

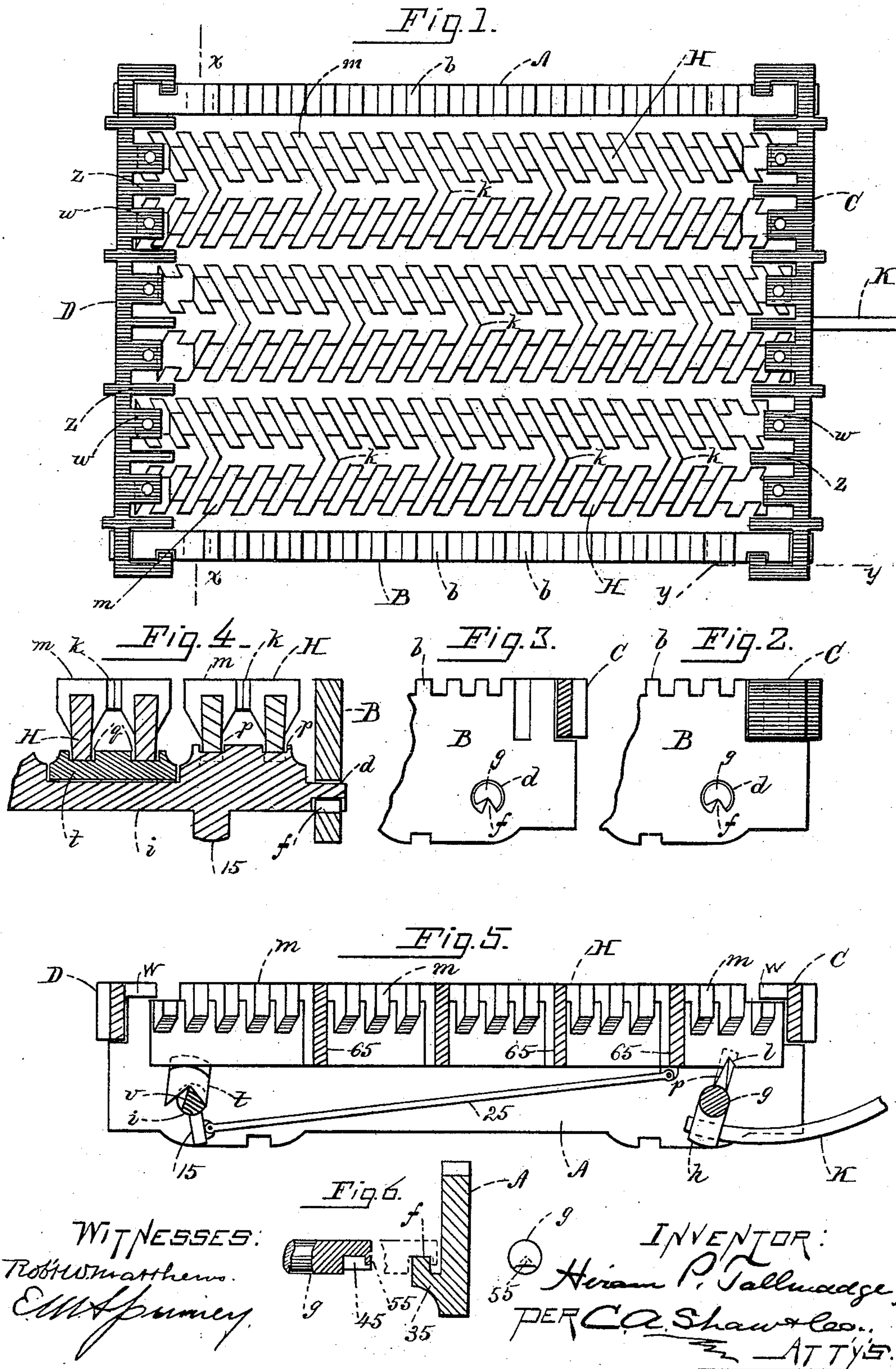
(No Model.)

2 Sheets—Sheet 1.

H. P. TALLMADGE.  
GRATE.

No. 407,379.

