

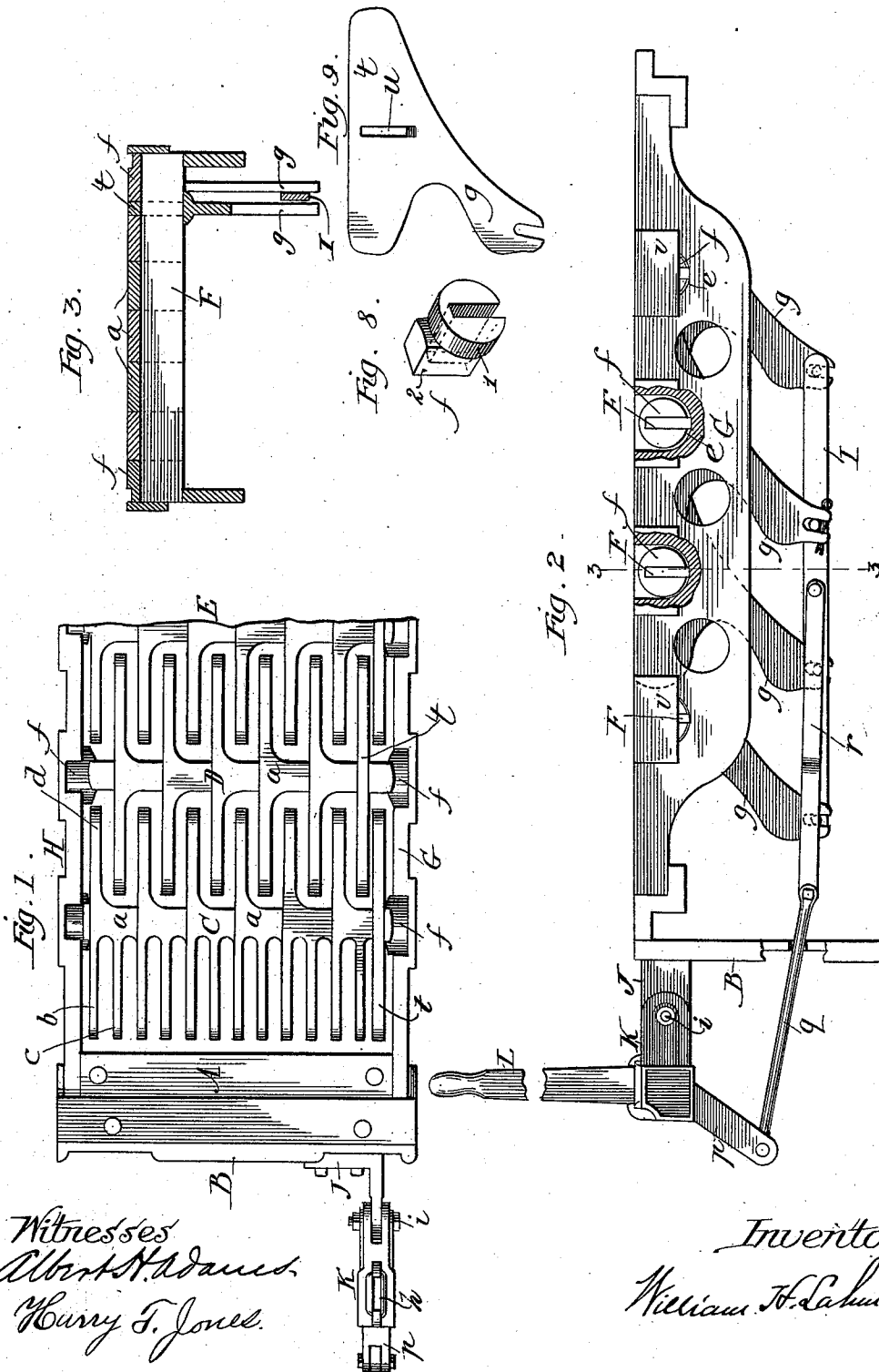
(No Model.)

