

Aug. 5, 1924.

1,503,767

K. REZSNY

FURNACE GRATE

Filed March 27, 1920

2 Sheets-Sheet 1

Fig. 1.

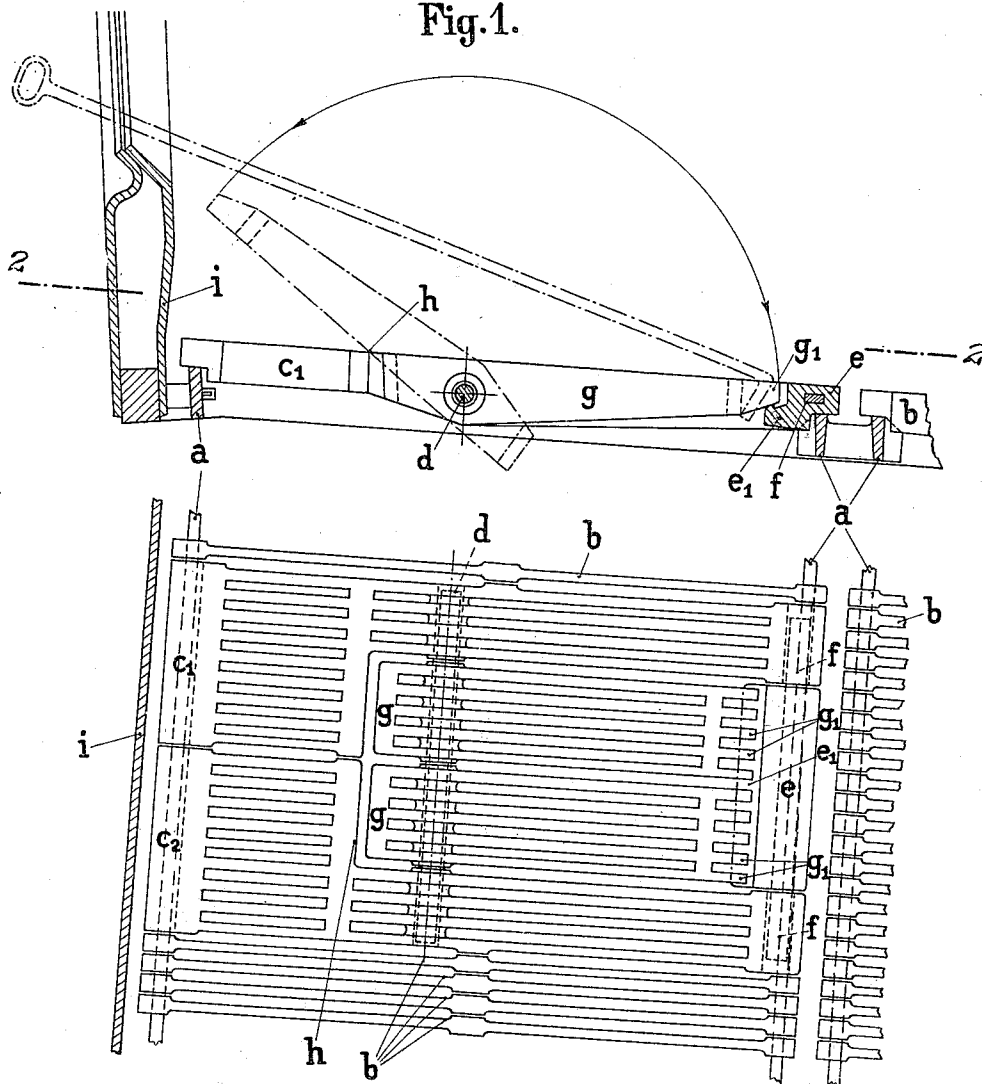


Fig. 2.

Inventor:
Koloman Rezsny
By Lawrence Langner
Attorney.

Aug. 5, 1924.

1,503,767

K. REZSNY

FURNACE GRATE

Filed March 27, 1920

2 Sheets-Sheet 2

Fig.3.

