(No Model.)

S. P. COOK.

GRAIN COOLER AND DRIER.

No. 271,604. Patented Feb. 6, 1883.

Fig. 1

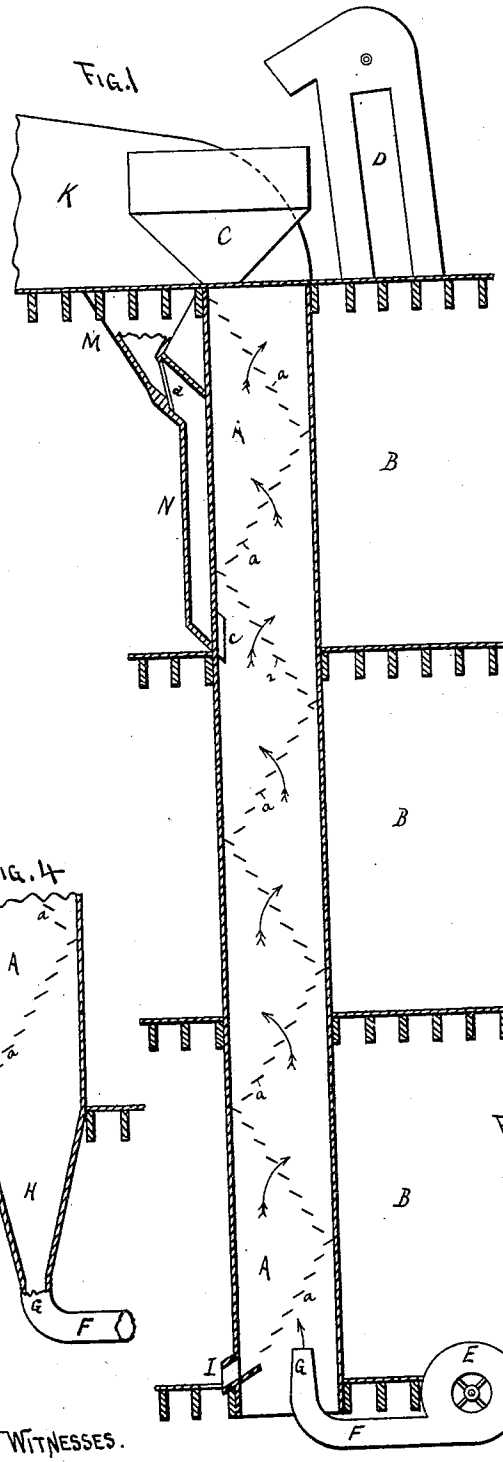


Fig. 2

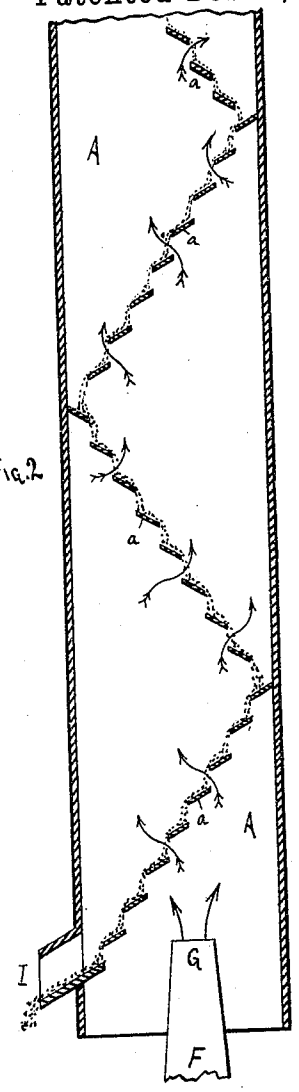
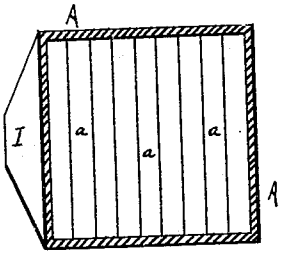


Fig. 4

Fig. 3



WITNESSES.

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UNITED STATES PATENT OFFICE.

SHELDON P. COOK, OF MINNEAPOLIS, MINNESOTA.

GRAIN COOLER AND DRIER.

SPECIFICATION forming part of Letters Patent No. 271,604, dated February 6, 1883.

Application filed June 12, 1882. (No model.)

To all whom it may concern:

Be it known that I, SHELDON PAUL COOK, the above-named petitioner, a citizen of the United States, and a resident of Minneapolis, in the county of Hennepin and State of Minnesota, have made certain new and useful Improvements in Apparatus for Cooling and Drying Grain, of which the following is a specification.

