No. 740,153. PATENTED SEPT. 29, 1903.

L. F. LYNE.

GRATE.

APPLICATION FILED NOV. 5, 1902.

NO MODEL.

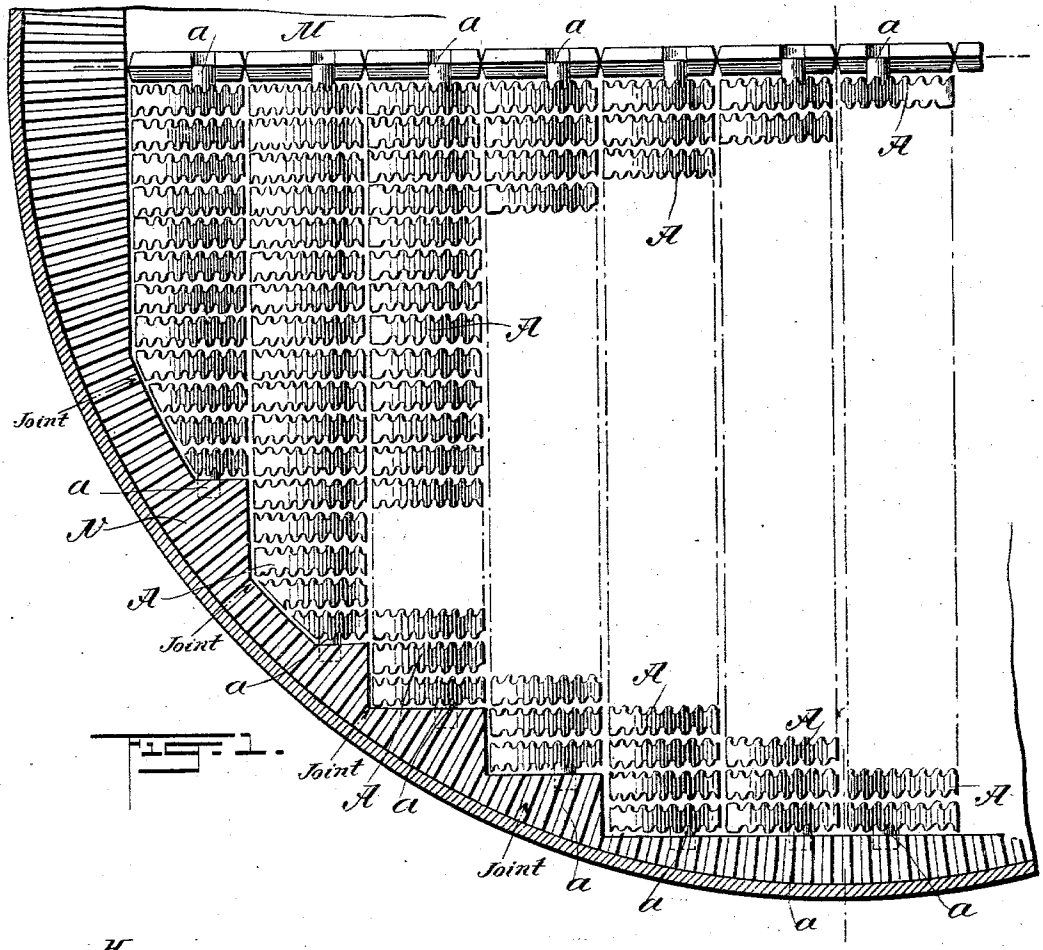


Fig. 1.

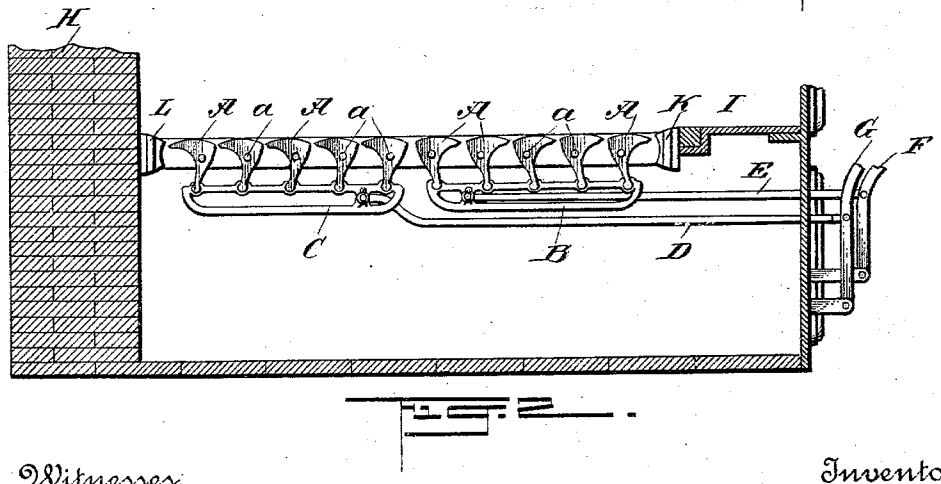


Fig. 2.

