

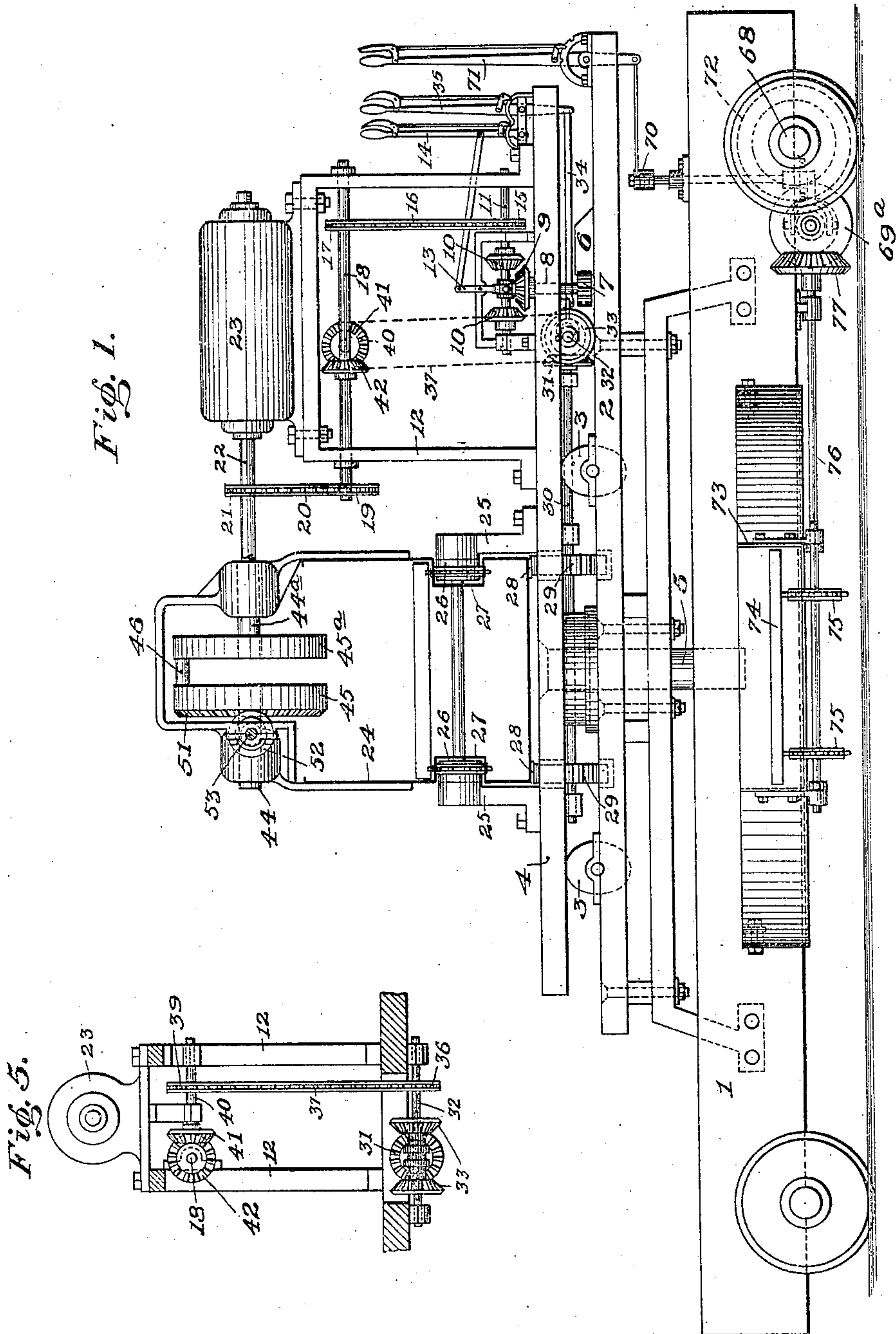
No. 843,568.

PATENTED FEB. 5, 1907.

MCLELLAN F. STUNKARD.
COKE DRAWING MACHINE.