Patented July 23, 1889.



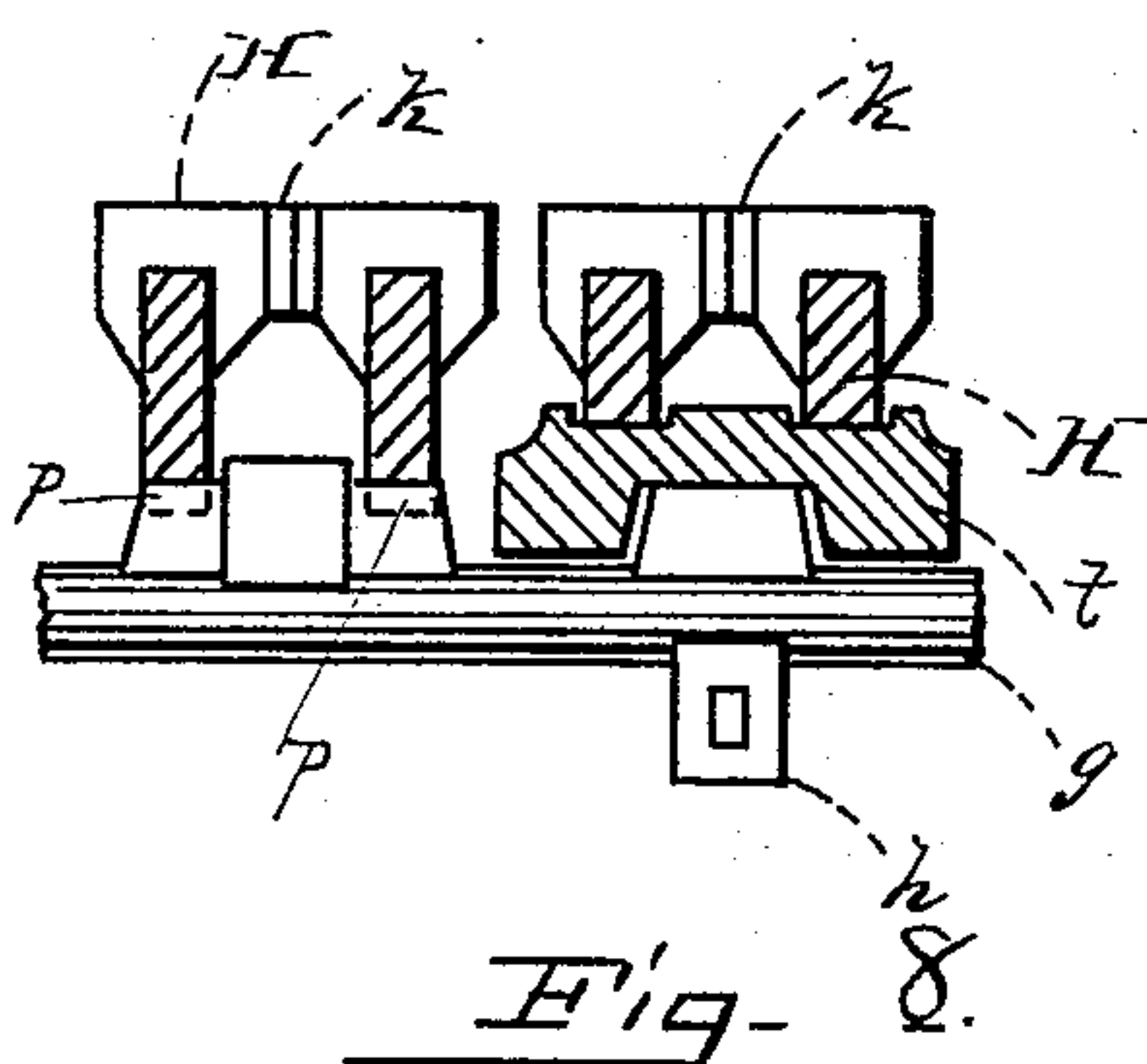