2 Sheets—Sheet 1.

W. H. LAHMAN.
GRATE FOR FURNACES.

No. 401,955.

Patented Apr. 23, 1889.



Witnesses
Albert H. Adams.
Harry F. Jones.

Inventor:
William H. Lahman

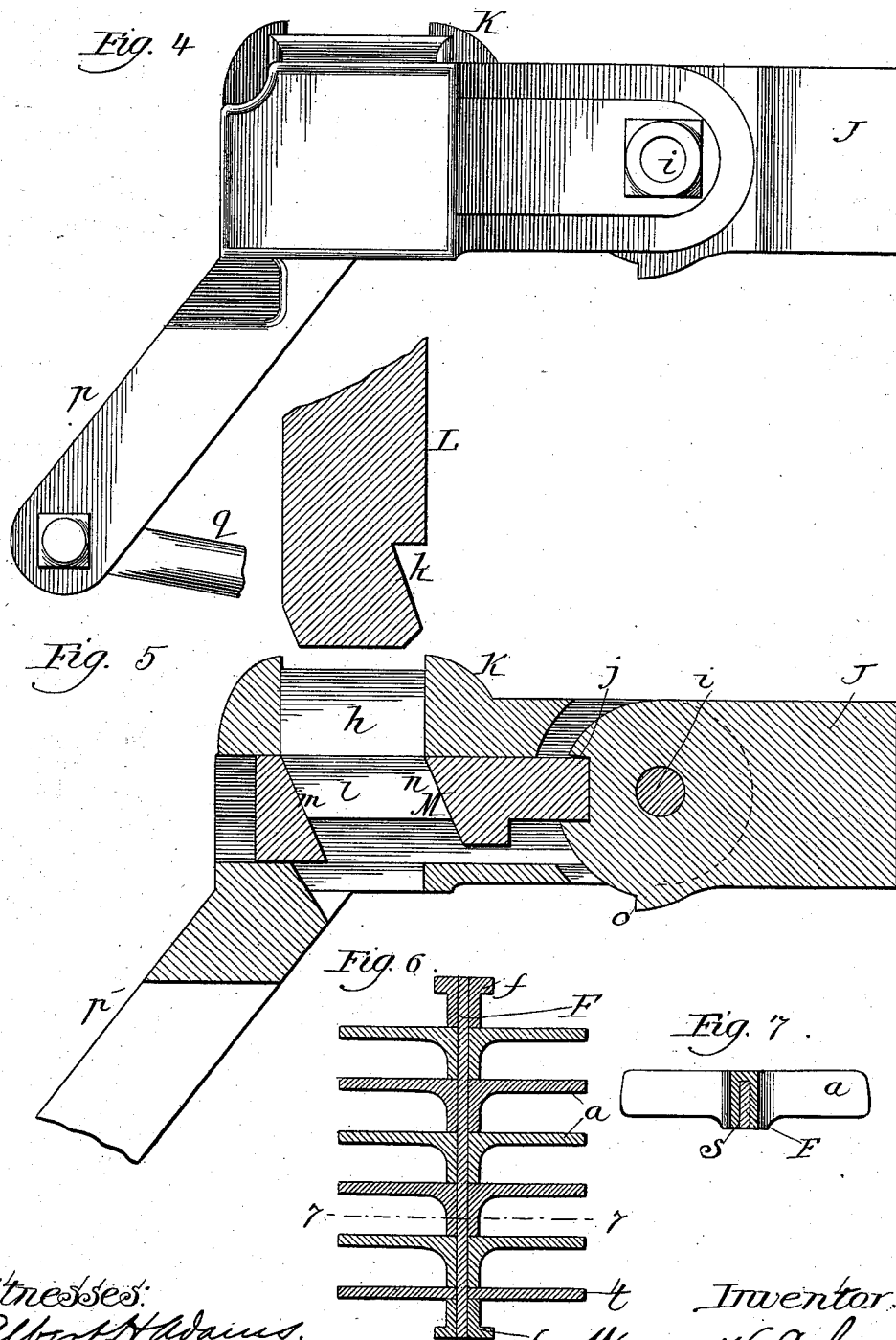
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UNITED STATES PATENT OFFICE.