APPLICATION FILED OCT. 29, 1906.

2 SHEETS—SHEET 1.



Witnesses
M. H. Samaris
R. B. Wakefield

Inventor
McClellan F. Stunkard.
by Edward A. Lawrence,
his attorney.

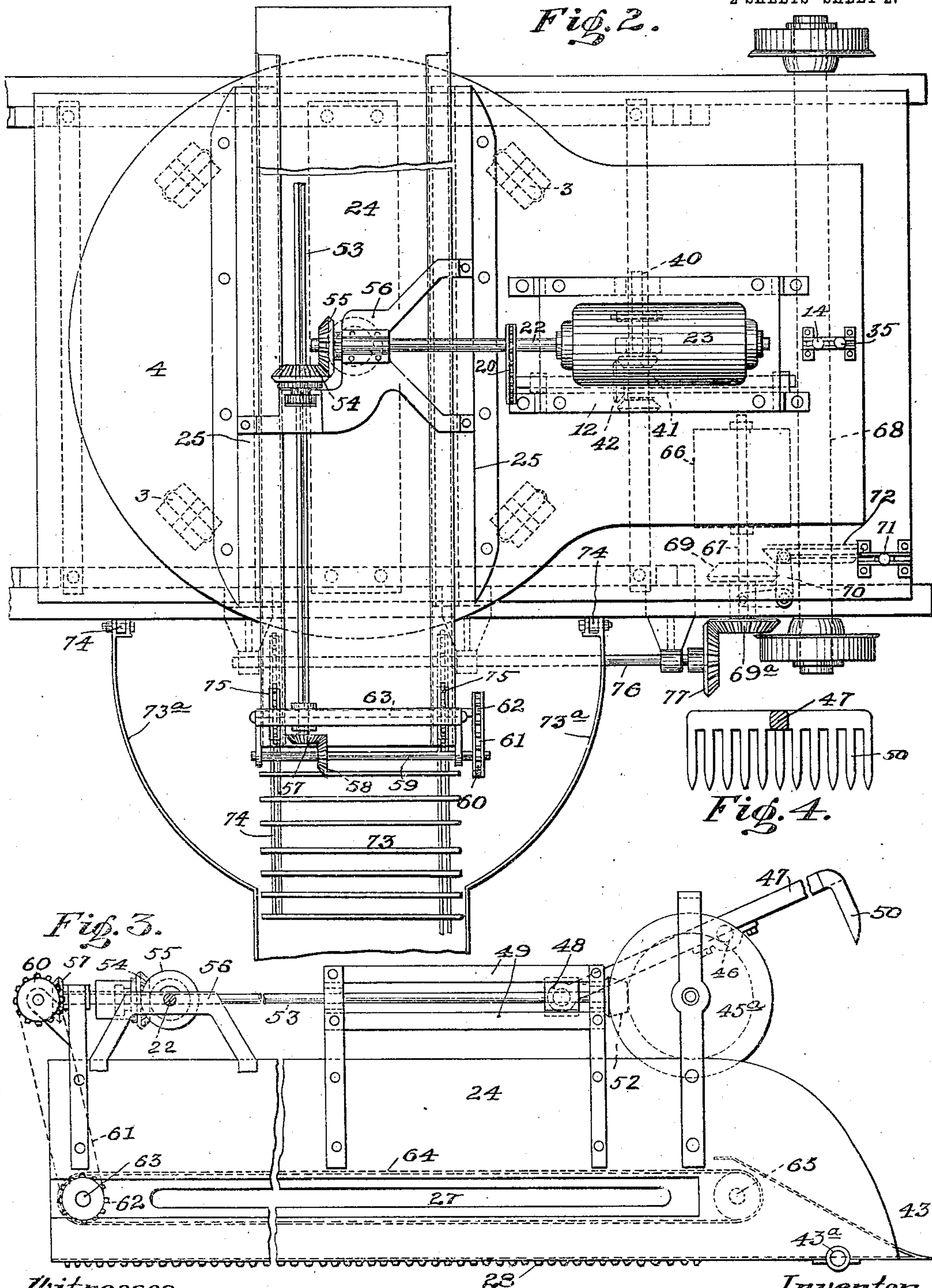
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R. W. Wakefield

Inventor
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his attorney.