This apparatus is intended to be used in elevators, mills, and other places where grain is kept or used, for cooling it when heated or drying it when damp; and it consists in the construction and arrangement of parts, as hereinafter shown, and as specifically claimed.

In the drawings, Figure 1 is a sectional side view of the apparatus arranged in a building. Fig. 2 is an enlarged sectional side view of a portion of the lower end of the apparatus, and Fig. 3 is a cross-sectional view of Fig. 2. Fig. 4 is a sectional side view of a portion of the lower part of the apparatus on the same scale as Fig. 1, showing a variation in the manner of arranging the air-inlet nozzle.

This apparatus consists in a tubular casing, A, having slats *a* at regular intervals across its interior, and set in an upright position, as shown. This casing A will be usually about three feet square on the interior, and as long as the height of the building in which it is erected will permit. In Fig. 1 it is shown running through three stories, B; but the longer it can be made the better, because the longer and more gradually the grain can be acted upon the better will be the result. The slats *a* will be usually about three or four inches wide and the same distance apart, and sufficiently inclined to cause the grain to flow over them freely, and will be arranged in zigzag lines, so that the grain will pass back and forth from side to side of the tubular casing from the top to the bottom. The edges of the slats will overlap slightly, so that the grain will fall from slat to slat, and not drop down between them.

C is a feed-hopper, through which the grain is fed to the casing A, and D is an elevator, by which the grain is elevated to the hopper.

Beneath the casing A a fan, E, is arranged, to force a supply of air up into it, and will be adapted to furnish hot, warm, or cold air, as the case may be. In cold weather hot air will usually be required, while in warm weather cold or slightly warm air is usually employed. Then, again, grain under different conditions will require air of different temperatures; hence to adapt the apparatus to treat all kinds of grain in all its conditions it is necessary that the air-currents should be changeable as to their temperature.

The discharge-nozzle G of the fan-tube F may be arranged to discharge just below the lower set of slats *a*, as shown in Fig. 1, or open into a wide flaring hopper-shaped mouth, H, as shown in Fig. 4. The latter form possesses the advantage of more evenly distributing the air over the first set of slats with which it comes in contact. It will thus be seen that while the grain is flowing downward a current of air will pass through it as it falls from slat to slat, and thus cool or dry it, as the case may be, the course of the air being indicated by arrows.

By forming the tubular casing A as long as possible, (and it should never be less than forty or fifty feet, and, if possible, one hundred feet,) the currents of air gradually become cooler as they approach the top, when hot air is used, so that the grain gradually becomes hotter and hotter as it approaches the discharge-spout I. Thus the grain is very gradually dried, and is discharged in the proper condition for grinding, storing, or shipping. The same results are obtained when heated grain is treated by cold or slightly warm air, except that the order of procedure is reversed. In the latter case the heat of the grain gradually heats the air as it approaches the hopper C; hence the grain passes down through a gradually-decreasing temperature, and is consequently gradually cooled and leaves the machine in the proper condition. Thus the grain is not injured by being too suddenly heated or cooled.

K is a flaring hood or cover to the tubular casing A, through which the air, after passing through the casing, escapes, and is provided in its lower side with a hopper-shaped receptacle, M, having a spout, N, leading therefrom into the casing A at *c*. By this arrangement the air is allowed to expand after leaving the casing, and any kernels of grain which may be carried upward by the power of the blast will fall into the hopper-shaped receptacle M and flow back through the spout N to the casing A; hence no grain will be wasted or lost.

A valve, *d*, will be arranged in the spout N, to open outward when the grain presses against it, but will close by the pressure of the air and its own weight from the other side, so that no air can escape through the tube or spout N.

What I claim as new is—

1. A vertical tubular frame or casing, A, open at top and bottom, and adapted to have a current of air forced upward through it, in combination with a series of inclined slats, *a*, running in zigzag lines from side to side of the frame, the slats of each line of slats overlapping each other, as set forth, and for the purpose specified.

2. A tubular frame or casing, A, provided on its interior with inclined slats *a*, and adapted to have a current of air passed upward through it, in combination with a flaring hood or cover, K, receptacle M, and spout N, connecting said receptacle with said hood, whereby grain carried out of the casing will be returned thereto, substantially as set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

SHELDON PAUL COOK.

Witnesses:
C. N. WOODWARD,
LOUIS FEESER, Jr.