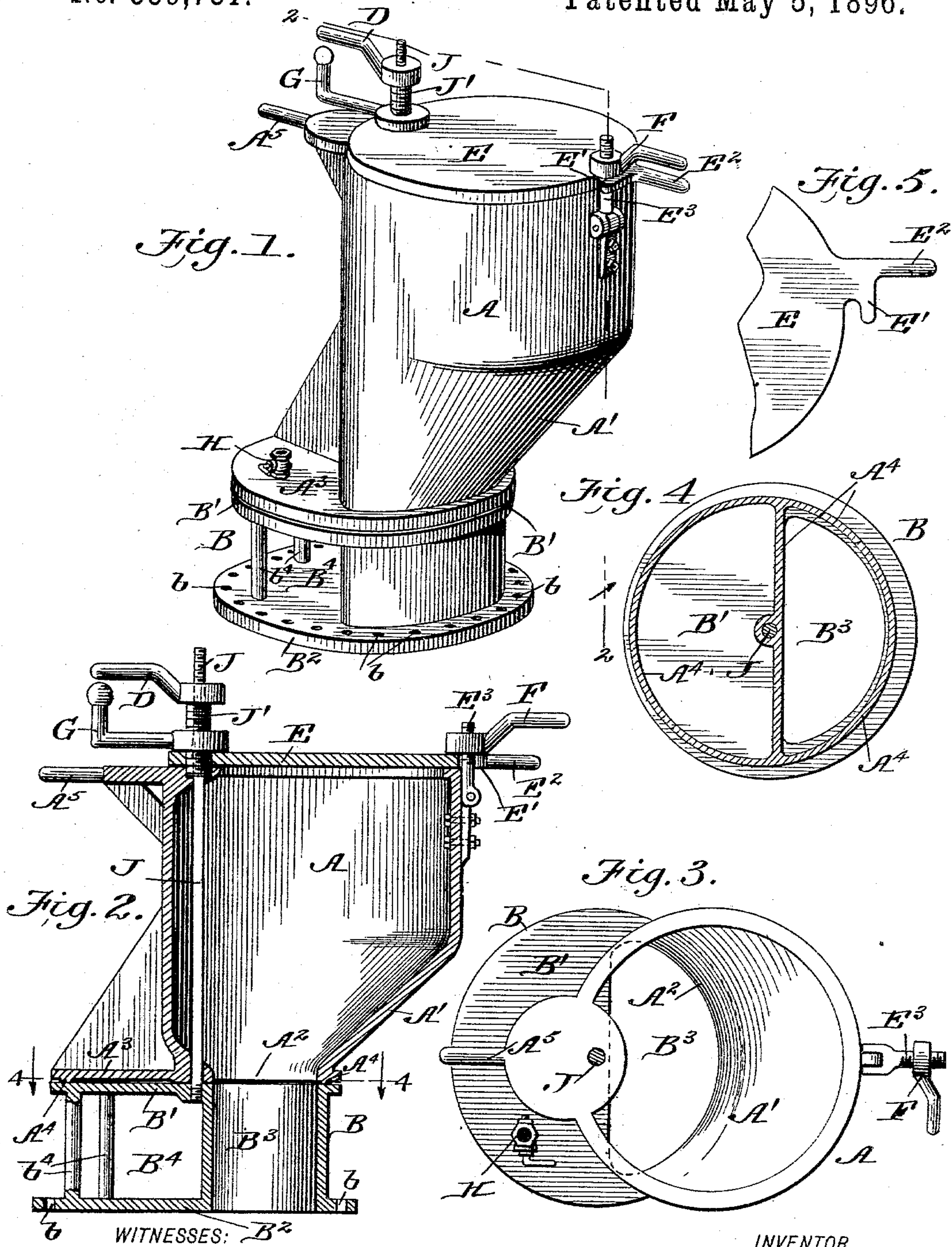


(No Model.)

D. McDONALD.
HOPPER FOR CHARGING COAL.

No. 559,731.

Patented May 5, 1896.



WITNESSES:
W. S. Ploude,
A. Keenon

INVENTOR
Donald McDonald
BY *Munn & Co.*
ATTORNEYS.

UNITED STATES PATENT OFFICE.

DONALD McDONALD, OF LOUISVILLE, KENTUCKY.

HOPPER FOR CHARGING COAL.

SPECIFICATION forming part of Letters Patent No. 559,731, dated May 5, 1896.

Application filed August 15, 1895. Serial No. 559,402. (No model.)

To all whom it may concern:

Be it known that I, DONALD McDONALD, a citizen of the United States, residing at Louisville, in the county of Jefferson and State of Kentucky, have invented certain new and useful Improvements in Hoppers for Charging Coal or Coke, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, in which—

Figure 1 is a perspective view of my improved hopper. Fig. 2 is a sectional view on the line 2 2, Fig. 1. Fig. 3 is a plan view of the hopper with the cover removed. Fig. 4 is a horizontal section, and Fig. 5 is a detail view of a portion of the lid.

The invention relates to that class of hoppers which are employed for charging coal or coke into a hot gas-generator or for charging limestone into a kiln, or it may be used wherever a generator has to be charged against gas-pressure.

The object of the invention is to provide a rotary hopper which when turned in one direction will cause its lower open end to register with an opening in the base to discharge its contents therethrough, and when turned in an opposite direction for refilling will close the said base-openings; also, to provide such a hopper with a close-fitting cover, whereby all escape of gas is prevented in both movements of the hopper; also, to provide the lower face of the hopper with a clearing-flange in close engagement with the upper face of the base.

