(No Model.) 3 Sheets—Sheet 1.

J. H. WHITING.

FOUNDRY PLANT.

No. 314,768. Patented Mar. 31, 1885.

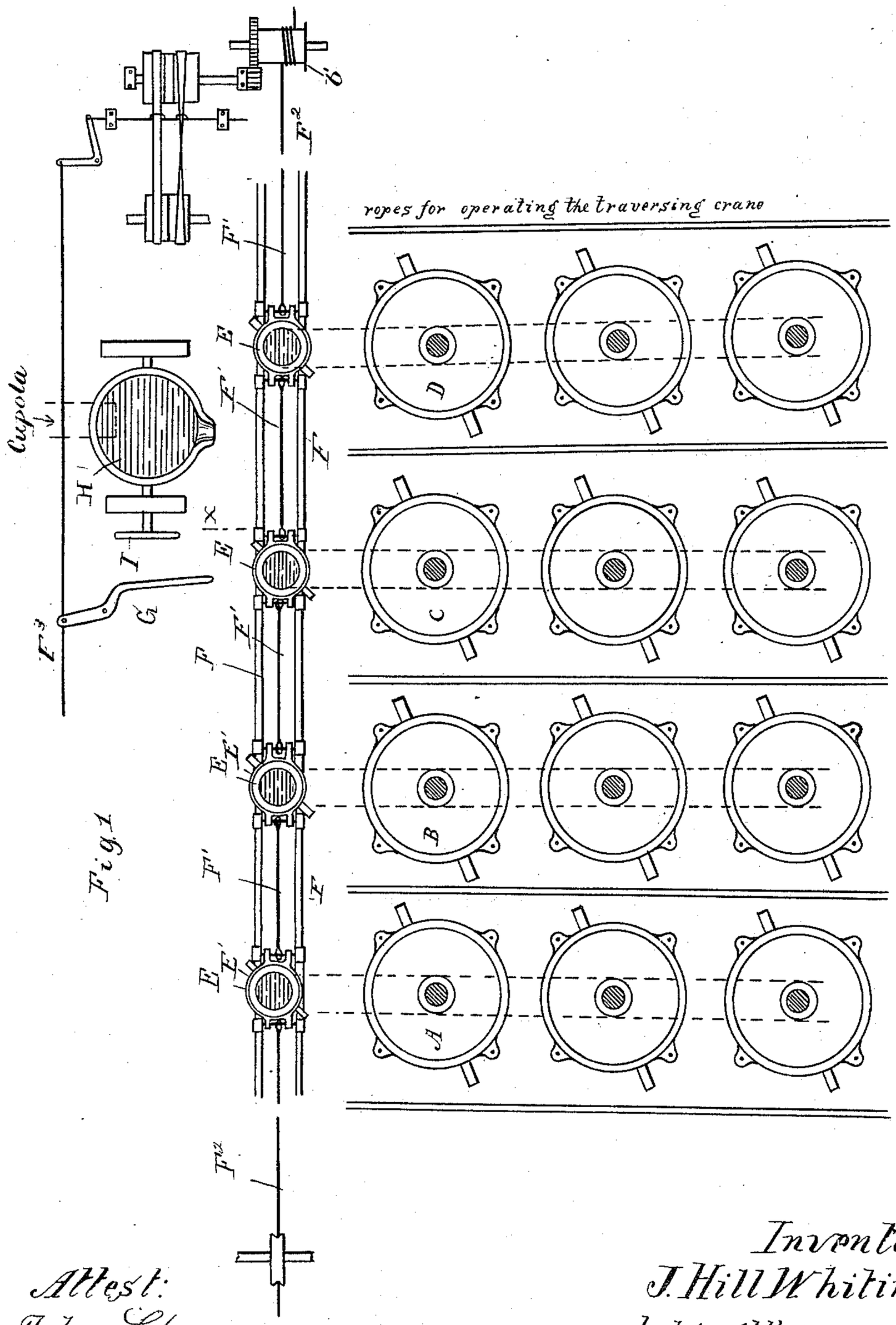

Fig. 1.

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(No Model.)

