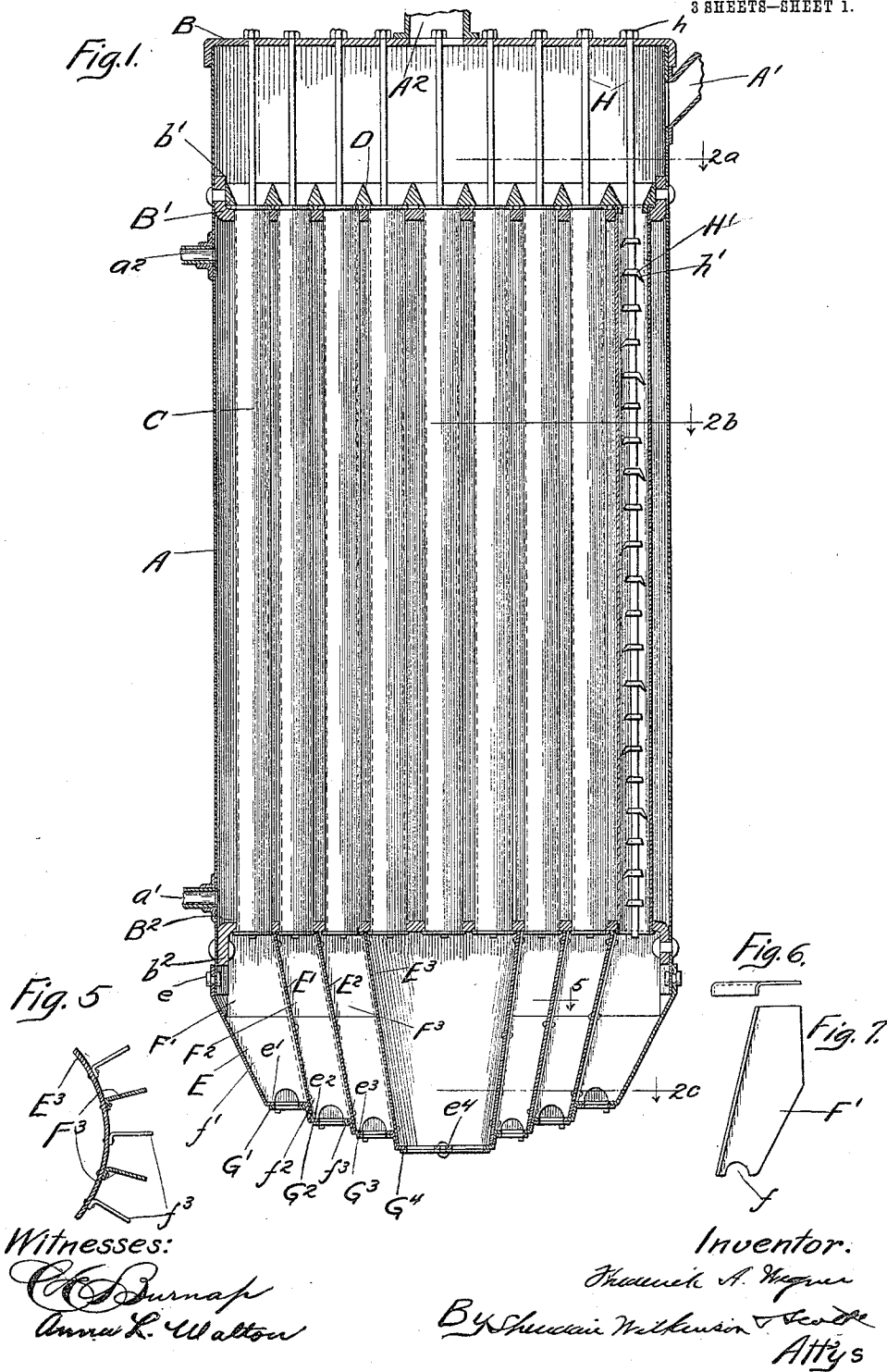


965,260.

Patented July 26, 1910.

3 SHEETS—SHEET 1.



F. A. WEGNER.

GRAIN DRIER.

