W. H. HIGBIE.

GRAIN CONVEYER AND DRIER.

No. 192,069. Patented June 19, 1877.

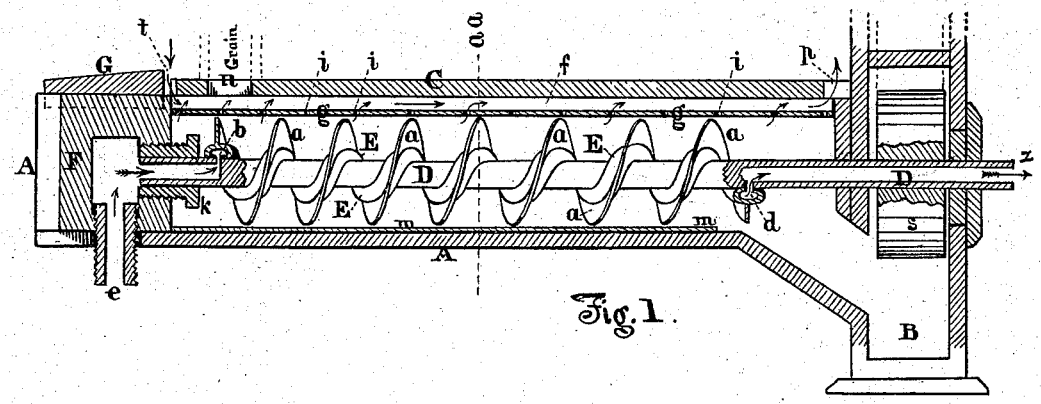

Fig. 1.

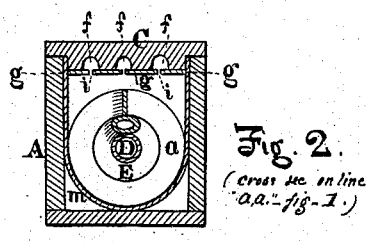

Fig. 2.
(cross sec. on line a.a. - fig. 1.)

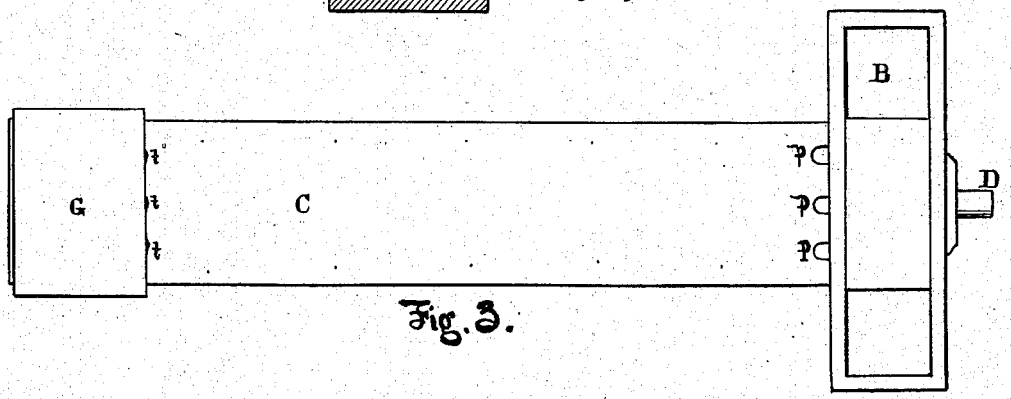

Fig. 3.

Witnesses
Henry H. Mills
Clarence Thurlow

William H. Higbie,
by E. Thurlow, his Atty. in fact

UNITED STATES PATENT OFFICE.

WILLIAM H. HIGBIE, OF PEORIA, ILLINOIS.

IMPROVEMENT IN GRAIN CONVEYERS AND DRIERS.

Specification forming part of Letters Patent No. **192,069**, dated June 19, 1877; application filed October 30, 1876.

To all whom it may concern:

Be it known that I, WILLIAM H. HIGBIE, of the city of Peoria, in the county of Peoria, in the State of Illinois, have invented a Combined Grain Conveyer and Drier; and do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the annexed drawings making a part of this specification, in which like letters of reference refer to like parts, and in which—

Figure 1 represents a vertical longitudinal section of the conveyer-trough in which the grain is dried, the steam-chest, and partial section of either end of the conveying and drying shaft; Fig. 2, a cross vertical section of the above on line *a a*, Fig. 1; Fig. 3, a plan of the same.

