

No. 819,312.

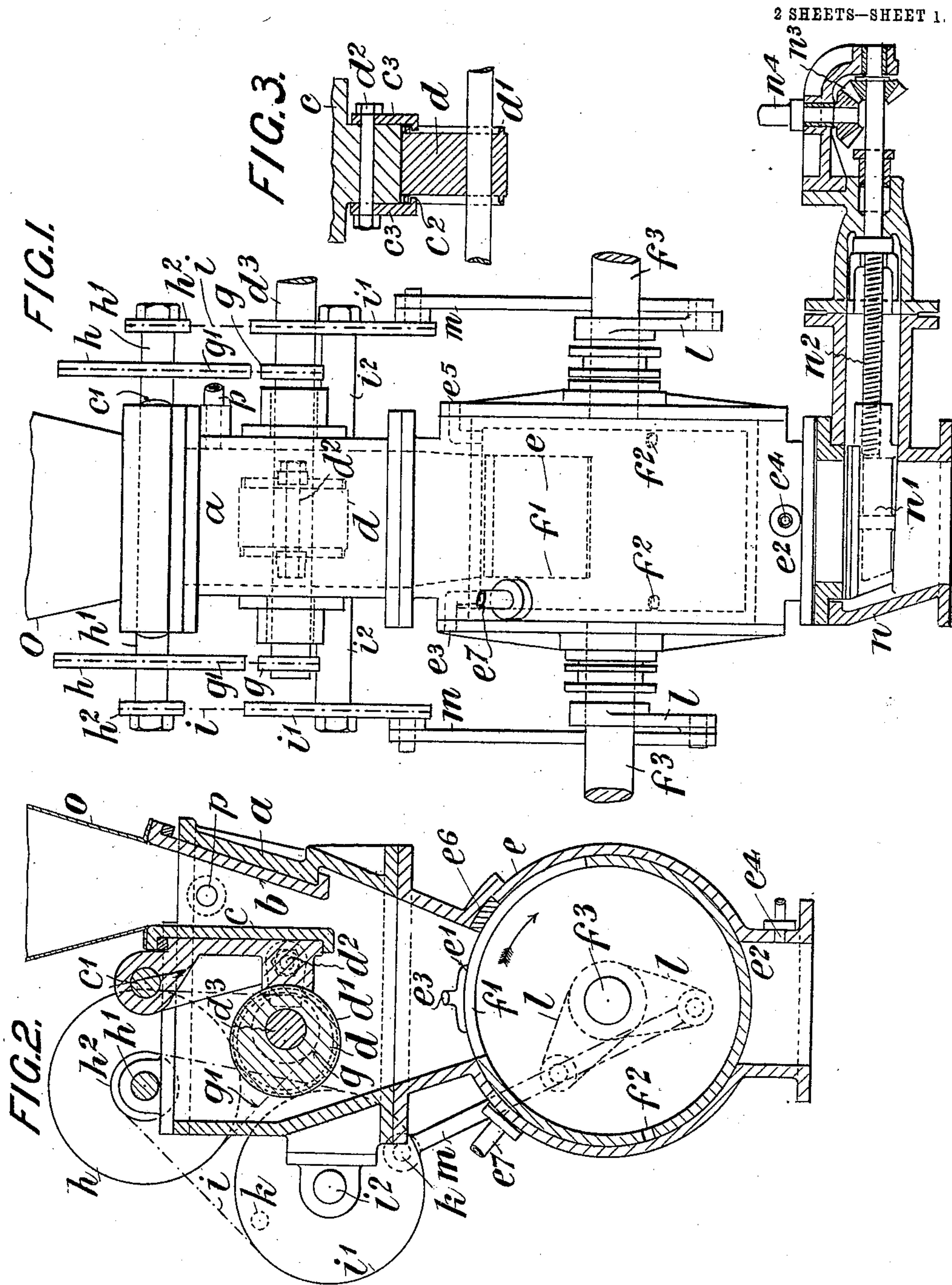
PATENTED MAY 1, 1906.