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No. 740,153. Patented September 29, 1903.

UNITED STATES PATENT OFFICE.

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GRATE.

SPECIFICATION forming part of Letters Patent No. 740,153, dated September 29, 1903.

Application filed November 5, 1902. Serial No. 130,139. (No model.)

To all whom it may concern:

Be it known that I, LEWIS F. LYNE, a citizen of the United States, residing at Jersey City, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Grates, of which the following is a full, clear, and exact specification, reference being had to the accompanying drawings and to the letters of reference marked thereon.

My invention has special relation to that variety of fuel-supporting grates whereof the bars are known as "cutting-off pocketing" bars—that is, bars which being rocked in one direction permit the fuel or the ashes to drop down a little distance, where they are held or "pocketed" and cut off from the portion above by rocking the bars in the opposite direction, the cut-off portion of the fuel or ashes being then free to drop into the ash-pit below. This variety of bar has one portion of the upper part, called the "leaf," projecting farther beyond the axis than the remainder, the cutting edge being suitably fashioned for the purpose and the leaf being supported upon a web or flange, which when the bar is rocked in the proper direction forms, with the adjacent bar, the necessary pocket. Heretofore in the use of these cutting-off bars it has been found necessary, owing to the two offices which the bar must perform in the matter of clearing the lower portion of the fire-bed, to make the front and the back of the grate-supporting frame or the pieces applied thereto of widely-different, and therefore expensive, construction. The front portion of the grate-supporting frame or of the fire-bed has been comparatively simple—that is, it needed only to be curved to permit the necessary partially-revolving movement of the adjacent bar to effect the pocketing and the cutting off; but with the opposite or rear portion it has heretofore been found necessary to build in the bridge-wall, placing a curved piece under this built-in portion, and to supply the grate at the back with a specially-formed bar, commonly known in this construction as a "crescent" bar, and with a special bar next to the crescent bar called a "heel-bar." The reason of the use of the crescent bar is that it is necessary when the grate-bars are rocked in the direction to effect the cutting-off that provision be made for preventing the fuel from dropping down between the last bar and the bridge-wall, and when they are rocked in the direction to pocket the fuel or ashes it is necessary to pocket all between the bridge-wall and the second bar therefrom. Besides the expense of making and mounting the crescent bar and the heel-bar there is the expense of the fitting under the projection of the bridge-wall, as well as the expense of building this projection, which frequently contracts or diminishes the otherwise available fire-space. It is obvious that the crescent bar is not applicable in connection with a circular grate, for if made in circular plan it could not be rocked in the necessary manner.

The principal object of my invention is to construct and arrange the grate so that the cutting-off pocketing bars of which it is composed shall be substantially alike and so that the forward and back portions of the fire-bed or grate-supporting frame shall be comparatively simple and plain, obviating the use of a crescent bar or heel-bar or such like addition to the grate and obviating the necessity of building any projection on the bridge-wall and to adapt the cutting-off bars for use in either rectangular or circular grates.

Another object is to simplify and improve the whole construction and arrangement, making the grate cheaper and easier to make and mount and less liable to become clogged or wedged, and therefore easier to manipulate.

To accomplish the foregoing objects and to secure other and further advantages in the matters of construction, operation, and use, my invention involves certain novel and useful arrangements or combinations of parts and peculiar features of construction, as will be herein first fully described, and then pointed out in the claims.

In the accompanying drawings, forming part of this specification, I have shown at Figure 1 in plan view a fragment of a circular grate made up of cutting-off pocketing bars, illustrating one manner of adapting my invention for use. Fig. 2 is a vertical section and side elevation showing my improved

arrangement of cutting-off pocketing bars in a rectangular grate-surface with adjuncts and appliances suitable for operating and permitting the grate to operate as a reliable and effective cutting-off grate.

In both figures like letters of reference wherever they occur indicate corresponding parts.

The grate-surface may be of any extent desired.