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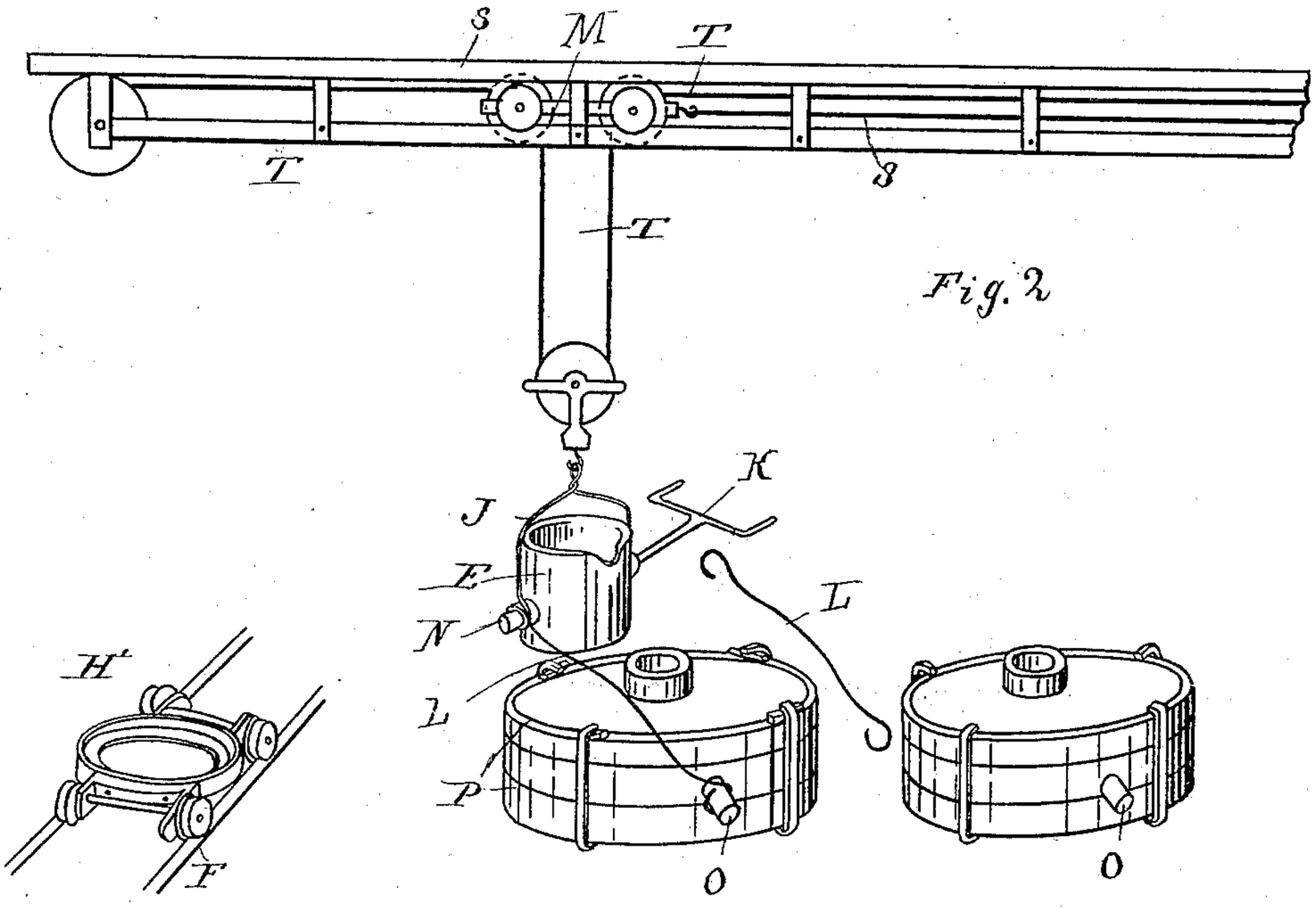


