No. 649,451. Patented May 15, 1900.

G. HILGENSTOCK.

DEVICE FOR DRAWING UP DOORS OF COKE OVENS.

(Application filed May 7, 1898.)

(No Model.) 2 Sheets—Sheet 1.

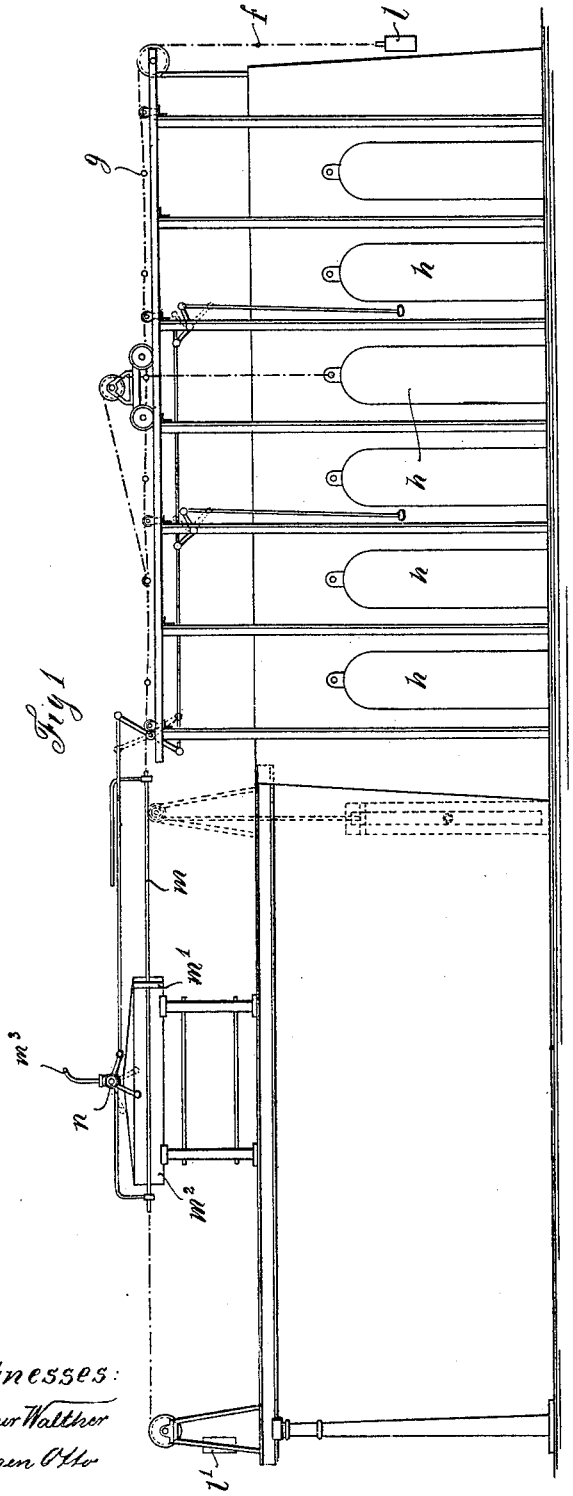


Fig 1

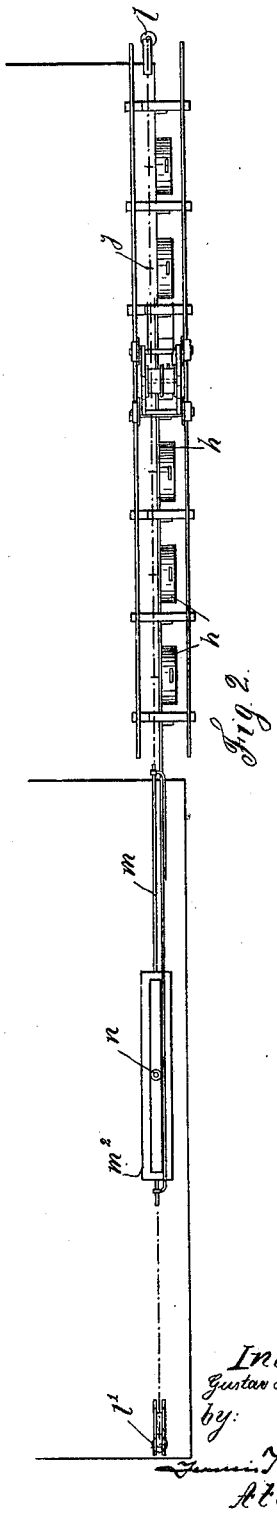


Fig 2.

Witnesses:
Arthur Walther
Eugen Otto

Inventor:
Gustav Hilgenstock
by:
Jenner J. Chester
Attorney.

No. 649,451. Patented May 15, 1900.

G. HILGENSTOCK.

DEVICE FOR DRAWING UP DOORS OF COKE OVENS.

(Application filed May 7, 1898.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 3.

