

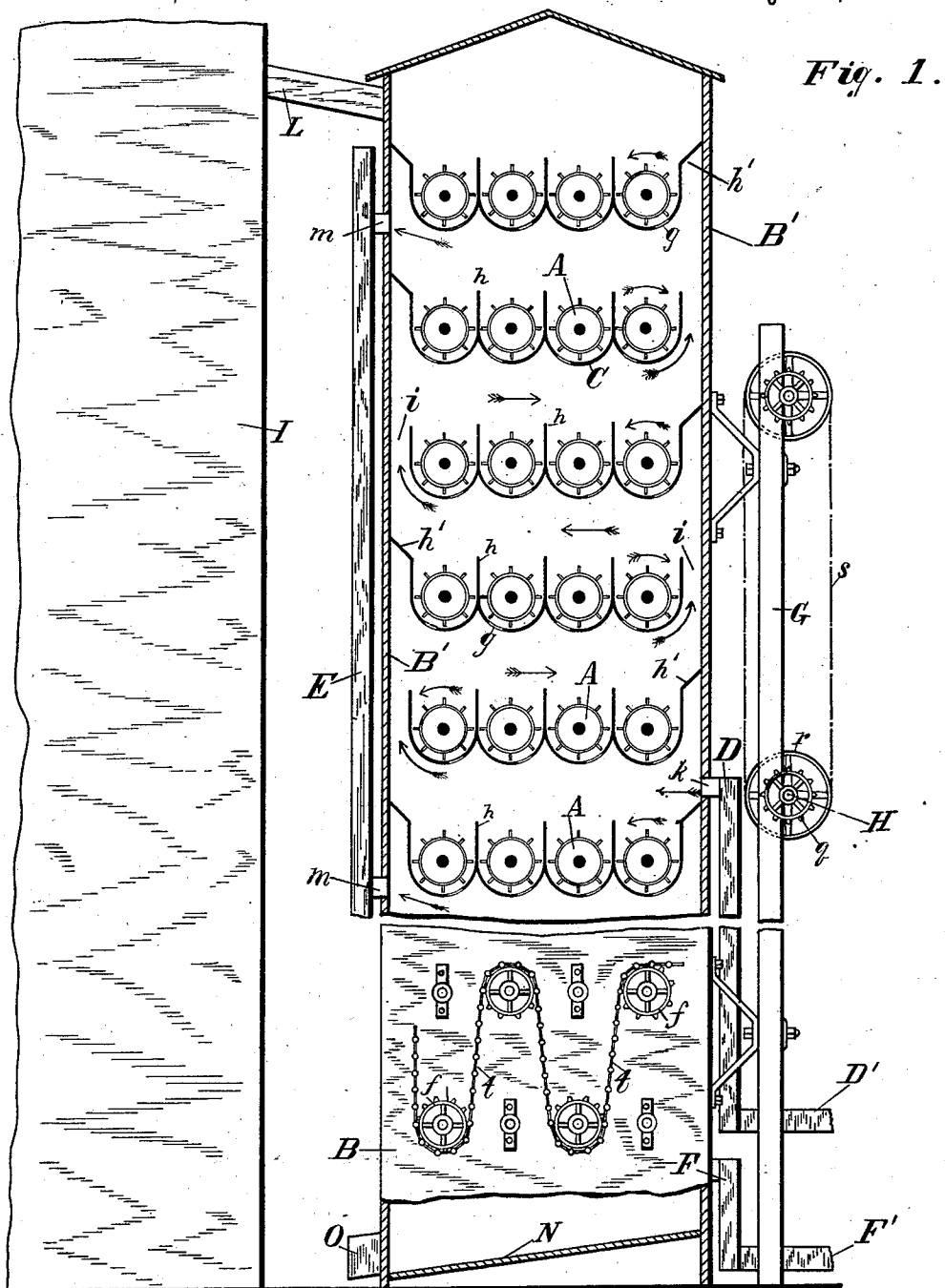
(No Model.)

4 Sheets—Sheet 1.

J. C. SLAUGHTER.
GRAIN DRIER.

No. 282,013.

Patented July 24, 1883.



Witnesses:

A. C. Eader
John E. Morris.

Inventor:

J. C. Slaughter

By Chas B. Mann

Attorney.

