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(1863 - 1945)

Luxembourg-city

Patents (details)

1 - Procédé d'épuration des gaz de hauts fourneaux

FR patent	327741
Application date	26 December 1902

L'invention a pour objet un procédé d'épuration des gaz, en particulier des gaz de hauts fourneaux, qui servent de préférence pour les moteurs à gaz, pour le chauffage des chaudières ou pour le réchauffage, etc.

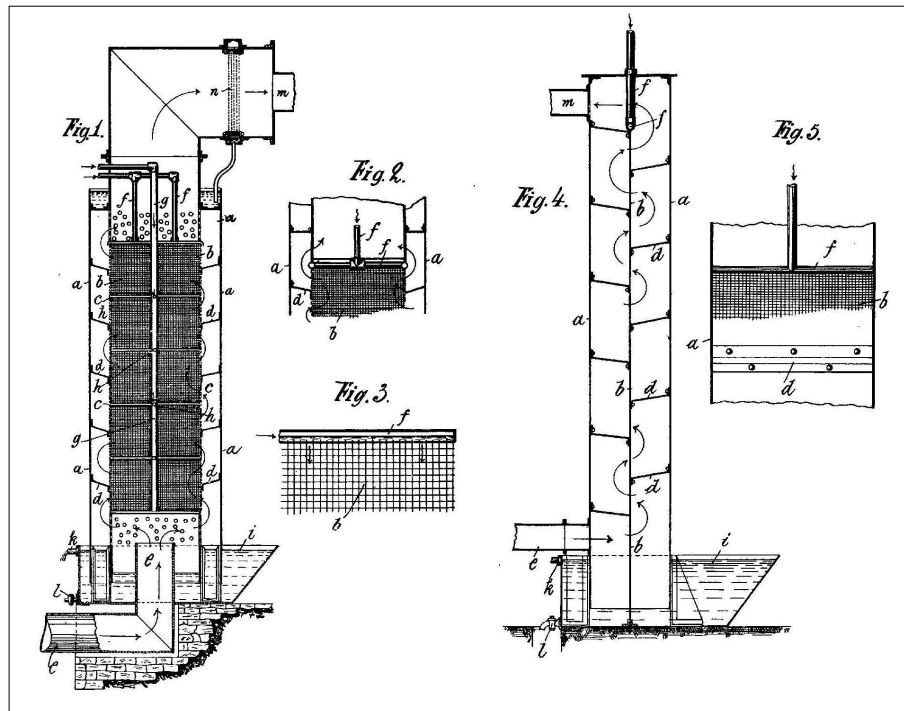
Il résulte de l'expérience acquise dans ces différentes applications des gaz que l'eau joue le rôle principal dans l'épuration desdits gaz. Partout on essaie de mettre les gaz en contact intime avec l'eau; les poussières restent alors en suspension dans l'eau et sont entraînées par celle-ci.

Pour assurer un contact intime des poussières contenues dans le gaz avec l'eau, dans mon procédé le gaz est aspiré ou refoulé à travers une couche d'eau continue formant en quelque sorte une surface filtrante. Il convient d'aspirer ou de refouler d'abord les gaz impurs à travers les couches d'eau filtrantes, qui ont déjà absorbé des poussières et d'amener ensuite lesdits gaz à des couches d'eau de plus en plus pures afin d'économiser l'eau. Il est avantageux pour mettre à exécution ce procédé de se servir d'un appareil comportant une toile métallique qui est arrosée par de l'eau. Les mailles sont remplies par celle-ci et la toile métallique avec l'eau qui ruisselle sur elle forme ainsi une couche filtrante continue d'eau à travers laquelle les gaz sont contraints de passer.

La toile métallique est disposée dans une colonne en tôle, et cela de différentes façons. Dans une disposition la toile métallique constitue la cloison médiane d'une colonne cylindrique. Afin que les gaz ne remplissent pas d'un seul coup toute la colonne en tôle, des deux côtés de la toile métallique sont disposées des cloisons qui obligent les gaz à lécher ladite toile métallique en passant alternativement de part et d'autre de celle-ci; ou bien, la toile métallique peut affecter la forme d'une colonne cylindrique concentrique à la colonne en tôle. Dans ce cas les cloisons intermédiaires sont disposées dans la colonne cylindrique en toile métallique et entre celle-ci et la colonne cylindrique extérieure en tôle de sorte que les gaz circulent d'abord dans la colonne en toile métallique et ensuite dans l'espace annulaire compris entre celle-ci et la colonne extérieure en tôle.