UNITED STATES PATENT OFFICE.

McCLELLAN F. STUNKARD, OF FAYETTE COUNTY, PENNSYLVANIA.

COKE-DRAWING MACHINE.

No. 843,568.

Specification of Letters Patent.

Patented Feb. 5, 1907.

Application filed October 29, 1906. Serial No. 341,027.

To all whom it may concern:

Be it known that I, McCLELLAN F. STUNKARD, a citizen of the United States, residing in the county of Fayette and State of Pennsylvania, have invented or discovered new and useful Improvements in Coke-Drawing Machines, of which the following is a specification.

My invention consists of certain new and useful improvements in machines for withdrawing coke or other product from ovens.

The machines now in use are more or less unsatisfactory owing to various reasons, such as their tendency to crush or break the pieces of coke into small particles, their failure to properly clean the oven, their costly and complicated construction, &c.

My machine is simple in construction and of such an adjustable or flexible nature that every portion of the interior of the oven may be reached and the coke removed. *Inter alia*, I have invented a new and improved form of digger or raking member for drawing the coke into the discharge-chute, which digger is capable of a "rotary reciprocating" motion, which renders its action much more effective and prevents the undesirable crushing of the coke. I also show a simple and convenient construction and arrangement of parts, which renders my machine both simple in structure and operation, thus effecting a saving both in first cost and operative expenses.

In the accompanying drawings, Figure 1 is an elevation looking toward the oven, the digger and conveyer mechanism being omitted from the upper chute and the lower chute being cut away near the head for the sake of clearness. Fig. 2 is a plan view of the same, the digger mechanism being omitted. Fig. 3 is a side elevation of the main chute and digger. Fig. 4 is a front view of the digger-blade, and Fig. 5 is a vertical section of the table and frame shown in Fig. 1.

The following is a detailed description of the drawings:

1 is a basic truck adapted to be operated on a track parallel with a line of coke-ovens, and 2 is a platform supported thereby.

3 3 are a series of rollers journaled in platform 2 and disposed annularly, as shown.

4 is a table pivoted on truck 1 by means of central shaft 5 and supported for easy rotation by said rollers 3 3.

6 is a circular or partially-circular track mounted on platform 2 and engaged by cog-

wheel 7, mounted on a vertical shaft 8, journaled in table 4.

9 is a beveled gear rigidly mounted on the upper extremity of shaft 8.

10 10 are twin gears reversely beveled and slidably mounted on and revolving with shaft 11, which shaft is suitably journaled in frame 12, mounted on table 4.

13 is a shifting device of any suitable design controlled by hand-lever 14, so that either gear 10 10 may be thrown into contact with gear 9 as desired.

15 is a sprocket-wheel rigidly mounted on shaft 11 and operatively connected, by means of chain 16, with sprocket-wheel 17, rigidly mounted on shaft 18, which is likewise journaled in frame 12.

19 is a sprocket-wheel rigidly mounted on the extremity of shaft 18 and connected by means of chain 20 with sprocket-wheel 21, rigidly mounted on main shaft 22 of electric motor 23, mounted on frame 12.

It is thus evident that when power is applied to shaft 11 from motor 23 the shaft 8 will be rotated in either direction, according as which gear 10 is thrown into contact with gear 9, thus permitting the table 4 to be rotated in either direction on the basic truck 1.

24 is a chute mounted on table 4 by means of standards 25 25, secured to said table and provided with rollers 26 26, which engage longitudinal grooves or recesses 27 27 in the sides of the chute 24, thus permitting easy longitudinal movement on the part of said chute.

28 28 are toothed racks attached longitudinally to the bottom of chute 24 and engaged by cog-wheel 29 29, rigidly mounted on shaft 30, journaled from table 4. On the extremity of shaft 30 is rigidly mounted a beveled gear 31.