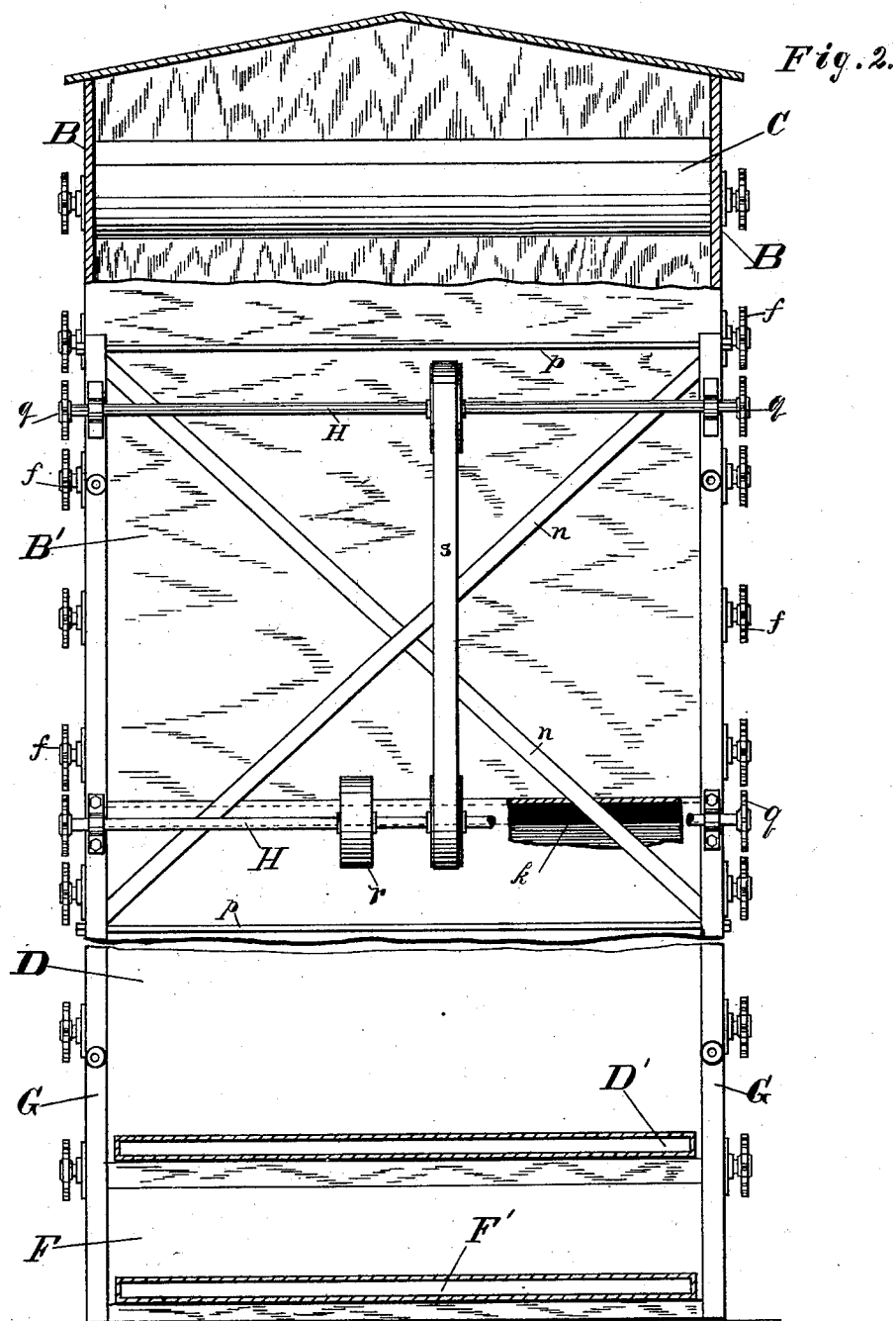
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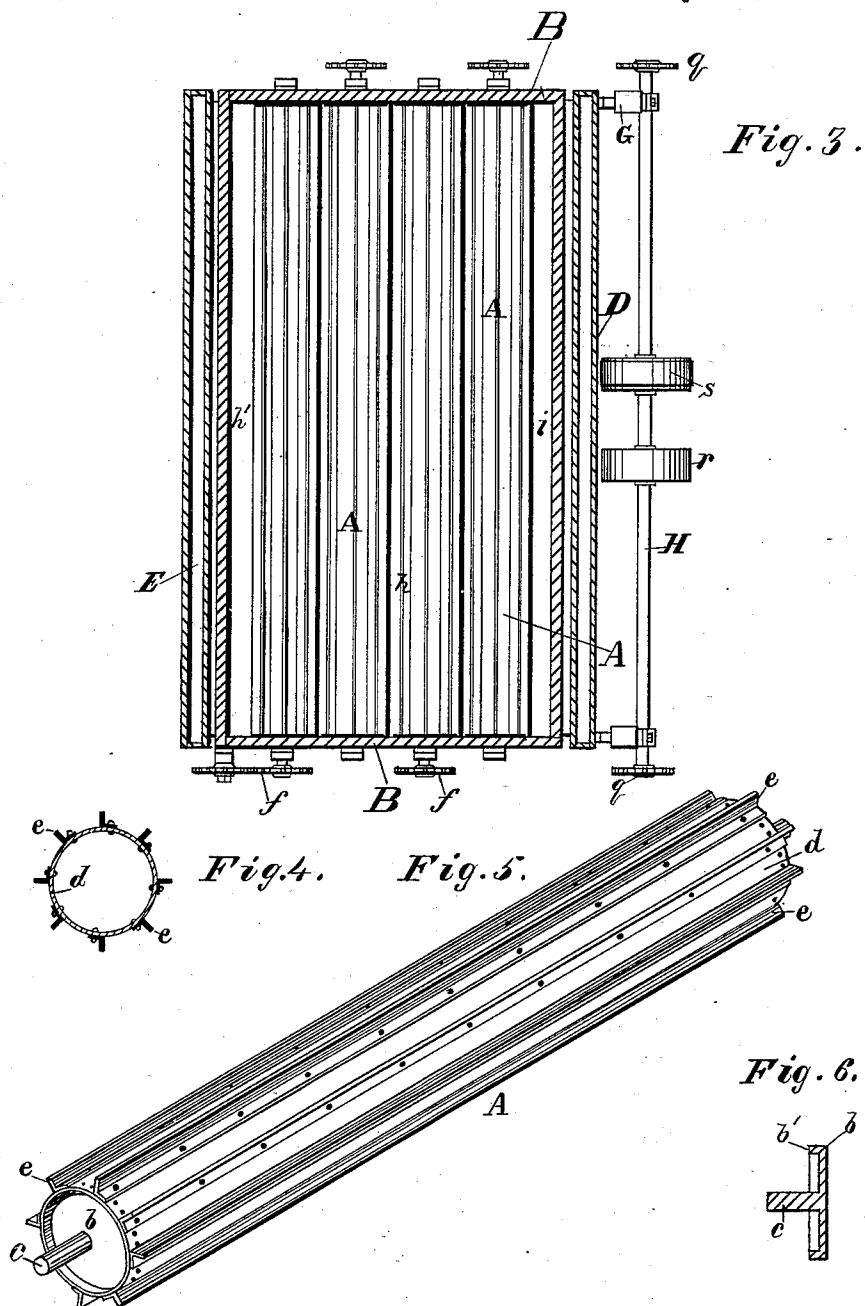
