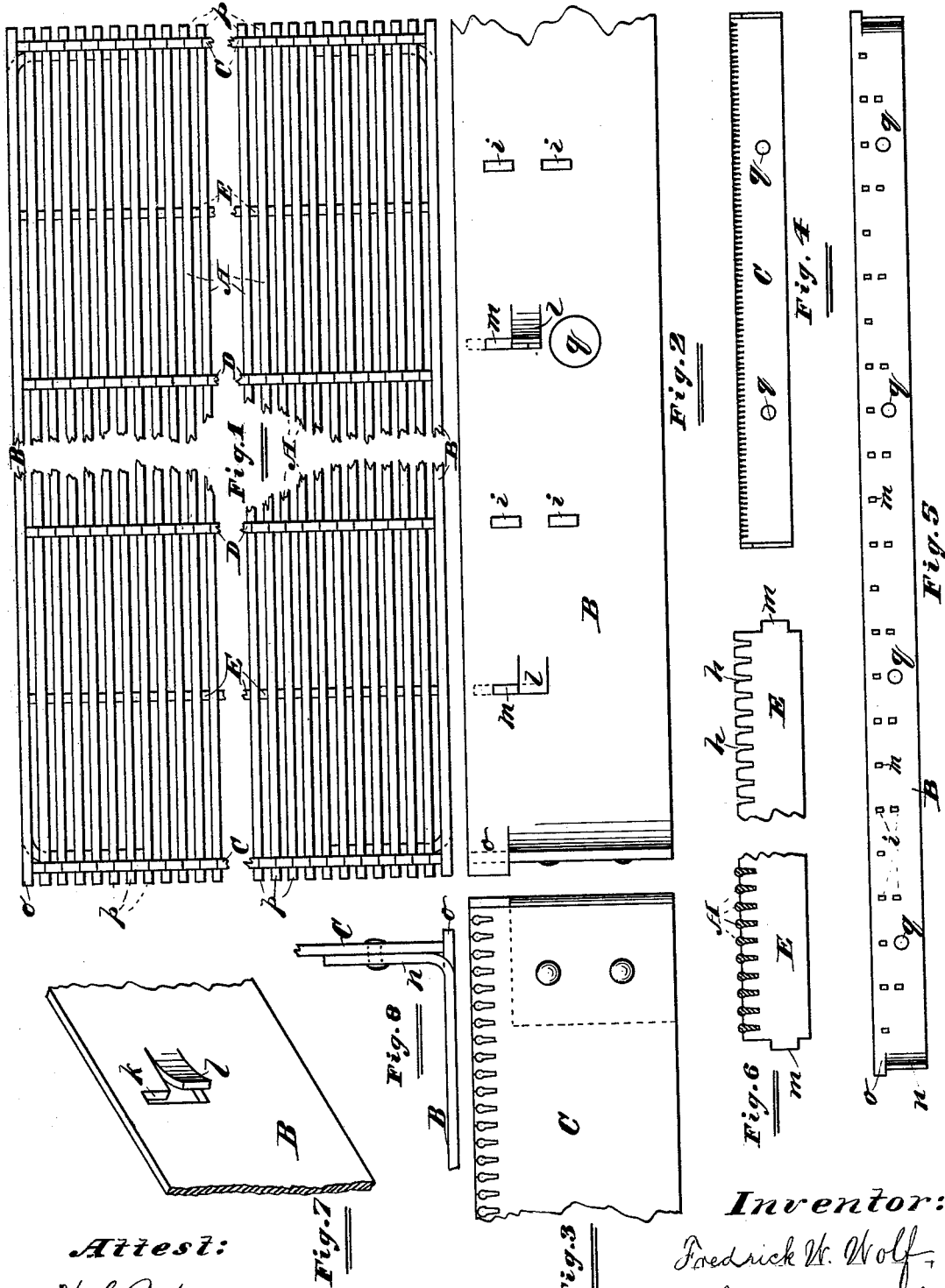


F. W. WOLF.
Malt-Kiln Floor.

No. 220,513.

Patented Oct. 14, 1879.



Attest:

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FREDRICK W. WOLF, OF CHICAGO, ILLINOIS.

IMPROVEMENT IN MALT-KILN FLOORS.

Specification forming part of Letters Patent No. **220,513**, dated October 14, 1879; application filed April 21, 1879.

To all whom it may concern:

Be it known that I, FREDRICK W. WOLF, of the city of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Malt-Kiln Floors; and I hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings, of which—

Figure 1 is a plan view of a single section of my improved malt-kiln floor with the central portion broken out; Fig. 2, a broken side view of a section; Fig. 3, a broken end view; Fig. 4, an end view reduced; Fig. 5, a side view reduced, and Figs. 6, 7, and 8 detail views.