APPLICATION FILED APR. 27, 1909.

965,260.

Patented July 26, 1910.

3 SHEETS—SHEET 2.

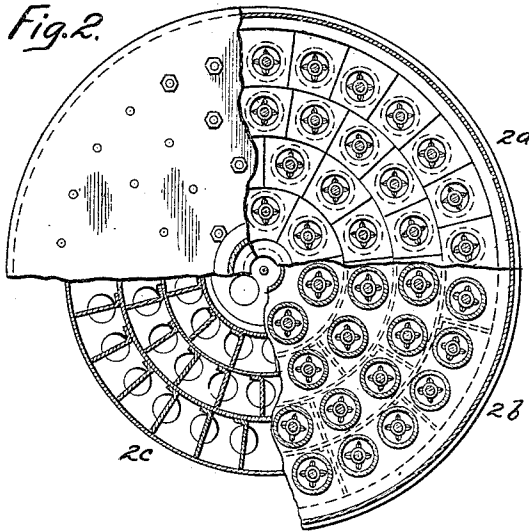


Fig. 3.

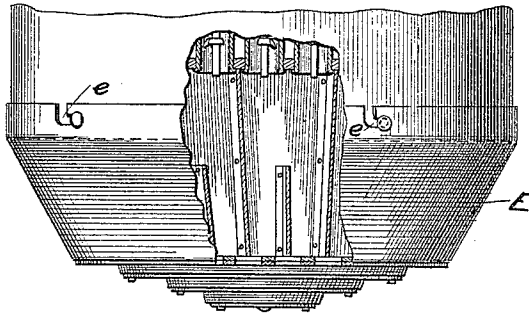


Fig. 8.

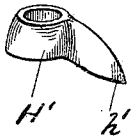


Fig. 4.

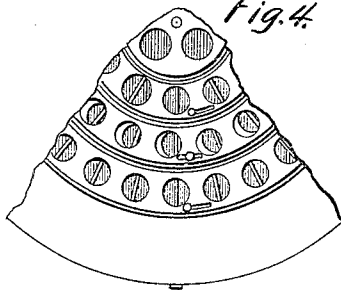
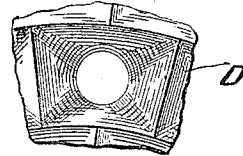


Fig. 9.



Witnesses:

C. Durnap
Anna L. Walton

Inventor:

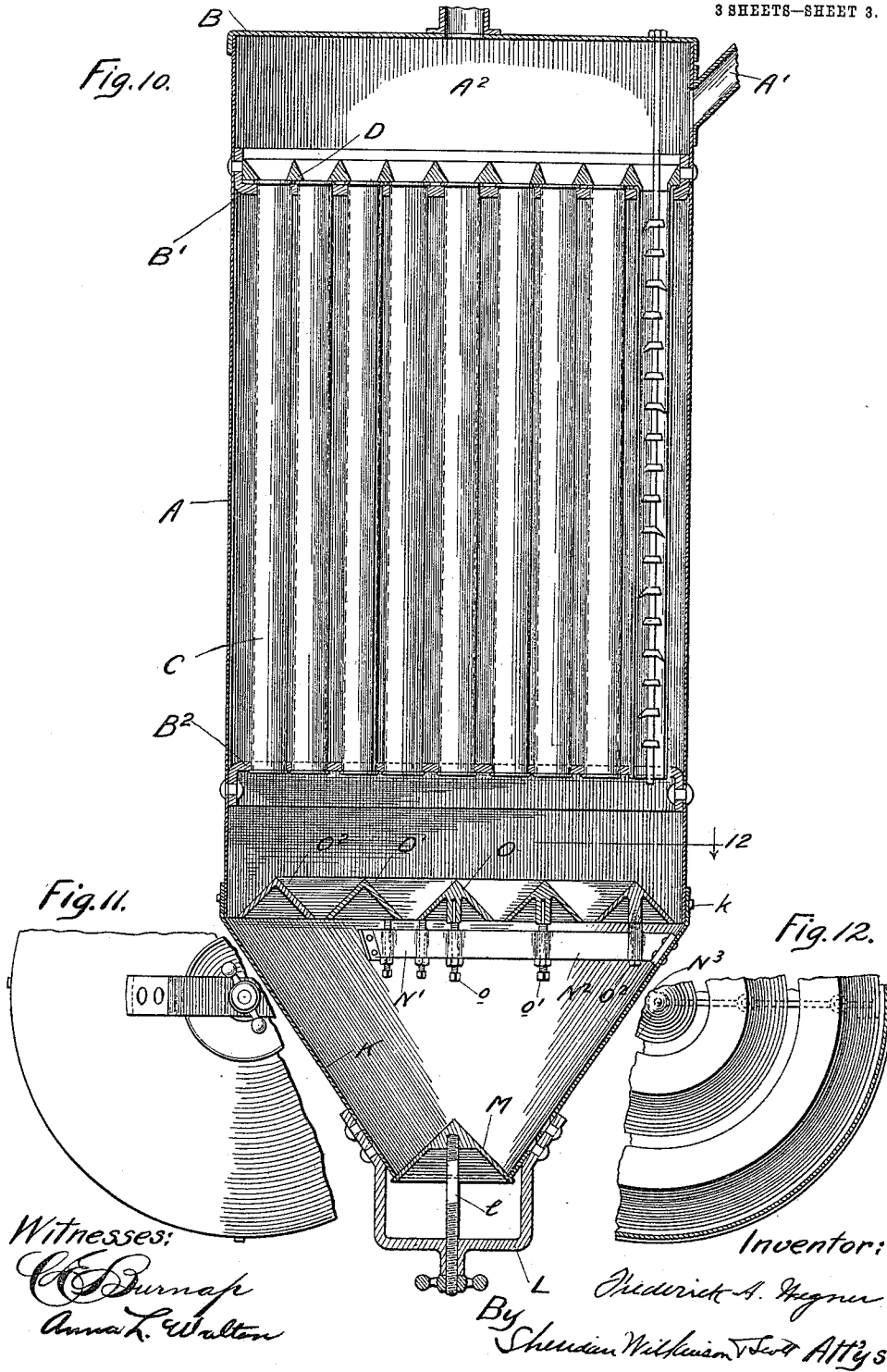
Fredrick A. Wegner

By *Shuridan McKenson* & *Scout*
Attys

965,260.

Patented July 26, 1910.

3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

FREDERICK A. WEGNER, OF MILWAUKEE, WISCONSIN, ASSIGNOR TO MILWAUKEE GRAIN DRYER COMPANY, A CORPORATION OF WISCONSIN.

GRAIN-DRYER.

965,260.

Specification of Letters Patent.

Patented July 26, 1910.

Application filed April 27, 1909. Serial No. 492,561.

To all whom it may concern:

Be it known that I, FREDERICK A. WEGNER, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Grain-Driers, of which the following is a specification.

My invention relates in general to drying apparatus and more particularly to grain driers.

Prior to delivering grain, especially wheat, to the mills it is desirable that it should be not only thoroughly dried, but that it should be tempered so that when it is subjected to the pressure of the mills the husk or hull will curl back from the kernel, thereby reducing the per cent. of kernel which adheres to the husk or hull and is consequently wasted.

The primary object of my invention is to provide a drier through which the grain will uniformly pass without choking; which will evenly heat all of the grain without danger of burning it; and which may be adjusted according to the nature or condition of the grain so that the grain will flow through the drier at the proper speed to secure the best results.

A further object of my invention is to provide a drier which will be simple in construction, inexpensive in manufacture, and efficient in use.

My invention will be more fully described hereinafter with reference to the accompanying drawings in which the same is illustrated as embodied in two convenient and practical forms, and in which—

Figure 1 is a vertical central section; Fig. 2 a partial plan and partial horizontal sectional view, the sections being indicated by reference numerals 2^a, 2^b and 2^c on Fig. 1; Fig. 3 an elevational view of the lower portion of the drier, a portion being shown in section; Fig. 4 a plan view of a portion of the lower end of the drier; Fig. 5 a detail sectional view on line 5 Fig. 1; Figs. 6 and 7 plan and elevational views of one of the partitions; Fig. 8 a detail view of one of the baffles; Fig. 9 a detail plan view of a portion of the top distributing plate; Fig. 10 a vertical section of a modified form of my invention; Fig. 11 a plan view of the bottom of a portion of the form shown in

Fig. 10; and Fig. 12 a detail view taken on line 12, Fig. 10.