32 is a shaft transversely journaled from table 4 and having mounted thereon to revolve therewith two slidable beveled gears 33 33, either of which may be thrown into engagement with gear 31 by means of shift mechanism 34, controlled by hand-lever 35.

36 is a sprocket-wheel rigidly mounted on shaft 32, which is operatively connected by means of chain 37 to a sprocket-wheel 39, rigidly mounted on shaft 40, mounted in frame 12 parallel with shaft 32.

41 is a beveled gear rigidly mounted on the extremity of shaft 40 and engaging beveled gear 42, rigidly mounted on shaft 18, which, as has been described, is operatively

connected with motor 23. It is thus seen that the shaft 30 is thereby rotated in either direction by the use of shift mechanism 34, thus advancing the chute 24 into a coke-oven or withdrawing the same therefrom, as desired. The extremities of said chute 24 are open, and the front is provided with a relatively sharp-edged incline portion 43, which slips along the floor of the oven underneath the charge of coke. 43^a 43^a represent small wheels or rollers underneath the forward extremity of said chute to assist in its travel along the oven-floor. Journaled in the sides of chute 24 are short shafts 44 44^a, on which are mounted to rotate disks 45 45^a, respectively, connected by wrist-pin 46.

47 is a digger-arm pivoted intermediate of its ends to wrist-pin 46 and at its inner extremity pivoted to cross-head 48, which is mounted on slideways 49 49, carried by chute 24.

The forward extremity of digger-arm 47 is provided with a digger rake or blade 50, which is intended to draw the coke into the chute 24. The disk 45 is provided with an annular beveled toothed ring 51, which is engaged by beveled gear 52. Said gear 52 is rigidly mounted on the forward end of shaft 53, journaled longitudinally from chute 24. Intermediate of its length said shaft is provided with a feathered bevel-gear 54, so mounted that while said gear remains stationary said shaft may be free to move longitudinally with chute 24, which is engageable with beveled gear 55 on main shaft 22 of motor 23. Gear 55 may be slidably mounted on shaft 22, if desired, and any form of shift device (not shown) may be provided for throwing said gear into and out of contact with gear 54.

56 is a frame carried by guides 25 to provide suitable journals for shafts 22 and 53 and to maintain gear 54 in a stationary position at all times.

On the rear extremity of shaft 53 is rigidly mounted beveled gear 57, which meshes with beveled gear 58 on shaft 59, transversely journaled in chute 24.

60 is a sprocket-wheel rigidly mounted on said shaft 59 and connected by chain 61 to sprocket-wheel 62 on shaft 63, journaled transversely in the bottom of chute 24.

64 is an endless conveyer forming the bottom of chute 24 and extending from said shaft 63 to idle shaft 65 in the forward end of chute 24, just at the rear or head of incline 43. It will thus be seen that said conveyer is operated by the motor 23 through the medium of shaft 53, as aforesaid.

66 is a second motor, preferably of a reversible type, mounted in truck 1 and having a main shaft 67 parallel with and adjacent to axle 68 of the truck. On shaft 67 are slidably mounted a pair of reversely-beveled gears 69 69^a. I prefer to equip said gears

with some convenient form of shift mechanism 70, controlled by hand-lever 71.

72 is a beveled gear mounted on axle 68 and adapted to be engaged by gear 69 when the shift device is thrown properly, so that axle 68 is rotated and the truck moved along the track.

73 is a chute attached to truck 1 by any convenient means, such as at 74 74, at the side opposite the coke-ovens. The office of this second chute is to carry the coke discharged from the rear end of chute 24 to the railway-car or storage-place. To allow for the varying angle of chute 24 as table 4 is turned on truck 1, the upper end of chute 73 is enlarged, as at 73^a 73^a. The bottom of said chute is composed of an endless conveyer 74, the upper end of which is engaged by sprocket-wheels 75 75, mounted on shaft 76, journaled from truck 1. Mounted on the end of shaft 76 is beveled gear 77, which is adapted to engage gear 69^a when said last-named gear is shifted into engagement therewith, thus imparting the desired motion to the conveyer 74.