My invention relates to an improvement upon the floors for malt-kilns and other purposes forming the subject of Letters Patent of the United States No. 168,948, issued October 19, 1875, to me, as assignee of the inventor, Paul Weinig, of Hanau, in the Kingdom of Prussia.

The invention of the said Weinig consists, as set forth substantially in the Letters Patent aforesaid, in constructing the said floor in sections of blade-shaped wires set parallel with one another into a rectangular frame with their edges downward, such frame having notches for the wires to rest in, and with cross-ties at regular intervals, riveted securely to the frame, to hold the latter together and support the flooring of blade-shaped wires, said cross-ties being likewise notched to receive the wires, the said wires being keyed straight, and then secured at the ends to the frame, and at intermediate points to the cross-ties, by swaging the metal of the frame and cross-ties down upon them.

I make no change whatever in the foregoing construction, so far as it goes, my improvements being in the way of additions for the purpose of supplying certain needs and curing certain defects in the Weinig floor, as hitherto constructed.

The objects of my invention may be stated as follows: For practical use the frame of each section is made of hoop-iron set on edge, and is of quadrangular form, three feet long and eighteen inches broad, and the cross-ties are

set at intervals of three inches throughout the length. I have found this distance between the cross-ties to be too great, owing to the slenderness of the wires and their consequent liability to become bent; and this difficulty I aim to overcome without, for reasons hereinafter to appear, varying the general structure.

Furthermore, much difficulty has always hitherto existed in fitting the sections together so as to form perfect joints at the ends, for heretofore the ends of the wires have been filed off until they were conterminous with the frame, and this operation has been found very difficult to perform without also filing the swaged rivet, thus weakening the same, and in some cases setting the ends of one or more of the wires entirely free; besides which, as the end and side bars of hoop-iron are rarely perfectly straight and flat, they do not coincide perfectly when set together, whereby spaces intervene. My invention aims also to overcome these defects.

My invention consists, first, in inserting between each two cross-ties an auxiliary tie-bar notched to receive the blade-shaped wires, the lower part only of the said wires entering the notches; secondly, in the manner in which I insert and secure these auxiliary tie-bars in frames already riveted together; thirdly, in having the wires project a short distance beyond the end bars of the frame, and having the unbent parts above the gashes in the ends of the side bars conterminous with them; and, fourthly, in the arrangement as to relative situation of the bolt-holes in the sides and ends of the frame, whereby these holes will coincide with each other however the sections are placed, all as hereinafter more fully set forth.

In the drawings, A A are the blade-shaped wires; B, the side bars; C, the end bars, and D the cross-ties, the wires being secured to the latter two in the manner hereinbefore described.

E are the auxiliary ties or supports, set midway, or thereabout, between the cross-ties D, and also between the said cross-ties and the end bars, and which consist simply of flat metal bars with notches *h* in their upper edges, and extending across from side to side of the frame, but not extending upward as far as do

the cross-ties D, but only high enough to receive the lower part of the wires A. This construction is to be preferred to that of increasing the number of cross-ties D, since a lateral and bottom stay for the wires only is needed at these points, and the ridges incidental to the swaging of the cross-ties, if too numerous, become a disadvantage. The labor and cost of inserting them are less also than that of additional cross-ties; and, indeed, since they perform all the functions of the cross-ties D, with the sole exception of binding down the wires, it may be no disadvantage even to increase their number and diminish the number of cross-ties D.

The cross-ties D are riveted into the side bars of the frame by means of a double tenon, *i*, and when introduced as a part of a newly-constructed floor, the auxiliary supports E may be secured in the same manner, or in any other that may be deemed suitable; but as it is frequently desired to insert them subsequently to the riveting together of the frame, I have devised the following mode for doing so:

At the proper point in the side bar I cut a vertical slot, *k*, and from the base of this slot, and at right angles to the same, I punch out the flange *l*, as shown, the end farthest removed from the slot *k* being left uncut.

A tenon, *m*, of the same dimensions as the slot *k*, is formed at each end of the bar E. The bar is inserted from the inside of the frame, the tenons *m* being brought into the openings left by the flanges *l* by slightly curving the bar and then allowing it to straighten; the bar is then pressed upward as far as possible, bringing the wires A into the notches *k*; and finally the flanges *l* are bent back into place, which brings them, of course, immediately under the shoulders formed by the tenons *m*. After this I usually plate the section with tin to prevent corrosion of the metal, and also to seal and tighten the various joints. The slot *k* and flange *l* may easily be formed simultaneously with the same punch.

