

(No Model.)

2 Sheets—Sheet 1.

J. M. McCUE.
GRAIN SEPARATOR.

No. 591,001.

Patented Oct. 5, 1897.

FIG-1-

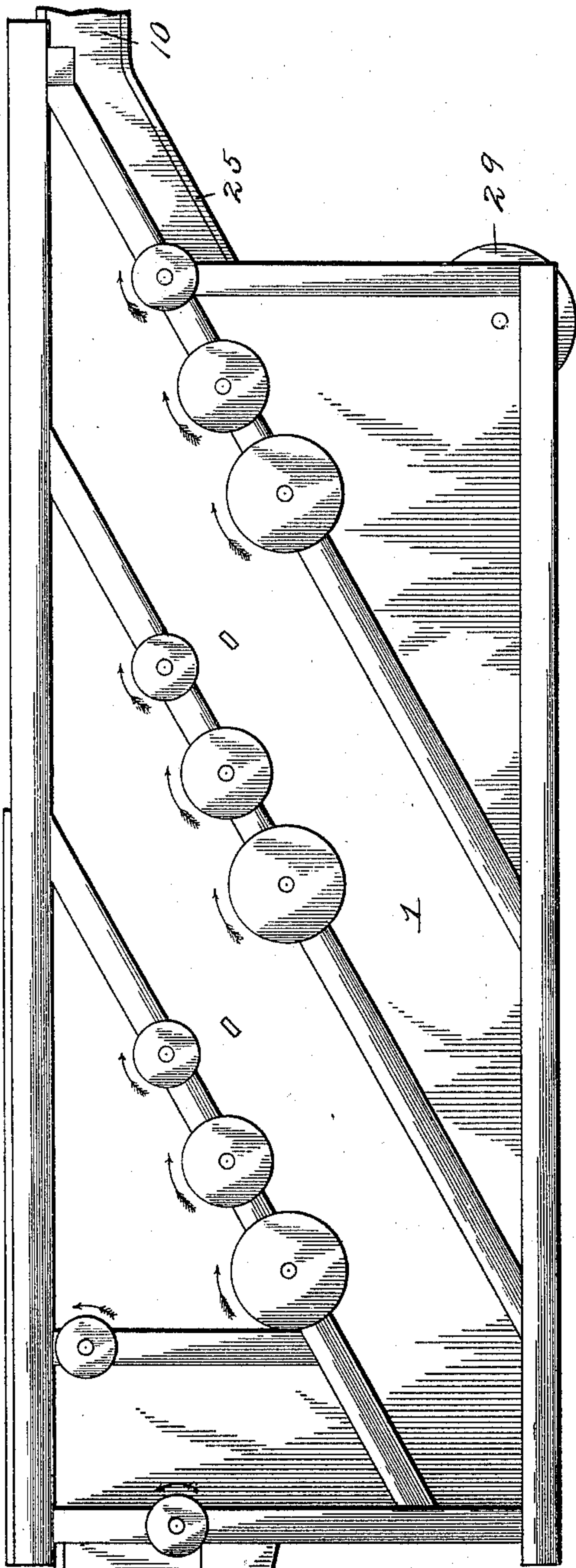


FIG-4-

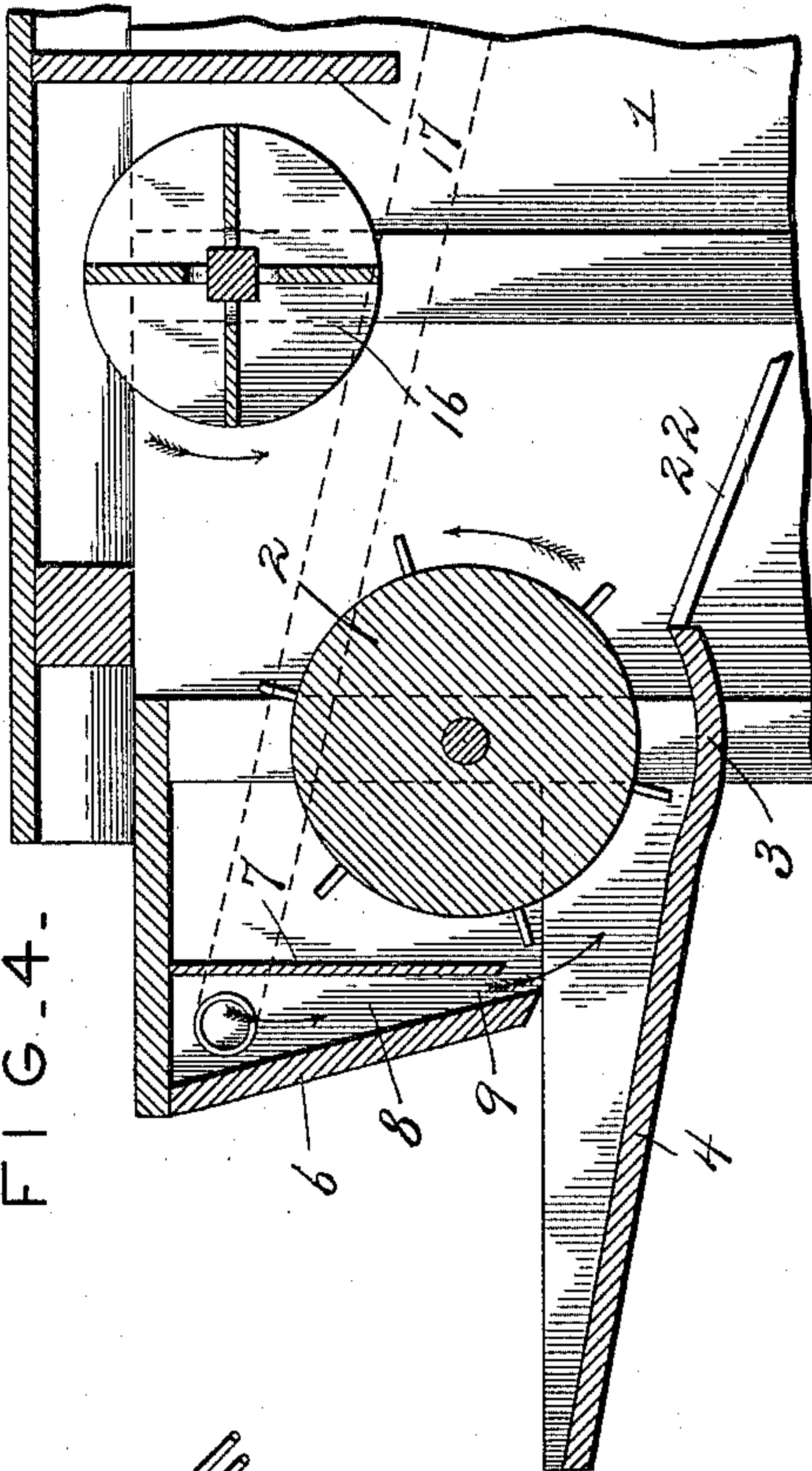
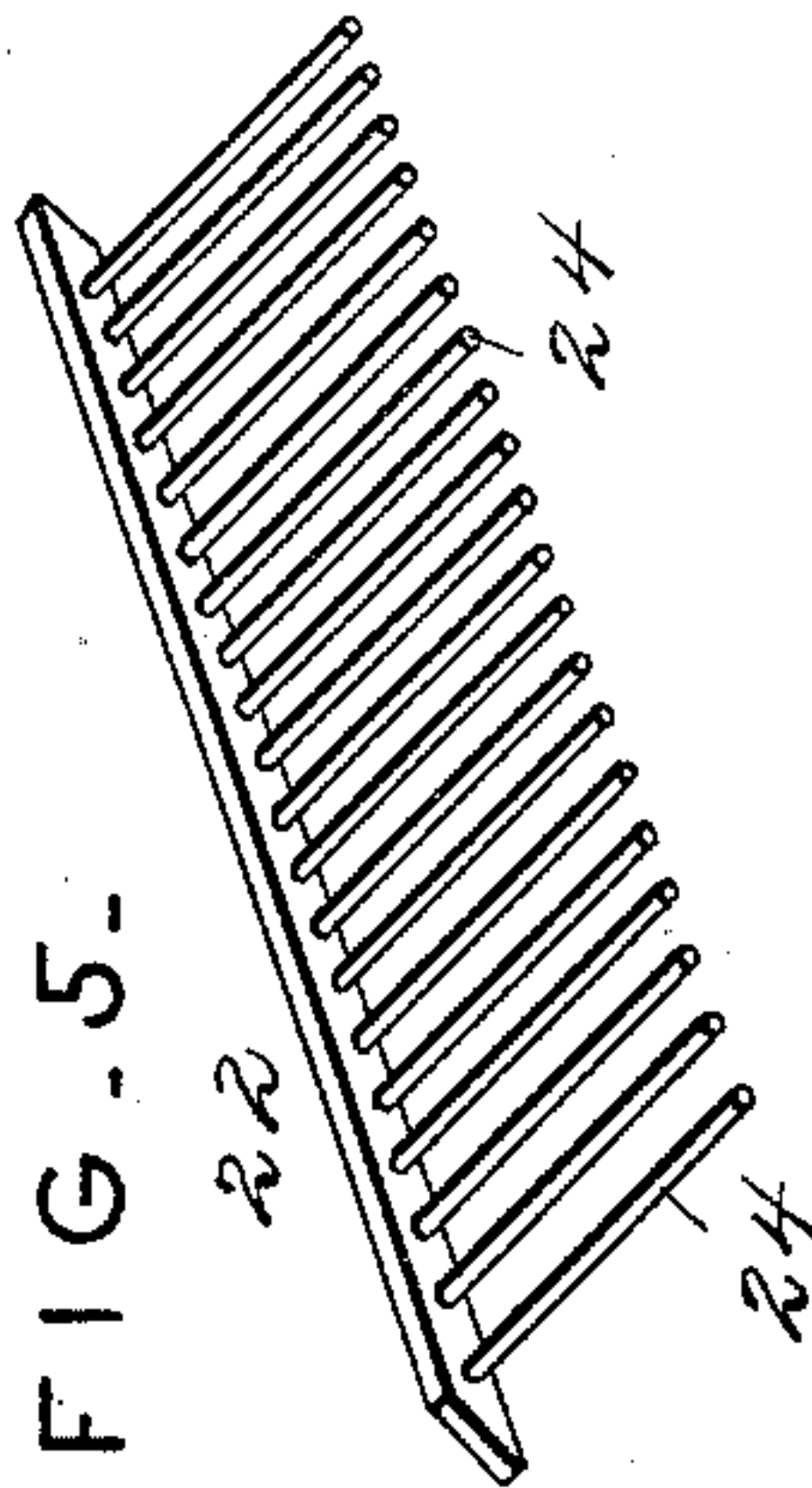