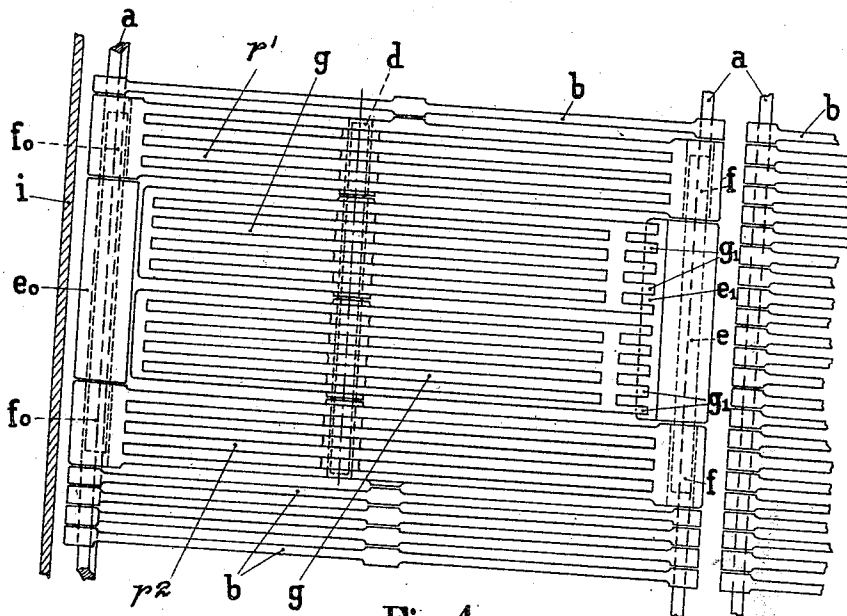
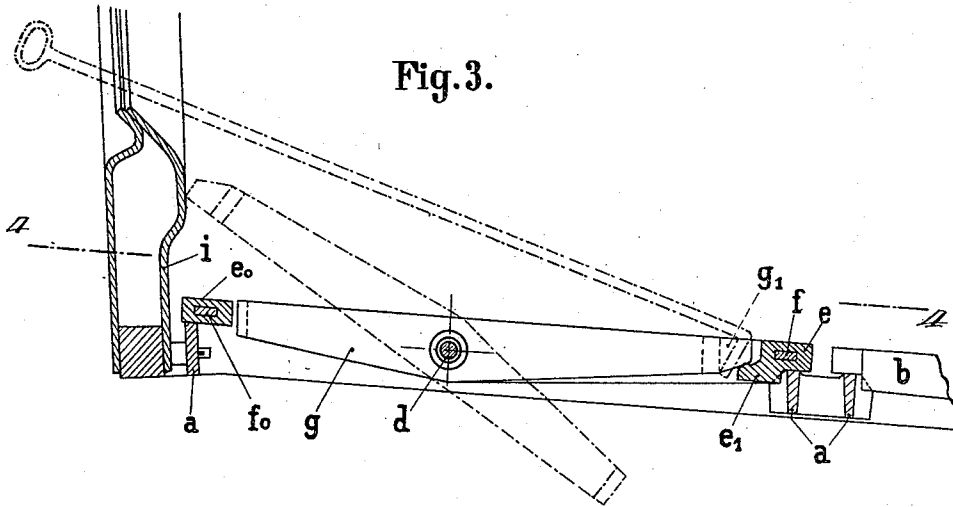


Fig.4.

Inventor:
Koloman Rezsny
By Lawrence Langner
Attorney.

UNITED STATES PATENT OFFICE.

KOLOMAN REZSNY, OF BUDAPEST, HUNGARY.

FURNACE GRATE.

Application filed March 27, 1920. Serial No. 369,371.

(GRANTED UNDER THE PROVISIONS OF THE ACT OF MARCH 3, 1921, 41 STAT. L., 1313.)

To all whom it may concern:

Be it known that I, KOLOMAN REZSNY, a citizen of the Hungarian Republic, residing at Budapest VIII, Ulloi-ut 2, Hungary, have invented certain new and useful Improvements in Furnace Grates (for which I have filed applications in Hungary, July 4, 1917, No. 72,370, accepted; Austria, July 9, 1917, No. 80,878, accepted; Germany, July 13, 1917, No. 312,826, accepted; Switzerland, March 22, 1918, No. 93,200, accepted; Belgium, Mar. 8, 1919, No. 279,290, accepted; Czechoslovakia, March 17, 1919, No. 12,061, accepted; Spain, April 19, 1920, No. 73,490, accepted; Norway, January 12, 1921, No. 34,877, accepted; Italy, June 24, 1919, No. 272/189, accepted; Sweden, March 26, 1920, No. 53,678, accepted; Portugal, October 15, 1921, No. 11,930, accepted; Great Britain, October 27, 1919, No. 134,533, accepted; Rumania, July 14, 1920, No. 6,072, accepted; France, March 27, 1919, No. 518,112, accepted; Yugo-Slavia, January 17, 1922, application No. 678, pending; Japan, July 12, 1920, No. 37,575, accepted); and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The invention relates to grates for furnaces which are particularly intended for locomotives but which may be employed wherever fuel is burned upon grates. The new or improved grate consists essentially of stationary side portions, and a central portion adapted to be tipped or tilted around an axis which does not pass through its centre of gravity. In known grates of this class, the tipping grate is arranged at the end wall of the boiler and is adapted to be turned downwards. This construction has the disadvantage that the tipping grate requires special supports in its two working positions. Furthermore, when clearing the grate the cold air entering directly impinges against the sensitive end wall of the boiler which is fitted with the fire-tubes and frequently causes leakage of the boiler. In the known constructions special means or apparatus is also required for lowering and raising the grate, especially as when tipping

the grate the ash pit door must be manipulated at the same time; the closing, that is the raising of the tipping grate can thus only take place slowly so that the cold air enters for a comparatively long time. The removal of the clinkers themselves requires considerable time as only a small opening in the grate is available.

