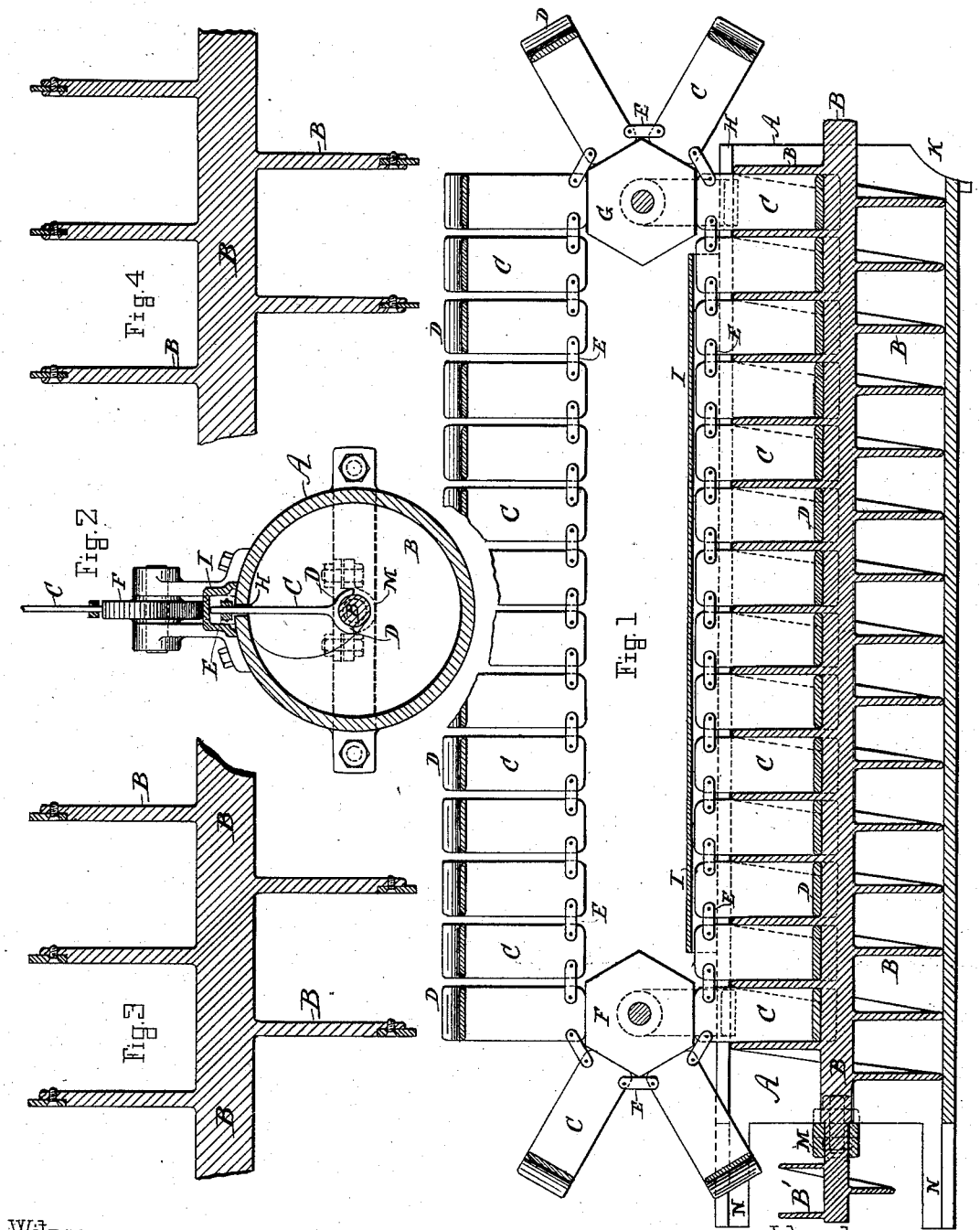
(No Model.)

J. V. HOPE.

ELEVATOR.

No. 261,714. Patented July 25, 1882.



Witnesses
Newton Wyckoff.
Harry S. Shipley

Inventor
J. V. Hope.
By Philip T. Dodge
atty.

UNITED STATES PATENT OFFICE.

JOHN V. HOPE, OF WEDNESBURY, COUNTY OF STAFFORD, ENGLAND.

ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 261,714, dated July 25, 1882.