Fig. 2

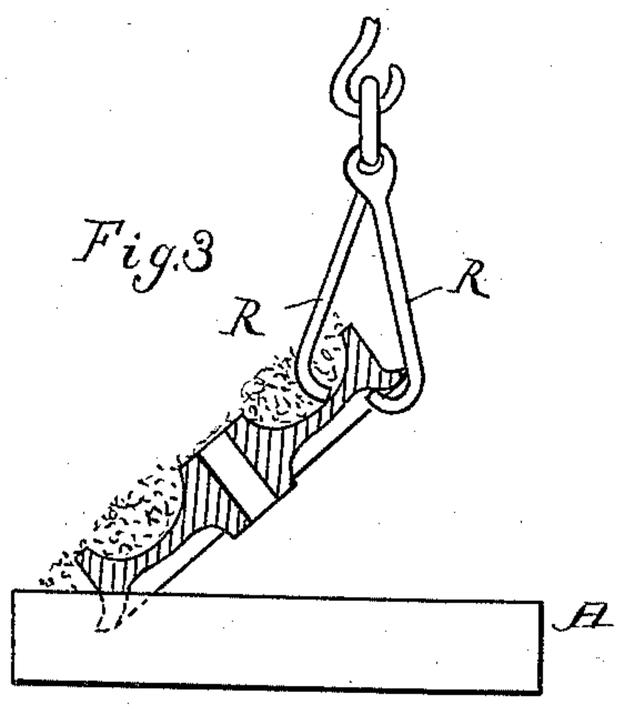
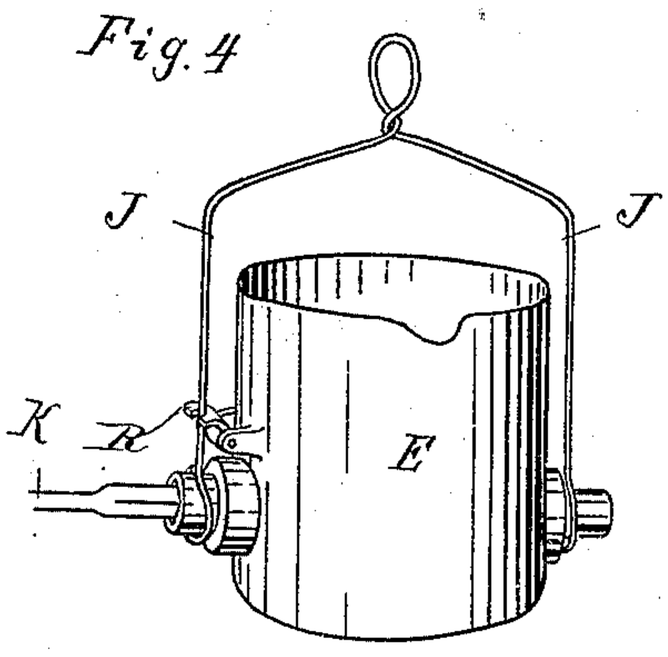


Fig. 3

Fig. 4



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J. H. WHITING.

FOUNDRY PLANT.

No. 314,768.

Patented Mar. 31, 1885.