G. C. RALSTON.

APPARATUS FOR REMOVING ASHES AND CLINKERS FROM STEAMSHIPS.

APPLICATION FILED NOV. 13, 1905.

2 SHEETS--SHEET 1.



Witnesses.

H. L. Amer.

B. M. Saunders

Inventor.

Gavin Carlyle Ralston.

by Henry M. J. atty.

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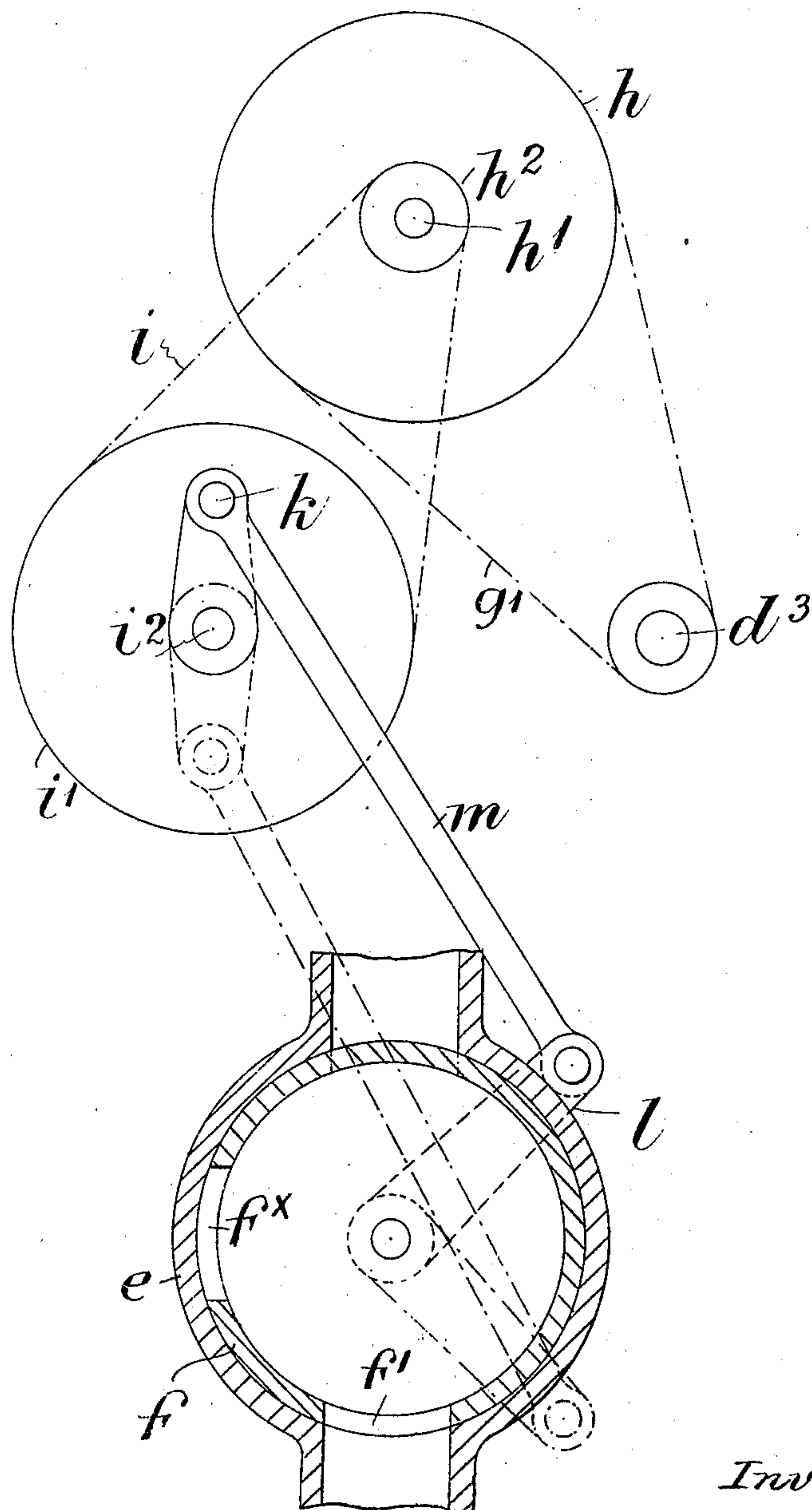
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2 SHEETS—SHEET 2.