Application filed June 29, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN VERNON HOPE, a subject of the Queen of Great Britain, residing at Wednesbury, in the county of Stafford, in the Kingdom of England, have invented a new and useful Elevator, of which the following is a specification.

In an Archimedean elevator the quantity of material raised never equals the actual capacity of the elevator, owing to the downward slip of the material being raised, which increases as the gradient becomes steeper and attains its maximum when the elevator is vertical. This slip has been hitherto counteracted by revolving the screw at a higher speed; but as the height of the elevator increases the speed required places it outside the range of practical mechanics. To obviate this I form an Archimedean screw fixed upon a center shaft, which screw revolves inside a tube fitting sufficiently closely to prevent a leakage between the flange of the screw and the tube. (In case of raising liquids this may be attained by packings of rubber, leather, or other suitable material.) Up one side of the tube I form a slot, and in this slot a number of plates connected on their edges outside the tube by links, and thus forming an endless chain working over pulleys at top and bottom. These plates move up the slot, standing vertically on their edges, and are of such a size as to fill the spaces between the threads of the screw, the center shaft, and the tube sufficiently closely to prevent leakage. For raising of liquids these plates can be lined with leather or formed partially or wholly of rubber. At each revolution the screw, after filling its lowest turn with material, takes in one of these plates, which entirely prevents the material falling back, and so carries it to the top of the elevator. These plates can be made sufficiently long to rest against the center shaft on the pressure side, and with jaws to partially embrace it, in order to give the plates greater strength to resist the slip of the material. In place of one chain of plates, two or more could be used; also, if the screw and tube are formed in one, the chain of plates could be brought up a central guide and over pulleys on the outside.

In order to more fully explain my invention, I append the accompanying drawings, in which—

Figure 1 is a vertical section of the apparatus, and Fig. 2 a horizontal section; Figs. 3 and 4, two forms of section of edge of screw, either of which can be used when the apparatus is employed for raising liquids.

In these drawings, A is the cylinder; B, the screw; B′, continuation of screw below lower bearing; C, plates catching into the axes of the screw by flies D; E, endless chain passing over pulleys F G, carrying the plates and propelled by the revolution of the screw; H, slot in tube for admitting and guiding the plates; I, casing attached to tube, strengthening same to make up for the weakening caused by the slot, and also protecting the chain; K, spout at top to deliver the material raised; M, lower bearing of shaft of screw. No driving arrangement is shown, as it forms no part of my invention, and any of the suitable driving appliances well known in the arts can be employed.

The leathers forming the edge seal of the screw can be fixed in place with marine glue or screw, as in Fig. 4, or by riveting or screw in Fig. 3.

The mode of action is as follows: The elevator being let down into the hold of a ship or other place having material to raise, it is set in motion. The screw, as it rotates the part B′, digs into the material and carries it upward, while at every revolution a fresh blade or plate is carried forward into the part B and serves as a stop to prevent back-slip. The forcing of the blades edgewise through the grain at bottom disturbs the grain below the elevator, and with the screw B′ assists the elevator to descend in the grain. Projections N can be formed on the tube, upon which it can rest like legs when it reaches the bottom of the mass to be raised, and thus it can stand and allow the plates to rotate and the grain to freely enter the tube between the legs.

I claim as my invention—

1. The method of preventing the grain or liquid raised in a screw-elevator from slipping back, which consists in stopping up each space between complete revolutions of the screw with a movable stop capable of a vertical motion only when in the screw.

2. The method of loosening the grain beneath an elevator, consisting in digging into it with a rotating series of vanes or cutters.

3. The combination of the Archimedean screw-elevator and a series of plates, one entering it at each revolution of the screw and rising with the grain in a vertical line to the top.

4. The combination of the tube A with slot H and series of plates C, projecting through the slot and guided thereby, substantially as described.

5. The plates C, provided with horns or flies D to grasp the screw-shaft, and guided at the other end by slot H.

6. The combination of the tube A, legs N, and the revolving chain of plates C.

7. The combination of the tube A, split for the passage of the plates C, and the casing I, substantially as and for the purposes described.

8. In combination with a screw-elevator, chain E of plates C, passing over pulleys F G at top and bottom, and being propelled by motion of the screw.

9. In combination with a screw, B, and traveling plates C, a small subsidiary feeding-screw, B′.

JOHN VERNON HOPE.

Witnesses:

W. H. HARRIS,

Notary Public, 47 *New Street, Birmingham.*

F. BAXTER,

His Clerk.