

No. 660,824.

J. B. FAULKNER, Dec'd.

Patented Oct. 30, 1900.

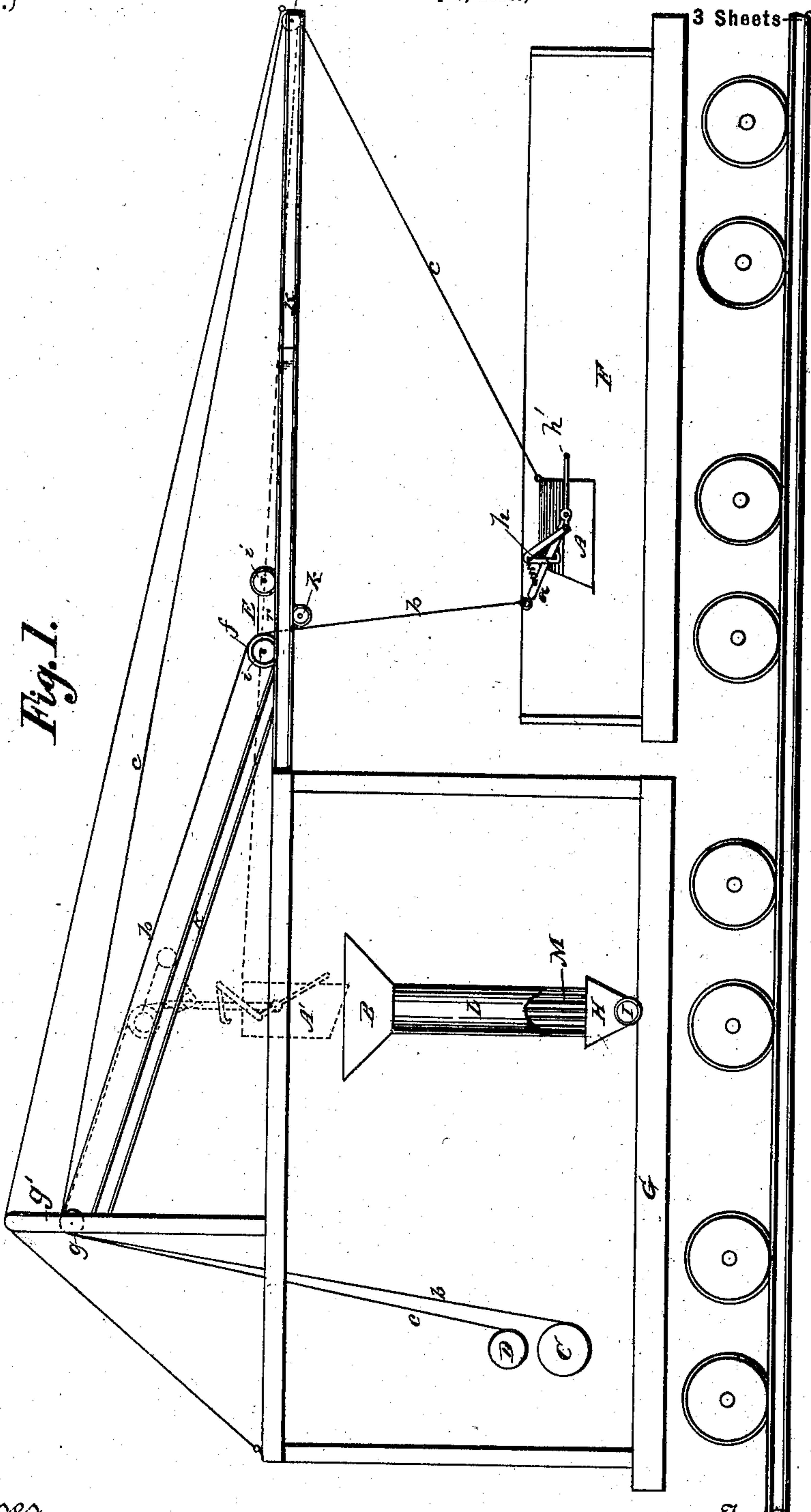
G. SNYDER, Administrator.

MACHINE FOR COALING OR SLACKING BALLAST KILNS PREPARATORY TO BURNING.

(No Model.)

(Application filed July 7, 1899.)

