

H. KOPPERS.
HORIZONTALLY MOVING LEVELING ROD FOR HORIZONTAL FURNACES.
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907,818.

Patented Dec. 29, 1908.

Fig. 1

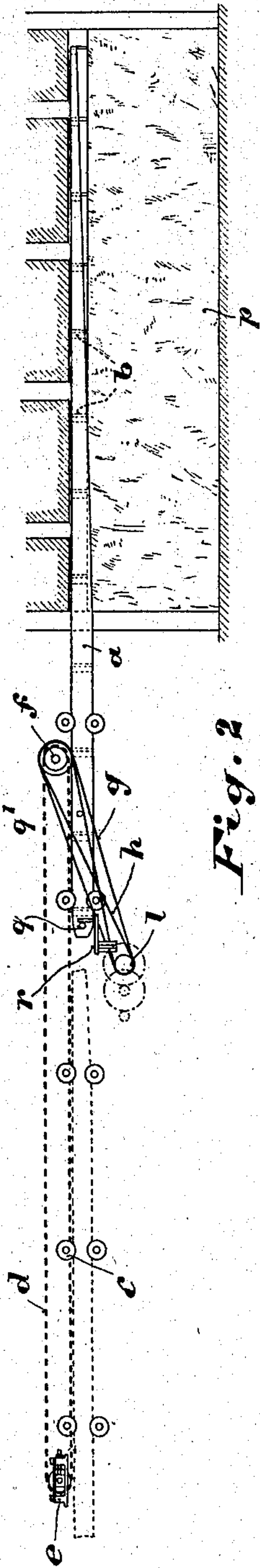


Fig. 2

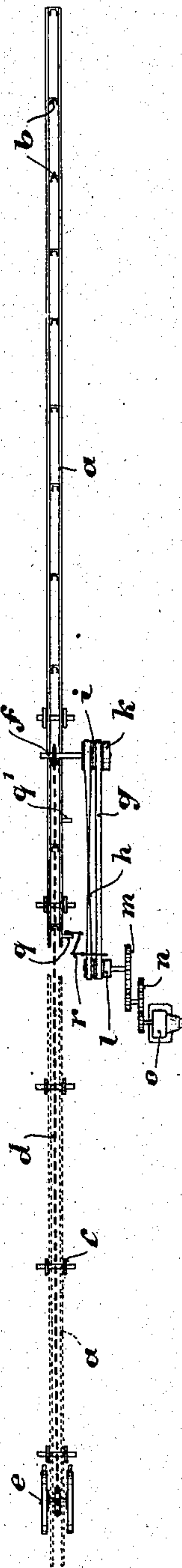


Fig. 3

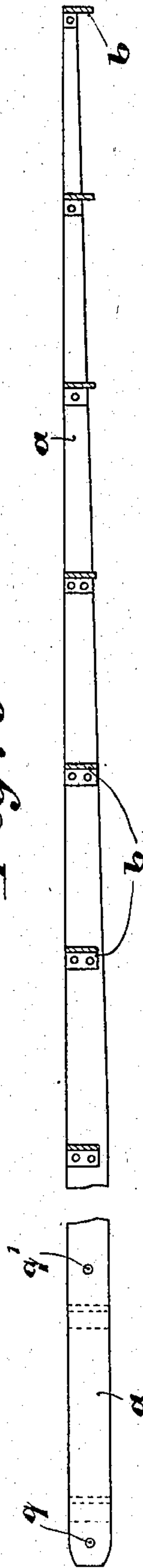
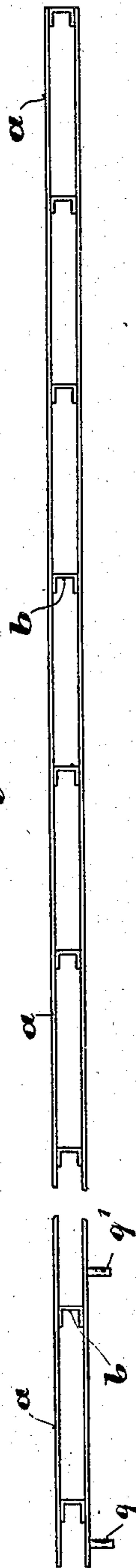


Fig. 4



Witnesses:
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UNITED STATES PATENT OFFICE.