WILLIAM H. LAHMAN, OF CHICAGO, ILLINOIS.

GRATE FOR FURNACES.

SPECIFICATION forming part of Letters Patent No. 401,955, dated April 23, 1889.

Application filed September 20, 1888. Serial No. 285,931. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM H. LAHMAN, residing at Chicago, in the county of Cook and State of Illinois, and a citizen of the United States, have invented a new and useful Improvement in Grates for Furnaces, of which the following is a specification, reference being had to the accompanying drawings, in which—

Figure 1 is a plan. Fig. 2 is a side elevation. Fig. 3 is a cross-section at line 3 of Fig. 2. Fig. 4 is an enlarged detail, and is a side elevation of the case or head which contains the lock and which receives the shaking-bar and a portion of the shaking devices. Fig. 5 is an enlarged detail, and is a vertical section through the parts shown in Fig. 4, showing also a part of the shaking bar or lever. Fig. 6 is a horizontal section through one of the grate-sections. Fig. 7 is a section at line 7 of Fig. 6. Fig. 8 is a detail, being a perspective of one of the guides. Fig. 9 is a side view of one of the finger-bars.

My invention relates to that class of grates for furnaces in which the grates are made in sections, which can be shaken and dumped.

The leading objects of my improvement are to provide improved devices for shaking and dumping the grate-sections, to provide an improved locking device for holding the sections of the grates in position for use, and to provide other minor improvements, all of which I accomplish as illustrated in the drawings, and hereinafter described.

That which I claim as new will be pointed out in the claims.

In the drawings, A is one of the end bars of the frame, which frame may be supported in use in the usual manner.

B is a part of the front of the furnace.

C, D, and E are sections of the grate. The parts shown in Fig. 2 are designed to receive a fourth section, which is not shown in Fig. 1, but which may be constructed substantially the same as the section C, the double fingers being at the rear, instead of the front. Any desired number of sections may be used. Each grate-section consists of a number of finger-bars, *a*, and one finger-bar, *t*. Each bar *a* has on the under side, at the center, a slot, *s*, which is open at the bottom and passes

over a cross-bar, F. Each finger-bar *t* carries a shaker-arm, *g*, cast therewith, and has a slot, *u*, to receive one of the bars F. Each finger-bar *a* of the front section, C, is provided in front with two arms, *b c*, and at the rear with a single arm, *d*. Each finger-bar of the sections D and E is provided with only one arm in front and one in rear.

The side bars, G H, of the frame are provided with deep circular recesses *e*, and the ends of each bar F of each grate-section are supported in such recesses, which form bearings for such bars F.

f are guide-pieces, which fit upon the bars F, and the outer ends of these guide-pieces are adapted to nearly fill the space between the ends of the bars F and the wall of the recesses in which they are located; but such pieces *f* do not extend down as low as the lower edges of the bars F. Thus the grate-sections are supported only by the narrow bars F, and not by hubs thereon, and when the sections are rocked the operation is easier than if the ends of the sections were supported by hubs. The openings *e* are partly covered on the outside by pieces *v*; but the lower ends of these recesses are uncovered, and hence cinders and other matters cannot accumulate in such recesses.

It will be observed that one portion, 1, of the guides *f* is round, so as to present no angular corners to strike against the walls of the recess in which it fits, and another portion, 2, which may be angular, as shown, and which serves as a shoulder to assist in holding the finger-bars on the bars F against endwise movement, and being angular will make the bearing or resting surface between the finger-bars and the side bars of the frame even, as shown in Fig. 1. The slot shown in the guides extends through them, so that the bar F may fit in both the angular and the round portions.

g are shaker-arms, which extend downward and forward—one from each finger-bar adjoining the side bar, G, of the frame.

I is a bar, with which the lower end of each shaker-arm *g* is connected in the usual manner.

J is a bracket bolted to the front of the furnace.