3 Sheets—Sheet 1.



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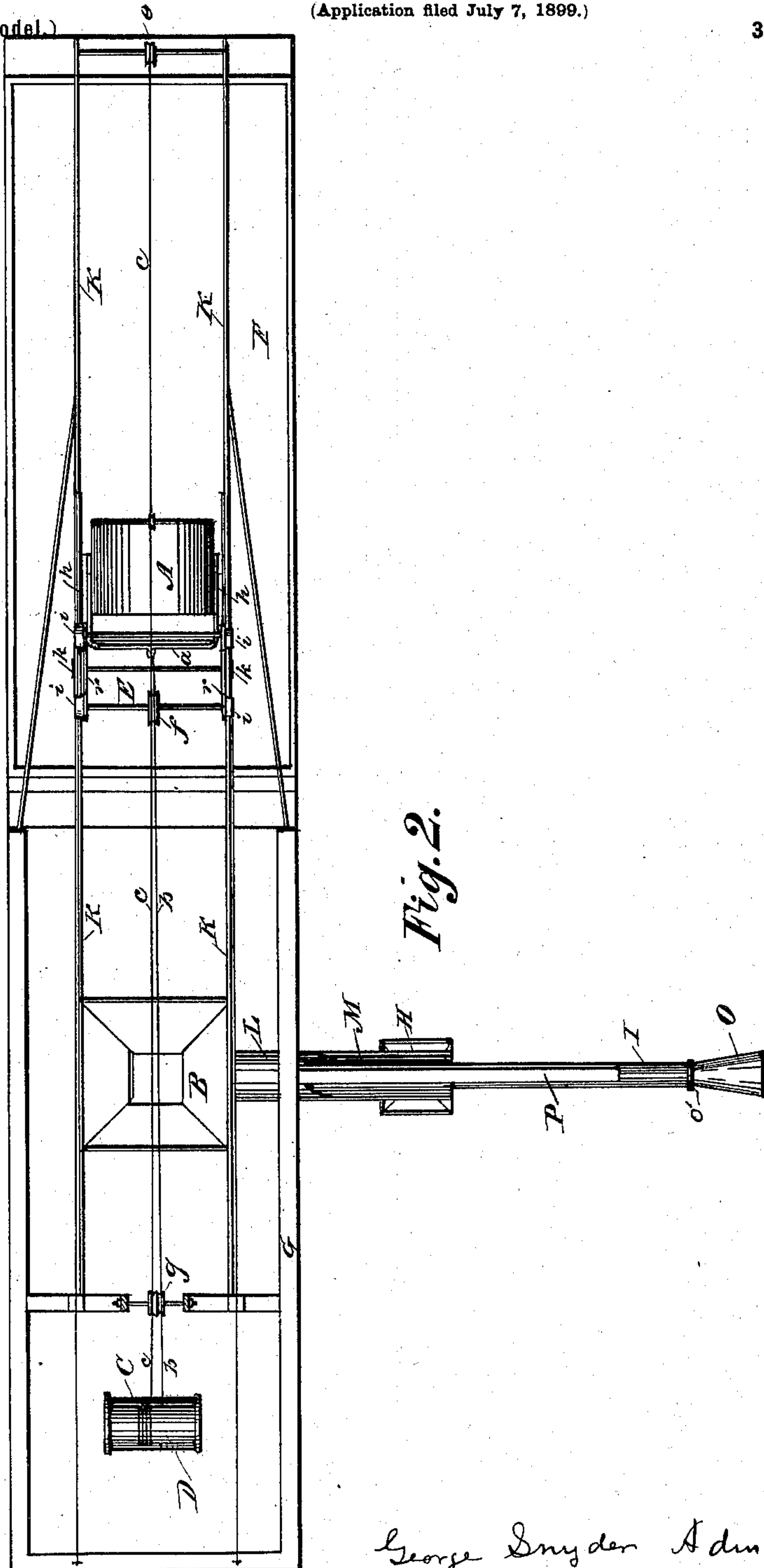


Fig. 2.