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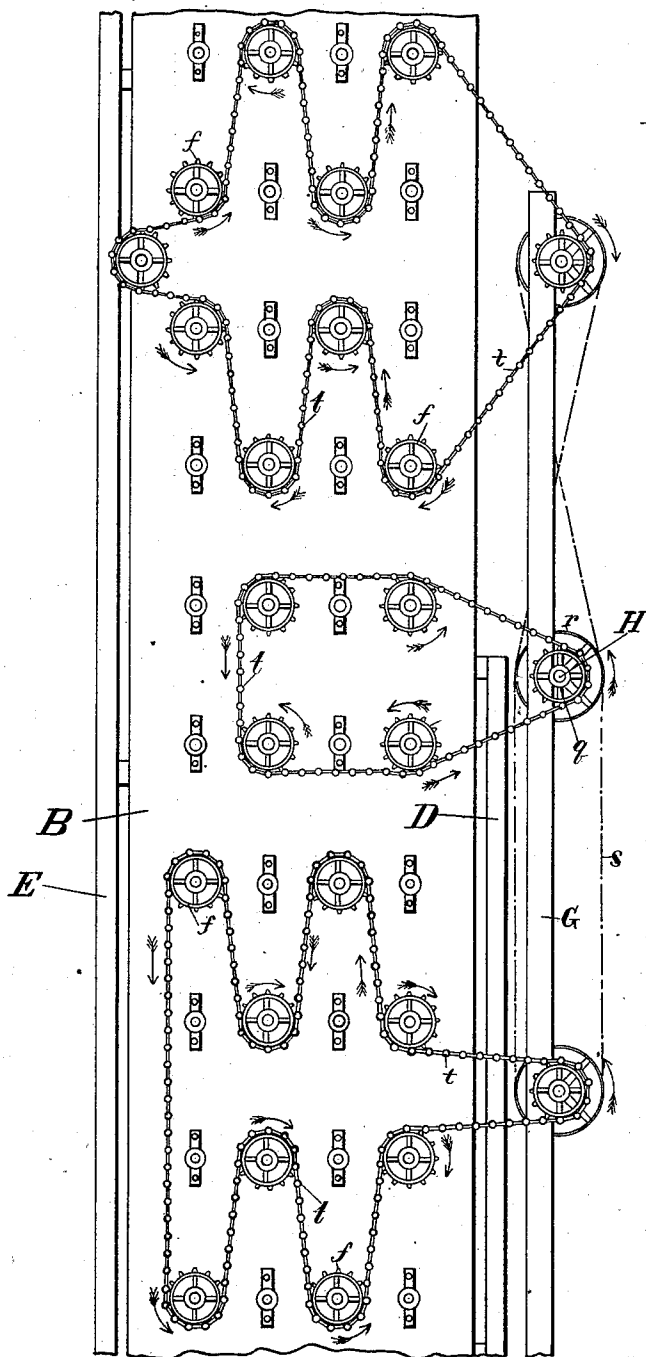


