

No. 757,134.

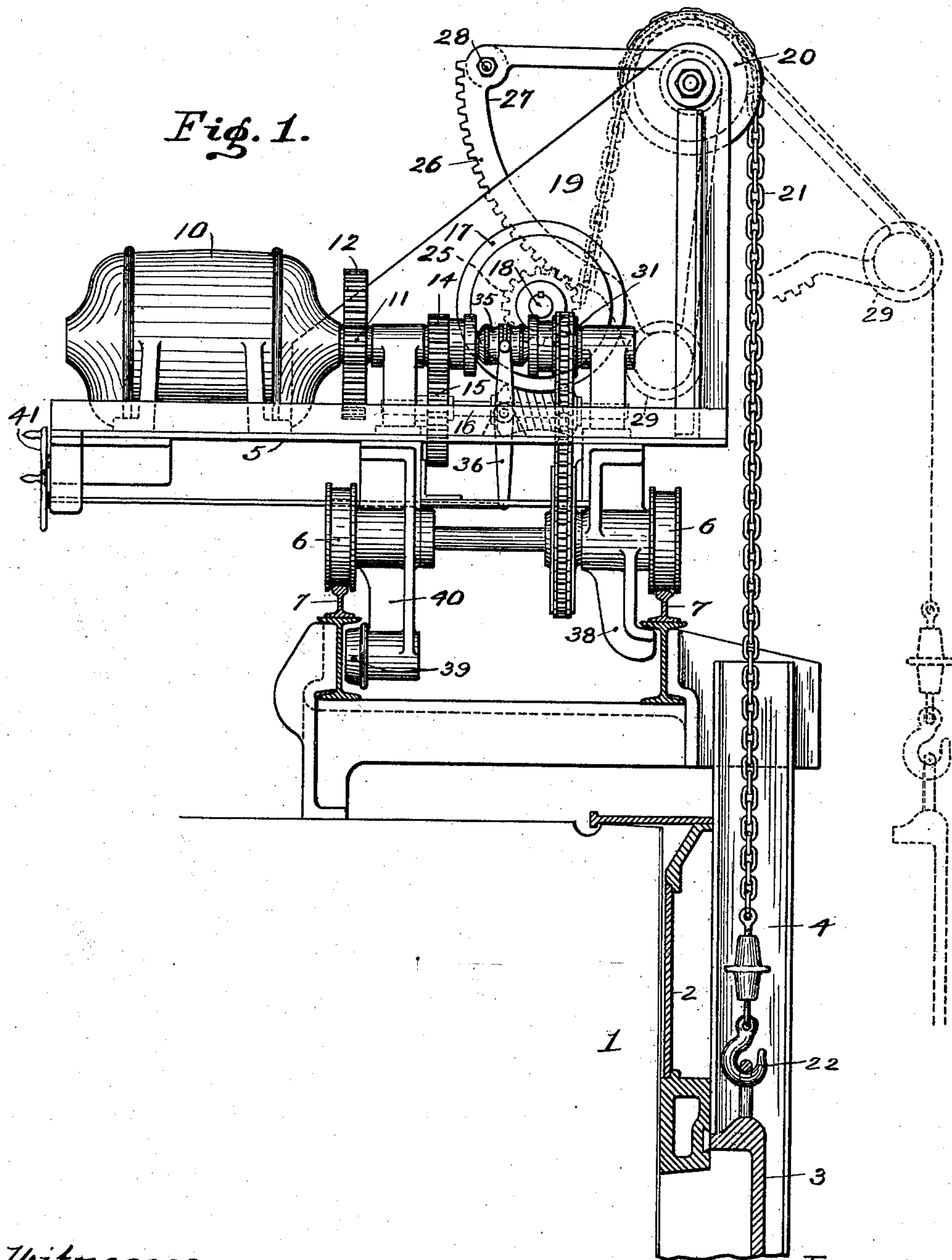
PATENTED APR. 12, 1904.

C. S. MASON.
COKE OVEN DOOR HOIST.

APPLICATION FILED SEPT. 30, 1903.

NO MODEL.

3 SHEETS—SHEET 1.



Witnesses:

Robert C. Fother
J. R. Keller

Inventor:

Clyde S. Mason
By Kay Fother & Winter
Attorneys.

No. 757,134.