A A are the cutting-off pocketing bars which constitute the grate-surface. These have journals, as *a a*, at each end, which journals ride in suitable bearings provided for them. I divide the grate into two or more portions, called "front" and "back" portions, and the division is made, preferably, so that one portion will be about equal to the other; but this is not always necessary. I mount the bars of the front portion so that when cutting off their cutting-off edges will swing toward the front and those of the back portion so that in the cutting-off movement their cutting edges will swing toward the back. To connect the bars of the front portion, I employ any suitable coupling-piece, as B, and those of the rear portion are also connected by a suitable coupling-piece, as C, so that all the bars of each particular portion may be simultaneously moved. Connecting-rods, as D and E, lead out through the front of the furnace and serve to connect the coupling-pieces B and C with suitable hinged levers, as F and G, or with other mechanical appliances for communicating motion to the bars from without the furnace. By the levers F and G or equivalent devices either portion of the grate may be operated to effect the clearing of the lower portions of the fire above it in a manner easily understood. While it is not impossible to operate all the portions of the grate at the same time, it is not necessary to do so, and in large grates it will probably be found impracticable. In any event it is preferred to operate the front and rear portions one at a time.

H represents the bridge-wall of a rectangular grate, and I the front or hearth over which the fuel is passed upon the fire. At the front of the hearth is arranged a piece or casting K. The adjacent cutting-off pocketing bar operates in connection with this piece to perform its office of pocketing and cutting off a portion of the fuel or ashes. Against the bridge-wall or the back of the furnace is another piece or casting L, which may be of the same form as the piece or casting K. In any event it is equally simple of formation and operates in like manner in connection with the cutting-off pocketing bar adjacent to it.

The simplicity, cheapness, and advantage of the construction and arrangement so far described over the crescent-bar application will be apparent.

In the case of a circular furnace or grate I prefer to divide the grate into four portions, although if the bars be not too long in the central part of the grate it need only be divided into two portions. With the four portions I have the advantage of employing a diametrically-arranged bearing-bar, as M, in which the adjacent journals are mounted. This stiffens the grate-bed and enables me to make the central bars much shorter than would otherwise be necessary. The journals for the outer ends of the bars find their bearings in suitable castings, as N, and these may be fingered or grated on top, as indicated in Fig. 1, if desired, to permit some of the ashes to drop down through them, and thus obviate unnecessary obstruction or clogging around the outer edge of the grate. The front and rear portions of the circular grate are arranged after the manner above explained of arranging the front and rear portions of the rectangular grate—that is, so that the tops of the bars in the front portion swing toward the front in cutting off and those in the rear portion swing toward the rear for the like purpose. By thus dividing the circular grate into front and rear portions and arranging the bars in the front and rear portions in the manner explained I am enabled to employ the cutting-off pocketing bars in the circular grate. The bars of each portion are connected and operated from the exterior by means substantially the same as in the case of a rectangular grate.

Fig. 2 shows only about one-fourth of a grate. Obviously the castings and the bars going to make up this quarter could be employed in the third quadrant, calling the quadrant shown the "first." For the second and fourth quadrants castings and bars would necessarily be shaped to fit those particular quadrants. The castings and bars are therefore to be made rights and lefts, as it is ordinarily explained. The improved construction and arrangement involves only the necessity of making two sets of patterns—rights and lefts—whereas if the grate were not divided in the manner substantially as above explained a complete set of patterns for the bearings and for the bars would be necessary for each change in the size of furnace. The saving in the number of patterns necessary is of considerable importance in the matter of diminishing the cost of manufacturing the grates.

Being constructed and arranged after the manner above described, my improvements will be found to admirably answer all the purposes or objects of the invention hereinbefore alluded to.

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

1. In a cutting-off pocketing grate of the character herein set forth, the grate-surface divided into portions arranged to be separately operated, the cutting-off pocketing bars in one portion being operative in one direction and those in the other portion oper-

ative in the other direction, and means for moving the two sections to effect the cutting-off and pocketing, the cutting-off edges of the extreme front and rear bars operating in connection with stationary pieces, substantially as shown and described.

2. In a cutting-off pocketing grate of the character herein set forth, the combination with the front and rear portions and means for moving the bars to effect the pocketing and cutting off, of the stationary pieces in connection with which the extreme front and rear cutting-off pocketing bars coöperate to effect the cutting off, substantially as shown and described.

3. The combination in a grate of cutting-off pocketing bars arranged to operate as explained, means for moving said bars to effect the pocketing and cutting off, the cutting-off edges and pocketing-web of one portion being turned in one direction while those of another portion are turned in the opposite direction and coöperating stationary pieces at the front and rear of the grate-frame, substantially as and for the purposes set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

LEWIS F. LYNE.

Witnesses:
C. SEDGWICK,
WORTH OSGOOD.