FIG-5-



Witnesses

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By His Attorneys,

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Inventor

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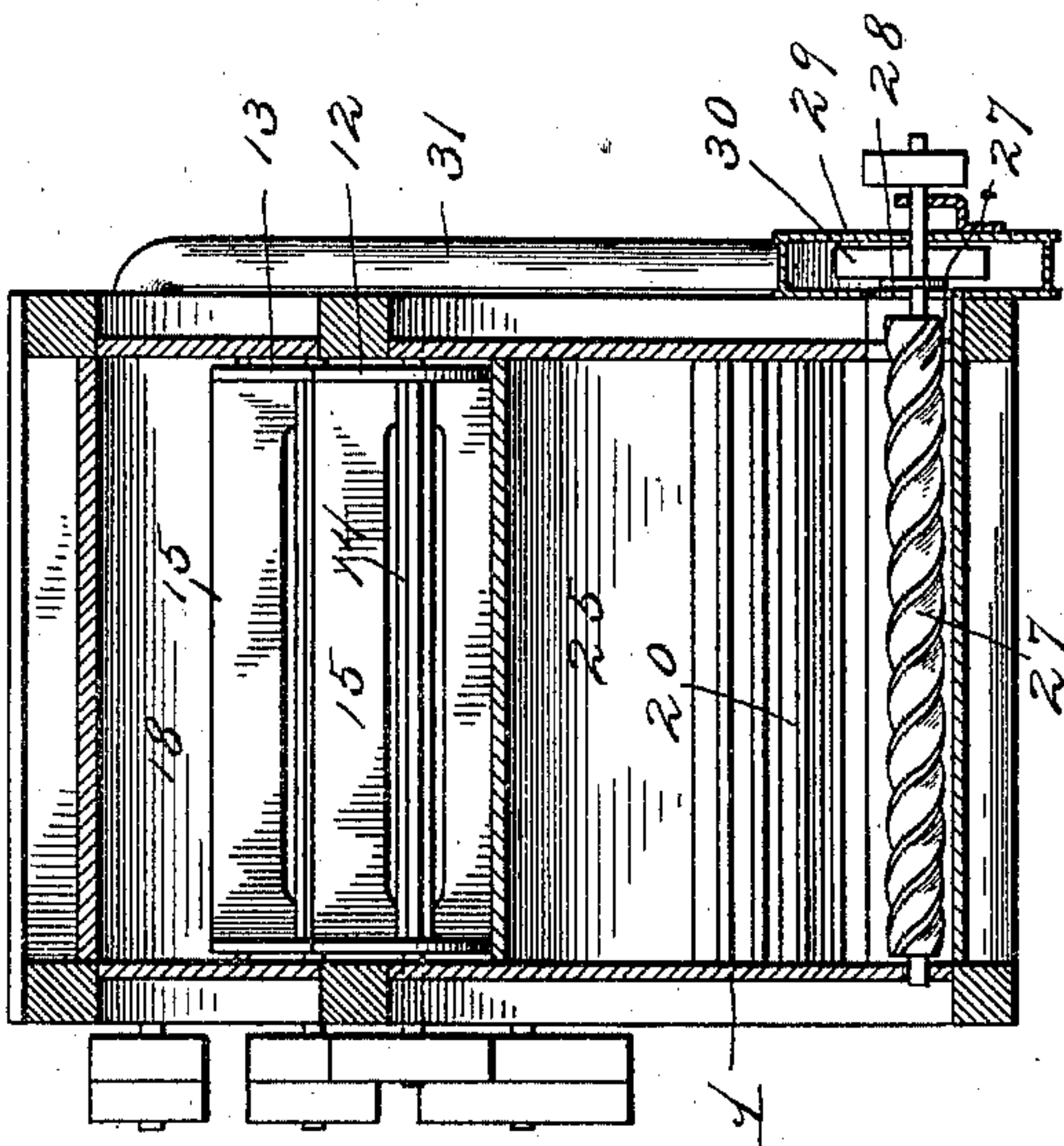
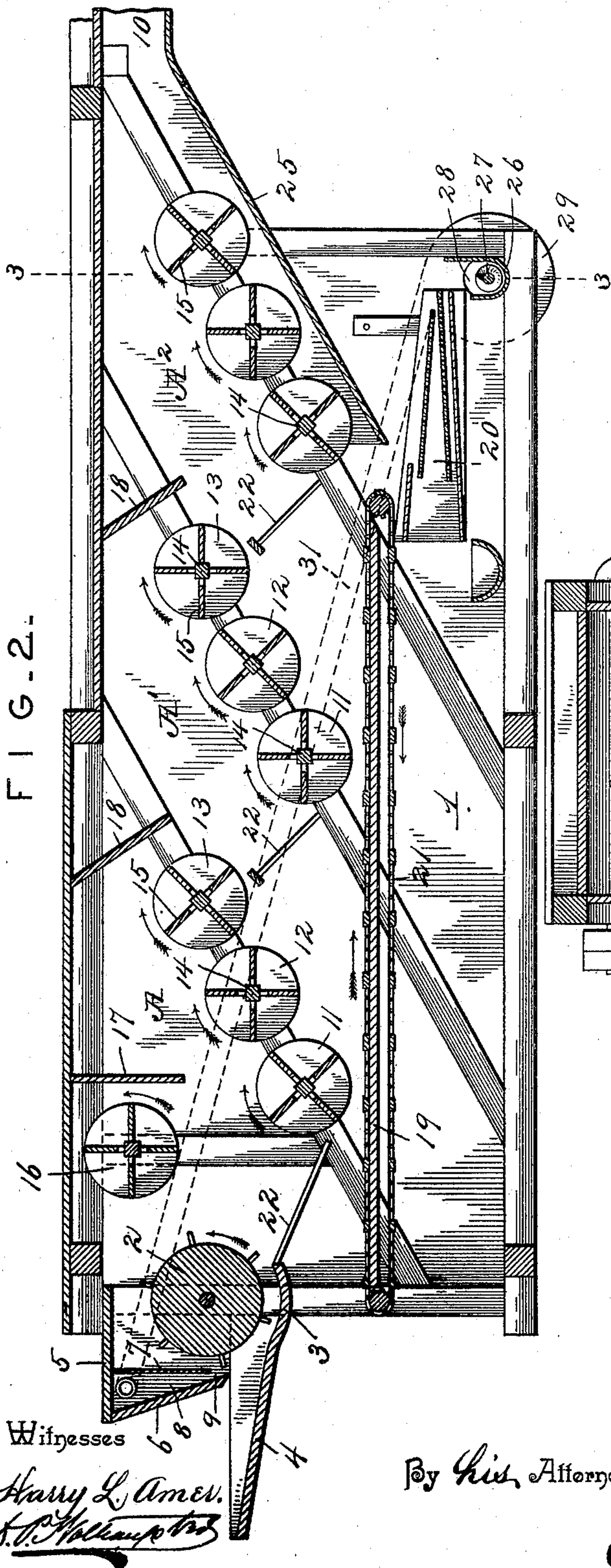
(No Model.)