The side bars, C, of the frame are gashed at the ends, as shown, and the part *n*, below the cut, is flanged inward and riveted to the inner face of the end bar, D, while the part *o*, above the cut, extends in each case straight across the extremity of the said end bar; but for the projecting, next to be explained, of the wires A beyond the ends of the frame, however, the parts *o* need not extend past the end bars. The obvious result of this construction is to close up at the top the spaces incidental to the flanging of the side bars, C, thus producing tight joints at the corners. The part *o* also serves as a stay for each outermost tooth on the end bar, which tooth is not only necessarily but half the width of the others, but is also in the very place where it is most liable to be broken off in the process of swaging, thus liberating the end of the wire.

The extremities *p* of the wires A project beyond the end bars of the frame, as shown, and the parts *o* of the side bars extend out to the

same distance. This, as before stated, obviates the need of filing close to the swaged rivets, and it also improves the joint of the section, for, as also before stated, the end and side bars are rarely perfectly straight, whereas the line of the extremities *p* of the wires may easily be made so by filing. Therefore, when two sections are set end to end, as is usual; the adjacent extremities of the wires A are in unbroken contact, notwithstanding any unevenness which may exist in the end bars of the frame. The latter are bolted together, with a space incidentally subsisting between them.

The sections are supported in the usual manner by level beams, and in laying them I begin at the end with a whole and a fractional section alternately, whereby each section terminates at some point between the ends of the adjacent ones at its sides. The sections in general all lie so that the wires run one way; but at the sides of the kiln it is often necessary, for various reasons, to turn them so that their bars lie at right angles to the others. As the length of each section is just double its width, it is clear that they must match perfectly, however they are laid; but it is necessary also that the bolt-holes in the sides and ends of the frame shall be in such relative locations that they will register exactly with one another, whether the sections are laid so as to lap one another, as above described, or coincidentally, or with the end of one against the side of another—the only three ways in which it is possible to lay them. This I provide for by forming in each end bar a certain even number of holes, arranged so as to be equally distant apart, with the outermost holes distant from the ends of the bar just half the space between contiguous holes, and in the side bars forming just twice as many holes as in the end bars, at the same distance apart, and with the outermost holes at the same distance from the ends as in the end bars. This arrangement, bearing in mind that the length of a section is in every case just double the breadth, will evidently bring the bolt-holes opposite each other in whichever of the above-mentioned three ways the sections are laid.

I generally employ two holes in each end plate, and four in each side plate, and since the sections are, as stated, ordinarily made three feet long by eighteen inches broad, the holes *q* in Figs. 4 and 5 will, according to the system above explained, be nine inches apart, with the outermost ones each four and one-half inches from its adjacent end of the bar. This construction, as to the side bars, necessarily brings a bolt-hole and an auxiliary tie-bar, E, in vertical line with each other in every instance. The said bars E therefore must be made sufficiently narrow not to interfere with the nut or head of the bolt.

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

1. The section of a malt-kiln floor, comprising the rectangular frame B C, cross-ties D,

extending from side to side of said frame, blade-shaped wires A, set in notches formed in the said frame and cross-ties, and secured in place by swaging, as described, and intermediate auxiliary bars E, extending from side to side of the frame, and provided with notches *k*, wherein the lower parts of the blade-shaped wires lie, as and for the purpose set forth.

2. The herein-described mode of inserting the auxiliary supports E in frames already riveted together, which consists in providing the said support with a tenon, *m*, at each end, and cutting through the side bars of the frame slots *k*, of the proper dimensions to receive the tenons *m*, and also cutting and bending out the described flanges *l*, then inserting the tenons *m* from the inside into the openings formed by the flanges *l*, bringing them into the slots *k*, and finally bending the flanges *l* back into place under the tenons *m*, substantially as set forth.

3. The blade-shaped wires A, projecting beyond the end bars, C, of the frame, in combination with the parts *o* above the gashes in the ends of the side bars, B, said parts *o* being continuous with the said wires A, substantially as and for the purpose described.

4. The rectangular frame, having its length exactly double its breadth, and having in each end bar an even number of bolt-holes placed at equal distances apart, with each outermost hole distant from its end of the bar just half the space between contiguous holes, and having in each side bar twice as many holes as in each end bar, but at the same distance apart, and with the outermost holes at the same distance from the ends as in the end bars, substantially as and for the purpose specified.

FRED. W. WOLF.

In presence of—

GEO. W. EVANS,

GEO. M. LOCKWOOD.