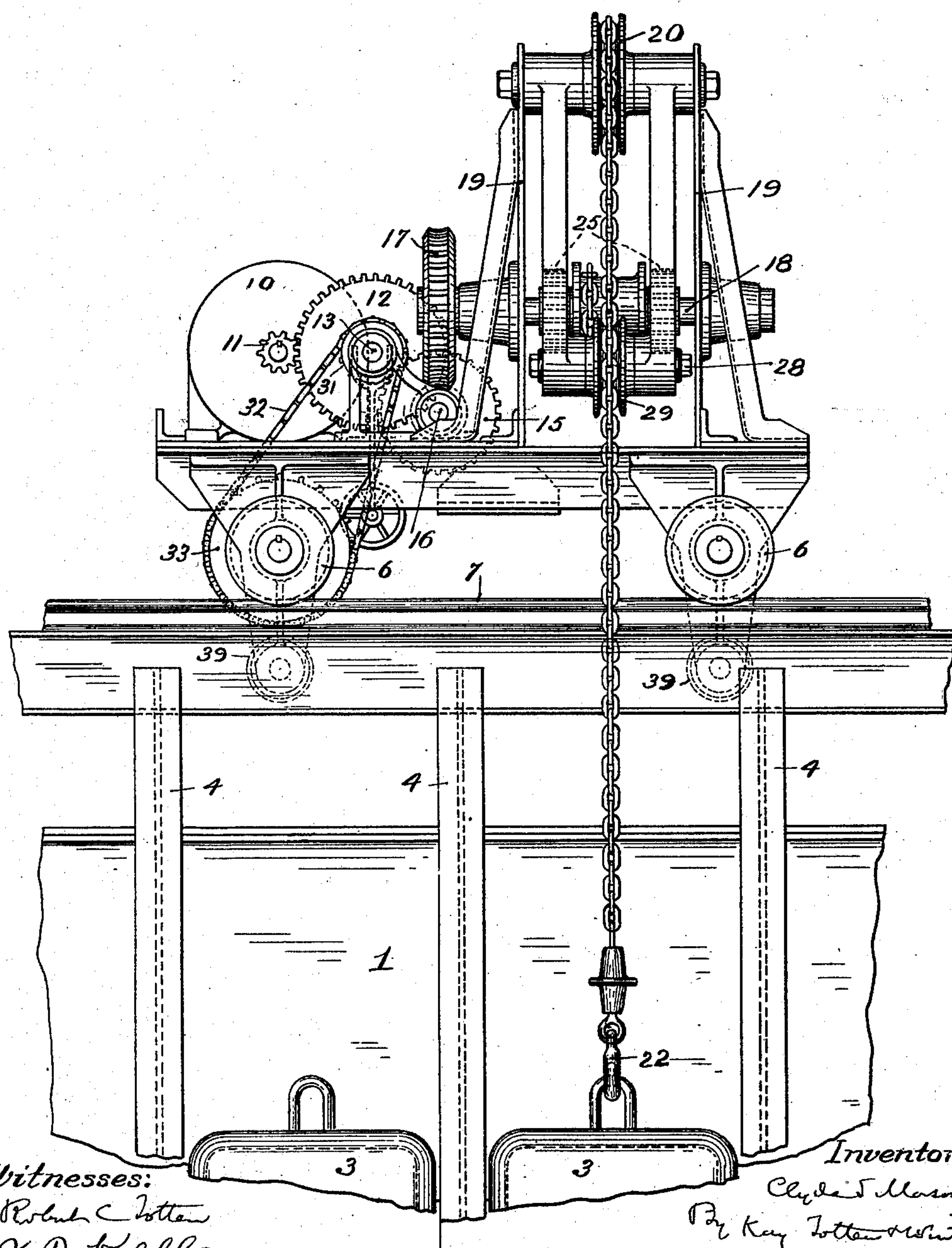
PATENTED APR. 12, 1904.

C. S. MASON.
COKE OVEN DOOR HOIST.
APPLICATION FILED SEPT. 30, 1903.

NO MODEL.

3 SHEETS—SHEET 2.

Fig. 2.



Witnesses:
Robert C. Totten
J. R. Keller

Inventor.
C. S. Mason
By Key Totten & Winter
Attorneys.