2 Sheets—Sheet 2.

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Inventor

John M. McCue.

By his Attorneys,

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UNITED STATES PATENT OFFICE.

JOHN MARSHALL McCUE, OF OAK CLIFF, TEXAS.

GRAIN-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 591,001, dated October 5, 1897.

Application filed January 17, 1896. Serial No. 575,885. (No model.)

To all whom it may concern:

Be it known that I, JOHN MARSHALL McCUE, a citizen of the United States, residing at Oak Cliff, in the county of Dallas and State of Texas, have invented a new and useful Grain-Separator, of which the following is a specification.

This invention relates to grain-separators or threshing-machines; and it has for its object to effect certain improvements in machines of this character whereby vibrating straw-racks will be entirely dispensed with and the machine so simplified as to obviate the heavy jars and jerks of most grain-separators or threshing-machines, while at the same time providing a construction of machine that will effectually separate the grain from the straw and will also keep the feeding end of the machine entirely free from dust, which is often a serious drawback to the operation of most machines of this character.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the drawings, Figure 1 is a side elevation of a grain-separator constructed in accordance with this invention. Fig. 2 is a central vertical longitudinal sectional view thereof. Fig. 3 is a transverse sectional view on the line 3 3 of Fig. 2. Fig. 4 is an enlarged detail sectional view of the feeding end of the machine. Fig. 5 is a detail in perspective of one of the stationary screens between each set of beaters.

Referring to the accompanying drawings, the numeral 1 designates the machine-casing, constructed in any suitable manner and mounted in the usual way on wheels. (Not shown.) Mounted within the casing 1 at one end thereof is a threshing-cylinder 2 of the ordinary construction and arranged to rotate above an ordinary concave 3, located at the inner end of the inclined feed-table 4, projected beyond one end of the machine-casing, and receiving thereon the grain that is fed to the threshing-cylinder 2 in the usual way.

The threshing-cylinder 2 is housed at its front upper side by a cylinder-cap 5, built at

one end of the casing and lying above the inner end of the inclined feed-table 4. The cylinder-cap 5 is provided with an inclined outer side 6 and has arranged therein intermediate of said inclined side 6 and the front side of the threshing-cylinder 2 a shorter upright partition 7, which extends transversely across the entire width of the cylinder-cap and is therefore of a length equaling the length of the cylinder. The said upright partition 7, fitted within the cylinder-cap, incloses between the same and the inclined sides 6 of the cap an upright blast-spout 8, provided at its lower end, between the lower ends of the inclined side 6 and the partition 7, with a contracted discharge-mouth 9, disposed directly above the feed-table and in reasonably close proximity to one side of the threshing-cylinder, and the function of this discharge-mouth and the blast-spout will be hereinafter more particularly referred to.

