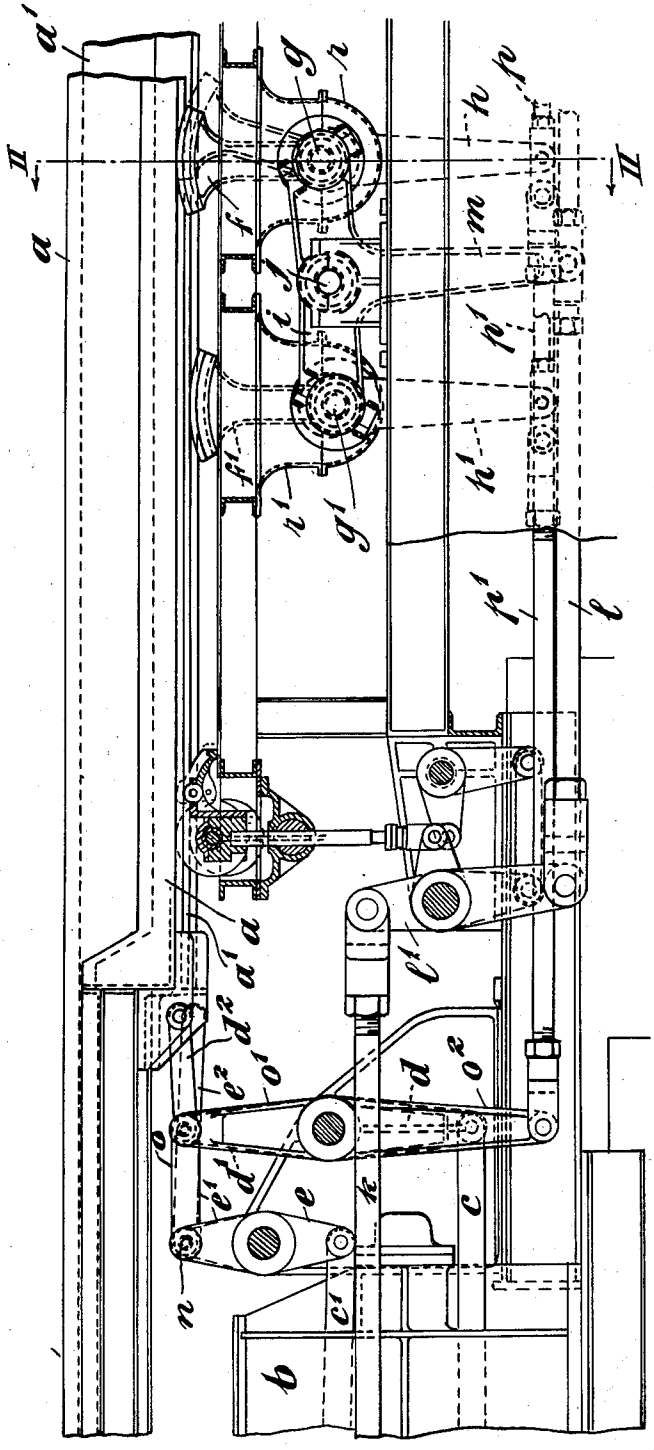
April 9, 1935. A. SMALLWOOD ET AL 1,997,318

CONVEYANCE OF GOODS THROUGH FURNACES AND THE LIKE

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Fig. 1.