Il convient de disposer les cloisons intermédiaires de façon qu'elles convergent vers le milieu en vue de faire écouler l'eau vers la toile métallique.

Afin d'assurer un remplissage complet des différentes mailles de la toile métallique, les fils de celle-ci sont suspendus dans les trous du tube d'arrivée d'eau de manière que chaque maille reçoive de l'eau de deux côtés. Si la toile métallique a la forme d'une paroi plane, les trous dans lesquels sont fixés les fils sont situés sur un tuyau rectiligne; si la toile métallique affecte la forme d'une colonne cylindrique, les trous par où s'écoule l'eau sont sur un anneau, dont l'eau d'alimentation arrive par des branchements.



Corresponding patent

LU

2 - Apparatus for drying air

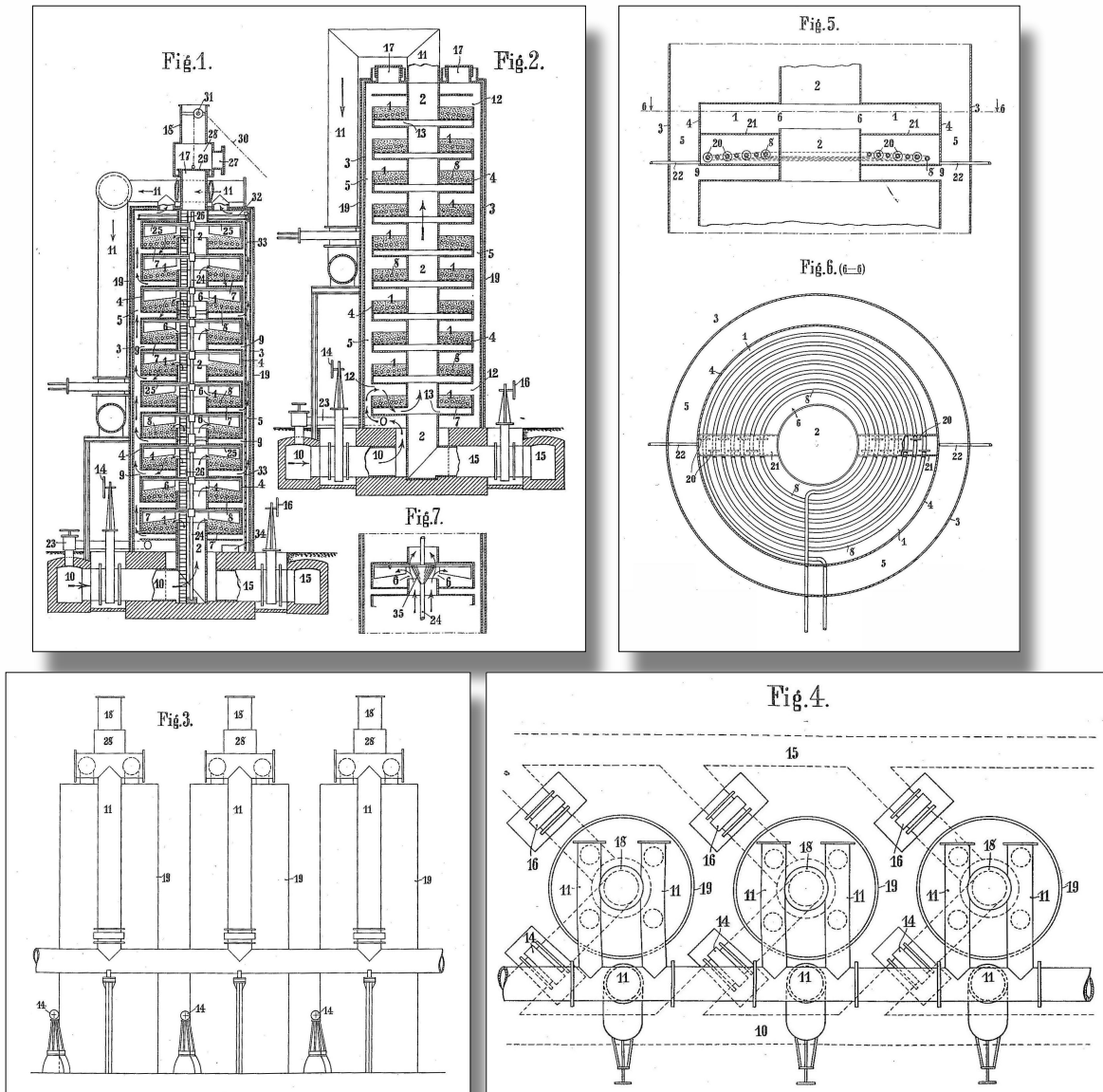
US patent	995513
Application date	7 November 1910

This invention relates to an apparatus for drying purposes and in particular for drying the air for blast furnaces, with the aid of chlorid of calcium, by means of which it is possible to utilize chlorid of calcium for drying the enormous quantities of air used in blast furnace practice and to regenerate the calcium chlorid in situ.