The above mentioned drawbacks are, according to this invention avoided by so constructing the grate that the tipping grate which is arranged at the end of the grate farthest away from the tube-wall of the boiler, and has its fulcrum arranged to provide a long side and a short side is adapted to be turned with the longer side upwards towards the furnace door through an angle which exceeds 90°. In this manner a very simple construction is obtained and the tipping grate maintains its two extreme positions, closed and open, without the provision of special supports because in its final positions it is in stable equilibrium. Furthermore, the impinging of cold air directly against the end wall of the boiler carrying the fire tubes is avoided by positioning the tipping grate at the end of the grate farthest away from the boiler end, that is in consequence of its position near the fire-door. In this manner the entering cold air is obliged to pass over the fire so that it reaches the end wall of the boiler in an already heated state. The removal of the clinkers is very quickly effected as on the one hand when the tipping grate is moved through an angular distance of more than 90° a large opening is uncovered through which the clinkers may quickly be raked, and on the other hand the closing of this opening on tipping the grate back again, which automatically falls back into its closed position, only requires a very short space of time. The construction according to this invention offers the further great advantage that it may easily be applied to existing locomotives as the improved tipping grate may be easily put in position in place of the ordinary solid grate.

In the accompanying drawings there are illustrated by way of example two modifications of the improved grate as applied to the fire-box of a locomotive,

Figure 1 is a partial longitudinal section through a fire-box furnished with one form of the new grate.

Figure 2 a horizontal section along line 2—2 of Figure 1.

Figure 3 shows a fire-box fitted with another modification of the improved grate in longitudinal section,

Figure 4 a section along line 4—4 of Figure 3.

Within the fire-box there is arranged the supporting frame *a* upon which rest two or more rows of the ordinary fire-bars *b*. In one portion of the grate at about the middle of the rear part instead of separate bars two L-shaped grate sections *c*₁ and *c*₂ consisting of a plurality of fire-bars joined together are provided which are so disposed that they meet with their shorter legs and together form a substantially U-shaped structure. These grate sections *c*₁ and *c*₂ serve for supporting the shaft *d* of a tipping grate which preferably consists of two parts *g*. At the front of grate sections *c*₁, *c*₂, rail *e* inserted between the sections ensures that the proper distance between their longer arm be kept. This spacing piece serves at the same time as support and stop for the longer arm *g*₁ of the tipping grate in its closed position. Two square pins *f*, *f* of the distance piece *e* extend into the grate sections *c*₁ and *c*₂. By means of the grate sections *c*₁, *c*₂, the tipping grate is carried independent from the supporting frame *a* and the tipping portion of the grate is considerably smaller than the whole grate so that the weight of the part to be tipped is reduced and consequently the power required for tipping the grate is also reduced. Each tipping grate *g* is capable of angular movement through an angle which exceeds 90° upwards and rearwards toward the furnace-door so that when it is opened as indicated in broken lines (Fig. 1), it remains in that position by gravity. The improved grate is worked in the following manner: When clearing the grate, a part of the fire and the clinkers are, by means of a rake, pushed off the tipping portion of the grate, the hook of the rake is then inserted between the projecting fire-bars *g*₁ of the tipping grate (see position of rake indicated in broken lines) and the two halves of the tipping grate are then pulled upwards and turned into the position indicated in dotted lines. Through the opening thus uncovered the clinkers are raked, the tipping grate is restored to its initial position and the fresh fire is again spread out over it.

The modification of the improved grate shown in Figures 3 and 4 corresponds almost

completely with the construction already described. The variation consists only therein that the grate sections *r*₁ and *r*₂ are I-shaped and that the tipping grate extends up to the rear-supports *a*, in such a manner that the halves of the tipping grate may freely be swung upwards. In order to also ensure the proper distance of the grate sections from each other, at the furnace-door, a spacing piece *e*₀ is there arranged between them, the square pins *f*₀, *f*₀ of which extend into the rearward portions of the grate sections *r*₁ and *r*₂. Since in this case when the halves of the tipping grate are swung upwards their ends abut against the wall *i* of the fire-box and would injure it after a time, the construction shown and described with reference to the Figures 1 and 2 must be given the preference.

It is evident that the construction of the improved grate may vary within wide limits from the constructions illustrated and described without departing from the spirit of the invention.

What I claim is:—

1. A grate for locomotive boiler furnaces comprising outer stationary longitudinal grate sections and a central tipping section arranged between the stationary sections, said tipping section being eccentrically pivoted, so as to provide a long arm and a short arm, whereby said section maintains its normal position due to the weight of the long arm, and said section being rotatable on its pivot to swing the long arm upwardly and rearwardly toward the furnace door and away from the forward face of the fire box through an angle exceeding 90°, in which position it remains by gravity.
2. A grate for locomotive boiler furnaces comprising outer stationary longitudinal grate sections, means at one end for spacing said sections, a central tipping section arranged between the stationary sections, said tipping section being eccentrically pivoted so as to provide a long arm and a short arm whereby said section maintains its normal position due to gravity with the end of the long arm resting on said spacing means, and said tipping section being rotatable on its pivot to swing the long arm upwardly and rearwardly toward the furnace door and away from the forward face of the firebox through an angle exceeding 90°, in which position it remains by gravity.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

KOLOMAN REZSNY.

Witnesses:

EDMUND HERMAN,
ERNEST MELLER.