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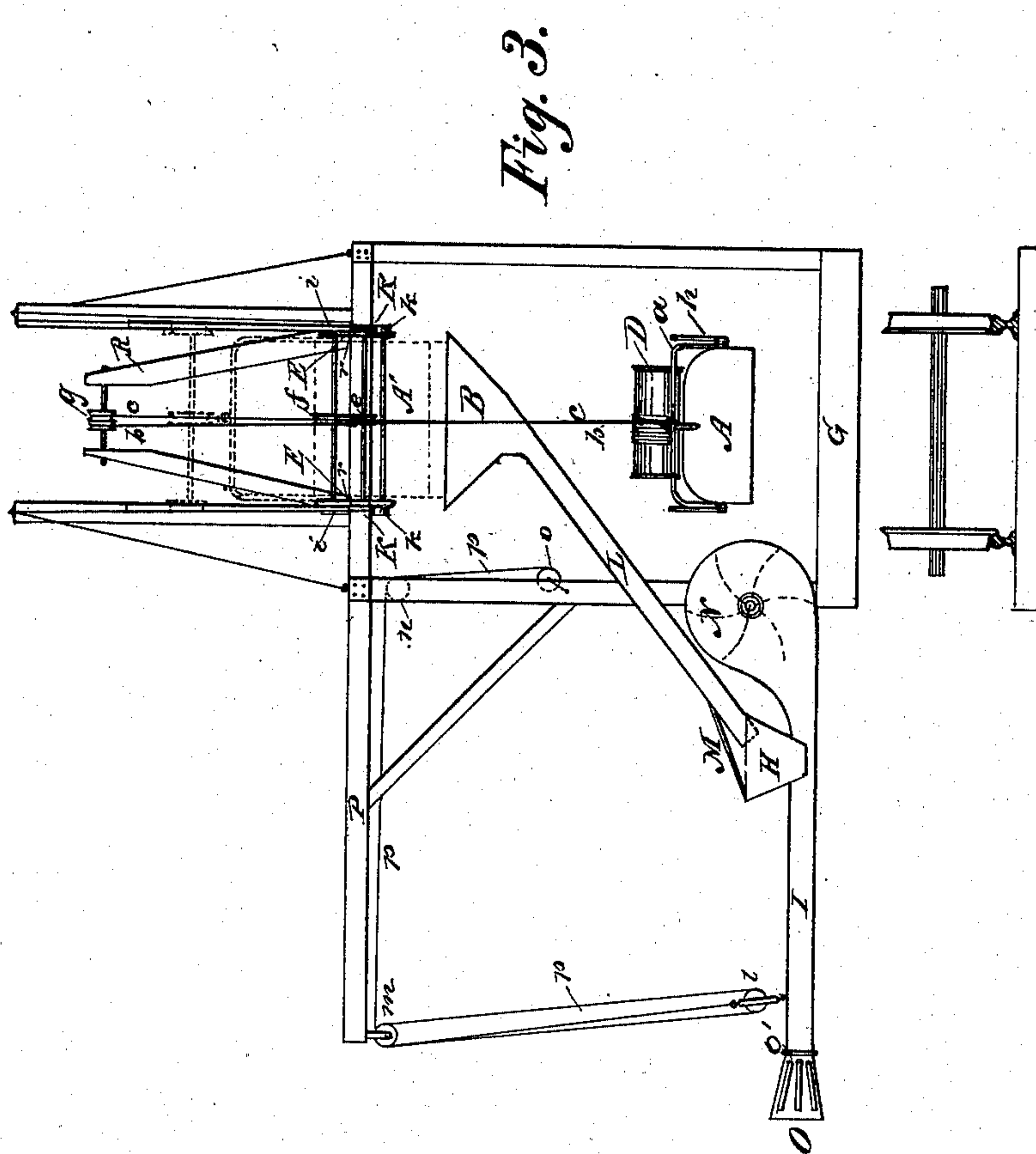
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**3 Sheets—Sheet 3.**

*Fig. 3.*



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# UNITED STATES PATENT OFFICE.

GEORGE SNYDER, OF MOUNT PLEASANT, IOWA, ADMINISTRATOR OF  
JOHN B. FAULKNER, DECEASED.

MACHINE FOR COALING OR SLACKING BALLAST-KILNS PREPARATORY TO BURNING.

SPECIFICATION forming part of Letters Patent No. 660,824, dated October 30, 1900.

Application filed July 7, 1899. Serial No. 723,054. (No model.)