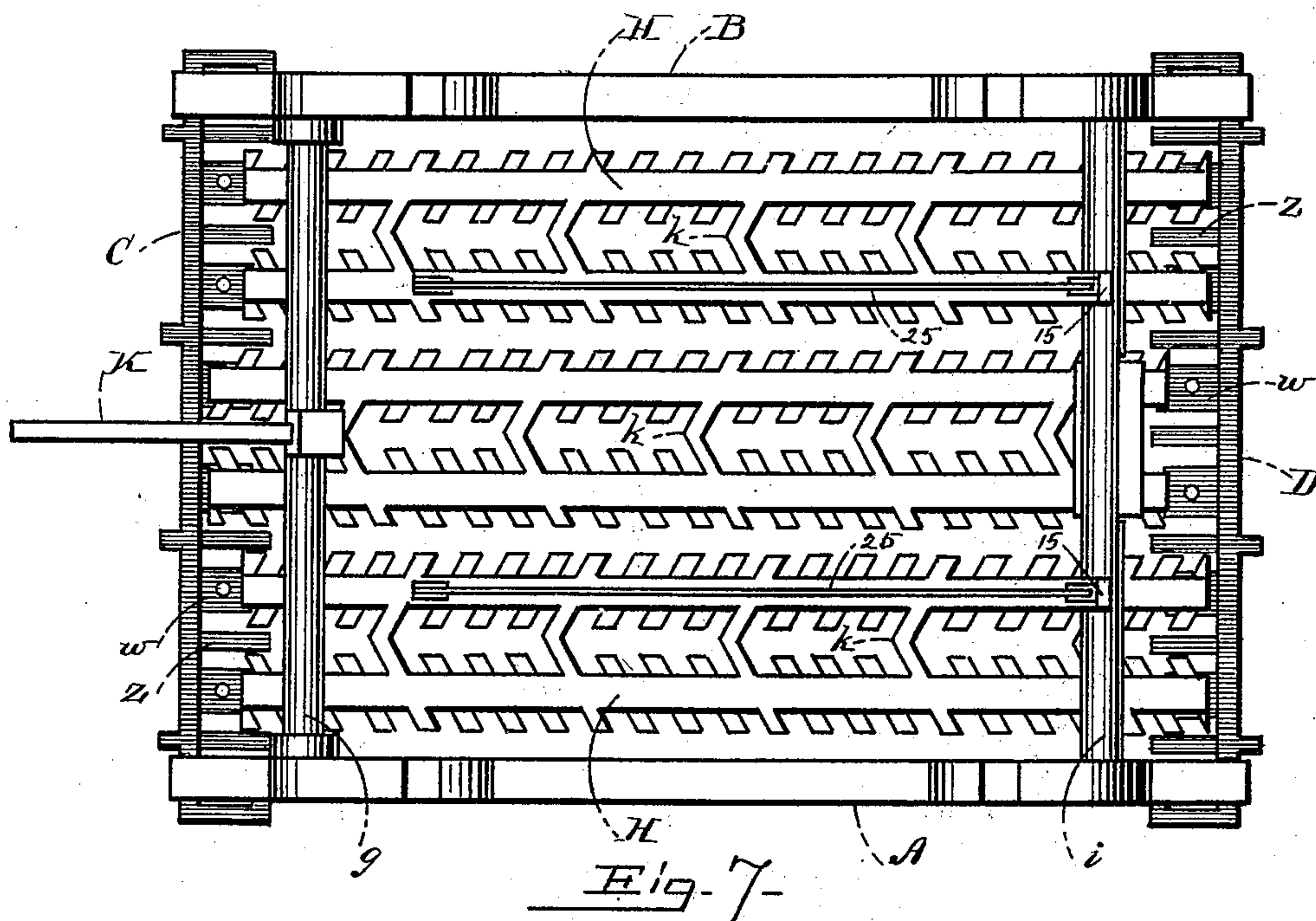
(No Model.)

