No. 669,013. Patented Feb. 26, 1901.

J. L. OWENS.

GRAIN SEPARATOR.

(Application filed Jan. 22, 1900. Renewed Jan. 26, 1901.)

(No Model.) 2 Sheets—Sheet 1.

FIG. 2

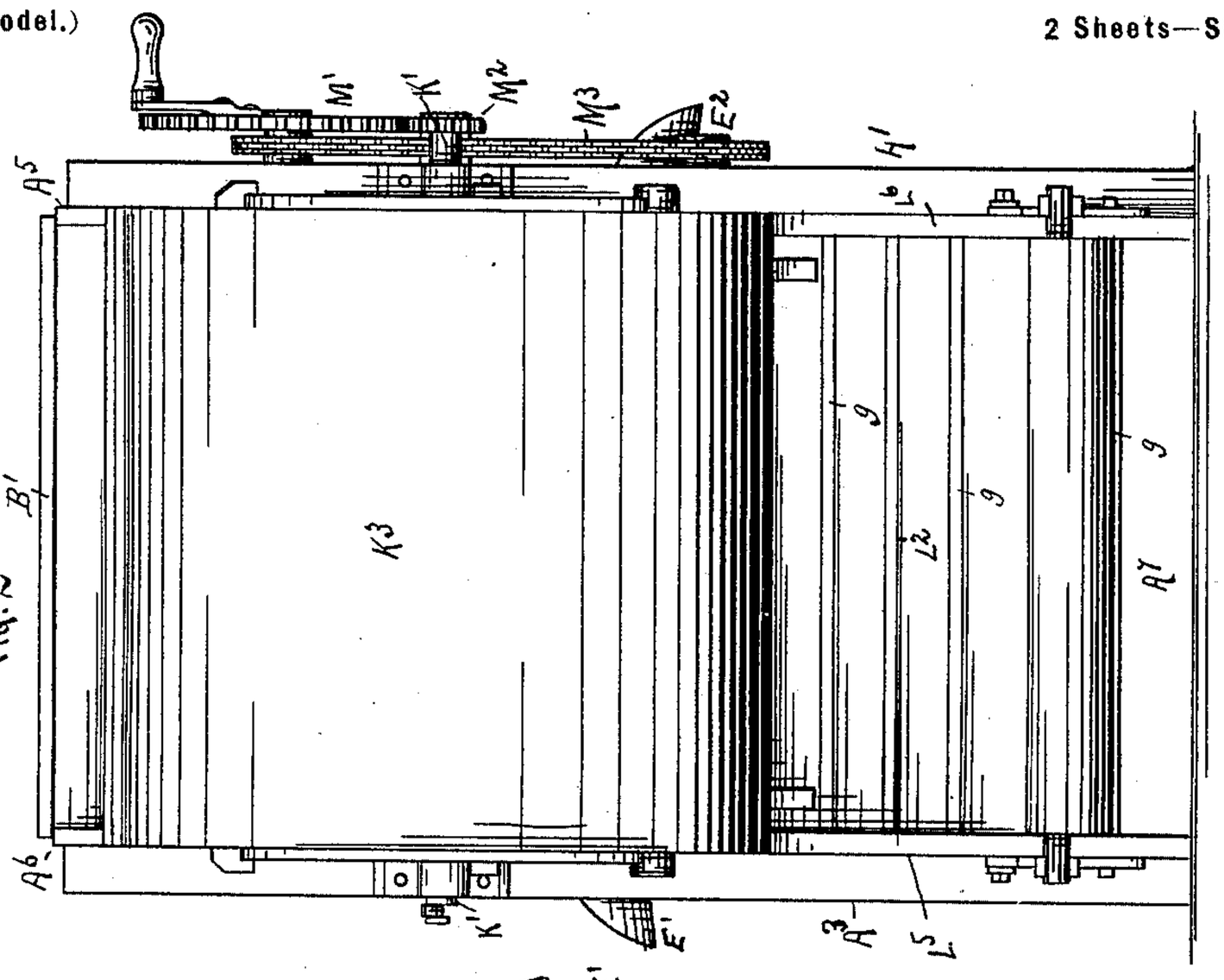
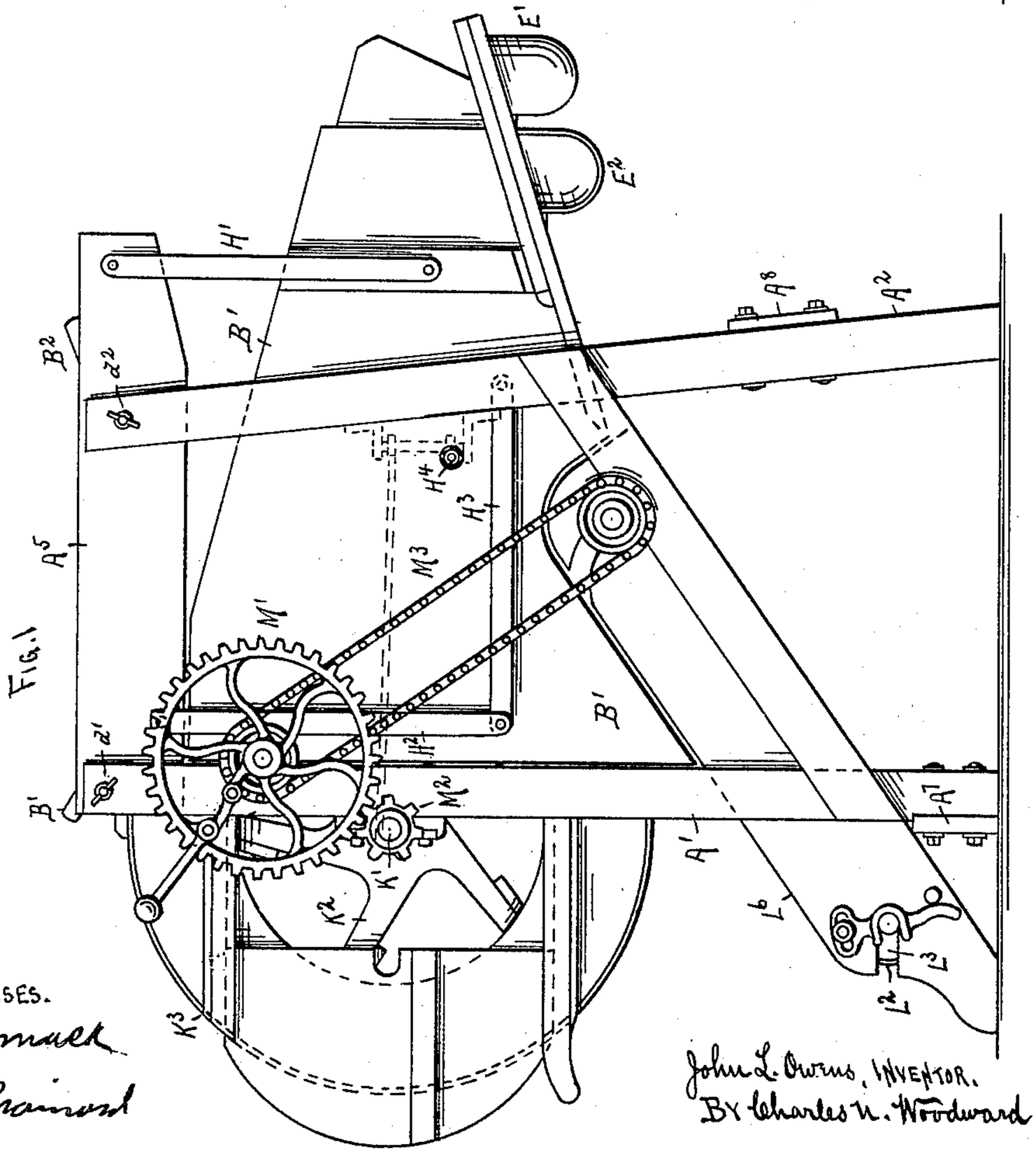


FIG. 1



WITNESSES.
F. Womack
L. D. Brainard

John L. Owens, INVENTOR.
By Charles N. Woodward Atty.