Fig. 7.

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UNITED STATES PATENT OFFICE.

JOEL C. SLAUGHTER, OF CHESTERTOWN, MARYLAND, ASSIGNOR OF ONE-HALF TO HENRY B. SLAUGHTER, OF KANSAS CITY, MO.

GRAIN-DRIER.

SPECIFICATION forming part of Letters Patent No. 282,013, dated July 24, 1883.

Application filed April 18, 1883. (No model.)

To all whom it may concern:

Be it known that I, JOEL C. SLAUGHTER, a citizen of the United States, residing at Chestertown, in the county of Kent and State of Maryland, have invented certain new and useful Improvements in Grain-Driers, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to an improved grain-drier, and will first be described, and then designated in the claims.

In the drawings hereto annexed, Figure 1 is an elevation showing a part side view and vertical section of the drier. Fig. 2 is an elevation showing one of the sides transverse to that seen in Fig. 1. Fig. 3 is a horizontal cross-section of the drier, looking down. Fig. 4 is a cross-section of one of the rollers. Fig. 5 is a view of a roller. Fig. 6 is a section of the head of a roller. Fig. 7 is an elevation or side view, showing the arrangement of the drive-chain.

A series of rollers, A, (in number as many as may be desired—in the present instance four rollers in each series,) are placed side by side horizontally. These rollers have a circular cast-iron head, *b*, with a flange, *b'*, and a journal, *c*. A sheet-iron tube, *d*, has each end riveted to the flange of one of the heads, and straight ribs or flanges *e* extend on the outside from end to end of the tube, being secured thereto by rivets, as shown in Figs. 4 and 5. The journals of these rollers have suitable bearings in the side walls, B, of the drier, and one journal of each roller projects entirely through the wall, and on the outside thereof has a sprocket-wheel, *f*. By this arrangement every other roller in a series has a sprocket-wheel at one side of the drier, while the intermediate roller has its sprocket-wheel at the opposite side of the drier, as seen by reference to Figs. 3 and 7.

Immediately below each roller is a concaved sheet-iron bottom, C, in which the roller revolves, the ribs or flanges *e* of the roller fitting the bottom reasonably close and accurate. The bottom has a slot, *g*, which extends its entire length. Between each two of the rollers is a vertical division-board, *h*, the bottom of which joins with the adjoining edges of the two concaved bottoms, and the top of this di-

vision-board projects up a little above the rollers. Thus all the concaved bottoms below the rollers in one series are connected. The concaved bottom next to one of the side walls, B', has an upward and lateral extension, *h'*, which fits close against said wall, while the concaved bottom in the same series next to the opposite side wall has simply an upward extension, (like the division-board,) between which and said side wall is a passage, *i*, to permit the air to ascend. The several series of rollers are placed in a tower, of which the walls B form two opposite sides and the walls B' the other two sides. There may be any number of these horizontal series, one above another, as seen in Fig. 1. The passages *i* are so arranged as not to come directly above each other—that is, in one series the passage will be on the left, while in the series next above and next below it will be on the right. The result of this arrangement is that the current of air will pass up at one side—for instance, on the right—thence horizontally across to the left, between two series of rollers, up the passage on the left, thence across to the right and up the passage on the right, and so on. A dry-air flue, D, (designed for hot air,) as broad as the side B' of the tower, extends up one of the said sides. This wall of the tower has inlets *k*, through which the hot dry air from the flue D enters, and thence passes up through the tower, in the manner just described. On the other side of the tower is a damp-air flue, E; and outlets *m*, in the wall of this side, allow the current of air, which has become damp by absorption of the moisture of the grain, to escape into the damp-air flue. There may be any desired number of these inlets and outlets; but at the point where the inlet occurs there is no passage *i* at all in the series of rollers and bottoms next below said inlet. The fact that it is closed at both sides insures the expulsion of the damp air below. Another dry-air flue, F, designed for cold air, is arranged to deliver a blast of air into the lower part of the tower. The hot dry air is designed to enter and pass through all the upper portion of the tower, while in the lowermost portion cold dry air enters, whereby the grain, which becomes somewhat heated in its downward passage, is cooled in the lower part before passing out to

be deposited in bulk. While both hot and cold air may thus be employed at one time, all hot or all cold alone may also be employed. The dry air may be obtained from a blower or fan, (not shown,) the supply entering the flues at D' and F'.