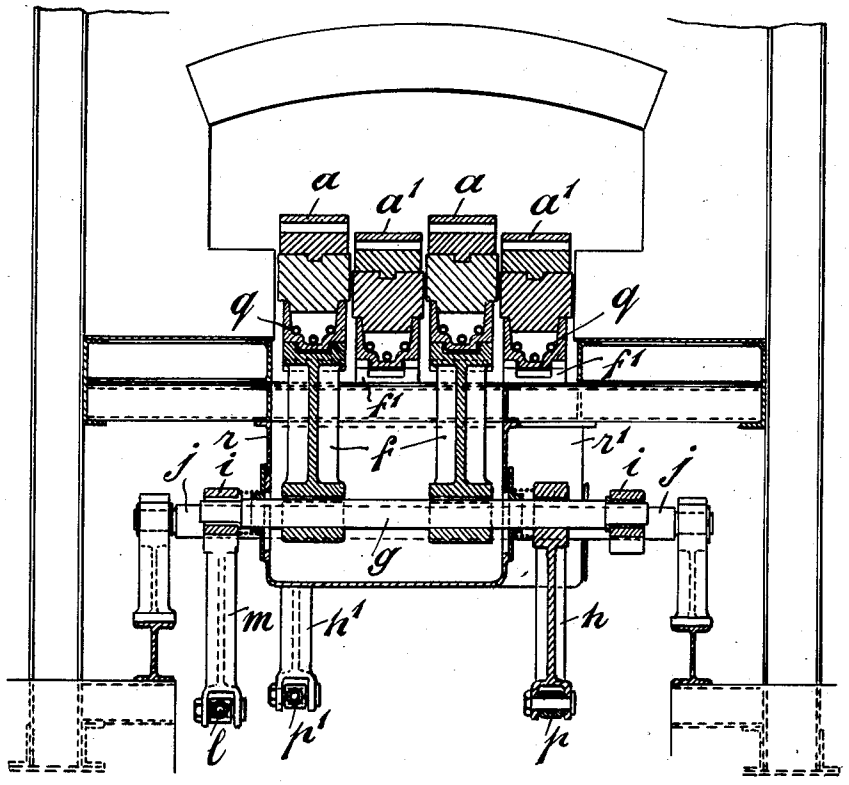
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Fig. 2.



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Patented Apr. 9, 1935

1,997,318

UNITED STATES PATENT OFFICE

1,997,318

CONVEYANCE OF GOODS THROUGH FURNACES AND THE LIKE

Alfred Smallwood and John Fallon,
Birmingham, England

Application February 19, 1934, Serial No. 712,008
In Great Britain February 24, 1933

4 Claims. (Cl. 198—219)

This invention has reference to improvements in connection with the conveyance of goods through furnaces and the like, more particularly furnaces of the type having interior carrier beams or bars for conveyance of the goods under treatment.

According to the primary feature of the invention, in a conveyor mechanism for a furnace or the like of the type referred to, each moving carrier beam or bar is freely supported upon quadrant or sector arms mounted to oscillate about bearings located externally of the heating zone.

The invention further includes an arrangement in which said oscillatory quadrant or sector arms are mounted in balanced pairs at opposite ends of rocker arms adapted to impart alternate rising and falling movements to carrier beams or bars arranged side by side in alternated series.

In order that the invention may be clearly understood and readily carried into practice, reference may be had to the appended explanatory drawings, in which:—

Figure 1 is a partly sectional side elevation of the relevant parts of a conveyor furnace embodying alternated series of carrier beams or bars and having the present improvements applied.

Figure 2 is a sectional end elevation of the conveyor furnace, the section being taken on a plane indicated by the line II—II in Figure 1.

In one method of carrying the invention into effect, as applied in connection with a conveyor furnace having a hearth constituted by longitudinal beams or bars a a^1 arranged side by side in two alternated series and reciprocated from a gear-box b by means of connecting-rods c c^1 having link and lever couplings d d^1 d^2 and e e^1 e^2 to the beams or bars of the respective series, each beam or bar a is freely supported upon a longitudinally spaced plurality of upstanding quadrant or sector arms f, and each beam or bar a^1 is similarly supported on quadrant or sector arms f^1. These quadrant or sector arms f f^1 are mounted for oscillation upon bearing shafts g g^1 having dependent lever arms h h^1 respectively, the supporting arms f f^1 and shafts g g^1 of adjacent beams or bars being mounted in counterbalanced pairs at opposite ends of a longitudinally spaced plurality of rocker arms i located on each side beneath the furnace on a corresponding plurality of shafts j and geared to impart alternate rising and falling movements to the alternated series of beams or bars a a^1, these movements being transmitted from the gear-box b by means of a connecting-rod k having link and lever couplings l l^1 to a lever arm m on one of the rocker arms i. The oscillatory movements of the quadrant or sector arms f f^1 are imparted from a point n in the beam or bar reciprocating gear by means of links and levers o o^1 o^2 and an opposite pair of connecting-rods p p^1 coupled to the respective lever arms h h^1 of the quadrant or sector arms. The bearings between each beam or bar and its respective quadrant or sector arms are of a rib-and-groove character as illustrated, and the quadrant or sector arms f f^1 are enclosed either in pairs or otherwise within a longitudinally spaced plurality of fixed casings r r^1 dependently mounted beneath the furnace setting, these casings being appropriately slotted for accommodation and movement of the shafts g g^1 carried by the rocker arms i. If desired the beams or bars a a^1 may be water-cooled, for instance by means of internally located water-circulated coils or pipes q.