The apparatus comprises a so-called column plant and contains the calcium chlorid receptacles arranged one above the other. Above the layer of the calcium chlorid each receptacle is provided with an opening leading to a central shaft common to all the receptacles and dividing the blast into sheets. Beneath the layer of calcium chlorid a second opening is arranged in each receptacle leading to an annular space formed by the outer wall of each receptacle and the casing of the apparatus. In this annular space the sheets of the blast are then united. The construction may be also such that each of the superposed chlorid of calcium receptacles is provided, above the layer of chlorid of calcium between the outer wall of a receptacle and the casing of the apparatus, with an opening dividing the blast into sheets and with another opening beneath the layer of chlorid of calcium leading to the shaft common to all receptacles and in which shaft the sheets of blast are united.

In the former construction the blast is introduced into the central shaft and divided into, sheets for the individual receptacles by the opening. It passes from the individual receptacles to the annular space in which the individual dried sheets of blast are united whence they pass as a whole to the place of action.

According to the second constructional form, the blast enters the annular chamber between the outer walls of the individual receptacles and the housing of the apparatus and is divided into sheets by the openings at the outer walls, which sheets, after traversing the layer of calcium chlorid are united in the central shaft whence they pass to the place of action after drying.



Corresponding patents

LU, FR, GB, CA, AT

3 - Improvements in the process of rolling thin-webbed I and H beams by means of universal mills

GB patent 1913/16479
 Application date 17 July 1913

The object of this invention is to enable I and H beams to be rolled, in universal mills, with thinner webs than has been possible in the previous practice.

A limit to the thinness of the web has always been imposed by the tendency of the web, with increasing thinness to become bent or wavy. This tendency is principally due to the fact that the web is spread to a greater extent than the flanges, so that the rate of spreading is greater in the web than in the flanges, the material forming the latter opposes resistance to the spreading of the web.

We have found that the tendency to undulation of the web decreases in proportion as, in determining the profile, the cross-sectional area of the web approximates to the cross-sectional area of a flange, the best conditions for obtaining a thin web being accordingly obtained when the web surface remains equal to each flange surface, that is to say when the coefficient of reduction between web surface and a flange surface is 1:1.

