

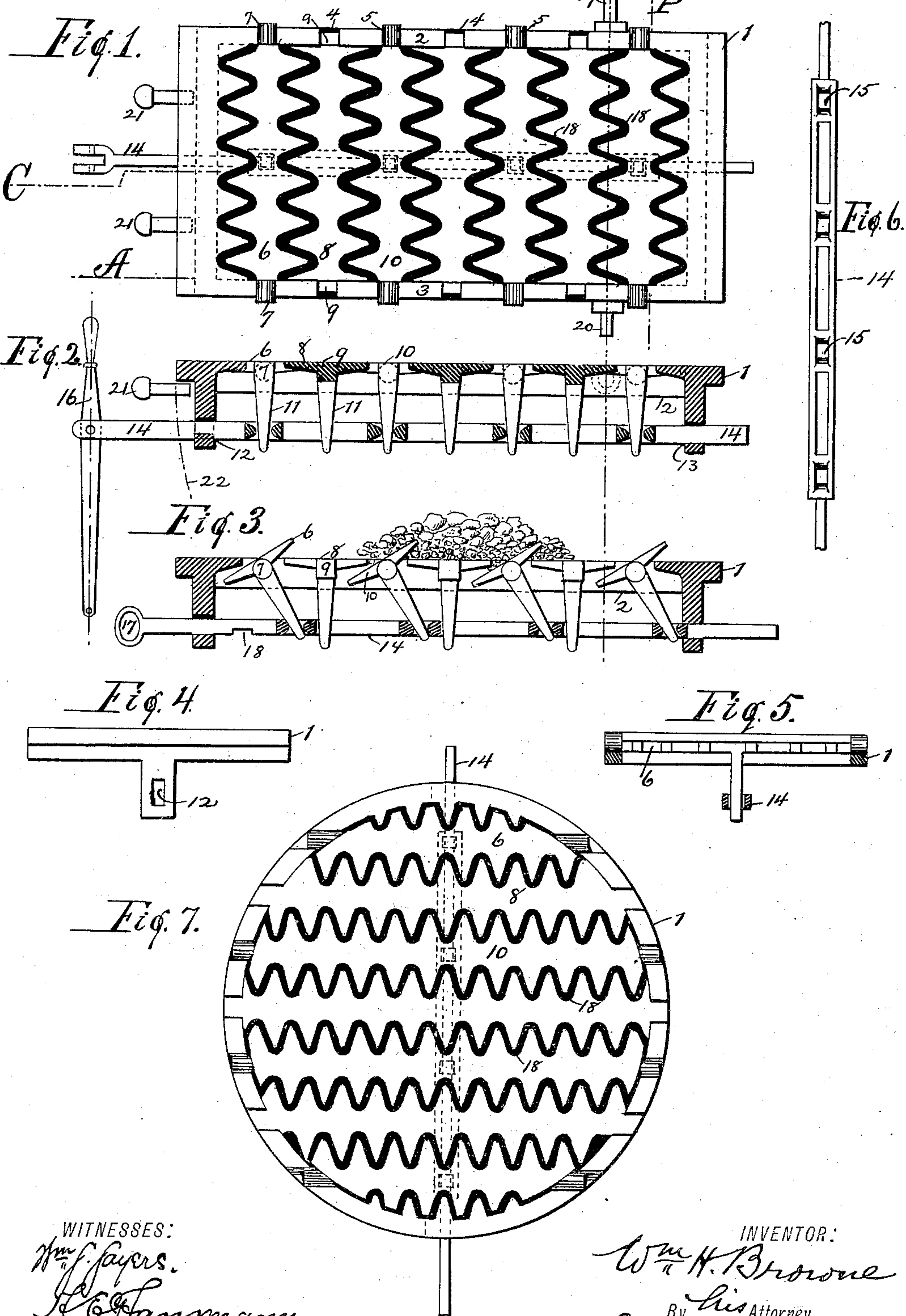
(No Model.)

W. H. BROWNE.

GRATE.

No. 331,031.

Patented Nov. 24, 1885.



WITNESSES:
Wm. J. Fayers.
C. S. Hansmann.

INVENTOR:
Wm. H. Browne
By *John Thomson* his Attorney

UNITED STATES PATENT OFFICE.

WILLIAM H. BROWNE, OF BROOKLYN, NEW YORK.

GRATE.

SPECIFICATION forming part of Letters Patent No. 331,031, dated November 24, 1885.

Application filed April 13, 1885. Serial No. 162,086. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. BROWNE, of the city of Brooklyn, county of Kings, and State of New York, have invented certain
5 new and useful Improvements in Grates, of which the following is a specification.

My invention refers to grates, and is adaptable to any or all kinds of coal or other solid material combustible burning-furnaces, boilers, heaters, open-grate fires, stoves, ranges,
10 &c.