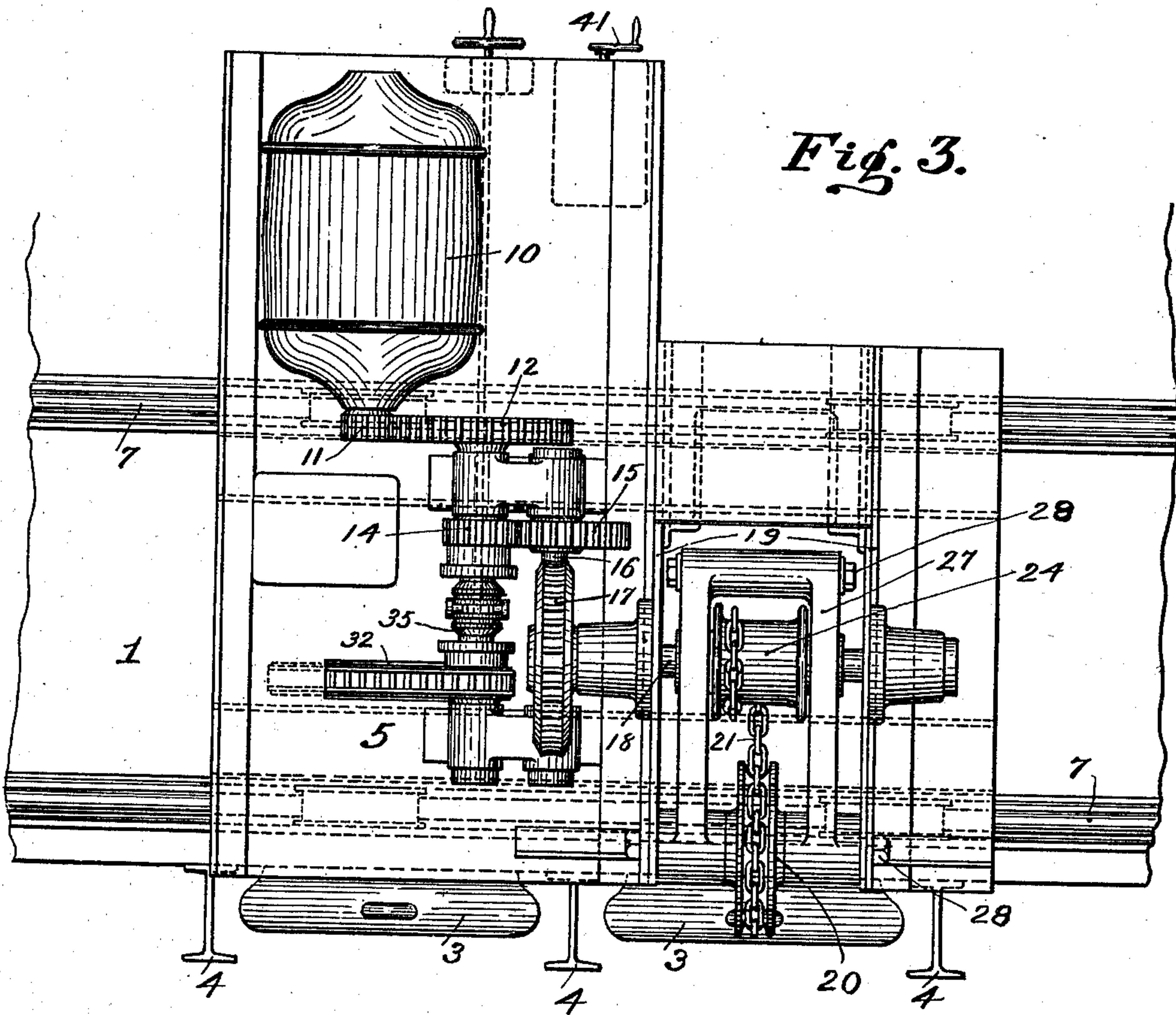
No. 757,134.

PATENTED APR. 12, 1904.

C. S. MASON.
COKE OVEN DOOR HOIST.
APPLICATION FILED SEPT. 30, 1903.

NO MODEL.

3 SHEETS—SHEET 3.



Witnesses:

Robert C. Zotten
J. R. Keller

Inventor:

Clyde S. Mason
By Kay Zotten & Winter
Attorneys.

UNITED STATES PATENT OFFICE.

CLYDE S. MASON, OF BUFFALO, NEW YORK.

COKE-OVEN-DOOR HOIST.

SPECIFICATION forming part of Letters Patent No. 757,134, dated April 12, 1904.

Application filed September 30, 1903. Serial No. 175,212. (No model.)

To all whom it may concern:

Be it known that I, CLYDE S. MASON, a resident of Buffalo, in the county of Erie and State of New York, (whose post-office address is The Alliance, Buffalo, New York,) have invented a new and useful Improvement in Coke-Oven-Door Hoists; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to hoisting mechanism for handling doors of coke-ovens, furnaces, and other similar structures having a door arranged vertically at the end thereof.

The object of my invention is to provide hoisting means for raising such doors and moving the same out of the way while a charge is being removed from the oven or furnace and a fresh charge placed therein.