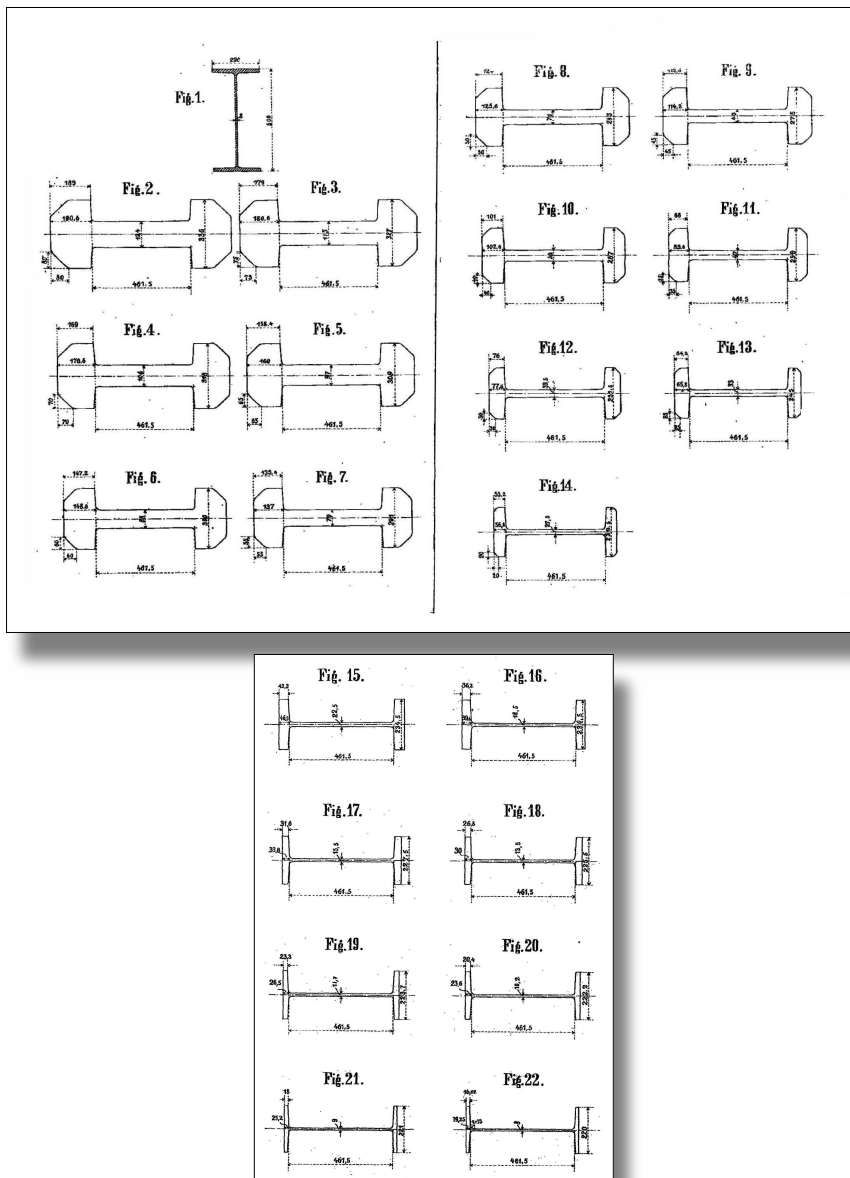
By coefficient of reduction we mean the ratio of the area of web cross-section to the flange area in two successive passes.

If $s^1, s^2, s^3 \dots s^n$ are the areas of successive web cross-sections, and $f^1, f^2, f^3 \dots f^n$ the areas of successive cross-sections of a flange, then in our method or process:

$$\begin{aligned} s^1 : f^1 &= 1 : 1 \\ s^2 : f^2 &= 1 : 1 \\ s^3 : f^3 &= 1 : 1 \\ s^n : f^n &= 1 : 1 \end{aligned}$$

Provided that this relative equality is maintained in the course of reducing the pass, the rolling pressures of the horizontal and vertical rolls have equal quantities of material to act upon. This is particularly important in regard to the formation of the flanges, for the reason mentioned, that if the spreading of the flanges is to show the resultant resistance to the spreading of the web renders the latter undulating

The flanges are shaped by the pressure of the circumferences of the vertical rolls on the outer flange surfaces, and by the pressure of the ends of the horizontal rolls on the inner flange surfaces. At the same time the horizontal rolls are shaping the web, but only by means of their circumferences. It is, therefore, of primary importance, in the case of a thin web, that the circumferences of the horizontal rolls acting on the web upon a mass equal to the masses acted upon by the end surfaces. In that case, the rate of spreading at the flanges, and that at the web, approximate to equality, and this condition is insured if in addition to invariability of the coefficient of reduction there is continued relative equality between the cross sectional area of the web and of each flange.



4 - Improvements in the method of and apparatus for charging shaft-furnaces

GB patent 117024
 Application date 8 December 1917

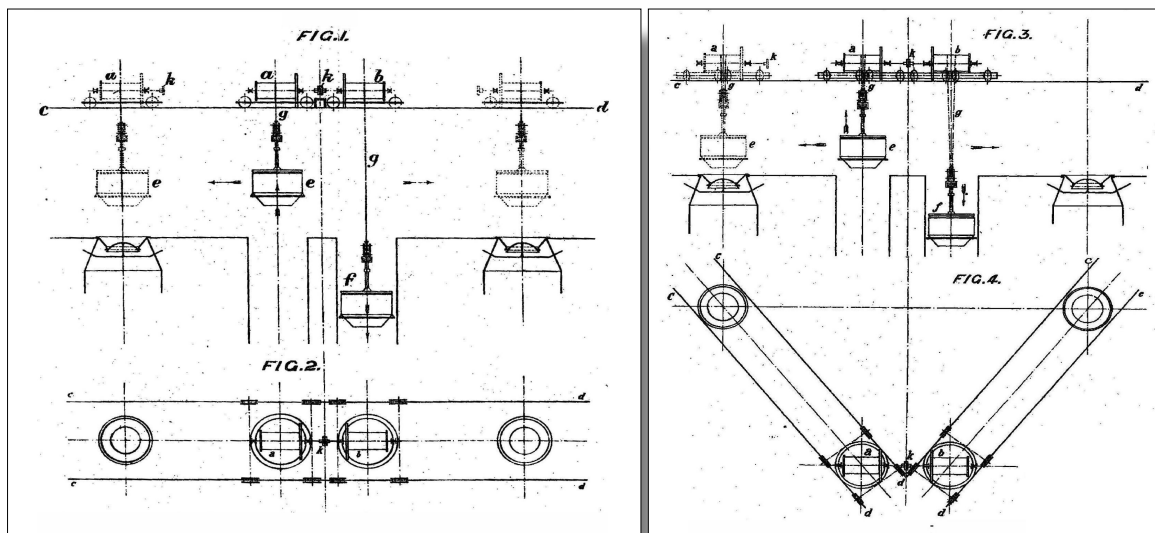
It is well known that in order to economise as far as possible motive power it is desirable to balance the ascending and the descending dead weights, and various attempts have been made to solve this problem in connection with the various types of charge elevating apparatus.