HEINRICH KOPPERS, OF ESSEN-ON-THE-RUHR, GERMANY.

HORIZONTALLY-MOVING LEVELING-ROD FOR HORIZONTAL FURNACES.

No. 907,818.

Specification of Letters Patent.

Patented Dec. 29, 1908.

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To all whom it may concern:

Be it known that I, HEINRICH KOPPERS, a citizen of the German Empire, and resident of 30 Isenbergstrasse, Essen-on-the-Ruhr, Germany, have invented a certain new and useful Horizontally-Moving Leveling-Rod for Horizontal Furnaces, of which the following is a specification.

This invention refers to the construction of leveling rods for coke furnaces which overcomes and considerably reduces the known objection of the bending of the same, as the free part of the leveling rod is formed like a ladder whose side walls consist of flat bar irons standing on edge, the rungs forming the actual leveling parts. This form of construction easily permits of forming the free part of the rod as a body of almost uniform resistance against bendings resulting from its own weight, consequently with the least deflection, inasmuch as the side walls decrease in height towards the end. Such a body only makes very slight swinging movements. This method of construction also permits of making the rod at the spot where it enters the furnace of a height which surpasses that of the remaining free space, inasmuch as the cross rungs which really serve for leveling, are made of such dimensions at these spots that they do not reach to the lower edge of the side walls, and consequently the leveling is not effected as in the old construction, at the height of the lower edge of the supporting rod but this plane is situated higher than the latter. On withdrawing the leveling rod only the side walls cut into and remain in the charge of coal, but this is of no importance.

I shall now describe my invention with reference to the accompanying drawing, in which,—

Figure 1 shows in elevation a leveling rod constructed according to the present invention. Fig. 2 is a plan view of Fig. 1. Fig. 3 is a vertical longitudinal section through the leveling bar, and Fig. 4 a plan of Fig. 3.

The leveling rod, formed from flat bar iron arranged on edge, and riveted cross rungs *b*, is guided in a horizontal direction by the shafts *c*. The leveling rods both for introducing and withdrawing as well as for the leveling movements are operated by the endless chain *d* which is held tightly stretched by the tension roller *e*. This chain *d* is moved

by means of the sprocket wheel *f* in the one or the other direction according as to whether the open belt *g* or the cross belt *h* is passed from the loose pulley *i* to the correspondingly fixed pulley *k*, which latter is rigidly connected to the sprocket wheel *f*. Both these belts run over the pulley *l* which is maintained in constant rotation by the electro-motor *o* by means of the cog-wheels *m n*. The introduction of the rod into the furnace *p* is preferably controlled by hand; the reversing at the end of the stroke of the actual working movement is effected automatically, in a similar manner to the known planing machine gear, by stops *q, q'* striking against the belt guide *r*.

The part of the leveling rod projecting into the furnace *p* is so formed that the flat bar irons *a* decrease in height towards the free end. Now the cross rungs or plates *b* are of such dimensions that their working lower edge projects at the front ends of the leveling rod beyond the walls *a*, whereas inwardly they draw back towards the same. The walls *a* consequently in the first half of the oven cut somewhat into the leveling plane; no obstacle, however, is thus formed to the withdrawal of the leveling rod from the furnace, as on account of the inclination of the lower edge of the walls, on the backward movement they are immediately lifted up from the coal.

I claim,—

1. A leveling rod for coke ovens, comprising a pair of spaced longitudinal bars of gradually reduced height, and a series of connecting cross rungs that project below the lower edges of the bars at the reduced ends thereof, substantially as specified.

2. A leveling rod for coke ovens, comprising a pair of spaced longitudinal bars of gradually reduced height, and a series of connecting cross rungs which project below the lower edges of said bars at the reduced forward ends thereof and are set back from said edges along the rear ends thereof, substantially as specified.

In witness whereof I have hereunto set my hand in presence of two witnesses.

HEINRICH KOPPERS.

Witnesses:

W. R. SCHULZ,

FRANK V. BRIESEN.