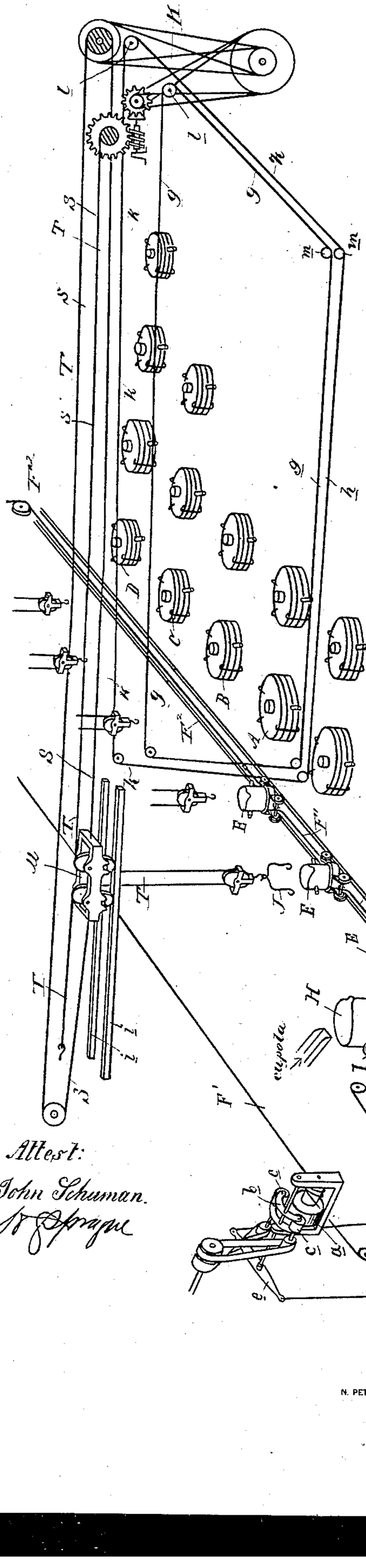

Fig. 5

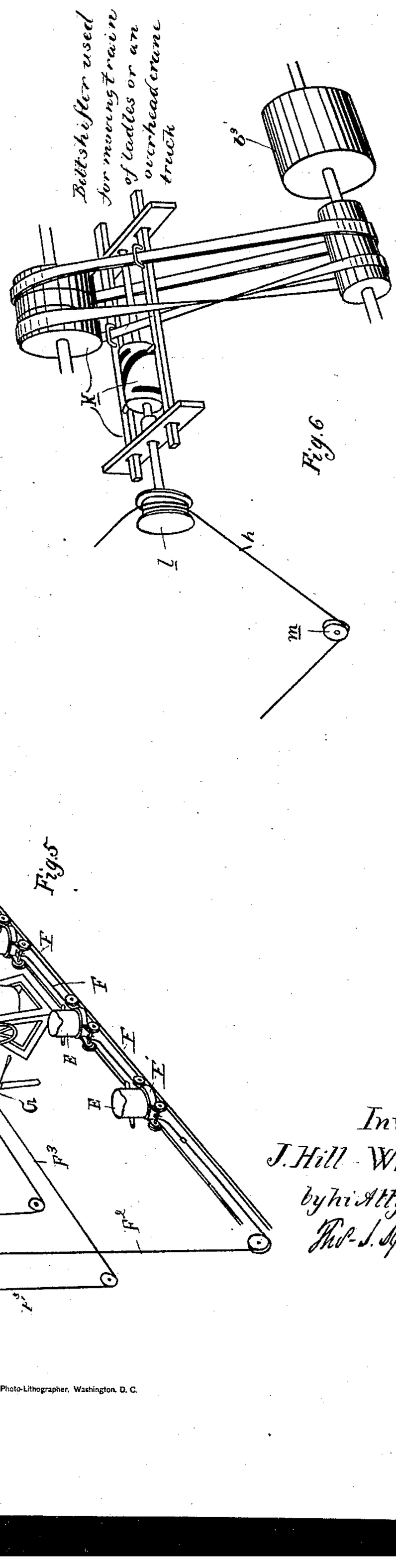

Fig. 6

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UNITED STATES PATENT OFFICE.

J. HILL WHITING, OF DETROIT, MICHIGAN.

FOUNDRY-PLANT.

SPECIFICATION forming part of Letters Patent No. 314,768, dated March 31, 1885.

Application filed September 24, 1884. (No model.)

To all whom it may concern:

Be it known that I, J. HILL WHITING, of Detroit, in the county of Wayne and State of Michigan, have invented new and useful Improvements in Foundry-Plant; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to an improvement in foundry-plant designed for the use of such foundries which make a specialty of heavy casting in large quantities, such as car-wheel foundries.

The object of the invention is to dispense with the help of such unskilled labor as is now employed to assist the molders in performing the work of casting proper.

The invention consists in the peculiar combinations and the construction and arrangements of parts, hereinafter more fully described and claimed.

In the drawings which accompany this specification, Figure 1 is a plan of my improved foundry-plant. Fig. 2 is a perspective view illustrating the manner of pouring. Fig. 3 is a diagram illustrating the removal of the casting from the mold. Fig. 4 is a detached perspective view of the small ladle. Fig. 5 is a perspective view showing the relative arrangements of the different parts of my improved foundry-plant. Fig. 6 is a perspective view showing a belt-shifting device, with devices for maneuvering it from the foundry-floor.