*To all whom it may concern:*

Be it known that JOHN B. FAULKNER, deceased, late a citizen of the United States, and a resident of Mount Pleasant, in the county of Henry and State of Iowa, did in his lifetime invent a certain new and useful improvement in machines for delivering coal or slack upon ballast-kilns as they are being prepared for burning and as they are burning, and thus dispense with the common and usual method of coaling such kilns by hand; and the following is declared to be a full, clear, and exact description of the invention, such as to enable any person skilled in the art of burning clay ballast to construct and use the same.

In the construction and erection of clay-ballast kilns for the production of burnt-clay ballast it has been and now is the usual practice to deliver the coal and slack upon the kiln by hand at great expense, either by first unloading it from coal-cars upon the ground by hand, and thence shoveling it upon the kiln, or by first unloading it upon the ground and allowing it to become intermixed with the clay and then delivering it upon the kiln by the action of a conveying elevator or scoop. One method used is to deliver the coal into a hopper which feeds it into an elevator, and which thence delivers it upon a platform immediately over the breast of the kiln, whence it is thrown upon the kiln by hand labor.

To overcome the great expense of coaling a kiln by hand and at the same time to insure a perfect and even distribution of the coal upon the kiln is the object of the invention, to fully understand which a brief description of the art of burning clay ballast will here be proper.

Selecting a suitable place—that is, one where there is suitable clay or gumbo—for the purpose, the operator builds upon the surface of the ground an initial or core fire the desired length of material to insure a strong heat, generally of old railway ties or timbers. Then by hand a light covering of clay is placed upon the kiln from an excavation or trench running along the face of the kiln. Then coal having been previously unloaded into this trench, it is then thrown by hand upon the face of the kiln above the ditch or trench. This is called “slacking” the

kiln. This operation is performed by hand, as before, until a ballast-excavating machine may be operated upon a railway-track running parallel with the face of the kiln, when the coal having been first unloaded upon the ground in the pathway of the excavating plow or scoop by hand is mixed with the excavated clay and so intermingled is carried upon the kiln by the conveyer, which carries and deposits thereon the clay or excavated material, and this operation being repeated continuously the kiln is constructed and contains when constructed a mass of clay, coal, and slack more or less intermingled, and being above and away from the initial fire it is expected that this fire from below will successively ignite the additional layers of coal and clay as they are from time to time added.

With this brief description of the art of burning clay ballast some of the many defects which exist in every kiln when it is coaled by hand will now be pointed out and how these defects by the use of this invention may be avoided.

The main purpose in the preparation of clay ballast is to insure a product of calcined clay thoroughly and evenly burned throughout the kiln and to produce this result at a minimum of expense.

The defects of coaling a kiln by hand are, first, the amount of coal distributed by hand must necessarily vary, according to circumstances. Its location upon the kiln also varies, according to the judgment of the men engaged in doing this most important work. If the coal is unevenly distributed, an unequal fire must necessarily result. If the fire is unequal, there must of necessity also be an inequality of the ballast product. To detect at the time and while the work is in progress whether or not the coal is being distributed evenly upon the kiln is oftentimes of the greatest difficulty, as it is dependent upon so many circumstances, and the coal distributed upon the kiln being quickly covered by the next and succeeding deposits of clay is at once hidden from the operator, however careful he may be, and if the coal is deposited upon the ground first by hand and then intermingled with the clay by the operation of the excavating-machine its even admixture



and distribution is but a matter of loose conjecture and the degree or evenness of the admixture cannot be really known until the kiln is burned out and opened, when, if there has been any uneven or unequal admixture of the coal and clay, it may be then seen in the inferior ballast product. The defect in the admixture cannot then of course be remedied, the loss to the operator being complete. Again, if from any cause it becomes necessary, as it frequently does, to reslack or recoal the kiln during the progress of the work it is practically impossible without great expense to do this by hand, as the condition of the kiln at the place where the coal is required is beyond remedy and reach of the operator attempting to coal by hand. There is, it is believed, not now in existence any practical method or way of recoaling a kiln of ballast by hand without great and unnecessary expense. Therefore in practice as the art is worked at the present time great quantities of inferior and partially-burned and unevenly-prepared ballast exist in every kiln, and the ballast product at present produced is generally of an unevenly-burned quality and low grade, resulting from the great uncertainty experienced in the coaling of kilns by hand.