Similar reference characters are used to designate similar parts in the several figures of the drawings.

Referring more particularly to Figs. 1 to 7, inclusive, reference character A indicates the outer wall of the drier which is preferably cylindrical in form. Secured within the cylindrical wall A are top and bottom headers B¹ and B² which are secured to the surrounding wall in any suitable manner as by means of rivets engaging peripheral flanges b¹ and b² respectively on the headers. The wall A extends upwardly above the top headers B¹ and is provided with a cover B, the space between the cover B and top header B¹ serving as a receiving chamber for the grain, to which the grain is supplied through either of the conduits A¹ or A². Vertical pipes C are located intermediate of the headers B¹ and B² and extend through holes therein.

In order that the grain may freely pass into the upper ends of the pipes, a plate D is located upon the top header, such plate being provided with conical chambers leading to the ends of the pipes, as shown in Fig. 9. The walls of the several conical chambers in the plate D meet in sharp edges so as to prevent any flat surfaces being formed upon which grain might lodge. A conical bottom E is detachably secured to the wall A below the header B² by any suitable means, such for instance as bayonet slots e which engage studs projecting outwardly from the wall A. A plurality of concentric conical hoppers E¹, E² and E³ are located within the bottom E and form annular passageways with which the lower ends of the concentrically arranged pipes C communicate. The lower ends of the conical hoppers E¹, E² and E³ extend to different levels and rest at their lower ends upon annular rings e¹, e², e³, and e⁴ formed integrally with the conical bottom E. Intermediate of the conical wall of the bottom E and the adjacent conical hopper E¹ are vertical partitions F¹ extending from the under surface of the header B² to the annular ring e¹ of the bottom. Similar partitions F² are interposed between the conical hoppers E¹ and E², while still other similar partitions F³ are located between the conical hoppers E² and E³. Intermediate of

the respective partitions F^1 , F^2 , and F^3 are shorter intermediate partitions f^1 , f^2 and f^3 , extending upwardly from the annular rings e^1 , e^2 and e^3 to a plane somewhat below that of the bottom header B^2 . Below the lower end of each of the several partitions is a hole through the underlying ring, the lower end of each partition having therein a curved notch overlying such hole, so as to permit the grain to pass from the chambers at opposite sides of each partition through the outlet hole beneath the partition. The circular portion e^4 at the center of the conical bottom E is also provided with outlet openings which are controlled by a plate G^4 having openings therethrough which may be brought more or less in register with the openings in the plate e^4 . Located beneath the rings e^1 , e^2 and e^3 are rotary rings G^1 , G^2 and G^3 having holes therein which may be brought more or less into register with the holes in the overlying stationary rings. A rod H depends within each of the tubes C and is provided with a plurality of collars H^1 , each having a baffle h^1 projecting laterally therefrom. The various baffles on each rod H are staggered so that they will retain the rod concentrically within the surrounding tube without impeding the flow of the grain therethrough. Each rod H projects upwardly through the top B where it is provided with a nut h by means of which the rod may be moved vertically to dislodge the grain in the corresponding tube should it become choked.

The operation of the embodiment of my invention above described is as follows: The heating medium, such as steam, is admitted through a supply conduit a^1 to the interior of the cylindrical wall A and circulates around the pipes C thereby heating the grain passing through them, after which the heating medium passes out through the discharge conduit a^2 . The grain passes from the supply chamber above the heater B^1 downwardly through the various tubes C and passing through them it is thoroughly agitated by the baffles h^1 . The grain passes from the lower ends of the tubes C into the respective concentric hoppers and is directed by the vertical partitions therein to the several outlets. It is obvious that by separately adjusting the valve plates G^1 , G^2 , G^3 and G^4 the discharge of grain may be so regulated that it will pass uniformly through all of the tubes of the drier.