No. 669,013. Patented Feb. 26, 1901.

J. L. OWENS.

GRAIN SEPARATOR.

(Application filed Jan. 22, 1900. Renewed Jan. 26, 1901.)

(No Model.) 2 Sheets—Sheet 2.

FIG. 4

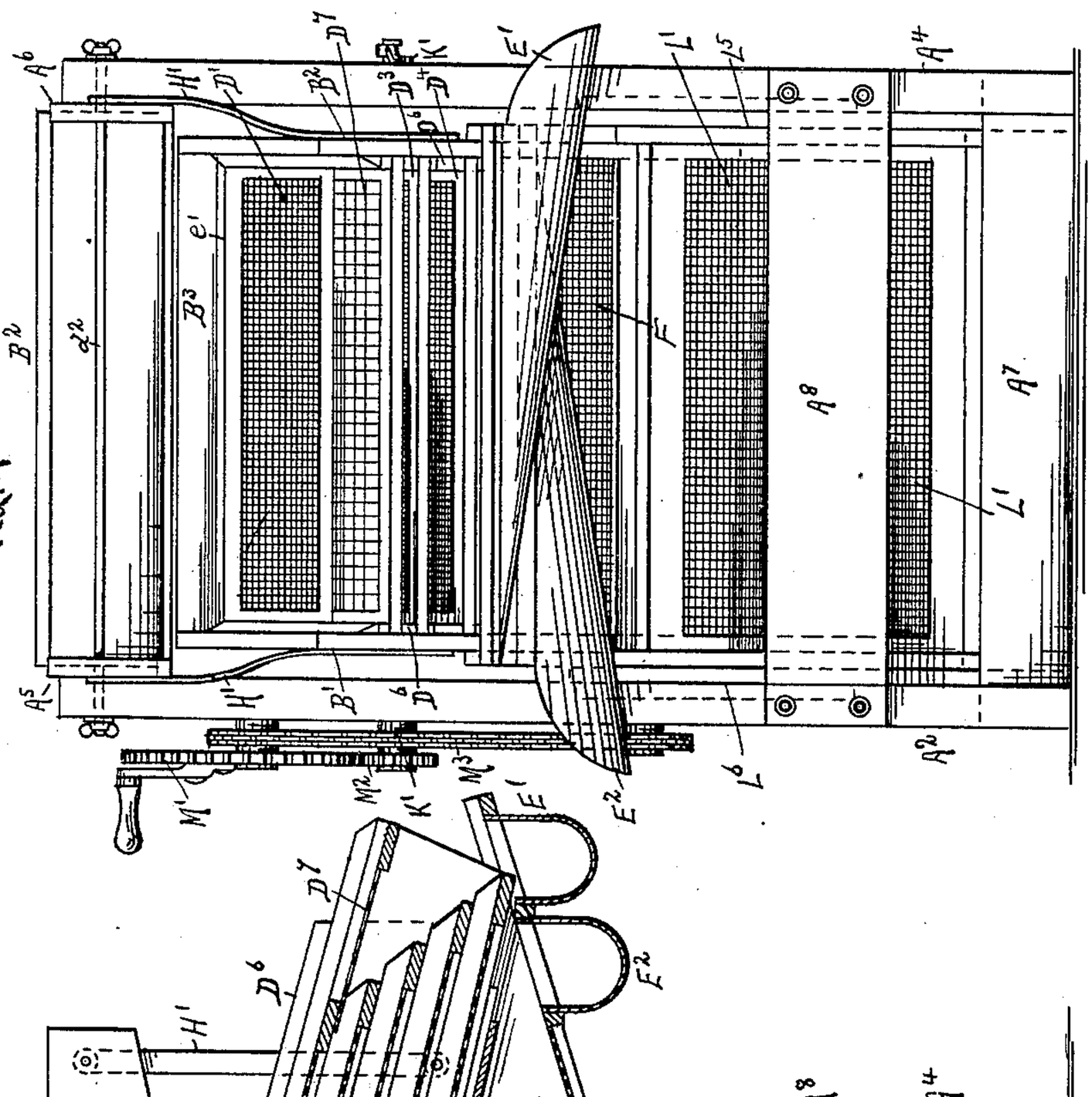
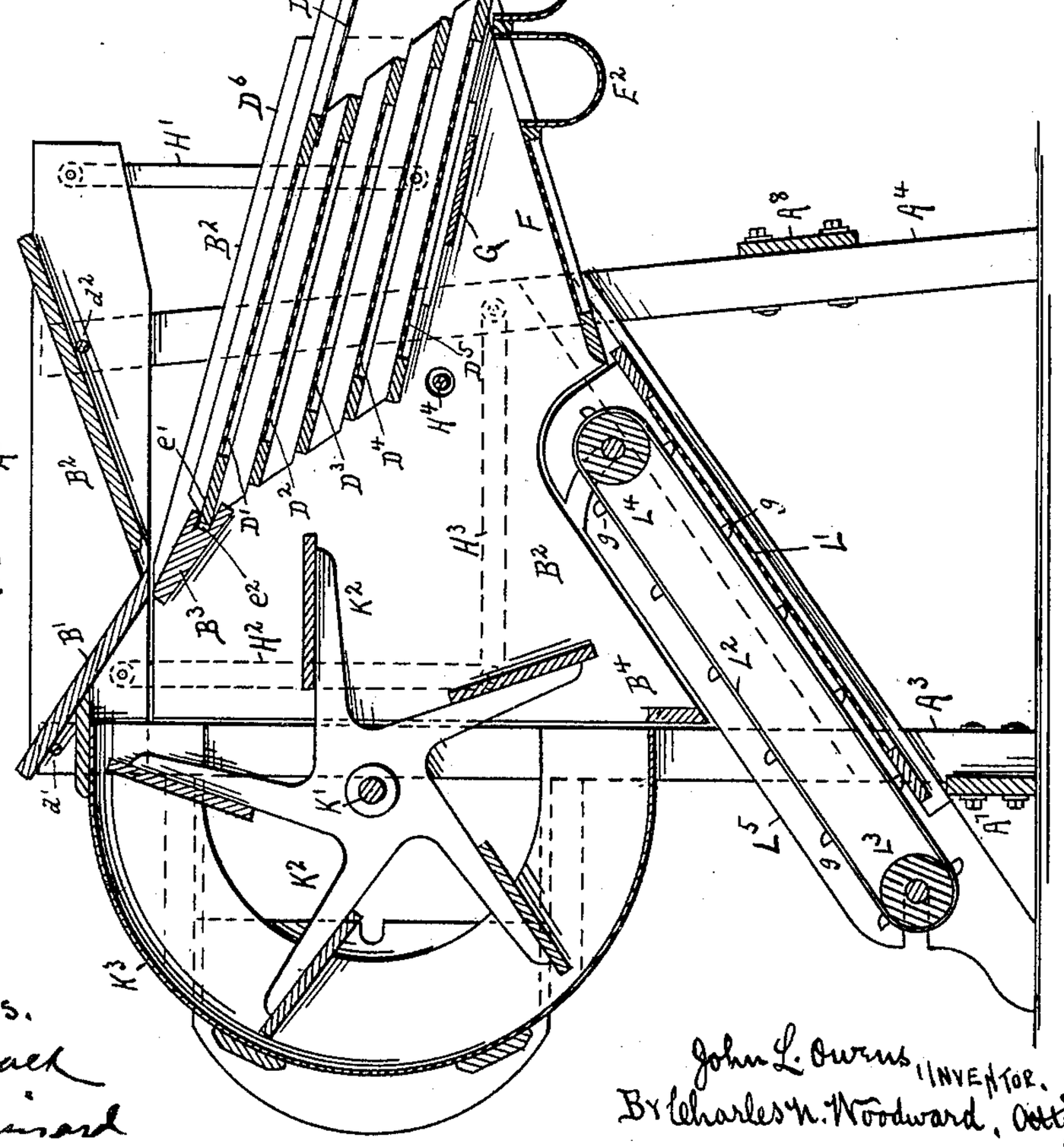