To overcome the foregoing and other defects in present processes and methods of burning clay ballast is the object of this invention set forth in the following specification. This object is attained by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side view of the machine and the attached car to be unloaded, omitting the motive power. Fig. 2 is a top view omitting the motive power. Fig. 3 is an end view of the machine, omitting the motive power and slack or coal car.

Similar letters refer to similar parts throughout the several views.

The cars are designated by G and F, the former having mounted upon it a suitable engine to operate the drum C and drum D, the car F carrying the load of coal to be distributed upon the kiln. Extending over the car F are booms K K, suitably braced to support the weight of the loaded scoop A. Adapted and constructed to travel upon booms K K is a trolley E, carrying a grooved sheave *f*, loosely mounted upon an axle midway between the sides of the trolley and the wheels *i i*. A winding and unwinding cable *b*, drawn and released by the winding-drum C, passes upward and over a sheave *g*, and thence over sheave *f*, to where it is connected to the bail *a* of the scoop A. The sheave *k* in a hanger below the trolley E, besides being a guide for the cable *b*, operates in connection with this cable to draw the trolley forward, so that the scoop A may more readily assume its position over the coal-car to be unloaded and in position for reloading.

Spring-latch *h*, with the spur *h'*, is the means to facilitate the unloading and dumping of the scoop-load into the hopper B. A cable *c*, attached to the upper rear end of the scoop A, thence passing upward over sheave *e*, mounted upon a shaft between the parallel booms K K, thence backward over a loosely-mounted double-grooved pulley *g*, and thence to the winding-drum D, constitutes the means whereby the scoop A is drawn backward into position for reloading after it has emptied its load into hopper B. To facilitate the downward and backward movement of the scoop and its speedier return to a position immediately over the coal-car, booms K K are inclined upward and away from the hopper and are secured to upright posts *g' g'*. Between the posts *g' g'* a frame, with bearings in its upper ends, supports the shaft carrying the double-grooved sheave *g*. Over this double-grooved sheave, it will be understood, pass both the cables *b* and *c*, the sheave being in two sections independent of each other. A hopper B, with a slanting discharge-pipe L, having a grating or screen at its lower end, furnishes an outlet from the hopper into the horizontal pipe I, from the latter of which the coal is finally discharged upon the kiln. A receiver H is shown in the drawings; but this may be omitted where the coal is free from lumps and other obstructions likely to choke the discharge-pipe. The screen M at the lower end of the pipe L prevents any large pieces of coal and other materials from obstructing the even flow of the coal from the hopper down and through the discharge-pipe I. The discharge-pipe I is supplied at its outer end with a concave deflector O, which may be readily adjusted or turned upon the end of the discharge-pipe I by means of the collar *o'*.

After the coal has been deposited into the hopper B and thence downward into the discharge-pipe I it comes in contact with an air-blast furnished by means of a blower N. For this purpose a centrifugal blower is preferred; but the invention is not limited to any precise form of blower. In practice it will be an advantage to employ a flexible discharge-pipe, so that the coal may be distributed at any desired angle; but if this be employed the deflector can then be dispensed with. To suspend and adjust the position of the discharge-pipe I, a transverse boom P may be employed, and to facilitate the speedy adjustment of the discharge-pipe I a pulley *l* and cable *p* may be employed to advantage. The cable *p* is wound around a drum *o* within reach of the operator.

The drum-and-clutch mechanism employed to wind and unwind the cables supporting and drawing the scoop A may be of any approved kind in well-known use. The motive power also used to operate the drums and to drive the blower or fan may be connected up to the car by any suitable sprocket-gear or



other mechanism by which the car may be moved upon the track.

