(No Model.)

F. H., G., & J. McKNIGHT.

GRAIN SEPARATOR.

No. 269,532. Patented Dec. 26, 1882.

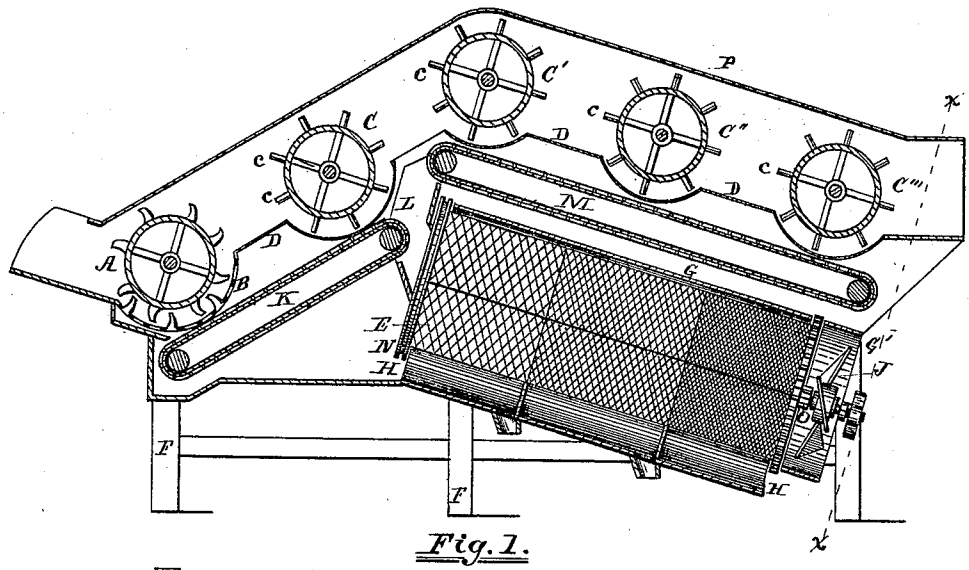


Fig. 1.

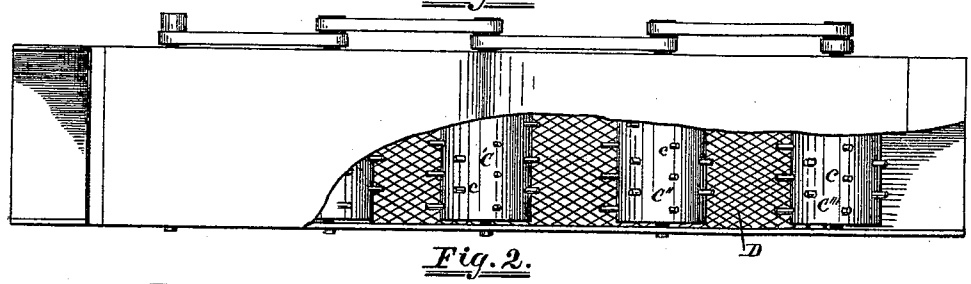


Fig. 2.

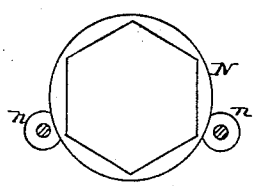


Fig. 4.

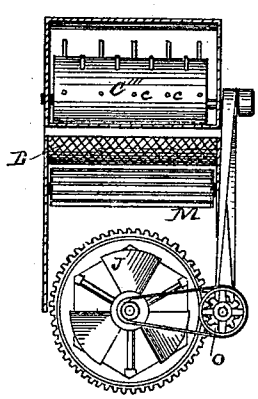


Fig. 3.

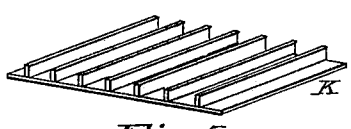


Fig. 5.

Witnesses:

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UNITED STATES PATENT OFFICE.

FRANCIS H. McKNIGHT, GEORGE McKNIGHT, AND JOHN McKNIGHT, OF SPRINGFIELD TOWNSHIP, SUMMIT COUNTY, OHIO.

GRAIN-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 269,532, dated December 26, 1882.

Application filed April 24, 1882 (No model.)

To all whom it may concern:

Be it known that we, FRANCIS H. McKNIGHT, GEORGE McKNIGHT, and JOHN McKNIGHT, of Springfield township, in the county of Summit and State of Ohio, have invented a new and useful Improvement in Grain-Separators, of which the following is a specification.

The object of our invention is the production of a machine simple in construction, which shall effect a more complete separation of the grain from the straw after it leaves the thrashing-cylinder than the devices now in use, which shall collect and discharge the dust at the rear of the machine, and which can be successfully operated against a head wind.

