(No Model.) 2 Sheets—Sheet 1.

F. E. CURTIS & W. H. HELFRICH.

GRAIN CLEANING MACHINE.

No. 294,205. Patented Feb. 26, 1884.

Fig. 1.

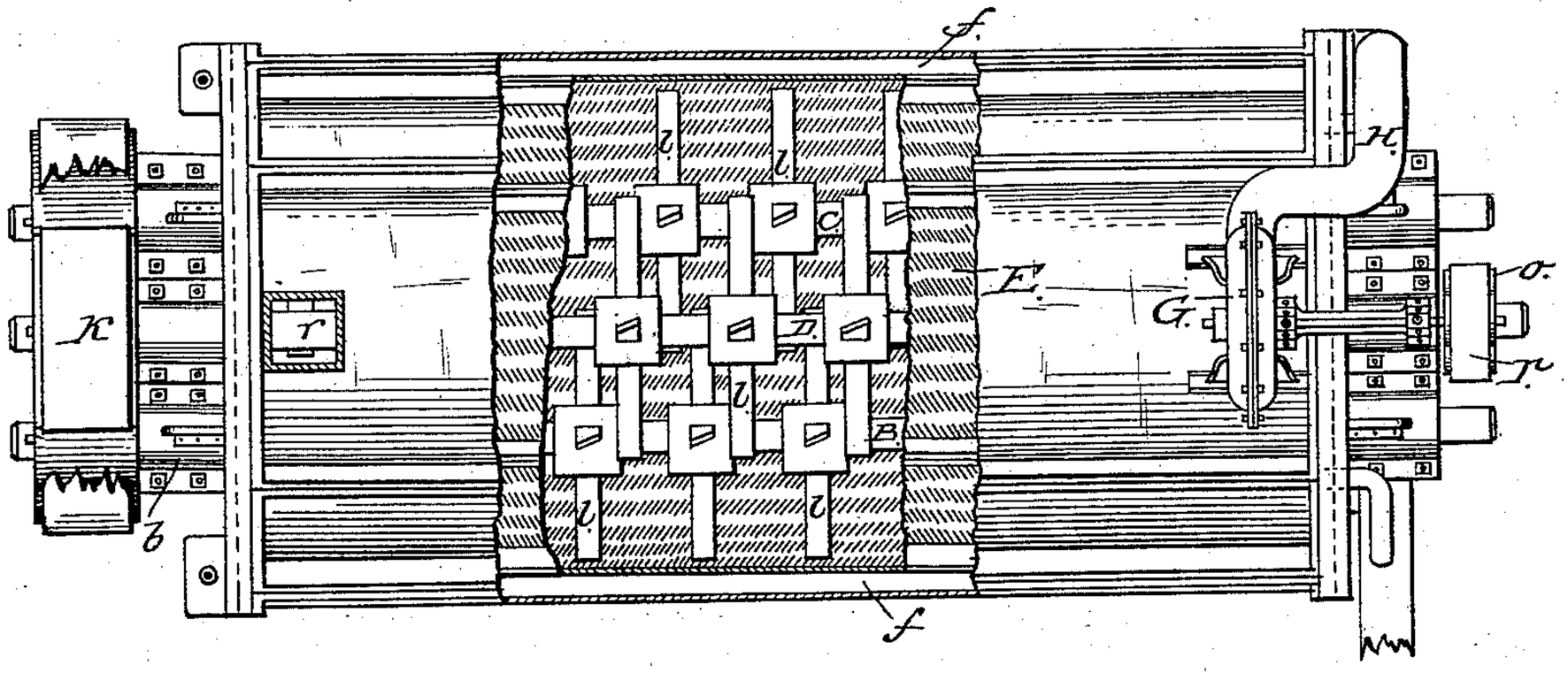
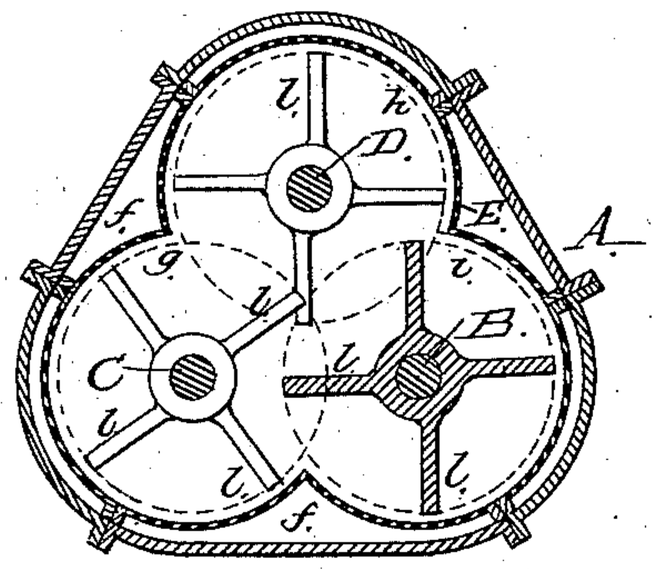


