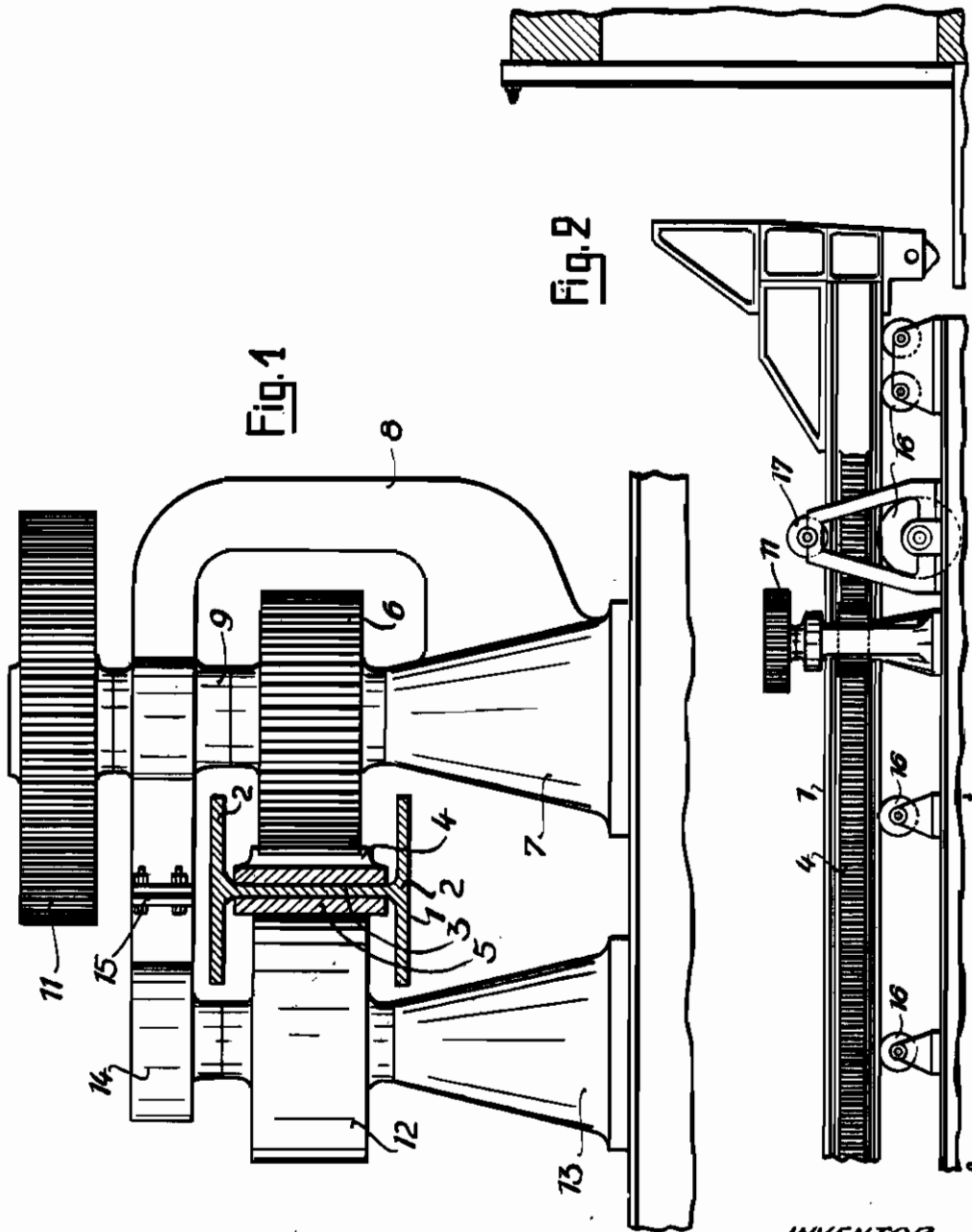


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# ALIEN PROPERTY CUSTODIAN

## PUSHER RAMS FOR COKE OVENS

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The present invention relates to devices for the removal of the coke cake from the coking chamber or retort of horizontal chamber- or retort-ovens for the production of gas and coke and more particularly to the pusher ram which is connected with means for effecting a reciprocating movement thereof.