A further object of the invention is to provide door-hoisting mechanism adapted to be mounted above a battery of ovens and furnaces and arranged to engage and raise the doors of any one of such batteries.

In the accompanying drawings, Figure 1 is a side elevation of my hoisting mechanism, showing the same in place over a coke-oven. Fig. 2 is a front elevation of the same, and Fig. 3 is a plan view of the same.

The coke-oven, furnace, or other structure whose door is to be operated is shown at 1, the same being provided with the usual front wall 2, having therein the door-opening, which is closed by the vertically-arranged door 3.

4 represents the usual buckstays employed with various types of furnaces and coke-ovens, said buckstays being arranged vertically on each side of the door-openings and extending practically to the top of the furnace or oven, as is well known.

My hoisting mechanism comprises a rectangular frame 5, which is mounted upon wheels 6, running on a track 7, laid along the top of a battery of ovens or furnaces. On this carriage is mounted any suitable motor, such as the electric motor 10, although any other kind of motor suitably geared to the hoisting-drum might be employed. The armature-pinion 11 of this motor meshes with a gear 12, fast on a shaft 13. Also secured to the shaft 13

is a pinion 14, which meshes with a gear 15 on a worm-shaft 16. The worm engages a worm-wheel 17 on a shaft 18, mounted in suitable bearings in the base of an upright frame 19, secured to the carriage. In the upper end of the frame 19 is a stud or cross shaft having mounted thereon the guide-sheave 20, over which passes the hoisting-chain 21, whose one end is adapted to be connected to the door of the oven or furnace by any suitable means, such as the hook 22, and whose opposite end is secured to and adapted to be wound on a drum 24, fast on the shaft 18. Also secured to the shaft 18 are a pair of pinions 25, one on each side of the winding-drum 24. These pinions mesh with gear-segments 26, formed on the curved portion of segmental frames 27, which are mounted to oscillate on the cross-shaft in the top of the frame 19. These segmental frames 27 are connected at their angles by cross-bolts 28, and on one of these cross-bolts is mounted the sheave 29, which in the oscillation of the frame is adapted to come into contact with the chain 21 and deflect the same, as shown in Fig. 1, thus carrying the door of the oven or furnace outwardly to clear the buckstays.

The pinion 14 is loose on the shaft 13, and also loosely mounted on said shaft is a sprocket-wheel 31, which is connected by means of a sprocket-chain 32 to a similar wheel 33 on one of the axles of the carriage. Keyed to the shaft 13 between the pinion 14 and sprocket-wheel 31 is a double friction-clutch 35, which may be moved by any suitable means, such as the lever 36, so as to engage either the pinion 14 or the sprocket-wheel 31. By means of this clutch motion may be transmitted from the motor either to the hoisting-drum 24 and oscillating frame 27 or to the carriage-wheels, so as to propel the carriage along the tracks 7.

The carriage is kept from rising or tipping on the tracks by means of an arm 38, projecting under the rail-flange on one side, and a friction-roller 39, secured to a downwardly-projecting arm 40, engaging the rail-flange on the opposite side. Any suitable starting, stopping, and reversing mechanism may be used with the motor 10, this being merely

shown in diagram at 41. The worm and worm-gear between the motor and the winding-drum 24 will prevent the winding-drum from paying out the winding-chain when disconnected from the motor by the shifting of the clutch 35.

In the operation of my device the carriage 5 is propelled along the track 7 by the gearing described until it is over the desired oven or furnace whose door is to be lifted. The hoisting-chain 21 is engaged with a door, and then by means of the clutch 35 the pinion 14 is connected to the shaft 13, when by means of the gearing described motion will be transmitted from the motor to the shaft 18, thus rotating the winding-drum 24 and through the segmental racks oscillating the frame 27. The parts are so arranged that the chain will wind on the drum slightly, so as to raise the door a short distance before the sheave 29 will bear against said chain. Then said chain will be further wound up on the drum and will also be deflected or carried outwardly, as shown in Fig. 1, thus swinging the door away from the oven or furnace and permitting the same to clear the buckstays, so that the carriage can be moved along the track 7 to move the door laterally out of the way while a charge is being removed from the furnace and a fresh charge placed therein, after which the carriage is again moved over the furnace, the movements above described are reversed, and the door lowered down into position.

By means of the mechanism described a door of any one of the battery of ovens or furnaces can be raised and moved out of the way. This mechanism, furthermore, is capable of being used in various relations where it is desired to both raise an object and also move the same outwardly away from the hoisting apparatus.