A B C D represent a series of car-wheel molds arranged in regular rows, as shown, so that all the molds in each row may have the joint use of an overhead traversing crane, M. In Fig. 5 such an overhead traversing crane for the use of one row of molds is shown, there being as many traversing cranes—each independent from the other—as there are rows of molds.

E are a series of ladles supported upon little trucks E′, and connected together by coupling-rods F′ to form a train, which is adapted to run upon a track, F. The trucks upon which the ladles are supported are spaced the same distances apart as the rows of car-wheel molds, and the track F runs in a direction at right angles, or nearly so, to the rows of car-wheel molds.

F^2 is an endless rope or chain operated by power, by means of which the connected train of ladles may be drawn in either direction along the track F.

G is a lever, by means of which the train of ladles is stopped or started in any direction.

H is the large ladle usually employed as an intermediate receptacle, which receives its charge of molten metal direct from the cupola, and from which the individual charges are poured into the ladles E, the cable-traction being used to bring one ladle after another in proper position for pouring. There are as many of such ladles H as there are cupolas. The ladle H is supported upon trunnions, so as to be easily tipped for pouring into the individual ladles, a hand-wheel, I, or other device allowing the operator who manages the lever G to perform this service at the same time, the lever G being placed for this purpose in close proximity to the big ladle H.

There are many devices known and used for operating a traction-cable in the manner desired for the endless cable F^2, and it is immaterial for the purposes of this invention what kind of device is used for that purpose. All that is essential is that the hand-lever G, which governs the movement of the cable F^2, is placed in proximity to the big ladle H. A suitable arrangement for this purpose can be easily devised by any skilled mechanic. For instance, as in Fig. 5, where the cable-traction devices are arranged overhead, and consist of a friction-wheel, *a*, secured upon the shaft of the cable-drum, and of an oscillating frame, *b*, carrying two friction-pulleys, *c c*, revolving in opposite directions, the frame *b* can be oscillated in its stationary bearings by the lever *e*, to the ends of which the starting-rope F^3 is secured and brought down around suitably-arranged rope-pulleys and connected to the lever G. By turning the lever G in one direction or in the opposite, one of the two friction-pulleys *c c* is brought in frictional contact with the friction-wheel *a*, and the train of ladles will start in one direction or in the opposite, according as the friction-pulley *c*, driven by the crossed belt, or that driven by the uncrossed belt, is brought

into contact with the friction-wheel *a*. If the cable-traction is of the kind driven by belts, with a sliding belt-shifter, as shown in Fig. 1, a starting-rope, F^3, similar to the rope F^3, Fig. 5, is arranged to maneuver the belt-shifter by means of the lever G, which oscillates the rock-lever shown and reciprocates the belt-shifter so that both are on the loose pulleys, that the endless belt be unmoved; or so that the uncrossed belt is on a loose pulley and the crossed belt on a fixed pulley, or the reverse, so that the endless belt and train may be moved in either direction by the proper motion of the gearing and drum.

In Fig. 6 is shown how a rotary belt-shifter may be maneuvered in a similar manner. Its wheel is provided with grooves in which work the pins of the belt-shifter proper. It is also immaterial for the purpose of my invention what kind of overhead traversing cranes are used. All that is essential in connection therewith is that an independent traversing crane is provided for each row of molds, with suitable ropes or cables, *g h*, for maneuvering it. These ropes have to run in proximity to the foundry-floor and to the row of molds to which the crane belongs. How such ropes can easily be arranged has been shown heretofore in connection with the cable-traction for operating the train of ladles. It is also indicated in Fig. 5, in connection with the traversing crane M, shown therein. This traversing crane M is of well-known construction and operation, S being the cable for traversing the truck upon the parallels ways *i i*, and T being the hoisting-cable. Each of these cables S T is operated by a cable-drum, to which motion is given by means of suitable belts and pulleys, the belts being controlled by belt-shifters *k* of the kind shown in Fig. 6. To each of these belt-shifters a cable-pulley, *l*, is attached for maneuvering it by means of endless ropes *g h*, the lower stretch of which passes in proximity to the foundry-floor and to the row of molds for which the crane is used.