K is a head provided with a socket, *h*, to receive a shaking-lever, L. The head or piece K is pivoted to the forward end of the bracket J at *i*, and the forward end of this bracket is circular, and is provided with a notch, *j*, as shown in Fig. 5.

M is a sliding bolt, located in a chamber provided for it in the piece or head K. This bolt is provided with a socket, *l*, to receive the lower end of the lever L, and the end walls, *m n*, of this socket are inclined, as shown in Fig. 5. The inner end of this bolt is arranged to engage with the notch *j* in the bracket J.

The lever L is provided with a notch, *k*, on one side, near the lower end, and the corners at the lower end are cut off a little, as shown in Fig. 5.

p is an arm, which may be cast with and extends out diagonally from the lower edge of the head or piece K.

q is a connecting-rod, which passes through a hole in the front wall of the furnace, one end of which is pivoted to the lower end of the arm *p*. The other end is pivoted to the forward end of the bar *r*, which bar *r* is pivoted at its rear end to the bar I. This construction dispenses with the long vertical slot in the front of the furnace which has heretofore been provided for the shake-rod, and improves the shaking and dumping operation.

In use, when the bolt M is in the position shown in Fig. 5, its inner end being engaged with the notch *j* in the bracket J, the several grate-sections will be in a horizontal position ready for use, and will be held locked in their position by the bolt M. Now if the lever L be inserted into the socket *h* and be forced down into the socket *l* in the bolt M, the front edge of the lever will come in contact with the wall *m* of the socket in the bolt, and as the lever is forced down the bolt will be forced outward, and will be withdrawn from the notch *j*. The notch *k* in the lever L provides an open space, into which the inclined wall *n* can pass as the bolt is withdrawn.

When the bolt has been withdrawn from engagement with the notch *j*, the sections of the grate can be rocked by means of the lever L, the head K being then free to swing down and then up on its pivot *i*, and through the arm *p*, rod *q*, and bar *r* a reciprocating movement will be given to the bar I, moving the arms *g* back and forth, and thus shaking the several sections of the grate. By throwing the head or piece K down far enough the several sections of the grate can be brought into

such a position that the material on the grate-sections will be dumped. By withdrawing the lever L when the head K is in the position shown in Figs. 4 and 5 the bolt will be forced inward by the withdrawal of the lever, the incline of the notch *k* acting upon the incline *n* in the bolt, and the bolt can be brought into engagement with the notch *j*, and the several sections of the grate will then be again locked in position for use.

I have provided a stop, *o*, on the bracket J, with which the inner end of the bolt M can come in contact when the head K has been depressed sufficiently, and thus limit the downward movement of such head.

The finger-bars *t* are, as shown in the drawings, all located at one side of the grate-sections; but, if desired, they may be located elsewhere on the bars F, according to the position of the shaker-rod *q*.

By casting the shaker-arms *g* with the several finger-bars *t* these parts are made much stronger than when made separately, and if any one of such finger-bars *t*, or any one of the shaker-arms *g*, should break in use the broken part can be readily replaced at little expense.

What I claim as new, and desire to secure by Letters Patent, is as follows:

1. The combination of the bracket J, provided with a notch, *j*, head K, provided with a socket to receive a lever, a sliding bolt located in the head K and provided with a socket, *l*, the end walls of which are inclined, as shown, and the lever L, formed with the notch *k*, substantially as and for the purposes specified.

2. In combination with the head K, having a socket, *h*, a sliding bolt located in the head and having a socket, *l*, the end walls of which are inclined, as shown, and a lever, L, provided with a notch, *k*, substantially as and for the purposes specified.

3. In a furnace, a series of grate-sections, each consisting of a series of finger-bars supported by a bar, F, in combination with a frame having circular recesses, as *e*, in the sides thereof, in which the bars F are supported, and guides *f*, one on each end of each bar F, said guides having slots in them open at their under side to receive the supporting-bars and allow the same to project below them, substantially as and for the purposes specified.

WILLIAM H. LAHMAN.

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