

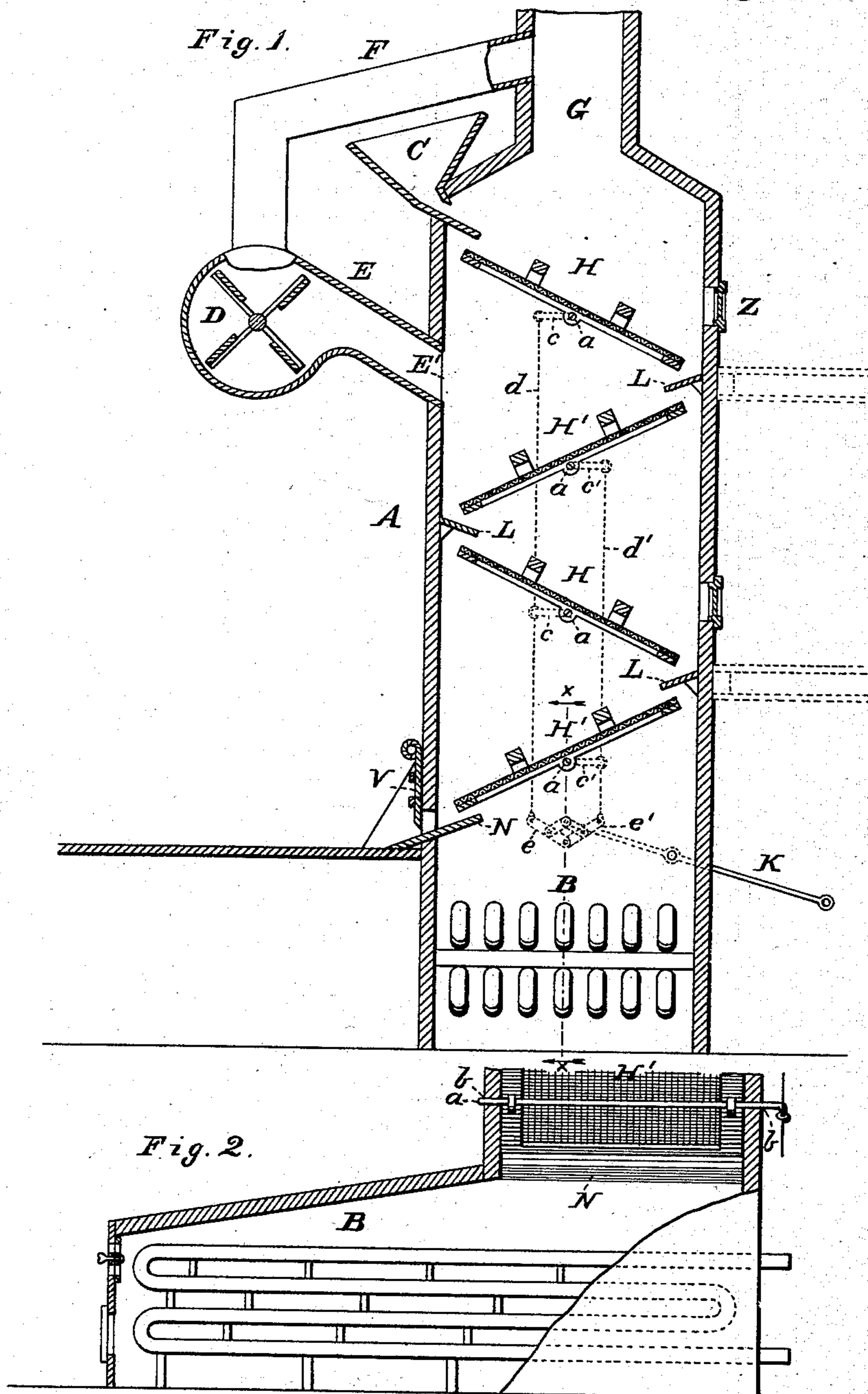
(No Model.)

J. J. PHILLIPS.

APPARATUS FOR DRYING NUTS, GRAIN. &c.

No. 410,017.

Patented Aug. 27, 1889.



WITNESSES  
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# UNITED STATES PATENT OFFICE.

JAMES J. PHILLIPS, OF NORFOLK, VIRGINIA.

## APPARATUS FOR DRYING NUTS, GRAIN, &c.

SPECIFICATION forming part of Letters Patent No. 410,017, dated August 27, 1889.

