

(No Model.)

C. N. CASE.
GRAIN SEPARATOR.

No. 303,982.

Patented Aug. 26, 1884.

Fig-1-

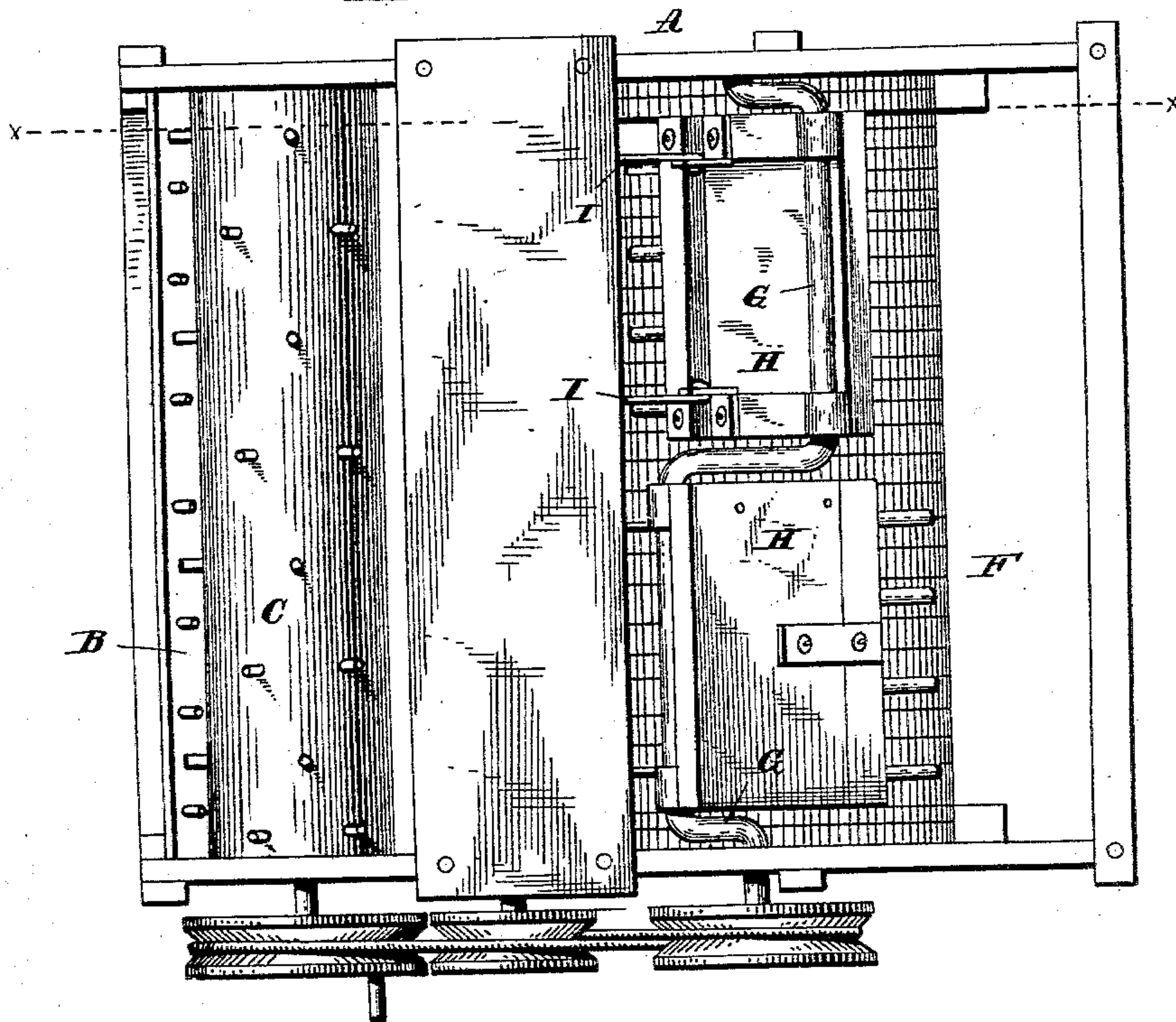