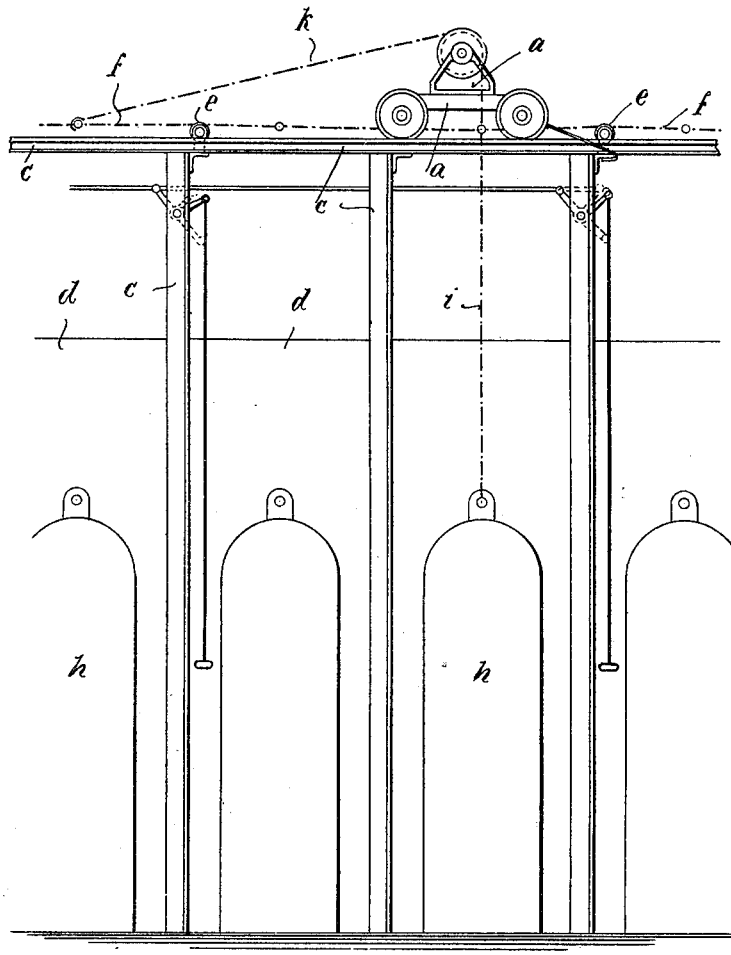


Fig. 4

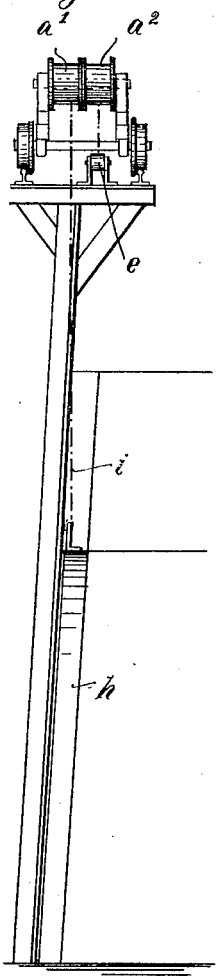
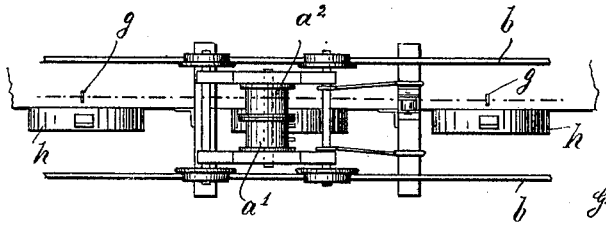


Fig. 5.



Witnesses:
Arthur Walther
Eugen Otto

Inventor
Gustav Hilgenstock
by Francis F. Lemmon
Attorney

UNITED STATES PATENT OFFICE.

GUSTAV HILGENSTOCK, OF DAHLHAUSEN-ON-THE-RUHR, GERMANY, ASSIGNOR TO THE UNITED COKE AND GAS COMPANY, OF PHILADELPHIA, PENNSYLVANIA.

DEVICE FOR DRAWING UP DOORS OF COKE-OVENS.

SPECIFICATION forming part of Letters Patent No. 649,451, dated May 15, 1900.

Application filed March 7, 1898. Serial No. 679,982. (No model.)

To all whom it may concern:

Be it known that I, GUSTAV HILGENSTOCK, a subject of the King of Prussia, German Emperor, residing at Dahlhausen-on-the-Ruhr, in the Kingdom of Prussia, German Empire, have invented a new and useful Device for Drawing Up the Doors of Coke-Ovens, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part thereof.

My invention relates to coke-ovens arranged in series side by side and having their doors lying in or substantially in the same plane, as is usual in such constructions.

The object of my invention is to provide a simple and convenient mechanism whereby the doors of the coke-ovens can be drawn up at will and by the action of a single fixed motor. With this object in view I provide a track running along and above the top edge or edges of the bank or group of ovens and place thereon a truck carrying a windlass. In practice the truck is moved to a position over the door to be lifted and is then anchored in position by any convenient means. A hoisting chain or rope is secured to the windlass-drum, and said drum is also provided with means for actuating it, adapted to be connected and disconnected at will with a series of drum-actuating devices, which in accordance with my invention I arrange at convenient intervals along the top of the bank of ovens and all of which I connect with a motor, by means of which each or all of said drum-actuating devices can be operated. Preferably my drum-actuating device consists simply of a series of rings connected to a chain running parallel to the track and longitudinally reciprocated by means of a motor, said rings being connected to actuate the drum by means of a chain wound on the drum and having a hook by which it can be attached to any of the rings at will.