The object of this invention is to produce a grate which shall embrace jointly and severally the following advantages: first, to shake
15 the entire surface of a bed of burning coals equally and to eliminate the ashes and cinders with the minimum loss of heat-producing elements; second, to expose a uniform and maximum area of space comprised by the interstices of the grate-bars, whereby to pass
20 such volumes of air as may be necessary to produce the most complete combustion; third, simplicity and cheapness of construction; fourth, convenience for shaking and dumping.

25 In the drawings, Figure 1 is a top plan view of my improved grate. Fig. 2 is a longitudinal section on line C. Fig. 3 is a longitudinal section on line A, with rocking bars in their extreme positions. Fig. 4 is an elevation
30 of grate with connecting-rods removed. Fig. 5 is a transverse section through frame at line P. Fig. 6 is a detached illustration of grate-bar connecting-rod, and Fig. 7 is a top plan view of grate as arranged for circular
35 stoves or heaters.

The construction, disposition, and operation of the grate as a whole are as follows: First, the frame 1 is constructed of cast or wrought iron metal, on which is formed, on
40 the upper edges, 2 3, of the sides, a series of square recesses, 4, alternating with half-round bearings 5. Into these bearings are simply placed a complement of intermeshing cross-bars or combs, the trunnions of which are
45 formed to correspond to the bearings in the side frame—that is, the bar 6 with round trunnion 7, the next bar, 8, with square trunnion 9, the next bar, 10, again with round bearings, and so on, be the number of the bars few or many. It
50 will now be seen that those bars having square

trunnions will be locked and as if a part of the frame, while those bars with the round trunnions are capable of being rotated. On the lower side, and preferably in the center, of all the bars tongues, as 11, are formed. Operating within the bearings 12 13, formed on the ends of the frame, is a connecting rod or yoke, 14, having bearings 15, which only engage those tongues that project from the bars having round trunnions. By imparting reciprocating movement to the connecting-rod, as by the hand-lever 16 or handle 17, the alternate bars may be vibrated with great force and rapidity. The action of the vibrating bars is limited by the bearings of the connecting-rod, which impinge against the tongues of the fixed bars. By this mode the cost of construction and assembling is reduced to a minimum, and any part may readily be replaced in the event of accidental breakage.
60 65 70

The vibrating motion imparted to the bars is that best calculated to engage, crush, and force through and out the residuals of combustion, the stationary bars being, as it were, the anvil and the vibrating bars the hammer,
75 between which the ashes, cinder, and clinker must pass to be ground and ejected.

The intersecting or intermeshing form of the side teeth or projections of the bars, as shown, develops a sinuous space, as 18, between
80 each pair of the said bars. This space may be of any desired width; but in any case it is evident that a much greater area is presented for the passage of air than by the forms of grates made heretofore. This furthermore,
85 for obvious reasons, insures a more uniform agitation and cleansing of the fire-bed.

On the back extension of the grate, on the sides of the frame, are two supporting-trunnions, 19 20, having their bearing in any
90 proper part of the furnace. Likewise, at the front of the grate, projecting preferably through the furnace from the outside, are one or more plugs or latches, 21, which engage the under side of the frame, and thus sustain it in
95 position. Now, when desirable to dump the grate, it is simply required to withdraw the latch or latches, when the grate will drop down at the front, as indicated by line 22, and thus ejects its load into the ash-pit. The grate is
100

then swung back into its normal position, and the latch or latches or other analogous means are reinstated to retain the grate in place.

5 In order to retain the movable bars in position when the grate is not being raked, the connecting-bar 14 has a notch, 18, which, catching with one of the bearings 12, holds the bar in position.

10 It will be evident that the bearing-frame and the intermeshing cross-bars of the grate may be of any shape, form, or dimension desirable without interfering with the principle and operation of the grate as a whole.

15 No machine-work nor fitting of any kind is necessarily required in the construction of this grate, as all the parts may be fitted so loosely as to go together in the exact form in which they are cast.

20 I do not limit myself to the precise form of connecting and bar-operating devices above described, as various devices may be employed for rocking the movable bars; and it will be apparent that the swinging or pivoted frame may be used in connection with different arrangements of rocking or raking bars and
25 with different kinds of catches for holding it in a horizontal position.

I claim—

30 1. A raking-grate consisting of a frame, a series of removable but stationary grate-bars

supported transversely in the frame, a series of intermediate grate-bars pivoted between the stationary grate-bars and provided with projections, and a bar mounted loosely in the frame and engaging said projections, substantially as set forth. 35

2. The frame carrying a series of removable fixed bars provided with teeth or projections on both sides, in combination with a series of intermediate rocking bars provided with teeth extending between those of the fixed bars, projections on the under side of the rocking bars, a bar engaging the projections, and a hand-lever connected to the bar, substantially as set forth. 40

3. The combination of a frame carrying a series of fixed transverse bars having pendent tongues 11, and intermediate rocking bars having like pendent tongues, and a connecting-rod provided with recesses receiving the tongues of the rocking bars, substantially as described. 45 50

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

WM. H. BROWNE.

Witnesses:

FRED WILKINSON,
CHAS. C. FIELD.