2 Sheets—Sheet 2.

H. P. TALLMADGE.  
GRATE.

No. 407,379.

Patented July 23, 1889.



WITNESSES—  
Helen M. Freegan  
H. Surfer.

INVENTOR:  
Hiram P. Tallmadge  
PER C. A. Shaw & Co.  
ATTYS.



# UNITED STATES PATENT OFFICE.

HIRAM P. TALLMADGE, OF BOSTON, MASSACHUSETTS.

## GRATE.

SPECIFICATION forming part of Letters Patent No. 407,379, dated July 23, 1889.

Application filed September 17, 1888. Serial No. 285,561. (No model.)

*To all whom it may concern:*

Be it known that I, HIRAM P. TALLMADGE, of Boston, in the county of Suffolk, State of Massachusetts, have invented a certain new and useful Improvement in Grates, of which the following is a description sufficiently full, clear, and exact to enable any person skilled in the art or science to which said invention appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a top plan view of my improved grate detached; Figs. 2 and 3, enlarged side elevations of portions of the side bars, showing the method of mounting the rocking bars; Fig. 4, a sectional view, enlarged, taken on line  $x-x$  in Fig. 1; Fig. 5, a vertical longitudinal section of the grate; Fig. 6, a sectional view showing an alternate method of pivoting the rocking bars. Fig. 7 is a bottom plan view of this improved grate. Fig. 8 is a detail showing one of the rocking bars, a tilting carriage thereon, a group of grate-bars supported on said carriage, and the adjoining group of grate-bars supported on bearings on said rocking bar.

Like letters and figures of reference indicate corresponding parts in the different figures of the drawings.

My invention relates to that class of grates which are provided with movable grate-bars; and it consists in certain novel features, as hereinafter fully set forth and claimed, the object being to produce a simpler and more effective device of this character than is now in ordinary use.

The nature and operation of the improvement will be readily understood by all conversant with such matters from the following explanation.

In the drawings, A B represent the side bars, C the front bar, D the back bar, and H the movable bars or grate-bars proper.

The side bars A B are provided on their upper edges with vertically-arranged transverse flanges  $b$ , and are mortised at their ends to receive the front and back bars C D, by which they are connected. The side bars are provided in their lower forward ends with circular openings  $d$ , having knife-edge bearings  $f$  in their lower portions.

The front rocking bar  $g$  is arranged horizontally across the grate and is disposed in said openings upon the bearings  $f$ , said rocking bar being provided centrally with a downwardly-projecting lug  $h$ , in which a curved handle K may be inserted for oscillating said bar. The rear rocking bar  $i$  is disposed in similar holes  $d$  in the rear ends of the side bars and rests upon knife-edge bearings  $f$  (see Fig. 4) in the same manner as the bar  $g$ .

The grate-bars H are provided on their upper edges with transversely-arranged upwardly-projecting flanges  $m$ , one of said flanges at suitable intervals on said bars being extended and secured at  $k$  to a corresponding flange on an adjacent bar and being provided with a downwardly-projecting web 65, extending to the bottom of said bars, thereby securely fastening the same together in groups consisting of two bars each.

I preferably cast the groups of bars integral in the form described, and arrange the flanges  $m$  diagonally, as shown in Fig. 1; but they may be arranged at right angles to the body of the bars, if preferred.

The body of each outer grate-bar H is provided on its lower edge with a notch  $l$ , which is adapted to receive a knife-edge bearing  $p$ , (see Figs. 4 and 5,) formed on the front rocking bar  $g$ , for supporting said grate-bars, and each alternate group is disposed in like manner on said front bar. The rear ends of said alternate groups of grate-bars are disposed in grooves  $q$ , (see Figs. 4 and 5,) formed in the upper side of a carriage  $t$ , which rests upon a knife-edge bearing  $v$ , formed on the rear rocking bar  $i$ .

The arrangement of the intermediate groups of grate-bars H is reversed, the second or middle group, as shown in Fig. 1, and every alternate group thereafter being pivoted by knife-edge bearings  $p$  to the rear rocking bar  $i$ , and having its forward end resting on a carriage  $t$ , disposed on bearings  $v$ , formed in the front rocking bar  $g$ , the purpose of this arrangement being to cause the alternate groups of grate-bars to move in opposite directions when manipulated as hereinafter described.