My invention can be applied in a great number of modified forms without departure from its fundamental features; but its general nature will be clearly understood, as described in connection with the drawings, in which I have illustrated my invention in what I believe to be at once the simplest and best form, and in which—

Figure 1 is a front elevation of a bank of coke-ovens equipped with my improved door-lifting device. Fig. 2 is a plan view of the door-lifting mechanism. Fig. 3 is an enlarged elevation showing some of the ovens, the windlass, and its immediate connections. Fig. 4 is a side elevation of the parts shown in Fig. 3; and Fig. 5 is a plan view, on an enlarged scale, of the hoisting-windlass.

d indicates the bank of coke-ovens, and *h h*, &c., the vertically-movable doors, having perforated ears, as indicated, at their tops.

c c, &c., indicate a structure for supporting the track. It is made, as shown, with cross-bars *c'* at top, upon which the rails *b b* are supported and which also support a series of supporting-rolls, (indicated at *e e*, &c.)

B is the platform, conveniently extending out from the end of the row of coke-ovens and level with the top of the ovens.

a is a wheeled truck moving out on the tracks *b b* and supporting a bipartite drum, (indicated at a' a^3.)

M indicates the motor, which may be conveniently constructed, as shown, of a long cylinder, (indicated at m^2,) in which works a piston, (indicated at m', Fig. 1,) *m* indicating the piston-rod.

m^3 indicates the conduit for steam or other fluid leading to the cylinder m^2, and *n* indicates the valve for regulating the admission and exhaust of the motive fluid from the cylinder.

n' indicates a lever for actuating the valve *n*.

o o' o^2 indicate a lever-actuating connection which by means of bell-crank levers (indicated at o^3) can be moved by depending handle-rods o^4 o^4, arranged at convenient intervals along the front of the bank of coke-ovens.

The position of the motor is of course a matter of minor importance, and I have shown in dotted lines at M', Fig. 1, that the motor can be placed in a vertical instead of a horizontal position if it is found more convenient to do so.

f indicates a chain connected with the piston-rod *m* and extending, as shown, between

the rails of the track along the top of the structure c, the chain being supported on the rolls e e, &c., and passing at the end of the bank of coke-ovens over a roller or pulley e^2, a weight l being attached to its end, so as to keep it taut. Preferably I connect a second chain f' with the other end of the piston-rod m and carry it over a pulley e^3, attaching a weight l' to its end, the weights l and l' balancing each other and leaving on the motor only the duty of actuating the chain and the connections made to it in practice. At convenient intervals, preferably the distance apart of the doors h h, I secure to the chain f a series of rings g g.

i is a chain wound on the drum a' and connectible at its end to the lugs at the top of the door h.

k is a chain wound on the drum portion a^2 and connectible at its free end with any of the rings g.

Preferably I make the chains i and k separate, connecting each with the drum independently at a^2 k^2; but obviously the chains may be connected and continuous and simply passed over the drum.

In practice the windlass-truck is moved to a position immediately above the door to be raised, anchored in said position, and then the chain k connected with the conveniently-situated ring g. The motor M is then set in operation, connecting the chain f and the rings attached to it and drawing up the door h connected with the chain i. A reverse movement of the motor-piston permits the door to again fall to a closed position, and the windlass-truck is then moved to another position, connected as described, and the same operation performed.

Having now described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In combination with a series of coke-ovens arranged side by side in a group, a movable hoisting-drum adjustable along and above the ovens, a hoisting-chain secured to the drum and adapted to engage the doors of the ovens, a series of drum-actuating devices, as eyes g, arranged at intervals along the top of the ovens, a motor arranged to actuate said devices, and a chain wound on the drum and connectible at will with the individual members of the series of drum-actuating devices.

2. In combination with a series of coke-ovens arranged side by side in a group, a movable hoisting-drum adjustable along and above the ovens, a hoisting-chain secured to the drum and adapted to engage the doors of the ovens, a longitudinally-movable device, as chain f, running parallel to the line in which the drum is adjusted, means for moving said device and a chain for actuating the drum secured thereto and attachable also to the longitudinally-movable device aforesaid.

3. In combination with a series of coke-ovens arranged side by side in a group, a track supported above the ovens, a truck movable along said track above the oven ends, a rotatable drum supported on said truck, a chain secured to said drum and adapted to engage the oven-doors, a longitudinally-movable device, as chain f, lying parallel to the track, means for moving said device and a chain wound on the drum and connectible at will with the different points in the longitudinally-movable device aforesaid.

In witness whereof I have hereunto set my hand, in presence of two witnesses, this 5th day of April, 1898.

GUSTAV HILGENSTOCK.

Witnesses:
WILLIAM H. MADDEN,
JOHANN HEBAR.