It is common use to equip horizontal chamber ovens with a pusher ram for pushing the coke cake out of the oven chamber, said pusher ram comprising a head or shield which is supported by an essentially horizontal bar or rod. The dimensions of the pusher head are a little bit smaller than those of the oven chamber so that the pusher head may be easily moved to and fro in the chamber. If the carbonisation of the coal charge is finished the doors at both sides of the chamber are opened and the pusher ram is introduced into the chamber from one side. The coke cake formed is thereby pushed out at the other side of the chamber. That means that the pusher ram moves through the whole chamber to be emptied and is drawn back after the chamber is completely discharged.

During the pushing procedure the pusher rod is exposed to the high temperature of the coking chamber the walls of which mostly have a temperature exceeding 1000° C. If the pusher ram is drawn back after the discharge is completed, it cools down rather quickly. This frequent heating up and cooling down of the pusher ram has a detrimental effect on its metal body.

The main object of my invention therefore consists in providing such improvements in the said pusher arms as will protect the rod against the influence of the high temperature in the coking chamber and increase its stability to a considerable extent.

It is usual to design the pusher ram of coke ovens in the form of an I-beam the centre rod of which extends vertically. This design I too principally adopted for my invention.

For the reciprocating movement of the pusher ram one generally applies a spur rack fitted to the pusher rod. A pinion connected with a suitable drive gears into this spur rack. If the pinion turns in one direction the pushing ram is moved into the chamber while it is withdrawn from the chamber at the opposite movement of the pinion. I likewise keep to this driving mechanism for the pusher ram.

My invention now provides for to arrange said spur rack for the pinion at the one side of the vertical centre rod and to fit protection plates, preferably consisting of thick-walled cast iron plates to the other side of the rod. By this arrangement the susceptible centre rod of the pusher ram is protected against the disadvantageous heat radiation of the highly heated chamber walls in a very simple though effective manner.

Preferably I apply an I-beam, the centre rod of which has a smaller height than that of the flanks extending rectangularly to the rod.

With the above and other objects and features of my present invention in view I shall now describe a preferred embodiment thereof on the lines of the accompanying drawing in which

Fig. 1 shows a vertical section through the pusher ram with its driving mechanism and

Fig. 2 represents a front view of the pushing ram.

The pusher ram 1 consists of an I-wide-flanged sectional iron as for instance the German industrial standard 30. At such wide-flanged irons the horizontal flanks 2 have a thickness of 20 mm while the vertical rod 3 only has a thickness of 12 mm. On the one side of the vertical rod 3 a spur rack 4 is fixed. The other side of the vertical rod is fitted with protection plates 5 preferably consisting of cast iron.

The spur rack 4 gears into a pinion 6 which is horizontally seated in a supporting frame 7. The latter is equipped with a connecting arm 8 which serves for the guidance of the shaft 9 above the pinion 6 and forms the supporting bearing 10. Above the bearing 10 a pinion 11 is provided for which is connected to the driving means being coupled to a driving motor.

In order to take up the counterpressure of the driving pinion on the pusher rod a wheel 12 arranged in a supporting seat 13 is provided at that side of the rod 3 which is fitted with the protection plates 5. The wheel 12 is guided by the guide bearing 14 by means of a shaft, the guide bearing 14 being connected at 15 with the bearing 10 of the connecting arm 8. The connection 15 is preferably adjustable so that at a simultaneous adjustment of the supporting seat 13 which is designed accordingly, an adjustment of the wheel 12 may be arrived at in order to warrant that the wheel lies closely against the pusher rod even if some wear and tear occurred during the operation. The pusher ram 1 is guided within the pushing machine by means of carrying rolls 16 and upper guide rolls 17 in order to render a movement of the ram towards the top of the machine impossible.

Instead of the cast iron protection plates 5 and the counterpressure wheels 12 on the one side of the vertical rod 3 another spur rack which gears in a toothed wheel may be provided whereby the pressure of the driving pinion is taken up and a bending of the pusher rod in lateral direction is safely avoided.

I have now described in the above my present invention on the lines of a preferred embodiment thereof but in no way is my invention limited to the mode of carrying out as described and shown.

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