FIG. 3



WITNESSES.
F. Womack
L. D. Brainard

John L. Owens, INVENTOR.
By Charles N. Woodward, Atty.

UNITED STATES PATENT OFFICE.

JOHN L. OWENS, OF MINNEAPOLIS, MINNESOTA.

GRAIN-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 669,013, dated February 26, 1901.

Application filed January 22, 1900. Renewed January 26, 1901. Serial No. 44,864. (No model.)

To all whom it may concern:

Be it known that I, JOHN L. OWENS, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain new and useful Improvements in Grain-Separators, of which the following is a specification.

This invention relates to machines for separating and winnowing grain; and it consists in the construction, combination, and arrangement of parts, as hereinafter shown and described, and specifically pointed out in the claim.

In the drawings, Figure 1 is a side elevation of my machine, and Fig. 2 is an end elevation from the feed end of the machine complete. Fig. 3 is a sectional side elevation. Fig. 4 is an end elevation from the "tail" end of the machine.

The framework consists of four posts A' A^2 and A^3 A^4, arranged in pairs and each pair connected longitudinally at their upper ends by side plates A^5 A^6 and transversely by plates A^7 A^8 near their lower ends, as shown.

The feed-hopper is formed by transverse plates B' B^2, supported between the plates A^5 A^6 and with one of the plates B^2 slidable between the side plates A^5 A^6 and rendered adjustable to regulate the feed-opening a' by cross tie-rods d' d^2, passing through the upper ends of the parts A' A^2 A^3 A^4 and the side plates A^5 A^6, as shown.

The "shoe" for supporting the screens is formed of two angular sides B' B^2, connected transversely at their upper edges by an inclined plate B^3, which being set beneath the discharge from the feed-hopper serves the double purpose of a cross-stay to the top of the shoe and also as a feed-distributing plate. The lower corners of the shoe may also be supported or "stayed" by a cross-bar B^4.

D' D^2 D^3 D^4 D^5 are a series of inclined screens connected into a frame D^6, the upper screen D^5 having an extension-screen D^7 of coarser mesh than the others and adapted to receive the "tailings" from the upper screen D'. The "nest" of screens thus arranged and supported in the frame D^6 is removable from the shoe B' B^2 to enable the screen to be changed or renewed. The upper edge e' of the upper screen fits into a groove e^2 in the front or adjacent edge of the feed-plate B^3, as shown, so that the screen will not only be properly supported, but the material will be guided from the feed-plate to the screens.

Beneath the tail end of the lowermost screen D^5 is an inclined transverse spout E' to receive the tailings from all the screens except the extension D^7 and conduct them off to one side of the machine, and beneath the lower portion of the lowermost screen D^5 is a reversely transverse spout E^2 to receive the material falling through the lower portion of the screen D^5 and conduct it off to the opposite side of the machine.

F is a shorter screen, generally of fine mesh, extending from the inner edge of the spout E^2 toward the lower end of the shoe formed by the sides B' B^2 at an incline reversed from the screens D' D^2 D^3 D^4 D^5 D^7, as shown, and adapted to receive the material falling through the upper part of the screen D^5.