The operation of my machine is as follows: The lever 71 is thrown to bring bevel-gear 69 into engagement with gear 72 on axle 68, and the motor 66 is started in the proper direction to drive the truck 1 along its track until it is located before the oven to be discharged. The motor may now be stopped and the lever 71 thrown to bring the gear 77 into engagement with gear 69^a and the motor started, thus putting in motion the conveyer 74 in chute 73. The motor 23 is now put into operation and the table 4 swung into the proper position before the oven. The chute 24 is now advanced into the oven, the inclined edge 43 sliding along the floor of the oven under the coke, the digger 47 maintaining its rotary reciprocating motion, thus drawing the coke up onto the conveyer 64, which delivers it in turn at the rear to the chute 73, as above described. The chute 24 may be withdrawn and the table 4 rotated slightly to either side, thus allowing the chute to reach all parts of the oven when it is again introduced. By this means the coke may be thoroughly drawn from the oven. After the oven is emptied the chute 24 is withdrawn and the truck moved in front of a full oven.

It is evident from the above that my machine is much simpler than those now in use, and the oven may be more thoroughly and quickly cleaned.

The peculiar action of my improved digger enables me to draw the coke expeditiously without breaking up the pieces into small particles, as is usually the case with machine-drawers.

The arrangement of parts and construction of the mechanism is novel and assures prompt and positive action.

Although I have described minutely the mechanism shown in drawings, I do not limit myself thereto, but claim broadly—

1. In coke-drawing machines, a chute adapted to be introduced into a coke-oven, a digger adapted to draw the coke onto said chute and means for imparting a rotary and sliding motion to said digger.
2. In coke-drawing machines, a chute adapted to be introduced into a coke-oven, a conveyer forming the floor of said chute, a digger adapted to draw the coke onto said conveyer and means for imparting a rotary and sliding motion to said digger.
3. In coke-drawing machines, a chute adapted to be introduced into a coke-oven, an incline forming the front of said chute and adapted to be introduced beneath said coke, a conveyer forming the floor of said chute at the rear of said incline, a digger adapted to draw said coke up said incline and onto said conveyer and means for imparting a rotary and sliding motion to said digger.
4. In coke-drawing machines, a chute adapted to be introduced into a coke-oven, a digger carried by said chute and adapted to draw the coke onto the same, means for imparting a longitudinal sliding motion to said digger and means for imparting a rotary motion to the forward end of said digger.
5. In coke-drawing machines, a truck, a table pivoted on said truck, a chute capable of longitudinal movement mounted on said table, a digger adapted to draw the coke into said chute and a second chute attached to said truck and adapted to receive the discharge from said first chute.

6. In coke-drawing machines, a truck, a table pivoted on said truck, a chute capable of longitudinal movement mounted on said table, a conveyer forming the floor of said chute, a rotary, reciprocating digger mounted on said chute, a motor mounted on said table and operative connection between said motor and said chute, conveyer, digger and table, respectively.

7. In coke-drawing machines, a truck, a table pivoted on said truck, a chute capable of longitudinal movement mounted on said table, a conveyer forming the floor of said chute, a rotary, reciprocating digger mounted on said conveyer, a frame carried by said table, a motor mounted on said frame and means whereby said motor serves to rotate said table, and operate said chute, said conveyer and digger, respectively.

8. In coke-drawing machines, a truck, a table pivoted on said truck, a chute capable of longitudinal movement mounted on said table, a conveyer forming the floor of said chute, a rotary, reciprocating digger mounted on said chute, a motor mounted on said table and adapted to operate said table, said chute, said conveyer and said digger, respectively, a second chute carried by said truck and a motor mounted on said truck and adapted to operate said truck and said second conveyer.

Signed at Pittsburg, Pennsylvania, this 26th day of October, 1906.

McCLELLAN F. STUNKARD.

Witnesses:

J. H. HARRISON,
EDWARD A. LAWRENCE.