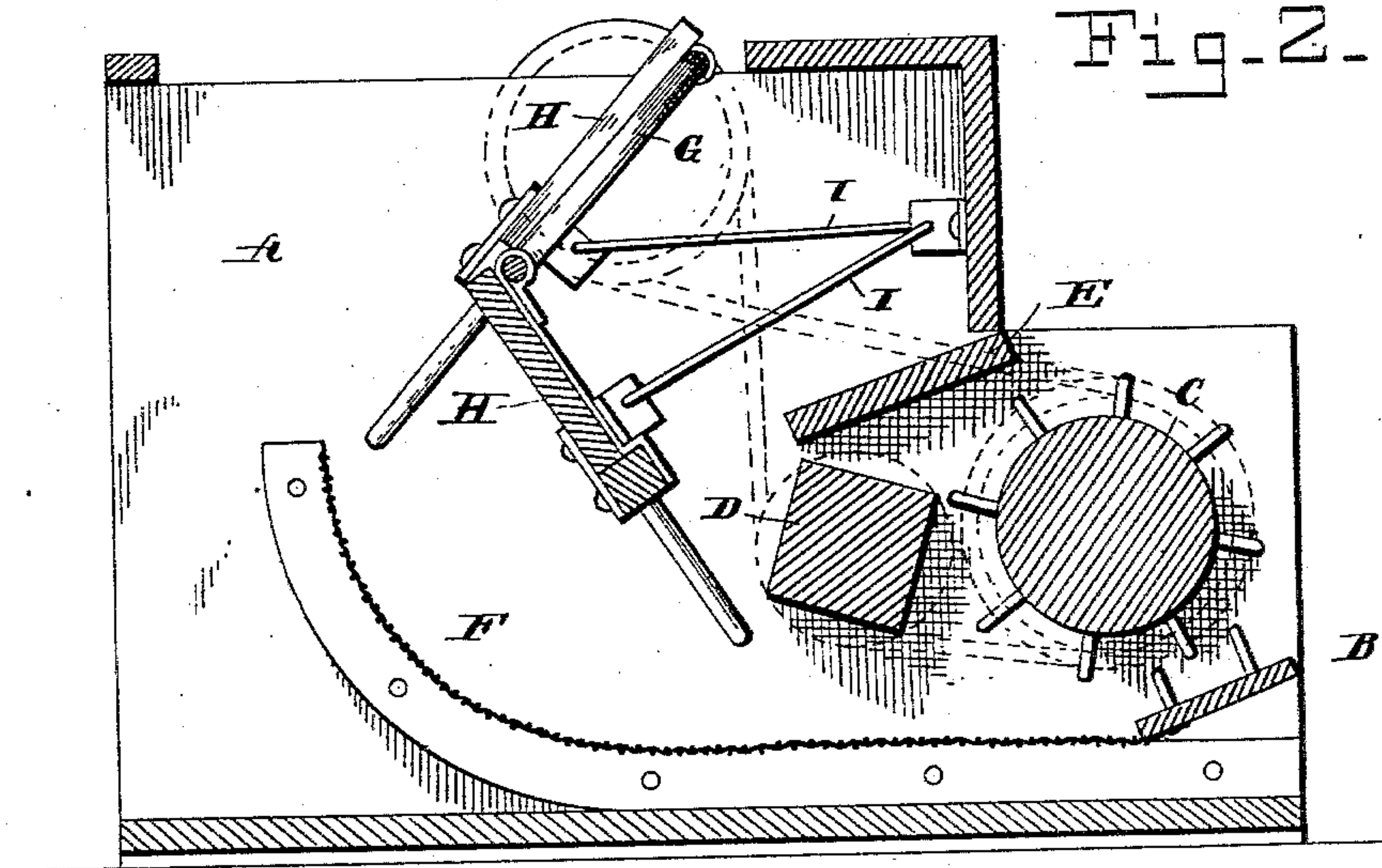


Fig-2-



WITNESSES

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UNITED STATES PATENT OFFICE.