It will be observed, by reference to Fig. 1, that the slots *g* in the concaved bottoms of one series are at one side—say the right side—of a vertical center line, while those in the series above or the series below, except at the point where there is an inlet, *k*, in the wall, are at the other side—say the left side—of a vertical line. The object of this diverse arrangement of slots is that the sheet or stream of grain falling from a slot may drop on that side of a center line drawn vertically through the bottom, which is toward the approaching current of air, thus allowing for the effect of the lateral current of air on the falling grain, whereby the grain is prevented from being carried or blown past the first division-board, *h*. It will, therefore, be understood that the grain passing down through the tower will pass from a given bottom of one series to the roller in the next series immediately below said bottom, and so on.

The driving mechanism, by which motion is imparted to the rollers, is at one side of the tower.

The letter G designates two upright posts, each one being near a separate corner of the tower. Suitable cross-braces, *n*, and bolts or rods *p*, unite these posts into a frame. Horizontal shafts H are mounted on this frame, and have at each end a sprocket-wheel, *q*, and in the center a sprocket-wheel or pulley, *r*. Power from any source may be applied to a pulley on the lowermost shaft, and from this shaft a belt, *s*, conveys power to the next upper shaft. A drive-chain, *t*, passes over a sprocket-wheel, *q*, on the end of the shaft, and over certain of the sprocket-wheels *f* on the journals of the rollers.

It is necessary that the rollers of one series be turned in a certain direction and those of another series be turned in the opposite direction to give the best result in feeding the grain to the slots *g*. The manner of gearing or rigging the drive-chain over the several sprocket-wheels is therefore shown in Fig. 7. Of course the arrangement shown best suits the particular construction of drier here illustrated; but this arrangement may be varied to adapt it to a drier having more than four rollers in a series, or where the air-inlets are placed differently.

The structure on the left of the tower in Fig. 1 (marked by the letter I) is intended to designate a store-house or elevator. A chute or spout, *L*, is to deliver the grain therefrom into

the top of the tower above the first series of rollers. At the bottom of the tower is a slanting floor, *N*, onto which the grain drops, and a chute, *O*, discharges the grain.

From the foregoing description the operation of the drier will be fully understood.

The apparatus is adapted for any kind of grain, and if the grain be very damp it may be found expedient to run it through the apparatus the second time.

Having described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a grain-drier, a roller composed of a sheet-iron tube, *d*, provided exteriorly with straight ribs or flanges *e*, extending from end to end, and having at each end a head with flanges *b'*, and a journal, *e*, as set forth.

2. A grain-drier having a number of rollers, *A*, placed horizontally, and each provided exteriorly with straight ribs or flanges, each roller turning in a concaved bottom, *C*, having a slot, *g*, extending its entire length, and between each two rollers a vertical division-board, *h*, the bottom of which joins the edges of the two adjoining concaved bottoms, as set forth.

3. In a grain-drier, the combination, in a tower, of a number of horizontal series of rollers and concaved bottoms, all the bottoms in each series being connected, and the several series placed in the tower one above another, and a passage, *i*, at one side of each series, the passage of one series being adjoining the left wall, for instance, while the passage of the series next above and next below adjoins the opposite wall, whereby no two passages are directly above each other, as set forth.

4. In a grain-drier, the combination of a tower, a number of horizontal series of rollers and concaved bottoms placed in the tower one above another, internal passages to allow the air to pass up, an exterior dry-air flue at one side of the tower, with inlets into the tower, and an exterior damp-air flue on the opposite side, with outlets from the tower, as set forth.

5. In a grain-drier, the combination of a tower, a number of horizontal series of rollers and concaved bottoms placed in the tower one above the other, internal passages for the air, an exterior damp-air flue, with outlets from the tower, an exterior hot dry-air tube to supply the upper portion of the tower, and an exterior cold dry-air tube to supply the lower part, as set forth.

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

JOEL C. SLAUGHTER.

Witnesses:

JOHN E. NICKERSON,

H. WINNIE VAN SANT.