Application filed November 24, 1888. Serial No. 291,826. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES J. PHILLIPS, a citizen of the United States, and a resident of Norfolk, in the county of Norfolk and State of Virginia, have invented certain new and useful Improvements in Machines for Drying Nuts and Grain; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Figure 1 of the drawings is a representation of this invention, and is a vertical section. Fig. 2 is a vertical section through the lower portion, and is taken where the broken line  $x x$  is marked on Fig. 1.

The object of this invention is to provide a self-feeding drier for nuts and grain; and it consists in the construction and novel arrangement of devices, all as hereinafter set forth. A drier of this character is designed to have considerable vertical extension, and may be built through several floors of a building.

The letter A designates the outer incasement of the drier, which is preferably rectangular in cross-section, and opening at its lower end into a heater B, which may be provided with a coil of steam-pipe or hot-air pipe, or may be supplied with hot air from a furnace of suitable character. A draft-regulator is provided in the heater in order that there may be more or less cool air allowed to enter, as the character of the work may demand.

C is a hopper at the upper end of the drier-case, and D is an exhaust-fan, to which a pipe E leads from an opening E' in the upper part of the drier. The object of this exhaust is to take out the vapor, which arises in great quantity from wet nuts when they enter the upper part of the drier. From the case of the exhaust the outlet-pipe F may connect with the flue G at the top of the drier, so that the draft will be unimpaired.

H H represent a series of pivoted planes over which the nuts pass as they descend through the drier. These planes are perforated or of open-work material, as wire-

cloth, so that the hot air can pass up freely through them to reach the nuts passing over their upper surfaces. They are usually constructed with strong frames, which are provided with shafts or journals  $a$ , seated in bearings  $b$  of the incasement. The planes H are arranged one above another and are adjustable to various degrees of inclination or to level position. For this purpose the planes are usually divided into sets, each set consisting of alternate planes, connected so that their adjustment is uniform. This may be accomplished by providing the shafts  $a$  of these planes with arms or cranks  $c c'$ , which are connected by rods  $d d'$  to short levers  $e e'$ , which may be operated by a common shifting-lever K when readjustment is required. As the planes H are inclined in the opposite direction from the planes H', this adjusting mechanism will enable the operator to move all the planes uniformly, so that when adjusted their inclination will be alike and the nuts pass down over them at equal rates of speed. The planes are usually provided with raised bars or guards extending transversely and designed to keep the nuts from heaping and to facilitate spreading them evenly in a thin layer as they pass under said guards.

L L are inclined ledges arranged alternately below the lower end of each plane and attached to the incasement, as shown. These ledges serve to receive the nuts as they pass from the lower end of one inclined plane and turn them over in delivering them to the upper part of the next inclined plane, so that the upper surface of one layer of nuts becomes the lower surface of the next, and so on, until the last or discharging plane delivers the nuts to the discharging-ledge N, over which they pass out of the drier into a chute or other receptacle. This discharge is designed to be regulated by a gate V, arranged in ways of the incasement and adapted to approximate the discharging-ledge N more or less closely, according to its adjustment, which is determined by the rapidity of feed, the object being to allow the nuts to pass over the planes in a thin layer rather slowly, and the angle of inclination of said planes being so regulated that the nuts will follow each other

rather than heap up. The regulation can be effected with nicety. If the gate V is closed, the progress can also be prevented by leveling the planes at any time.

5 Glazed doors Z are provided in the incase-ment at intervals opposite the planes in order to permit inspection and facilitate rectifying the work going on inside at any time.

10 Having described this invention, what I claim, and desire to secure by Letters Patent, is—

1. The drier having a series of planes arranged one above the other and in consecutive oppositely-inclined positions, and having  
15 central pivot-shafts provided with crank-arms extending in successive opposite directions and connected together in alternate pairs by opposite parallel rods, the lower ends of said

rods being connected by interacting levers, actuated by a hand shifting-lever, substan- 20 tially as set forth.

2. The combination, with a vertically-elongated drier-case having alternate turning- 25 ledges attached to its wall, and a top flue, of a discharge-regulator, series of alternating inclined planes, an exhaust connected to the upper part of the case and leading into the flue, the same being arranged wholly to one side of the updraft, and a heater at its base, 30 substantially as specified.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES J. PHILLIPS.

Witnesses:

VILLETTE ANDERSON,  
MARY BOYKIN.