CLARENCE N. CASE, OF BATTLE CREEK, MICHIGAN.

GRAIN-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 303,982, dated August 26, 1884.

Application filed January 2, 1884. (No model.)

To all whom it may concern:

Be it known that I, CLARENCE N. CASE, a citizen of the United States, residing at Battle Creek, in the county of Calhoun and State of Michigan, have invented certain new and useful Improvements in Grain-Separators, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to certain new and useful improvements in grain-separators.

It has for its objects, first, to provide means for effecting a continuous and rapid feed of the straw from the thrashing-cylinder, to conduct the straw and grain to the opening beneath the beater, and to prevent any winding of the straw on the revolving beater and thrashing-cylinder; second, to provide means for effecting a thorough and rapid separation of the grain from the straw before reaching the straw-carriers.

25 In carrying out the first object of my invention I provide a rapidly-revolving beater located in close proximity to and in the rear of the thrashing-cylinder, and a division board or guard placed crosswise of the casing and approximately over the beater.

30 In carrying out the second object of my invention I provide a screen contiguous to the rear termination of the concave, running in a rearward direction, and curved upwardly from a point approximately coincident to a perpendicular dropped from the axial line of the beater, in combination with the rakes, having heads widened to form fans and guards, and means for giving said rakes a reciprocating and partially rotary motion, and adapting them to sweep over the curved portion of the screen, all as hereinafter described, and specified in the claims.

40 In the accompanying drawings, forming a part of this specification, and on which the same letters of reference indicate the same or corresponding features, Figure 1 represents a plan view of a portion of a thrashing-machine casing, showing my improvements applied thereto; and Fig. 2 represents a longitudinal sectional view taken on the line *xx* of Fig. 1, showing the relative arrangements of the devices.

50 The letter A indicates the casing of a thrash-

ing-machine of the ordinary or any approved construction, in which is secured the usual concave B. Mounted in suitable journals secured to the frame of the apparatus is the thrashing-cylinder C, the same being provided on its periphery with the ordinary thrashing-teeth, which are adapted to act upon the straw in conjunction with those extending from the concave.

60 Located immediately in the rear of the thrashing-cylinder is a beater, D, the journals of which are mounted in bearings formed in the sides of the casing. This beater is preferably of angular form, as represented in the drawings, and its periphery revolves in about the same plane as the lower side of the thrashing-cylinder, and in the same direction as the cylinder itself. It will be observed, therefore, that as the straw advances rearwardly from the cylinder, it is engaged by the beater and made to continue more positively in that direction, thereby effecting a more rapid feed of the straw.

75 The letter E represents a division board or guard placed crosswise of the casing, preferably at an angle of about forty-five degrees. This guard is located approximately over the beater D, its forward face forming a guide or deflecting surface, and adapted to conduct the straw and grain to the opening beneath the beater, while its rearward surface and lower edge form a guard to prevent any winding of straw around the revolving beater or thrashing-cylinder.

85 The letter F refers to a screen which is located within the casing of the machine, and runs continuously from the rear termination of the concave toward the rear end of the machine. The forward portion of the screen or that portion extending from its forward end to a line approximately coincident to a perpendicular dropped from the axis of the beater, is horizontal or nearly so, while from this latter point to its rear termination it gradually curves upwardly, describing the arc of a circle.

90 Located transversely in the casing is a crank-shaft, G, the bearings of which are secured to the sides of the casing at a point somewhat forward of the line at which the curvature of the screen commences. These bearings are also placed at a considerable