In practice the operator placed in charge of the train of ladles operates the lever G so as to bring each ladle successively in proper position to pour the required charge of molten metal into it. When he has thus charged the required number of ladles, he brings his train into the proper position to have the ladles in line with the rows of molds in which the pouring is to be done. The molders now take charge of the ladles, and, by placing the bail J over the trunnions and hooking it onto the traversing crane, lift them off their trucks and direct each ladle to the place required, the molders using the cables *g h* to direct the movement of the traversing crane. To prevent any accidental spilling of metal, each ladle is provided with a pivoted dog, R, which is engaged upon the bail J, as shown. As soon as a ladle is in position for pouring, one molder places the brace-rod L in position, as shown in Fig. 2. This brace-rod has an eye at each end, one of which is slipped over the free trunnion N of the ladle, while the other is put over one of the trunnions O, with which the iron chill is provided, to allow of its being handled by the crane. The pouring can now be performed by one man alone, instead of, as heretofore, by two men operating the ladle with handles E inserted into both trunnions.

The placing of the brace-rod L in position can be performed by the man required to operate the stirring-rod.

To take the car-wheel out of the mold after casting, the cope P is lifted up, leaving the sand on top of the wheel. Heretofore this sand was removed by manual labor before the car-wheel was lifted out of position by the crane to be conveyed to the cooling-pit. I dispense with this manual labor of cleaning off the sand by the use of a different mode of hoisting the wheel.

Instead of lifting the wheel up (as is now done) in the same manner as it lies in the mold, I use a grappling-hook, constructed as shown in Fig. 3, having only two legs, R, instead of three, as heretofore. One leg of the grappling-hook I insert on the under side of the wheel as it lies in the mold, so that in starting the crane this leg will catch with its hook on the rim of the wheel and raise it gradually up into a standing position, thus allowing the sand to fall off by its own gravity. As soon as the wheel is in a standing position, the hook of the other leg also catches on the rim of the wheel and allows of lifting the wheel off the ground and conveying it to the cooling-pit. Thus it will be seen that by the use of my improved plant all such manual labor necessitating heretofore the employment of additional though unskilled labor is entirely done away with, leaving only such work to be performed as is incidental to the use of machinery, and which may be in this case exclusively performed by the two molders themselves who usually are working upon a mold.

What I claim as my invention is—

1. In a foundry-plant for the purposes described, a series of trucks connected together the same distance apart as the rows of molds, and operated by chain, cable, or other equivalent device in a direction transverse to the row of molds, substantially as and for the purpose described.

2. In a foundry-plant for the purposes described, a train of trucks operated by power in a direction transverse to the rows of molds, and adapted to support the ladles the same distances apart as the rows of molds, in combination with a chain or cable, a starting-rope, a belt-shifting device, and the starting-lever G and big ladle H, placed in proximity to each other, substantially as and for the purposes described.

3. In a foundry-plant for the purposes described, the combination of the following devices: a train of trucks supporting the ladles and registering with the rows of molds, a chain,

cable, or equivalent device for carrying the train of trucks, with their ladles, from and to the supply-ladle and transverse to the rows of molds, and a series of overhead traversing cranes, one for each row of molds, all arranged and operating substantially as described.

4. In a foundry-plant for the purposes described, the combination of a suspended ladle with the brace-rod L, provided with hooks or eyes at each end, slipped over trunnions on the ladle and the mold, respectively, whereby the ladle in pouring is held and steadied in its relative position toward the mold while pouring, substantially as described.

5. In a foundry-plant for the purposes described, the combination of a series of molds arranged in parallel rows, a series of independent overhead traversing cranes, a belt-shifting device, and the cables *g h*, arranged in proximity to the rows of molds and connected with said belt-shifting device, substantially as and for the purpose specified.

J. HILL WHITING.

Witnesses:
H. S. SPRAGUE,
E. SCULLY.