FIG. 4.



Witnesses.

H. L. Amer.

B. Mommers

Inventor.

Gavin Carlyle Ralston

by Henry M. J. Barry.

UNITED STATES PATENT OFFICE.

GAVIN CARLYLE RALSTON, OF TWICKENHAM, ENGLAND.

APPARATUS FOR REMOVING ASHES AND CLINKERS FROM STEAMSHIPS.

No. 819,312.

Specification of Letters Patent.

Patented May 1, 1906.

Application filed November 13, 1905. Serial No. 287,186.

To all whom it may concern:

Be it known that I, GAVIN CARLYLE RALSTON, a subject of the King of Great Britain, residing at 14 Morley road, Twickenham, in the county of Middlesex, England, have invented new and useful Improvements in Apparatus for Removing Ashes and Clinkers from Steamships, of which the following is a specification.

10 The object of this invention is to remove ashes and clinkers from steamships, the material being for this purpose rendered into such a condition as to make it possible to effect the said object in a simple and efficient manner.

15 The apparatus is applied in the bottom or bilge of the ship; and it consists of a suitable device for finely crushing the clinkers, and from this crusher the material falls into a hollow drum furnished with an opening and intermittently rotated in a casing, into which drum, while receiving the material through an opening in the casing, water is injected for the purpose of rendering the material into a wet or compact mass, whereupon compressed air can efficiently act. The drum, having received its charge of wet crushed material, is now rotated so far that it can discharge it into the sea, and this discharge is effected by means of compressed air admitted into the interior of the drum. If the material were in a dry powdery state, the air-pressure employed would evidently have to be much higher. Moreover, there would be a danger of the lighter particles floating up toward the surface of the water again and entering through openings in the ship's skin into pumps and condensers and blocking the latter and also entering the stern-tube-stuffing-box bearing. The drum in further rotating cuts off communication with the sea, and just before the opening in the drum comes to the top a small port in the drum comes opposite an exhaust-port in the casing and relieves the pressure of air, thus preventing dust or ashes from being violently blown upward by the expanding air.

45 In the accompanying drawings, Figure 1 is a part-sectional front elevation, and Fig. 2 a sectional end elevation, of an apparatus constructed according to this invention. Fig. 3 is a detail view, and Fig. 4 a part-sectional end view, of a modified form of drum-driving gear.

55 In a casing a , provided with inlet-hopper o , is provided a fixed jaw b , of hardened steel,

and a movable jaw c , of hardened steel, which is pivoted at c' and receives reciprocating motion by an eccentric d , which is kept in contact with and draws back with it the jaw c during the return stroke by means of the rings d' , which engage with projections c^2 on the tongue-shaped plates c^3 , that are fixed to the jaw c by means of the bolt d^2 . To the under side of the casing a is fixed a drum-shell e , with inlet-opening e' and outlet-opening e^2 . This drum-shell is provided with upper air-inlet e^3 , lower smaller air-inlet e^4 for holding the sea-water back and for preventing the adhesion of material to the drum f , and water-inlet e^5 . A water-inlet p may also be provided in the crushing device. In the shell e is fitted a hollow drum f , provided with an opening f' for inlet and outlet of the crushed material and a small opening f^2 for inlet of air. The shell e has a steel facing e^6 in the place where it is exposed to the greatest wear.

On the driving-shaft d^3 are fixed two small sprocket-wheels g , which by chains g' g' transmit motion to sprocket-wheels h h on a spindle h' . This spindle also carries two sprocket-wheels h^2 , which by chains i transmit rotary motion to sprocket-wheels i' , fixed on a spindle i^2 . On each of the wheels i' is fixed a gudgeon k . The drum f is fixed on a spindle f^3 , on which are also fixed at each end a lever l with gudgeons which connect by rods m with the gudgeons k . The rotary motion of the shaft i^2 in this manner causes the drum-spindle f^3 to oscillate through a large arc.