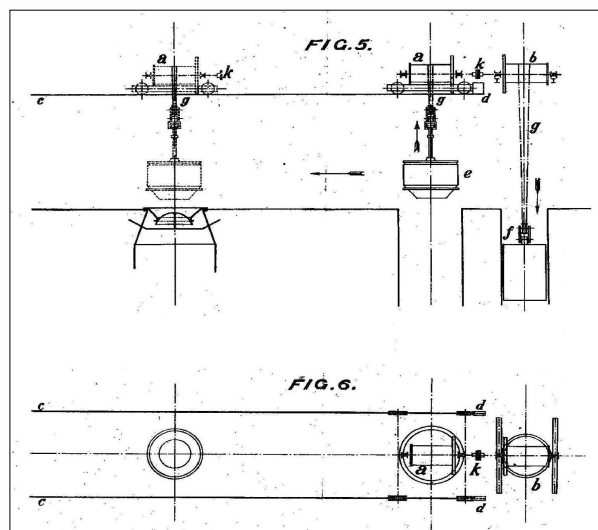
The object of the present invention is to deal with this problem in the particular case in which the material carried by the bucket or grab has to be moved successively along paths of different inclinations, for instance a vertical path followed by a horizontal path or by an inclined path. Such conditions occur for instance in connection with the charging of shaft furnaces.

The invention may be said to consist essentially in coupling the cars from which the two charge receptacles are suspended during the vertical transport of the charges in such a manner that the dead weight of the ascending charge vessel, bucket or grab is balanced by the dead weight of the descending vessel, and in uncoupling or disconnecting the two cars after the completion of the hoisting operation so that the two cars may be moved independently during the subsequent horizontal transport.

The advantages of the invention are mainly the following; owing to the two cars being coupled to form a single hoisting apparatus during the period of vertical transport, the dead weights of the two vessels containing the charge are fully balanced, which results in a saving of motor power amounting to from 25% to 50%. Moreover as the empty and the full vessel are moved simultaneously the time required for the vertical transport may be reduced by 50%. During the vertical transport the elevating motors of the cars are coupled and work simultaneously, therefore each motor will work as if under half load. Each of the motors should however be sufficiently powerful for raising the charge vessel and the charge contained therein so that whenever one of the cars requires to be repaired, the other car may be used for charging both furnaces.

It may also be mentioned that as the vessels may in this arrangement be elevated within a vertical shaft, the danger of accidents to the attendants arising from the use of shoots or from accidental fall of the charge is considerably reduced. The cost of the whole charging plant is considerably less than in other installations in which buckets or grabs are used.





Corresponding patents

AT, CH, FR

5 - Combiniertes Crack- und Hydrierungsverfahren, nebst Apparatur

LU patent 14101
Application date 22 July 1925

(copy to be obtained from Archives nationales)

6 - Extrahierung leichtflüssiger Kohlenwasserstoffe aus Gasen in kombinierten Crack- und Hydrierungsanlagen

LU patent 14102
Application date 22 July 1925

(copy to be obtained from Archives nationales)

7 - Hydrierungsverfahren nebst Apparatur

LU patent 14103
Application date 22 July 1925

(copy to be obtained from Archives nationales)

8 - Automatische Crackmaschine

LU patent 14259
Application date 10 December 1925

(copy to be obtained from Archives nationales)