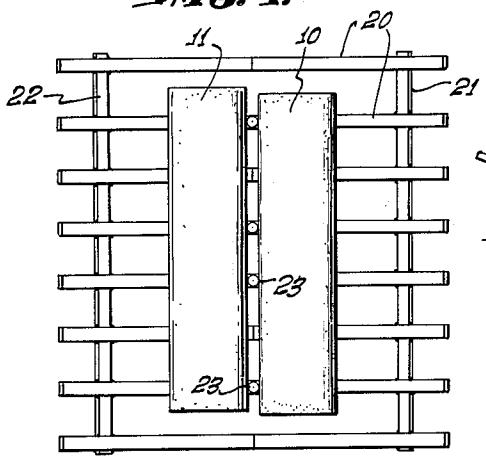


FIG. 2.

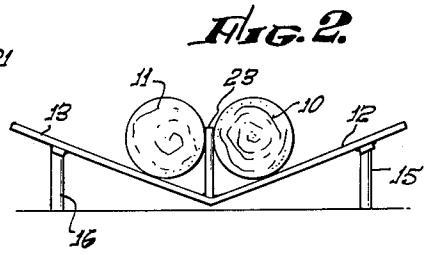


FIG. 4.

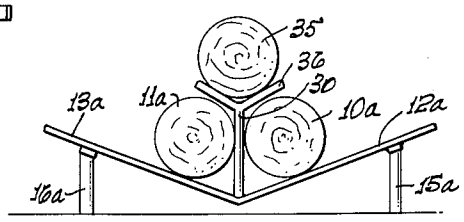
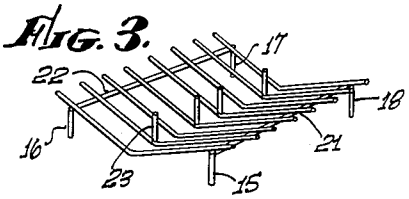


FIG. 3.



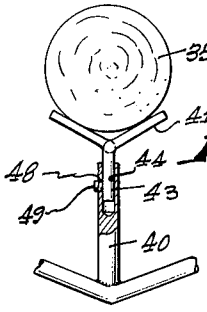


FIG. 6.

FIG. 5.

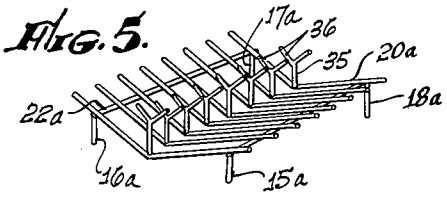


FIG. 8.

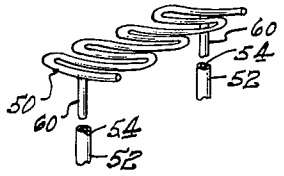
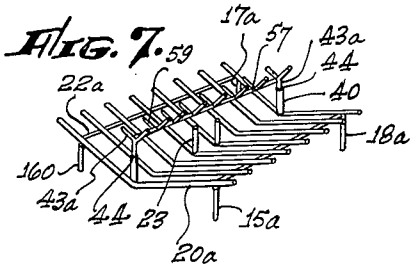


FIG. 7.



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GRATE

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6 Claims. (Cl. 126—165)

This invention relates to grates and more particularly to an improved grate for the burning of synthetically manufactured logs in an open or partially open fireplace.

In recent years there has been an increase in fireplaces built into the walls of private dwellings. This has been especially true in urban areas where natural logs are not readily available. A synthetic log made of compressed saw dust, and the like, shaped into cylinders having predetermined dimensions are probably the most widely used fuel being burned in these home fireplaces.

Synthetic logs are inherently difficult to burn, as the successful burning of these smooth barkless logs is sensitive to the spacing between the logs in the grate. This is due to the fact that most of the burning takes place on the surface between two closely spaced logs only. It has been experimentally determined by the inventors that the spacing between the logs is critical within a predetermined range.

In grates according to the present art, such as that disclosed in U.S. Patent No. 1,385,931 entitled "Grate-Basket" by P. F. Semonin, issued July 26, 1921 and British Patent No. 173,344 entitled "Improvements in Domestic Firegrates" by F. M. Wineberg, complete accepted January 5, 1922, a fixed log spacing is difficult to maintain. The grates disclosed in both of these patents are essentially flat bottomed. When two synthetic logs, for example, of the type hereinabove mentioned, are burned, they have a tendency to burn mostly at the surfaces facing each other. After a time the sections of the logs closest to the burning surfaces are burned away, leaving a burned out moon shaped section on each log. Thus, the center of gravity of each log will shift away from these sections causing the logs to roll away from one another increasing the spacing between them. As the spacing between the logs has been determined to be critical to maintain a satisfactory fire, the fire soon will deteriorate due to this change in spacing.