height above the thrashing-cylinder and beater, the object of which is to elevate the crank-shaft so as to aid in effectually preventing the straw from winding around it. Flexibly connected with the cranks of this shaft, near their upper ends, are the reciprocating rakes or fork-heads H. These heads are widened out so as to form fans which act as blowers or agitators, as well as guards, to agitate and keep the straw from winding around the rakes and shafts. Projecting from the lower edges of these heads are the forks or tines B, which engage with the straw and effect the separation of the grain therefrom, in a manner which shall be presently pointed out. The rods or pitmen I are connected flexibly with the lower portion of the rake-heads at one end, and at their opposite ends with any convenient part of the casing. This latter point of connection should be on or nearly on the center from which the curvature of the screen is struck, so that as the crank-shaft carrying the rakes is revolved in a reverse direction to that of the rotation of the beater and thrashing-cylinder, the tines are swept upwardly and rearwardly following the curvature of the screen, the crank at this time being on the upward quarter-stroke. The thrashing-cylinder, beater, and crank-shaft are respectively provided with pulleys or sprocket-wheels over which passes a belt or chain, as seen in dotted lines in Fig. 2. This belt or chain is crossed so as to rotate the crank-shaft in the reverse direction to that in which the cylinder and beater travel, for the purpose just named, and, as indicated by the relative size of the pulleys in both figures, the beater and crank-shaft are made to revolve more rapidly than the cylinder, the straw to the latter of which may be fed in the usual manner, yet more rapidly, as the beater acts to aid in advancing the straw rearwardly.

It will thus be observed that in consequence of the more rapid rotation of the beater and crank-shaft as compared with the speed of the thrashing-cylinder, and the action of the rake-heads as combined blowers, agitators, and guards, the utmost facilities are afforded for securing a rapid and thorough agitation of the straw from the moment of its exit from beneath the beater to the point of its delivery from the upper rear termination of the screen onto the straw-carriers.

It is also noticeable that the hinderances to rapid work incident to the use of extended conduits and other obstacles to the free passage of the straw rearward are fully overcome by means of my improved screen, when used in connection with the rake-heads, which act as blowers and agitators, and the forks or tines which sweep rearwardly and upwardly over the screen and engage the straw, to effect a separation of the grain therefrom simultaneously with a rearward advance of the straw to the straw-carriers.

It is also noticeable that, through the action of the beater and by the use of the division

board or guard, the straw is fed more rapidly to the screen and the practical difficulty heretofore encountered in the winding of the straw on the cylinder, and in the present instance on the beater and the clogging of the machine, is overcome.

It is also further noticeable that by reason of the angular form of the beater and the location of the screen below the same, the straw receives repeated blows or strokes, as distinguished from a continual pressure, the effect of which strokes is to loosen the grain from the straw and to cause the greater portion of the grain to pass through the screen.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a grain-separator, the combination, with the under-shot thrashing-cylinder, its concave, and the screen, of the division-board placed at an angle and the under-shot revolving beater of angular form located approximately beneath the division-board and close to and in the rear of the cylinder, the peripheries of the cylinder and the beater below their axes lying in about the horizontal plane, and means for causing the beater to revolve more rapidly than the cylinder.

2. In a grain-separator, the combination, with the thrashing-cylinder, the beater located near the same, and the division board or guard placed over the beater, of the screen running horizontally, or nearly so, a portion of its length and terminating in a curve, the crank-shaft, the widened rake-heads provided with tines, and means whereby they are flexibly connected to the frame of the machine.

3. In a grain-separator, the combination, with the machine-frame, of the crank-shaft, mounted in bearings placed considerably above the thrashing-cylinder, and having widened rake-heads whose upper ends are connected therewith, and provided with tines projecting from their lower ends; and rods connected with said rake-heads near their lower ends and with the frame of the machine at their other ends, whereby the heads are made to act as guards or tines, and are given a reciprocating and partially rotary motion by the revolutions of the crank-shaft.

4. In a grain-separator, the combination, with the machine-frame and the thrashing-cylinder, of the crank-shaft mounted in bearings considerably above said cylinder and geared therewith, so as to rotate in the opposite direction, and provided with widened rake-heads, whose upper ends are secured thereto, and from whose lower ends tines extend, and rods connecting the lower ends of said heads flexibly with the frame.

In testimony whereof I affix my signature in presence of two witnesses.

CLARENCE N. CASE.

Witnesses:

FRED M. WADLEIGH,
THURLOW W. CASE.