Arranged within the casing between the threshing-cylinder 2 and the rear discharge-spout 10, at the rear end of the casing, is a series of successively-arranged inclined sets of combined rotary beaters and straw-carriers A, A', and A², respectively. There may be any number of sets of rotary beaters disposed between the threshing-cylinder and the discharge end of the casing, and each of said sets comprises an inclined series of beaters 11, 12, and 13, disposed in the same oblique plane and progressively speeded relative to each other. The beaters 11, 12, and 13 of each set are duplicates in construction and essentially consist of a central shaft 14, extending transversely from side to side of the machine-casing, and a series of wings or blades 15, extending radially from and carried by the said shaft 14, and in connection with the said beaters it will also be observed that the same are preferably of a uniform size and rotate in one direction to provide not only for the agitation of the straw to loosen the grain therefrom, but also to provide for the rapid carrying or conveying of the straw from one end of the casing to the other. While three beaters are illustrated in each of the sets A, A', and A², it will of course be understood that any number of beaters may comprise each set, and in further explanation of the progressive speed-

ing of the beaters it is to be noted that the first or lowermost beater 11 of each set has the slowest rotation, while the last or uppermost beater of each set has the fastest rotation, and it will therefore be obvious that each successive beater of each set has a faster rotation than the beater immediately preceding the same, whereby the proper agitation of the straw is secured. A certain amount of the grain fed to the threshing-cylinder 2 is thrown thereby toward the top of the casing, but in order to insure the delivery of all of the grain onto the lowermost beater 11 of the first set A a primary winged beater 16 is mounted for rotation within the top part of the casing in rear and above the plane of the threshing-cylinder 2, and at one side of the primary beater 16 is located a depending deflecting-board 17, extending transversely across the casing and disposed in substantially a line above said lowermost beater 11 of the first set A, in order that the beater 16 in its rotation will not throw any grain toward the rear of the machine, but will beat the same downward directly onto the beater 11 referred to. To secure practically the same result with respect to the uppermost beater 13 of each set, inclined deflecting-boards 18 are arranged transversely within the casing and depend from the top thereof beyond and at one side of said uppermost beater 13 to provide means for deflecting the straw downward from the uppermost beater 13 of one set and directly onto the lowermost beater 11 of the next succeeding set of beaters.

By reason of the arrangement in sets of the beaters and the progressive speeding thereof it will be obvious that the straw will be carried out of the machine so fast that it will be almost impossible for the loose grain to remain therein, and at the same time the several beaters in each set will exert a tearing or pulling action on the straw, so as to thoroughly spread and loosen the same, thus allowing the loose grain to readily fall out of and separate from the straw, while at the same time positively preventing the straw from accumulating in bunches at any one point within the machine. The loose grain which is thus separated from the straw falls directly onto an imperforate grain-floor 19, which is arranged horizontally within the casing and extends from a point below the cylinder-concave 3 to a point short of the extreme rear end of the casing and disposed above one end of the ordinary cleaning-shoe 20, which is supported within the rear lower portion of the casing and is vibrated in any suitable well-known manner. The grain which falls onto the imperforate floor 19 is carried thereon up to the chute 20 by means of an endless slatted grain-belt 21, the slats of which travel on top of the grain-floor and positively deliver all of the loose grain which falls thereon directly into the cleaning-shoe 20, wherein the grain is subjected to the usual cleaning action, Fig. 2 of the drawings simply illus-

trating the relative arrangement of the cleaning-shoe with respect to the other portions of the machine forming a part of this invention.

In order to prevent the straw from falling onto the grain-floor or into the shoe, screens 22 are secured in a fixed inclined position between the directly-adjacent beaters of each set, and also between the lowermost beater of the first set and the cylinder-concave 3. The stationary screens 22 preferably comprise a series of parallel screen bars or fingers 24, suitably supported in position so as to extend in a series entirely across the machine-casing and arranged sufficiently close together to allow the loose grain to readily fall onto the grain-floor, while at the same time preventing any straw from falling through the screens.