Fig. 4.



Attest;

Walter Fowler

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his Attorney

(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

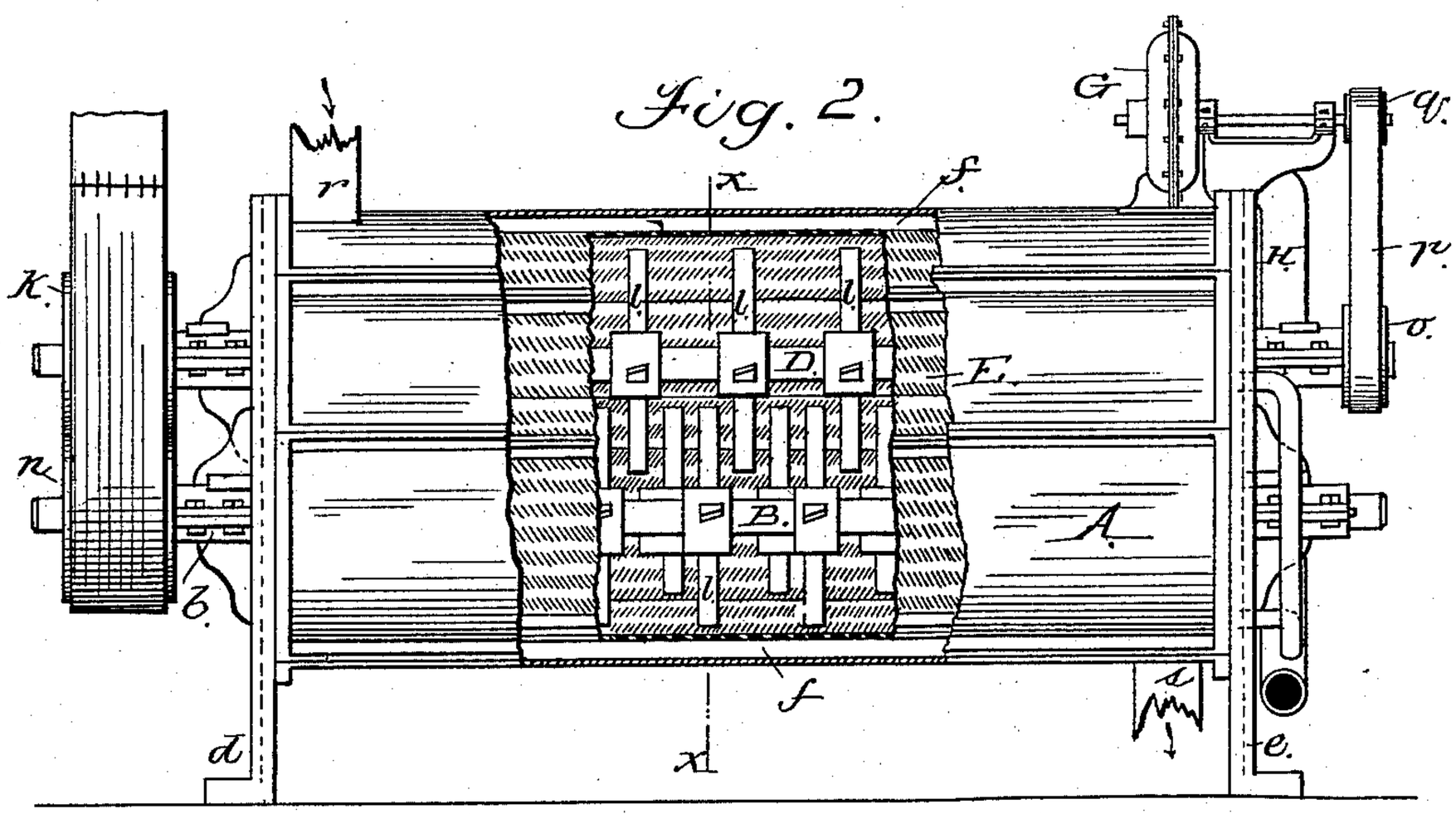
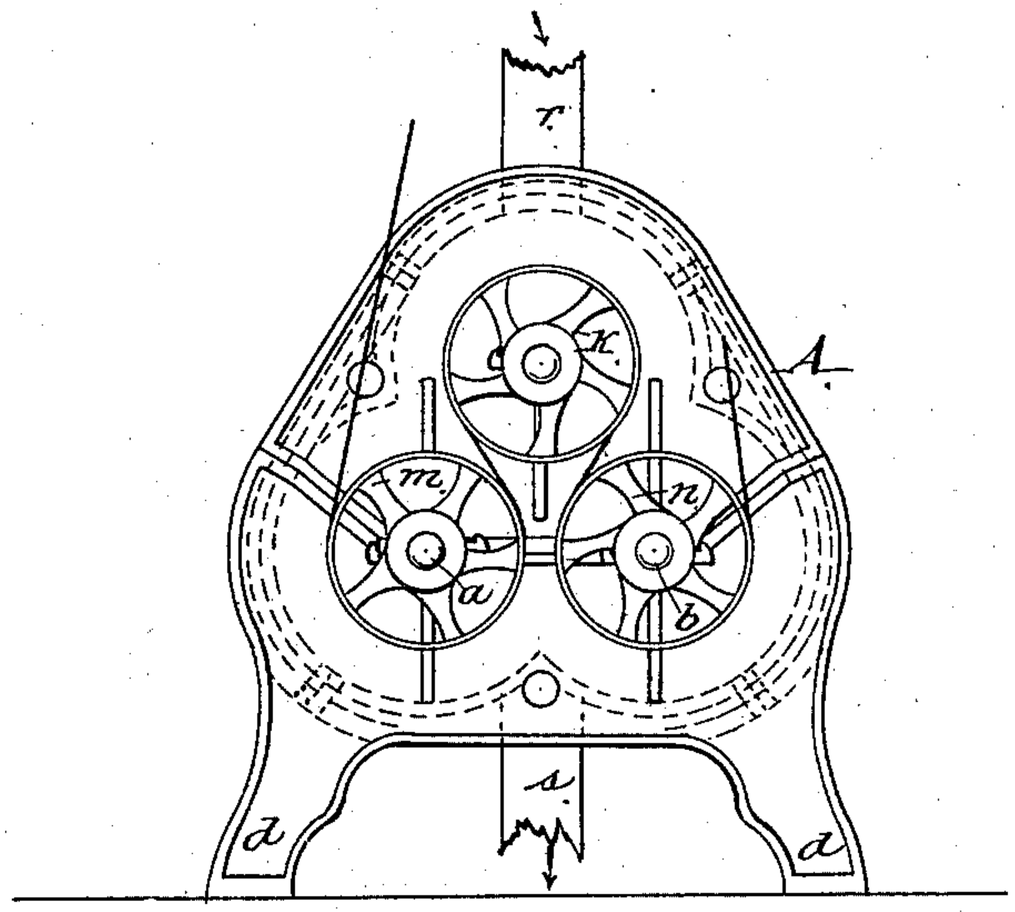


Fig 3.



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Their Attorney.