It will be seen that whilst each quadrant or sector arm is free to move vertically with its bearing shaft, it will oscillate with the forward and backward movements of its respective beam or bar, in synchronous relation to these movements of the beam or bar, the latter being in static relationship to the quadrant or sector arm throughout the forward and backward movements, thereby eliminating friction between the beam or bar and the quadrant or sector arm, which is so arranged that the vertical thrust of the beam or bar is always over the centre of the bearing. It will further be seen that in the particular embodiment described the quadrant or sector arm and rocker arm mechanism provides a complete system of counterbalanced support for the moving beams or bars, eliminating the use of roller, ball, or plain bearings in conjunction with intermediate supports for the beams or bars.

Suitable provision may be made for overcoming expansion, either of the moving beams or bars or of the quadrant or sector arms, and it will be appreciated that the system of quadrant or sector arm support may be adapted for use in connection with other forms of longitudinally reciprocating beam or bar conveyors, for instance of the single beam type, or in connection with conveyors having moving beams or bars disposed transversely of the furnace.

What we claim as our invention and desire to secure by Letters Patent is:—

1. A conveyor mechanism for a furnace or the

like and which comprises, in combination, interior carrier beams or bars for conveyance of the goods under treatment, mechanism for imparting reciprocating movements to said beams or bars, and quadrant or sector arms upon which said beams or bars are freely supported, said quadrant or sector arms being mounted to oscillate about bearings located externally of the heating zone, in accordance with the forward and backward movements of the respective beams or bars.

2. A conveyor mechanism for a furnace or the like and which comprises, in combination, interior carrier beams or bars for conveyance of the goods under treatment, mechanism for imparting reciprocating movements to said beams or bars, quadrant or sector arms upon which said beams or bars are freely supported, external bearings supporting said arms, and connecting mechanism whereby oscillatory movements are imparted to said arms in accordance with the reciprocatory movements of the respective beams or bars.

3. A conveyor mechanism for a furnace or the like and which comprises, in combination, interior carrier beams or bars arranged side by side in alternated series for conveyance of the goods under treatment, mechanism for imparting reciprocating movements to said beams or bars, rocker arms located externally of the heating zone, quadrant or sector arms mounted in balanced pairs at opposite ends of said rocker arms so as to provide free supports for alternate beams or bars, and mechanism for rocking said rocker arms so as to impart alternate rising and falling movements to said beams or bars, said quadrant or sector arms being adapted for oscillation in accordance with the forward and backward movements of the respective beams or bars.

4. A conveyor mechanism for a furnace or the like and which comprises, in combination, interior carrier beams or bars arranged side by side in alternated series for conveyance of the goods under treatment, mechanism for imparting reciprocating movements to said beams or bars, rocker arms located externally of the heating zone, quadrant or sector arms mounted in balanced pairs at opposite ends of said rocker arms so as to provide free supports for alternate beams or bars, mechanism for rocking said rocker arms so as to impart alternate rising and falling movements to said beams or bars, and connecting mechanism whereby oscillatory movements are imparted to said quadrant or sector arms in accordance with the reciprocatory movements of the respective beams or bars.

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