The object of this invention is to dry grain, &c., while in process of handling or storage, or in transit from the receiving bins or sinks by the flanged conveyer; and it consists in a spiral steam-pipe attached to and winding around the whole length of the common metal conveyer-shaft, adjoining or between the flange or flanges, or within the base of the latter, extended or opened for this purpose, or even made hollow to admit a current of steam to heat said flange or flanges, thereby to dry the grain. The spiral pipe or duct receives steam from the shaft, and discharges it at its farther end again into the shaft, whence it may be ejected into the open air, the shaft being made hollow, or partially so, for the purpose. The moisture driven off from the grain by means of contact with the heated flange or flanges, and the warmed trough, ascends through a perforated lining or ceiling attached to the under surface of the trough-cover, and passes off between said lining and said cover away into the open air. The escape of moisture may be assisted by the admission, by means of a slide, of a graduated current of air at one end of the lining flowing in the direction of the escape-holes.

By this plan the flange or flanges are heated by means of the spiral steam-pipe, so as to stir and thoroughly dry the grain in process of transmission, in the ordinary handling of grain, by the conveyer from the receiving-bins to the elevator, or by any other conveyer in the warehouse similarly fitted up for this purpose.

One of the forms in which I construct my invention I now describe as follows: In the drawings, A is the conveyer-trough with the usual metal lining *m*, closed at one end by the steam-chest F next to the grain-receiving spout or opening *n*. The other end of said trough opens into the bottom of the elevator B. C represents the cover of the conveyer-trough, provided with longitudinal grooves or air-passages *f*, covered with a perforated screen, *g*, of metal having openings, *i*, into said passages *f*, which latter communicate by upward passages, *p*, at the discharge end of the conveyer-trough, into the open air. Similar openings, *t*, at the opposite end of the cover C supply an inward draft, regulated by the slide G, which abuts against that end of the cover. D is the conveyer-shaft, mounted at one end in the steam-tight journal-box *k* in the steam-chest, and at the other end in the elevator B, where it is fitted with its motor-pulley or cup-elevator wheel, *s*. The shaft is hollow, or at least those portions between the end and the entrance *b* to the origin of the spiral pipe E near the steam-chest, which must be stopped beyond this passage, *b*, and that portion between the exit *d* of said pipe and its discharging end *z*. E is the spiral steam-pipe, which receives steam at *b* from shaft D, and discharges it again into said shaft by *d* after heating the flange or flanges *a a*. F is the steam-chest, abutting upon and closing that end of the trough receiving steam by the pipe *e* and discharging it into the shaft D, which revolves in the steam-tight journal or box *k*. G is a sliding air cut-off embracing the sides of the trough, and abutting against the end of the cover C and its passages *o o o* into the grooves *f f f*.

The operation of this combined grain conveyer and drier needs little description; but the grain entering at *n* in the cover C comes in contact with the heated flange or flanges *a*, which are kept hot by the spiral steam-pipe E, and so by contact with said flights and with the heated air of the trough the grain becomes thoroughly dried, while any eliminated moisture is carried off through the perforations *i i*, &c., in the trough-ceiling *g*, into the

horizontal passages *f*, and thence away through the openings *p*. This current is regulated by means of the slide G and the induction-holes *t t t* at the receiving-end of the conveyer.

The drawing illustrates only one form and location of a grain-drying conveyer; for the spiral pipe E, cover C, and chest F may be located with any other conveyer in a warehouse or grain-elevating house.

What I claim as my invention is—

1. In combination with a partially-hollow conveyer-shaft and its spiral flange or flanges, a spiral steam-pipe following the line of the flange or flanges, and receiving its steam from said shaft, and discharging it again into said shaft, for the purpose of heating said flange or flanges and the trough to dry the passing grain, substantially as described.

2. The combination, in a grain-conveyer, of the steam-chest or shaft-journal F with a partially hollow shaft D, provided with the spiral steam-pipe E, having openings into said shaft by which to receive and discharge steam to heat the flange or flanges and dry the conveyed grain, substantially as and for the purposes described.

3. The combination with the trough A, provided with a spiral steam-pipe around the shaft, of the cover C having ventilating-holes *t p*, as described.

4. The combination of the cover C and the air-regulating block G, substantially as described, when used in connection with and in combination with the trough A and shaft D, as described.

In testimony that I claim the foregoing combined grain conveyer and drier I have hereunto set my hand this 19th day of October, A. D. 1876.

WILLIAM H. HIGBIE.

Witnesses:

H. W. WELLS,

JAMES M. MORSE.