The grate of the present invention is so constructed as to maintain the predetermined critical spacing between the burning logs as they are consumed by burning.

In accordance with one embodiment of the present invention there is provided a grate having a V-shaped base portion with an upright spacer provided at the center of the V to maintain a constant spacing between the logs which logs are forced down to the trough of the V.

Accordingly, it is an object of the present invention to provide an improved grate for burning logs which will maintain optimum burning of the logs.

It is another object of the present invention to provide a grate for a fireplace which will maintain two central logs to be burned at a predetermined spacing one from the other during the entire period of combustion.

The novel features which are believed to be characteristic of the present invention, both as to its organization and method of operation, together with other objects and advantages thereof, will be better understood from the following description considered in connection with the accompanying drawing in which several embodiments of the invention are illustrated by way of example. It is to be expressly understood, however, that the drawing is for the purpose of illustration and description only,

and is not intended as a definition of the limits of the invention.

In the drawing:

Figure 1 is a plan view of one embodiment of a grate in accordance with the present invention showing two synthetic logs supported thereby;

Figure 2 is an end view of the grate of Figure 1;

Figure 3 is a view in perspective of the grate shown in Figures 1 and 2;

Figure 4 is an end view of an alternate embodiment of a grate in accordance with the present invention designed to burn three logs;

Figure 5 is a view in perspective of the grate of Figure 4;

Figure 6 is an end view partly in section of an alternative design of the upright spacers permitting removal of the support for the third log of the Figure 4 embodiment;

Figure 7 is a perspective view of an alternative embodiment of the grate of Figures 4 and 5; and

Figure 8 is a perspective view of an alternative upright spacer and upper log support for the embodiment shown in Figure 7.

Referring now to the drawing and more particularly to Figures 1 and 2 there is shown one embodiment of the grate of the present invention. The grate includes a substantially V-shaped bottom including inclined sections **12** and **13** which support logs **10** and **11**. For the purposes of clarity it will be assumed that only two logs are to be used as fuel in the grate of this embodiment. It will, however, be appreciated that more logs could be accommodated by disposing them on either side of logs **10** and **11**. It will further be assumed that the logs to be used as fuel in the embodiments shown are of the synthetic type as previously discussed herein. This is done to point out the particular advantages inherent in the grate of the present invention in the burning of these synthetic logs which are far more difficult to burn than are natural logs. It will be understood, however, that natural logs may also be burned in this grate.

While the bottom has been shown as being in the shape of a V with flat angular sections, curved sections may alternately be used in their stead. The inclined sections **12** and **13** each include a plurality of cross bar members **20** joined together by transverse members **21** and **22**. The term inclined section as used herein is intended to include a curved, as well as a flat section. Cross bar members **20** may be separate short metal bars joined together at the trough of the V or one continuous member bent or formed to assume a V-shape. Transverse members **21** and **22** may conveniently be brazed or welded to member **20**.

Vertical separator or upright spacer bars **23** are provided to extend upward from the trough between sections **12** and **13**, as shown in Figures 1 and 3. Therein are provided four bars **23** each meeting central cross bar members **20** at the intersections as shown; of course, more or fewer spacer bars **23** may also be provided. The four bars **23** shown herein have been found to be a convenient design by the inventors.

Supporting legs **15**, **16**, **17** and **18** are spaced out near the raised portions of the inclined sections **12** and **13** and are of such a height as to maintain the lowest point of the bottom of the grate at an elevation from the horizontal. The supporting legs may be joined to the bottom of the grate by welding or the like. There may be four supporting legs, i.e., one in each corner or some other convenient number to adequately support the bottom of the grate together with the fuel to be burned.

The angle of incline shown in Figure 2 has been experimentally found by the inventors to be best for the purposes stated, if limited within the range from 10° to 35°.

The spacing between the logs **11** and **12** should preferably be limited within the range from ¼" to ¾" with a 4" diameter log to optimize burning in accordance with the objects hereinbefore set forth. Accordingly, the diameter of separation bars **23** should be in the range from ¼ to ¾ of an inch. If different size logs are used, the dimensions may be proportionally varied in a manner as would be apparent to one skilled in the art in view of the objectives herein disclosed.

Referring now to Figure 4 there is shown an alternative embodiment of the grate of the present invention. Basically, the difference between the embodiment of Figures 1, 2 and 3 and that of Figure 4 is the provision of a support for a central third log **35**. In this embodiment all of the other parts of the grate are the same as shown in Figures 1, 2 and 3 with the exception of the separator bar **30**. In the Figure 4 embodiment the separator bar **30** unlike bar **23** of Figures 1, 2 and 3 has an upper V section **36** to support log **35**.