The mode of operation of this machine is as follows: Adapted to travel upon a railway-track adjacent and parallel to a clay-ballast kiln in course of construction is a flat-car carrying the motive power and frame supporting the scoop and fan. The booms projecting out longitudinally reach over a loaded coal-car filled with the necessary coal or slack to be distributed upon the kiln. Power being now applied to the drum D by means of cable c, the scoop A is drawn into a position over the coal-car and there dropped with its open face downward into the coal. Power is then applied to the drum C, and by the operation of this mechanism and that of the draft-cable b the scoop is drawn forward, filled, and carried upward toward the trolley E and, coming in contact with the trolley and the cable c being released or loosened, is carried upward, with the trolley, over the inclined booms K K to its dumping position over the hopper B. Cable c is then tightened, cable b is released, and the scoop A turns upon its pivoted bail and discharges its load into the hopper B. The coal from the hopper naturally descends through the pipe L, is screened by the grating M, and flows on into the discharge-pipe I, where it comes in contact with the air-blast supplied by the fan or blower N, and by this means the coal is blown and distributed upon any part of the kiln evenly, as desired by the operator. By means of the deflector O the contents of the hopper as said contents pass out of the end of the discharge-pipe I may be diverted in any desired direction by changing the location of the deflector.

It is to be understood that this invention is not restricted to the particular construction shown and described, since it is obvious that various changes in the construction might be made by one skilled in the art without departing from the spirit of the invention.

Having thus fully described the invention of the late JOHN B. FAULKNER, deceased, what is claimed as the invention, and is desired to be secured by Letters Patent, is—

1. In a coaling apparatus for a ballast-kiln the combination with a pair of booms mounted upon a suitable car of a trolley adapted to travel thereon, a scoop depending from said booms and connected at its forward end with said trolley, a hopper and discharge-pipe carried by said car, and means for causing the trolley to travel along the boom and thereby bring the scoop into a position over the hopper, substantially as described.

2. In a coaling apparatus for ballast-kilns the combination with a pair of booms mounted upon a suitable car of a trolley adapted to travel thereon, a scoop depending from said booms, a pair of cables attached to said scoop, one of said cables passing over a sheave on the trolley and the other passing over a sheave

on the outer end of the booms, a hopper and discharge-pipe carried by said car said discharge-pipe terminating in a deflector, and winding-drums to which said cables are attached, whereby the scoop is first drawn into engagement with the trolley, and, guided and supported by the latter, is drawn to a position over the hopper, substantially as described.

3. In a coaling apparatus for ballast-kilns, the combination with a pair of booms supported upon a suitable car and extending rearwardly thereof so as to be capable of occupying a position over another car loaded with coal or slack of a scoop suspended from the rearwardly-extending portion of said booms, a receiving and discharging device supported on said first-named car, and the means for effecting the travel of said scoop from the loaded car to the receiving and discharging device and back again, substantially as described.

4. In a coaling apparatus for ballast-kilns, the combination with a car of a hopper mounted thereon, a pair of booms supported thereby, a portion of said booms located above the hopper being downwardly inclined and the remaining portion extending horizontally and rearwardly thereof so as to be capable of occupying a position over another car loaded with coal or slack, a trolley adapted to travel on said booms, a scoop suspended from said booms, and supporting-cables attached to said scoop and passing over said trolley and booms to suitable winding-drums, whereby said scoop may be drawn to a discharging position above said hopper, and may then be assisted by gravity in its downward and backward movements, to a position above said coal or slack car, substantially as described.

5. In an apparatus for distributing coal or slack upon kilns, the combination with the car having a suitable supporting-frame of a pair of fixed booms extending rearwardly therefrom, a scoop suspended from said booms, a hopper supported on said car beneath the inner end of said booms, means for bringing said scoop to a discharging position above said hopper and returning it therefrom, a slanting discharge-pipe connected with said hopper, a horizontal discharge-pipe communicating with said slanting discharge-pipe and extending laterally of the car and over the kiln, a blower in said horizontal discharge-pipe in rear of the junction of said slanting and horizontal discharge-pipes, and means for adjusting said horizontal discharge-pipe above the kiln, substantially as described.

6. In an apparatus for distributing coal or slack upon ballast-kilns the combination with a car having a suitable supporting-frame of a pair of booms extending therefrom, a scoop suspended from said booms, a hopper supported upon said car, means for bringing said scoop to a discharging position above said



hopper and returning it therefrom, a slanting discharge-pipe connected with said hopper, a horizontal discharge-pipe extending laterally of the car and over the kiln and having an  
5 adjustable deflector on the outer end, a receiver and screen intermediate said discharge-pipes, a blower in said horizontal discharge-pipe, and means for adjusting the position of

said horizontal discharge-pipe above the kiln, substantially as described.

GEORGE SNYDER,  
*Administrator of the estate of John B. Faulkner, deceased.*

Witnesses:

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