G is a board arranged across the bottom of the frame D^6 beneath the screen D^5 and adapted to receive a portion of the material falling through the screen D^5 and conduct it into a spout E^2 and prevent it falling upon screen F. By this means a greater quantity of the material passing through the screen D^5 will be conducted into the spout E^2 than if the stop-board G were not present. The board G may be arranged removable from the frame D^6, as it may not be required in separating some kinds of grain. The spout E^2 is technically known as the "repeat-spout," as the material which finds its way thereto generally contains much valuable material and requires to be returned to the feed-hopper and again passed through the machine or the cleaning process "repeated" upon such material. By using the stop-plate G a larger proportion of the material passing through the screen D^5 is conducted to the repeat-spout, and to accomplish this result is the function of the stop-plate, which is called a "repeat-board." The shoe B' B^2 is suspended from the framework by suspension-bars H' H^2 H^3, as shown in Figs. 1 and 3, and adapted to be vibrated laterally by a cross-rod H^4, connected to a crank on the fan-shaft through levers and bell-crank arms;

but as the vibrating mechanism is no part of the present invention I do not further describe it. The spouts E′ E² and the screen F thus partake of the vibrations of the shoe and its nest of screens.

K′ is the fan-shaft, carrying the fan K², whose blades project into the space between the sides B′ B², forming the shoe, so that the latter thereby form a part of the fan-case. The remainder of the fan-case is of a semicylindrical form K³, inclosing the outer portion of the fan, as shown; but as this construction of the fan-case is the subject of a claim for novelty in another application for Letters Patent filed November 21, 1899, Serial No. 737,738, it is not further described in the present application.

L′ is a stationary inclined screen supported in the lower part of the framework and with its upper edge projecting beneath the tail end of the screen F, so that the tailings from the screen F will flow upon the screen L′, as shown.

L² is an endless belt running over transverse rollers L³ L⁴, journaled in side plates L⁵ L⁶, which support the screen L′, the belt having cross-strips *g* at intervals and running in close proximity to the screen L′.

The incline of the screen L′ will be sufficient to permit the grain to flow freely and rapidly over its surface; but the endless belt L² will be caused to travel with its lower surface downward over the surface of the screen L′, but at a slower speed than the natural flow of the material over the surface of the screen, so that the material will be retarded and form in "banks" behind the slowly-moving strips *g* and be thereby rolled over and over and cause the cockle and similar-shaped seeds to be precipitated to the surface of the screen and pass through its mesh and leave the larger perfect kernels only to be discharged over the tail of the screen.

Recesses will be formed in the lower edges of the sides B′ B² of the shoe to receive the upper portion of the side plates L⁵ L⁶, as shown, so as to bring the screen L′ and the endless slatted belt into proper relations to the screen.

Motion will be imparted to the fan-shaft from a master gear-wheel M′ and a pinion M² and to the endless slatted belt by a chain belt M³, as shown.

Having thus described my invention, what I claim as new is—

In a grain-separating machine, a supporting-framework, a shoe supported movably in said framework, a series of inclined screens supported in said shoe, a transverse spout arranged to receive the tailings from said inclined screens, a secondary transverse spout arranged to receive the material flowing through the lower part of said inclined screens, a "repeat-plate" secured across the lower surface of said series of inclined screens, and adapted to conduct a portion of the material flowing through said series of inclined screens into said secondary transverse spout, and a reversely-inclined screen connected to said shoe, and with its upper edge adjacent to the inner edge of said secondary transverse spout and adapted to receive the material flowing through the upper portion of said series of inclined screens, said series of inclined screens and said transverse spouts and said reversely-inclined screen secured to and partaking of the vibratory motion of said shoe, a fan arranged to cause induced air-currents to pass between said series of inclined screens, a stationary inclined screen adapted to receive the tailings from said reversely-inclined screen, and an endless belt having transverse slats, and traveling over said stationary inclined screen in close relation thereto, substantially as and for the purpose set forth.

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

JOHN L. OWENS.

In presence of—
A. LINDAHL,
C. N. WOODWARD.