The rocking bar  $i$  is provided near each end with a downwardly-projecting lug 15, (see Figs. 4 and 5,) and connecting said lug with



the forward portion of a grate-bar II is a rod 25.

The front and back bars C D are provided on their upper sides with inwardly-projecting horizontally-arranged flanges  $z w$ , formed in different lengths and designed to prevent the coal from interfering with the movement of the grate-bars, the flanges  $z$  being disposed between adjacent grate-bars and extending downward to the bottom of said front and back bars, respectively, their purpose being to prevent lateral motion of said grate-bars.

The connecting-flanges  $k$  of the grate-bars are provided with a downwardly-projecting web 65 between the two bars, forming a group for the purpose of directing a draft upward through the different portions of the fire, instead of causing the fire to rush directly back against the bridge-wall of the furnace.

In the use of my improvement the handle K is inserted in the socket formed in the lug  $h$  and moved upward and downward. On the downward motion of the handle the rocking bar  $g$  is moved on its bearings  $f$ , causing the knife-edge bearings  $p$  on said bar to throw the outer grate-bars forward, and the carriage  $t$ , supporting the rear ends of said bars, to roll or tilt forward on its bearing  $v$ , the parts assuming the position shown in Fig. 5. Meanwhile the rods 25, connecting said grate-bars with the lugs 15 on the rocking bar  $i$ , causes said bar to tilt backward on its bearings  $f$  and carry with it the middle or intermediate group of grate-bars, which are pivoted to said rocking bar  $i$  by bearings  $p$ , and rest on a carriage  $t$  on the front rocking bar  $g$ , as described, thereby causing alternate groups of grate-bars to move in opposite directions in a manner that will be readily understood by all conversant with such matters without a more explicit description.

On the upward motion of the handle K the outer groups of bars are forced backward and the middle group forced forward, assuming the position shown in Fig. 1.

I do not confine myself to connecting only two grate-bars II by the extended flanges  $k$ , as shown, as the groups may consist of three or more groups, if desired.

It will readily be seen that when the flanges  $m$  are formed diagonally to the body of the grate-bars, as shown, said bars will pass much more easily through the ashes of the fire than

when at right angles to said bars; and in "banking" or "drawing" the fire the hoe will slide over the diagonal flanges without hooking against them, and displace the ashes much easier.

By grouping the bars, as described, the liability of their warping or twisting is practically overcome, which is especially essential when bars of great length are employed.

In the modification shown in Fig. 6 the side bars A B are provided with an inwardly-projecting lug 35, having a knife-edge bearing  $f$ , and the rocking bar  $g$  provided with a socket 45, adapted to receive said bearing, the end of said bar having a lip 55 to prevent it from slipping longitudinally.

Having thus explained my invention, what I claim is—

1. In a grate, the combination of side bars, end bars connecting the side bars, rocking bars pivotally connected with the side bars, tilting carriages pivoted on said rocking bars, and grate-bars supported at their opposite ends on said rocking bars and carriages, respectively, substantially as described.

2. In a grate, the combination of side bars connected by end bars, grate-bars, rocking bars pivoted on knife-edge bearings in each end of said side bars, knife-edge bearings on said rocking bars for receiving an end of each group of grate-bars, and tilting carriages pivoted on said rocking bars for supporting the opposite ends of said grate-bars, whereby the grate-bars may be moved in opposite directions when said rocking bars are rotated, substantially as described.

3. In a grate, the combination of the side bars A B, connected by the bars C D, the rocking bars  $g i$ , pivoted in said side bars and provided with the knife-edge bearings  $p v$ , the tilting carriages  $t$ , disposed on the bearings  $v$ , the grate-bars II, disposed at one end on a carriage  $t$  and at the opposite end on a bearing  $p$ , and the rod 25, for connecting one or more of said groups, with a lug 15 on the bar  $i$ , whereby the grate-bars may be moved in opposite directions as said rocking bars are rotated, substantially as set forth.

HIRAM P. TALLMADGE.

Witnesses:

O. M. SHAW,  
E. M. SPINNEY.