Our invention consists of the mechanism hereinafter more fully described and claimed, and illustrated in the accompanying drawings, wherein Figure 1 is a vertical longitudinal section of a grain-separator embodying our invention; Fig. 2, a plan of the same with the covering partly cut away to show the beater-drums and screen; Fig. 3, a section of Fig. 1 at the line *x x;* Fig. 4, the front end of the screening-bolt, to show the manner in which it is supported; and Fig. 5, an enlarged view of a part of the conveyer-belts.

Journaled within a suitable frame, F, is the thrashing-cylinder A, above the grate B, both of which are of the kind ordinarily used in grain-separators. Within the same frame and back of the thrashing-cylinder is journaled a series of drums, C C′ C″ C‴, the peripheries of which are of thin sheet metal, having series of pins *c c c c* projecting radially therefrom.

Extending from the grate B to and beyond the drum C‴ is a continuous apron, D, of wire-netting of such mesh as to carry the straw and coarse material, but permit the grain, chaff, unthrashed heads, &c., to fall through.

Beneath each drum the apron D is bent in a curve concentric with and slightly exceeding the circle described by the pins *c c.*

Motion is communicated to the drums in any suitable manner, as by belts, from the axis of the thrashing-cylinder, so that they revolve in the same direction as the thrashing-cylinder.

Journaled longitudinally within the frame, beneath the apron D, is a bolting-screen, E, sloping to the rear and adapted to revolve in that position. This screen is supported at the front end by a grooved wheel, N, revolving on friction-wheels *n n,* (see Fig. 4,) and at the rear by a central journal, running in suitable bearings, and it is turned by means of a pinion, O, actuated from the beater-cylinders meshing into a large gear-wheel surrounding the rear end. (See Fig. 3.) This bolt is covered with wire screen of different degrees of fineness, so as to subdivide the product of the thrashed grain.

Surrounding the bolt is a metallic case, G, opening along its lower side into a smaller case, H, which latter is subdivided into apartments corresponding with the grades of netting on the bolt. The front end of the bolt is open to admit of the free entrance of air; and at the rear, in a case, G′, which is substantially a continuation of the case G, is situated a screw-fan, J, journaled concentrically with the bolt, and arranged by devices—such substantially as shown in Fig. 3—to be rapidly revolved and draw the air from the bolt. An endless belt, K, conveys the grain, chaff, &c., from beneath the grate B and front part of apron D to a spout, L, entering the bolt, while a similar endless belt, M, receives whatever falls through the latter part of the apron D, and also conveys it to the spout L.

In operation, the straw and such other parts as do not fall through the grate B are, by the momentum imparted by the cylinder A, carried out upon the apron D, and by each successive cylinder C C′ C″ C‴ beaten, shaken up, and carried forward, thereby completely separating all grain from the straw, the grain, chaff, &c., falling through the apron D upon the belt M.

All danger of clogging may be averted by causing each beating-cylinder to revolve more rapidly than the one next preceding; and increased separation may in some instances be secured by causing one beater to run in a direction contrary to the others. The finer parts are, by the belts, K M, carried to the spout L, and as they fall thence the suction of the fan J at once draws all chaff and lighter parts away; the heavier, falling upon the bolt, are subdi-

vided by the respective screens and fall into the case G and smaller case, H, whence they are delivered by suitable spouts.

The entire machine is inclosed by a casing, P, and thus the fan J is enabled to perform the further function of carrying off all dust from the machine, while by arranging the fan to draw instead of to blast the air through the bolt the hinderance occasioned by a strong wind blowing in a direction contrary to the course of the straw is obviated. The coarser parts falling through the screen are, by mechanism which it has not been deemed necessary to show, conveyed back again to the thrashing-cylinder.

In practical operation it may be found advantageous to make the bolt adjustable with reference to the machine, so that it may be always inclined at the same angle whatever may be the position of the machine; and a gate may be placed at its front end to regulate the current of air passing through it.

A cast-metal or other grating may be substituted for the apron D, and some other fan may be used instead of a screw without departing from our invention, which is—

1. A winnowing and separating device consisting essentially of an inclined revolving screen, an exhaust-fan at the rear end of said screen, adapted to draw the air through said screen, and a case inclosing said screen and fan, all constructed and arranged substantially as shown, and for the purpose specified.

2. In a grain-separator, the combination of a series of beating-cylinders, a grating arranged below said cylinders, an inclined rotating screen, an exhaust-fan situated at the discharge end of said screen, adapted to draw the air through said screen, and a case inclosing said screen and fan, all constructed and arranged as shown, and for the purpose specified.

3. The herein-described grain-separator, consisting of the thrashing-cylinder A, beating-cylinders C C′ C″ C‴, grating D, conveying-belts K M, bolt E, and fan J, all constructed and arranged substantially as shown, and for the purpose specified.

In testimony that we claim the foregoing we have hereunto set our hands this 18th day of April, A D. 1882.

FRANCIS H. McKNIGHT.
GEORGE McKNIGHT.
JOHN McKNIGHT.

Witnesses:
C. P. HUMPHREY,
E. W. STUART.