Also the height of bar **30** must be greater than bar **23** where logs of 4 inch diameter for example, are to be burned. This difference in height is required to produce the desired optimum spacing between the upper log **35** and lower logs **10***a* and **11***a*. This spacing, i.e., between the upper log **35** and lower logs **10***a* and **11***a* has been found to give the best results in accordance with the stated objects of the invention, if maintained in the range from ¼" to 1". In this alternate embodiment the spacing between the lower logs may either be maintained as for the embodiment of Figures 1, 2 and 3 or increased slightly on the higher side of the range to a distance approaching 1 inch. Again, if larger or smaller diameter logs are to be burned appropriate changes in dimensions may be made by one skilled in the art in accordance with the stated objectives of this invention.

Figure 5 shows a perspective view of the embodiment of Figure 4 in which a separator is placed at each cross bar junction. In this figure and in Figure 4 all of the parts which are equivalent to those of the first described embodiment have the same number followed by the letter *a*.

In Figure 6 there is shown another alternative embodiment of the invention. Herein, there is provided in the grate of Figures 1, 2 and 3, a central hole **44** in the separator bar **40** to accommodate removable Y-shaped member **43** which has a V-shaped section **41**. With this type of separator bar in place of bars **23** in the first embodiment, one may alternately have use of either of the first two embodiments by merely inserting or removing members **43** from vertical bar **40** or placing the same therein as desired. An added feature which may be added to the embodiment of Figure 6 is the provision of a height adjustment of member **43** within separator bar **40**. This may be accomplished by a threaded hole **48** through the wall of bar **40** to receive a set screw **49**, thus permitting the upper log **35** to be raised or lowered at will. The height adjustment feature of member **43** may alternatively be achieved by the use of a series of spaced holes within the vertical portion of member **43** to receive a pin instead of a threaded screw **49**.

One arrangement for the use of members **43***a* similar to **43** of Figure 6 in combination with the first embodiment of this invention is shown in Figure 7. Therein the two members **43***a* each fit into holes **44** of bar **40**. A central log supporting member **57** having several V-shaped supports **59** is connected at either end by welding, by insertion within a notched hole or the like to support a third log. Two central spacers **23** are also provided as shown to insure proper spacing between the two lower logs to be burned.

In Figure 8 an alternative central supporting member **50** is shown in place of **55** in Figure 7. Member **50** may be made of tubing or the like for ease of manufacture. Member **50** has extending legs **60** to fit within holes **54** of supports **52**.

There has thus been described a new and novel grate which insures optimum burning of synthetic logs and the like with each of the various spacers, cross-members, and the like, may be made of heat resisting metal of any desired cross-section including, but not limited to the following: rod, tubing, cored tubing, strip T-beam and I-beam.

What is claimed as new is:

1. A fireplace grate for burning at least two cylindrical synthetic logs comprising: a bottom including first and second inclined sections, said sections each being at a predetermined angle with the horizontal and being joined together to form a V-shape; support means adapted to support said bottom at an elevation; vertical separator means adapted to maintain a constant spacing between two logs supported by said first and second inclined sections; means for supporting a third log spaced above and equidistant from said two logs, said last named means being removably supported by said vertical spacer means; and means for adjusting the vertical position of said last named means.

2. The grate defined in claim 1 wherein said angle is in the range from 10° to 30°.

3. The grate defined in claim 1 wherein said constant spacing is within the range of from one quarter inch to three quarter inch.

4. A fireplace grate for burning at least two substantially cylindrical logs comprising: a bottom including first and second inclined sections, said sections each being at a predetermined angle with the horizontal and being joined together to form a V-shape; support means adapted to support said bottom at an elevation; and vertical separator means adapted to maintain a constant spacing in the range from ¼" to ¾" between two logs supported by said first and second inclined sections, whereby said V-shape of said bottom together with said vertical separator means serve to maintain the constant spacing between the fuel elements to be burned during burning thereof.

5. A fireplace grate for burning at least two substantially cylindrical logs comprising: a bottom including first and second inclined sections, said sections each being at a predetermined angle with the horizontal and being joined together to form a V-shape; support means adapted to support said bottom at an elevation; vertical separator means adapted to maintain a constant spacing in the range from ¼" to ¾" between two logs supported by said first and second inclined sections; and means for supporting a third log spaced above and equally distant from said two logs, said last named means being removably supported by said vertical spacer means.

6. A fireplace grate for burning at least two substantially cylindrical logs comprising: a bottom including first and second inclined sections, said sections each being at a predetermined angle with the horizontal and being joined together to form a trough of transverse V-shape; support means adapted to support said bottom at an elevation; and a plurality of identical vertical Y-shaped members in spaced alignment along the center line of said trough and oriented in planes perpendicular to said line, said Y-shaped members being of a sufficient size for supporting a third log spaced above and equidistant from logs disposed in said bottom on either side of said Y-shaped members.

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