By reason of the length of the grain-floor 19 and the disposition of the shoes 20 relative thereto the last or rearmost inclined set of beaters A² is disposed above said shoe and above an inclined fall-board 25. The inclined fall-board 25 declines from the rear discharge-spout 10 of the casing and is disposed directly below the rearmost series or set of beaters in order to catch any loose grain separated from the straw by said beaters, and discharges such grain directly into the shoe 20, it being noted that the inner lower end of the fall-board 25 is disposed directly above said shoe. The cleaned grain is discharged from the shoe in the ordinary manner; but the tailings or heads of grain not threshed and which pass over the upper screen or riddle of the shoe are delivered by such shoe into the tailings-trough 26, arranged transversely at the rear end of the machine-casing. The tailings-trough 26 has arranged therein a screw conveyer 27, and one end of said trough communicates with and opens into the side inlet-opening 28 in one side of the circular fan-casing 29, supported at one side of the machine-casing. The fan-casing 29 has mounted therein a suitable rotary fan 30, which discharges its blast through the elevator-spout 31. The elevator-spout 31 is suitably connected at one end with the fan-casing 29 and, extending the entire length of the machine-casing on the outside thereof, has its end opposite the fan fitted in one side of the cylinder-cap 5, so as to communicate with one end of the blast-spout 8 within said cylinder-cap.

By reason of the construction just described the unthreshed heads of grain or tailings are elevated by a blast of wind through the spout 31 and are discharged into the vertically-disposed blast-spout 8 of the cylinder-cap 5. The said heads of grain or tailings are delivered through the discharge-mouth 9 of spout 8 to the cylinder 2, so as to be rethreshed, and the inclination of the outer side 6 of the cap 5 serves to deflect the tailings almost directly between the cylinder and its concave. Furthermore, the inclination of the said outer side of the spout 8 provides for a distribution

of a current of air directly under the cylinder and throughout its entire length, so as to create an inward draft within the machine, whereby all dust and dirt will be carried rearwardly within the casing away from the feeder and discharged out of the discharge-spout at the rear end of the machine. The rotary fan therefore not only provides for the elevation of the tailings and the delivery thereof to the threshing-cylinder, but also acts as a blower to carry the dust out at the rear end of the machine, and thereby entirely relieve the feeder working at the table 4 from the annoyance of the dust so prevalent in most threshing-machines at their feeding end.

Changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed, and desired to be secured by Letters Patent, is—

1. In a grain-separator, a straw-rack consisting of a series of successively-arranged inclined sets of rotary winged beaters spaced at uniform distances apart, each separate inclined set having the same number of beaters, which beaters are disposed in the same oblique plane and are progressively speeded relatively, whereby each succeeding beater of each set has a faster rotation than the immediately preceding beater, the uppermost and lowermost beaters of the several sets being arranged in precisely the same horizontal plane, stationary screens 22 arranged in an inclined position and bridging the space between the directly proximate beaters of the adjacent sets to prevent the falling of the straw while at the same time permitting of the fall of loose grain, and inclined deflecting-boards 18, arranged transversely within the casing beyond and at one side of the uppermost beater of each set, said inclined deflect-

ing-boards being disposed at such an angle as to provide means for deflecting the straw downward from the uppermost beater of one set directly onto the lowermost beater of the next succeeding set, substantially as set forth.

2. In a grain-separator, the combination with the casing, the threshing-cylinder, and the grain separating and cleaning devices; of an exteriorly-arranged tailings elevator-spout having a suitably-located blast-fan connection therewith, and a blast-deflecting device arranged at the front side of the cylinder and connected with the tailings elevator-spout to provide for deflecting the tailings under the cylinder, and also to create an inward draft of air for freeing the front feeding end of the machine from dust, substantially as set forth.

3. In a grain-separator, the combination with the casing, the threshing-cylinder, and the grain separating and cleaning devices, of a cylinder-cap provided with an outer inclined side 6 and an inner upright partition 7 terminating short of the lower edge of the inclined side 6, said side 6 and partition 7 forming a vertically-disposed blast-spout arranged in front of the cylinder and of a length equaling the same to provide for deflecting the tailings and blast of air inward under the cylinder, and an exteriorly-arranged tailings elevator-spout communicating at one end with the interior of said blast-spout and having a blast-fan connection with its opposite end to receive the tailings from the cleaning devices of the separator and force the same through the spout, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN MARSHALL MCCUE.

Witnesses:

HENRY W. LEE,

J. C. DAVIS.