What I claim is—

1. In mechanism for handling doors of coke-ovens, furnaces and the like, the combination of a carriage arranged to move on ways above the oven or furnace, a chain or cable for engaging the door, a winding-drum on said carriage on which said chain is wound, and mechanism on said carriage operated from said winding-drum and adapted to engage said chain and deflect the same to move the door outwardly.

2. In mechanism for handling doors of coke-ovens, furnaces and the like, the combination of a furnace, a door therefor, overhead ways, a carriage arranged to move on said overhead ways, hoisting mechanism on said carriage comprising a chain or cable arranged to engage the door, a winding-drum on which said cable is wound, an oscillating frame adapted to engage said cable and deflect the same, and mechanism for oscillating said frame.

3. In mechanism for handling doors of coke-ovens, furnaces and the like, the combination of a chain or cable for engaging the door, of

a winding-drum on which said chain is wound, and mechanism operated from said winding-drum and arranged to engage said chain and deflect the same to move the door outwardly.

4. In mechanism for handling doors of coke-ovens, furnaces and the like, the combination of a chain or cable adapted to engage the door, a winding-drum on which said chain is wound, an oscillating frame arranged to engage said chain and deflect the same to move the door outwardly, and actuating mechanism common to both said drum and said oscillating frame.

5. In mechanism for handling doors of coke-ovens, furnaces and the like, the combination of a chain or cable for engaging the door, a guiding-sheave over which said chain passes, a winding-drum to which said chain is connected, and an oscillating frame driven from said winding-drum and arranged to engage said chain.

6. In mechanism for handling doors of coke-ovens, furnaces and the like, the combination of a chain or cable for engaging the doors, a guide-sheave over which said chain passes, a hoisting-drum on which said chain is wound, an oscillating frame arranged to engage said chain and deflect the same, gear-segments on said oscillating frame, and gearing for rotating said winding-drum and engaging said segments to oscillate said frame.

7. In mechanism for handling doors of coke-ovens, furnaces and the like, the combination of a carriage moving on ways over the oven or furnace, a winding-drum on said carriage, a chain or cable wound on said drum and arranged to engage the door, mechanism operated from said drum and arranged to engage said chain and deflect the same to move the door outwardly, and a motor on said carriage and geared to said drum.

8. In mechanism for handling doors of coke-ovens, furnaces and the like, the combination of a carriage arranged to move on overhead ways, a hoisting-drum on said carriage, an oscillating frame, gearing on said carriage for rotating said drum and oscillating said frame, and a door-engaging chain arranged to be wound on said drum and deflected by said oscillating frame.

9. In apparatus for handling doors of coke-ovens, furnaces and the like, the combination of a carriage arranged to travel on overhead tracks, a chain arranged to engage the door, a support to which said chain is secured, an oscillating frame on the carriage arranged to engage the chain and deflect the same, and gearing for oscillating said support.

10. In mechanism for handling doors of coke-ovens, furnaces and the like, the combination of a frame, a winding-drum mounted in said frame, a chain or cable passing therefrom and arranged to engage the door, mechanism operated from said drum and arranged to engage said chain and deflect the same to

move the door outwardly, a motor, a worm driven by said motor, and a worm-gear engaging said worm and connected to said drum.

11. In mechanism for handling doors of coke-ovens, furnaces and the like, the combination of a carriage arranged to move on overhead tracks, a winding-drum on said carriage, a chain secured to said drum, mechanism operated from said drum and arranged to engage said chain and deflect the same to move the door outwardly, a motor also mounted on said carriage, gearing between said motor and winding-drum including a worm and worm-wheel, gearing between said motor and the carriage-wheels, and clutch mechanism arranged to connect the motor to either of said trains of gearing.

12. Mechanism for handling the doors of coke-ovens, furnaces and the like, the combination of an upright frame, a guide-sheave mounted in the upper end thereof, an oscillating frame also mounted in the upper end thereof, a winding-drum mounted below said guide-

sheave, a chain passing over said guide-sheave and secured to the winding-drum, a motor, and mechanism driven from said motor and arranged to operate both said winding-drum and said oscillating frame.

13. Mechanism for handling the doors of coke-ovens, furnaces and the like, comprising an upright frame, a guide-sheave mounted in the upper end thereof, an oscillating frame mounted in the upper end of said frame and provided with a segmental gear or rack, a winding-drum mounted below said guide-sheave, a gear rotating with said winding-drum and arranged to engage said segmental gear or rack, a chain or cable passing over the guide-sheave and secured to said drum, and mechanism for rotating said drum.

In testimony whereof I, the said CLYDE S. MASON, have hereunto set my hand.

CLYDE S. MASON.

Witnesses:

H. B. SEARS,

GEO. D. MACDOUGALL.