The invention consists in the construction and combination hereinafter described and claimed.

A represents the hopper mounted to turn horizontally on the rod J, projecting vertically from the center of the circular base B. The rod J extends up through the hopper, adjacent to one side thereof, and the opposite side of the hopper is inclined downwardly and inwardly, as at A', to the outlet A². The bottom of the hopper is formed with a horizontal circular flange A³, concentric with the hopper-axis J, and the lower face of this flange A³ is provided with an annular rib A⁴, which rests upon the flat upper side B' of the base B. This rib A⁴ is, however, eccentric to the axis J, so that when the hopper is rotated

said rib will exert a scraping or clearing action on the base and prevent the accumulation of dust, &c., thus providing for a close joint between the hopper and base to prevent escape of gas. The flange A³ projects beyond the pivoted side of the hopper, so that when the hopper-opening A² is partially or entirely out of register with the base-opening B³ the flange will close said base-opening. The upper threaded end of the bolt projects above the hopper and is surrounded by a tubular bolt J', which is screwed at its lower end into the upper edge of the hopper.

E is the hopper cover or closure, which turns freely on the bolt J' and is clamped at that side by means of the handle-nut G, which screws on the tubular bolt J' and against the upper side of the cover. The opposite side of the cover is provided with a hook or recessed lug E' and a handle E², and this hook or lug engages with the bolt E³, hinged to the upper front portion of the hopper A and provided with a handle-nut F for clamping that side of the cover down upon the hopper.

D is a handle-nut on the upper extremity of the rod J and bearing at its lower side against the upper end of the tubular bolt J', so that by turning the nut D down tight against bolt J' the hopper and base B will be drawn together and a tight joint formed. The hopper is turned by means of a handle A⁵ at the upper end of its rear side.

The base B is circular or cylindrical, and its upper face is trued or faced off for engagement with the rib. The upper and lower flanges B' B² are separated to one side of the opening B³ by means of the space B⁴, which, if desired, may be filled with asbestos or other suitable material, and b⁴ are strengthening posts or braces connecting the base-flanges within this space. The lower base-flange B² is provided with bolt-holes b, by means of which the entire hopper mechanism may be bolted in place. When the parts are in the position shown in Fig. 1, a charge will have been discharged from the hopper through the base-opening B³, and the attendant will now grasp handle A⁵ and swing the hopper around so that the opening A² will come directly over the space B⁴, and its flange A³, directly opposite opening A², will close the hopper-opening B³. The nuts F and G will be loosened and

the cover swung open. The bolt E^3 will be swung down out of the way of the coal-heavers, who will now fill the hopper and again close the lid tightly thereon. The coal in the hopper will be prevented from coking and thereby running together by means of the space B^4 , which prevents heating of the hopper and its contents. The nut D will be turned down a little if any gas or odor escapes from between the hopper and base. I thus dispense with all cone, slide, plug, and other valves, which are liable to become clogged from the dirt and tarry matters in the coal, and my construction of base prevents coking in the hopper, as when filled the hopper always rests over space B^4 until its contents are to be discharged, when it is turned by its handle A^5 to bring its outlet A^2 into register with the base-opening B^3 and then immediately returned to its position over space B^4 .

H is a sight-cock mounted on the flange A^3 to permit the operator to look down into the furnace, oven, or kiln to which the hopper is applied.

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

1. The combination with the base formed of upper and lower parallel plates spaced apart, connected at one side of the center by a tubular portion which forms the opening through the base, and connected at the opposite sides of the center by vertical posts or lugs, of the horizontally-turning hopper pivoted to the base and having a horizontally-flanged lower end resting on the upper plate of the base and adapted to close the base-opening when the hopper-opening is over the closed portion of the base, and a cover for the upper open end of the hopper and pivoting on the same axis with the hopper, a nut on the hopper-axis for bearing down on that side of the cover and means for securing the

opposite side of the cover to the hopper, substantially as and for the purpose described.

2. The combination with the circular base having an opening therethrough to one side of its center, of the horizontally-turning hopper pivoted to the center of the base and having a flanged lower end provided with an annular eccentric rib engaging the faced upper side of the base to scrape the same and form a tight joint; the hopper having an outlet to register with the closed or open portion of the base, and a cover or closure for the hopper, substantially as set forth.

3. The combination with the circular base having a central vertical rod and an opening at one side thereof, of the hopper pivoting at one side on said rod, having a bottom flange engaging the upper face of the base to open or close the base-opening; the hopper also having an outlet to register with the base-opening or the closed portion of the base, a closely-fitting cover turning on upper end of the rod, a handle-nut for tightening that side of the cover, a hook or lug at opposite sides of the cover, and a hinged bolt and hand-nut for engaging said hook or lug and clamping that side of the cover, substantially as set forth.

4. The combination with the base and its vertical rod, of the hopper pivoting on said rod, a tubular nut or sleeve on the upper portion of the rod, the horizontally-turning cover turning on the tubular nut or sleeve, a jam-nut on said tubular nut or sleeve for clamping that side of the cover, a bolt and nut for clamping the opposite side of the cover, and a jam-nut on upper end of the central rod for drawing the hopper and base together, substantially as set forth.

DONALD McDONALD.

Witnesses:

WM. H. CRUTCHER,
A. RANSON.