UNITED STATES PATENT OFFICE.

FRANK E. CURTIS AND WILLIAM H. HELFRICH, OF MINNEAPOLIS, MINN.

GRAIN-CLEANING MACHINE.

SPECIFICATION forming part of Letters Patent No. 294,205, dated February 26, 1884.

Application filed November 17, 1883. (No model.)

To all whom it may concern:

Be it known that we, FRANK E. CURTIS and WILLIAM H. HELFRICH, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented a new and Improved Grain-Cleaning Machine; and we hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, making part of this specification, in which—

Figure 1 is a plan of the machine, having the casings cut away to show the interior mechanism. Fig. 2 is a side elevation having the casing cut away. Fig. 3 is an end elevation. Fig. 4 is a vertical cross-sectional view on the line *x x* of Fig. 2.

Our invention relates to machines for cleaning grain; and it consists of the combinations of devices, hereinafter fully described, and specifically set out in the claims.

In order that those skilled in the art may make and use our invention, we will proceed to describe the exact manner in which we have carried it out.

In the said drawings, A is a casing, of cast-iron or other suitable material, made, preferably, in two parts, the juncture being at the journal-boxes *a b* of two lower shafts, B C, so that the upper portion may be lifted off. This casing A is supported on legs *d e*, and has within it a perforated steel shell, E, whose greatest transverse dimension is less than the transverse dimension of casing A, the space *f* between casing A and shell E forming an air-chamber, for a purpose hereinafter fully set forth.

In cross-sectional area the wall of shell E represents sections of three intersecting circles, *g h i*, the center of each circle being occupied by one of the shafts B C D. Each of the shafts B C D has keyed or otherwise secured to it a series of equidistantly-arranged radial beaters or spiders, *l*, the beaters on each shaft intermeshing or passing between the ends of the beaters on the other shafts, and the ends of each series of beaters describing in their movements a circle which intersects the circle described in the rotation of each of the other series of beaters. The ends of the shafts B C D are provided with pulleys *k m n* and proper belting to revolve the said shafts in opposite directions, and on the end opposite to the driving-pulley shaft D carries a pulley, *o*, which, by means of a belt, *p*, drives a pulley, *q*, which actuates a suction-fan, G, mounted on top of the casing A. The suction-fan housing opens into the space or air-chamber *f*, and has a discharge through pipe H. The grain is fed into one end of the machine, at *r*, and is discharged at the other end, at *s*. The length of the beaters *l* from the centers of the shafts is a little less—say about half an inch—than the radii of the circles on which the curves of the perforated shell E are struck. This gives the ends of the beaters sufficient clearance; but this clearance may be somewhat varied without departing from the spirit of our invention. The feed and discharge of the grain are so regulated that at all times practically all the grain within the shell E is in a state of suspension, and kept so by the rapid blows given the grain in opposite directions by the oppositely-revolving beaters. The conflicting motions and blows given the grains remove the germ and the outer husk, clean out the crease, and take off the brush end. As the grain is decorticated and cleaned, the resultant dust is drawn through the perforated shell E into the space or air-chamber *f* by the suction-blast of fan G, whence it is carried to any convenient point through pipe H. As the force applied is centrifugal, the strength of the blow delivered on the flying grains is proportioned to the length of the beaters and the rapidity of their revolutions.

It is evident the fan-exhaust may be located at either end of the machine without departing from the spirit of our invention.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a grain-cleaning machine, a series of rotating shafts carrying beaters, in combination with an inclosing investment having a series of curvilinear plane surfaces, the curves of which are substantially struck from the axes of the rotating shafts, for the purpose set forth.

2. The casing A, provided with the suction-fan G and discharge-pipe H, and proper gearing to drive said fan, in combination with the curvilinear shell E, of less cross-sectional dimension than casing A, and a series of shafts, B C D, geared to revolve in opposite directions, and carrying interlapping beaters *l*, all constructed, arranged, and operated as set forth.

FRANK E. CURTIS.
WILLIAM H. HELFRICH.

Witnesses:
GEO. W. MARTIN,
JOHN G. BUTLER.