Referring to Figs. 10, 11 and 12 it will be seen that in the form of my invention shown therein a different arrangement of concentric annular hoppers is provided below the lower ends of the tubes C . In this form of my invention a conical bottom K is detachably secured to the lower end of the cylindrical wall A by any suitable fastening devices l . An inverted conical valve M con-

trols the open lower end of the bottom K and is adjustable by means of a screw l vertically adjustably supported by a stirrup L supported at its ends by the walls of the conical bottom K . Supported within the upper end of the conical bottom K is a spider comprising arms N^1 , N^2 and N^3 above which are supported two concentric inverted V-shaped rings O^1 and O^2 . Within the inner ring O^1 is a cone O adjustably supported by means of a bolt o extending upwardly through the center of the spider. Similar bolts o^1 and o^2 extend upwardly through the arms of the spider and support the rings O^1 and O^2 . It will be observed that by adjusting the horizontal planes of the rings O^1 and O^2 and the central cone O , the annular concentric passageways between the cone, the concentric rings, and the surrounding lower edge of the wall A may be varied so as to insure the uniform flow of the grain through the several tubes C . The speed with which the grain passes through the drier may be regulated by means of the conical valve N .

From the foregoing description it will be observed that I have invented an improved grain drier in which the grain will be evenly heated by reason of the uniform flow of the grain through all of the heating tubes.

It will be evident that by means of both of the embodiments of my invention herein shown the flow of grain through the various tubes may be separately regulated by varying the discharge through the concentric annular passageways, thereby insuring the same speed of flow through all of the heating tubes. It will further be seen that I have provided means for thoroughly agitating the grain as it passes through the tubes, such means also serving to dislodge the grain should it become choked in the tubes.

I claim:

1. In a grain drier, vertical drying tubes arranged in concentric series, and concentric hoppers to receive the grain from the respective series of tubes.

2. In a grain drier, drying tubes through which the grain is adapted to pass, central rods in the respective tubes, and laterally projecting baffles on the said rods, said baffles being arranged in staggered relation around each rod.

3. In a grain drier, vertical drying tubes, a vertical drum within which said tubes are arranged, and a plurality of concentric annular walls forming discharge passageways below the lower ends of the tubes.

4. In a grain drier, vertical drying tubes arranged in concentric series, concentric walls forming discharge passageways to receive the grain from the respective series of tubes, and means for adjusting the flow of grain through said passageways.

5. In a grain drier, vertical drying tubes

arranged in concentric series, concentric
hoppers to receive the grain from the re-
spective series of tubes, each hopper extend-
ing a little lower than the hopper outside
5 thereof, and adjustable closures for the an-
nular bottoms of the hoppers.

6. In a grain drier, a vertical drum, ver-
tical tubes extending through the drum for
carrying grain, a hopper attached to the bot-
10 tom of the drum comprising concentric walls
forming annular discharge openings, and
concentric walls within the hopper to deflect
grain as it discharges from the lower ends
of the tubes and to direct the grain through
15 said annular openings.

7. In a grain drier, a drying drum with
drying tubes therein, said tubes being ar-
ranged to discharge downward from the bot-
tom of the drum, separate grain conveying
20 chutes extending downwardly below the
drum from various parts thereof, and inde-
pendently adjustable closures for the vari-
ous chutes.

8. In a grain drier, vertical drying tubes

arranged in concentric series, concentric 25
hoppers to receive the grain from the re-
spective series of tubes, each inner hopper
extending a little below the bottom of the
hopper outside thereof, annular plates clos-
ing the bottoms of the respective hoppers, 30
said plates having holes therein, and corre-
sponding rotatable annular plates adapted
to act as closures for the bottoms of the hop-
pers.

9. In a grain drier, drying tubes through 35
which the grain is adapted to pass, central
rods in respective tubes, rings mounted upon
the said rods at intervals, and laterally pro-
jecting baffles on the respective rings, said
baffles being arranged in staggered relation 40
around each rod.

In testimony whereof, I have subscribed
my name.

FREDERICK A. WEGNER.

Witnesses:

FRANK P. BURKE,
JOHN J. REILLY.