Below the drum-casing e is fixed an ordinary sluice-valve casing n , with valve or gate n' , operated by screw n^2 , and bevel-wheel gearing n^3 and spindle n^4 for shutting off the apparatus from the sea whenever that might be necessary or convenient to do.

The action is as follows: In the position shown the crushed material is admitted to the interior of the hollow drum f through the opening f' . As the drum is rotated in the direction of the arrow water of the required pressure is admitted from the pipe e^5 , whereby the material is thoroughly wetted and conglomerated, and as the opening f' begins to communicate with the lower outlet e^2 from the casing the crushed material is discharged from the drum partly to a little extent by its own weight, but mostly by the compressed air now admitted by the port f^2 when opposite to the compressed-air inlet e^3 , and the

material which is so thoroughly wetted as to acquire the form of a liquid plug or piston is by the compressed air shot out at e^2 with great force and delivered into the sea some distance below the bottom of the ship, thus obviating any chance of clinker-grit ever reaching any openings in the ship below the water-line or any part of the propeller stern-tube. The drum f in its return movement again cuts off communication with the sea and at the same time cuts off the supply of compressed air from the pipe e^3 ; but a little later, just before the opening in the drum comes to the top again, the small port f^2 in the drum comes opposite a small exhaust-port e^7 in the casing and relieves the pressure of air, thus preventing dust or ashes from being blown violently upward by the expanding air. The position of the gudgeons k and the levers l in an upper position is indicated in Fig. 2 by chain lines. It will be noticed that the oscillating drum is moved slowly while being filled and moved quickly when being discharged.

In the modification, Fig. 4, the hollow drum f is provided with an opening f' and an opening f^x , the former being for discharging and the latter for charging or filling the drum. The full lines show the discharging position and the chain lines the charging position of the rod m and lever l .

Some of the advantages of the apparatus are the following: In warships neither the protective deck nor the armor has to be pierced and there is no fear of the apparatus being damaged by shell-fire. The ashes and clinkers are effectually disposed of and cannot enter any opening in the ship's skin or the propeller stern-tube bearing and without the use of hoists or of manual labor.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In combination with a device for crushing clinkers and the like delivered into same along with the ashes from a marine boiler, a casing fixed under the crushing device and provided with upper opening, for receiving the ashes and clinkers crushed, a lower opening for discharge of the said material into the sea, a port for admitting compressed air at the top, a smaller port for admitting com-

pressed air at the bottom, and a port for admitting water for the purpose set forth, a hollow drum adapted to be reciprocated in the casing, and pierced in its circumference for alternately receiving and discharging the material admitted from the upper opening in the casing and with ports registering with the ports in the casing, and means for reciprocating the drum, substantially as set forth.

2. In combination with a casing provided with an upper opening for receiving ashes and crushed clinkers and the like from a crushing device, a lower opening for discharge of the said material into the sea, a port for admitting compressed air at the top, a smaller port for admitting compressed air at the bottom, and a port for admitting water, of a hollow drum adapted to be reciprocated in the casing and pierced in its circumference for alternately receiving and discharging the material admitted from the upper opening in the casing and with ports registering with the ports in the casing, and means for reciprocating the drum with a slow motion while it is being filled and with a quick motion while it is being discharged, substantially as set forth.

3. In combination with a casing provided with an upper opening for receiving ashes and crushed clinkers and the like from a crushing device, a lower opening for discharge of the said material into the sea, a port for admitting compressed air at the top, a smaller port for admitting compressed air at the bottom and a port for admitting water, of a hollow drum adapted to be reciprocated in the casing and pierced in two portions of its circumference for alternately receiving and discharging the material admitted from the upper opening in the casing and with ports registering with ports in the casing, and means for reciprocating the drum, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GAVIN CARLYLE RALSTON.

Witnesses:

H. D. JAMESON,
F. L. RAND.