No. 621,912. Patented Mar. 28, 1899.

A. D. FERGUSON.

GRAIN OR SEED RECLEANER AND GRADER.

(Application filed May 15, 1897.)

(No Model.) 3 Sheets—Sheet 1.

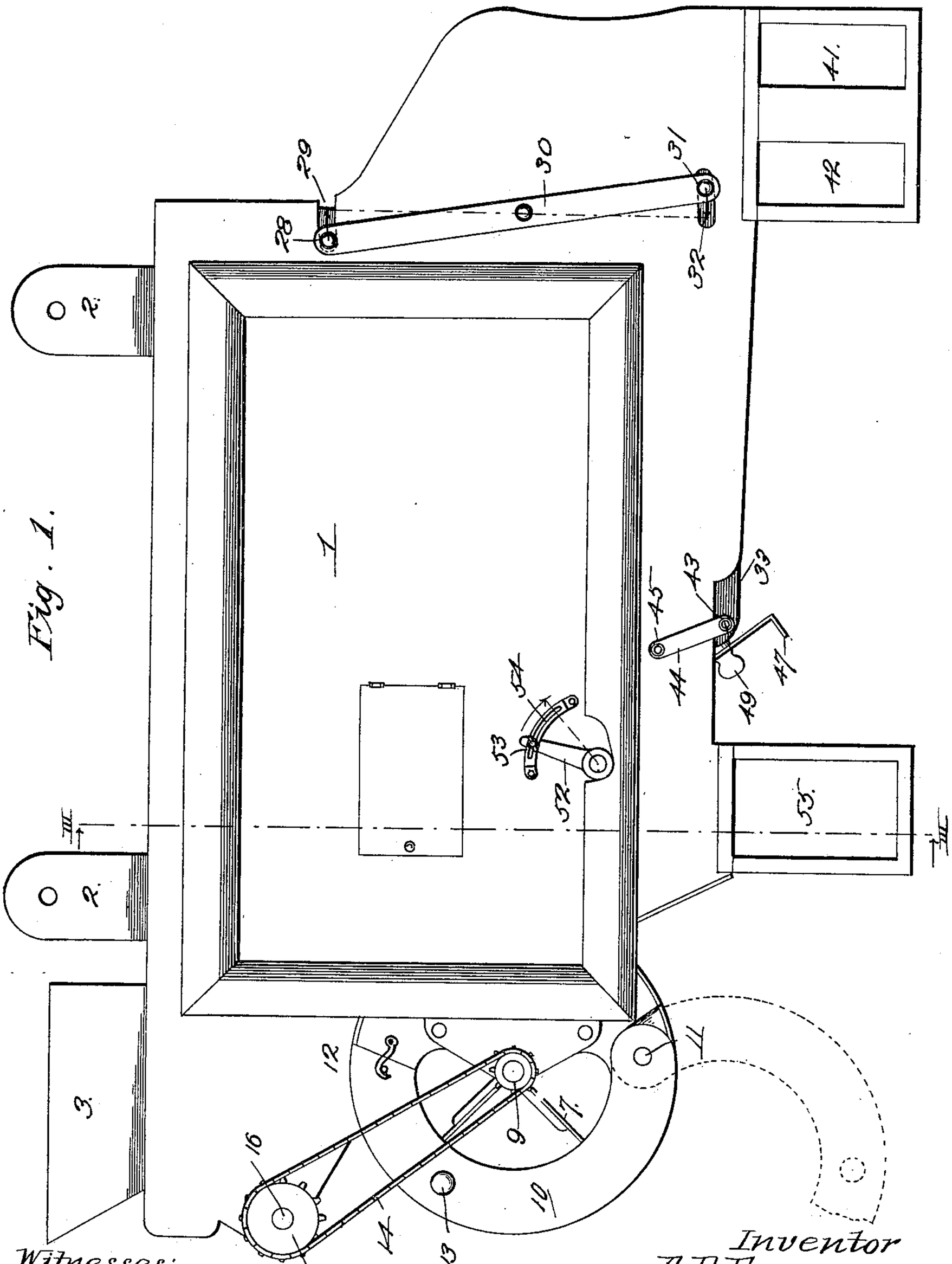

Fig. 1.

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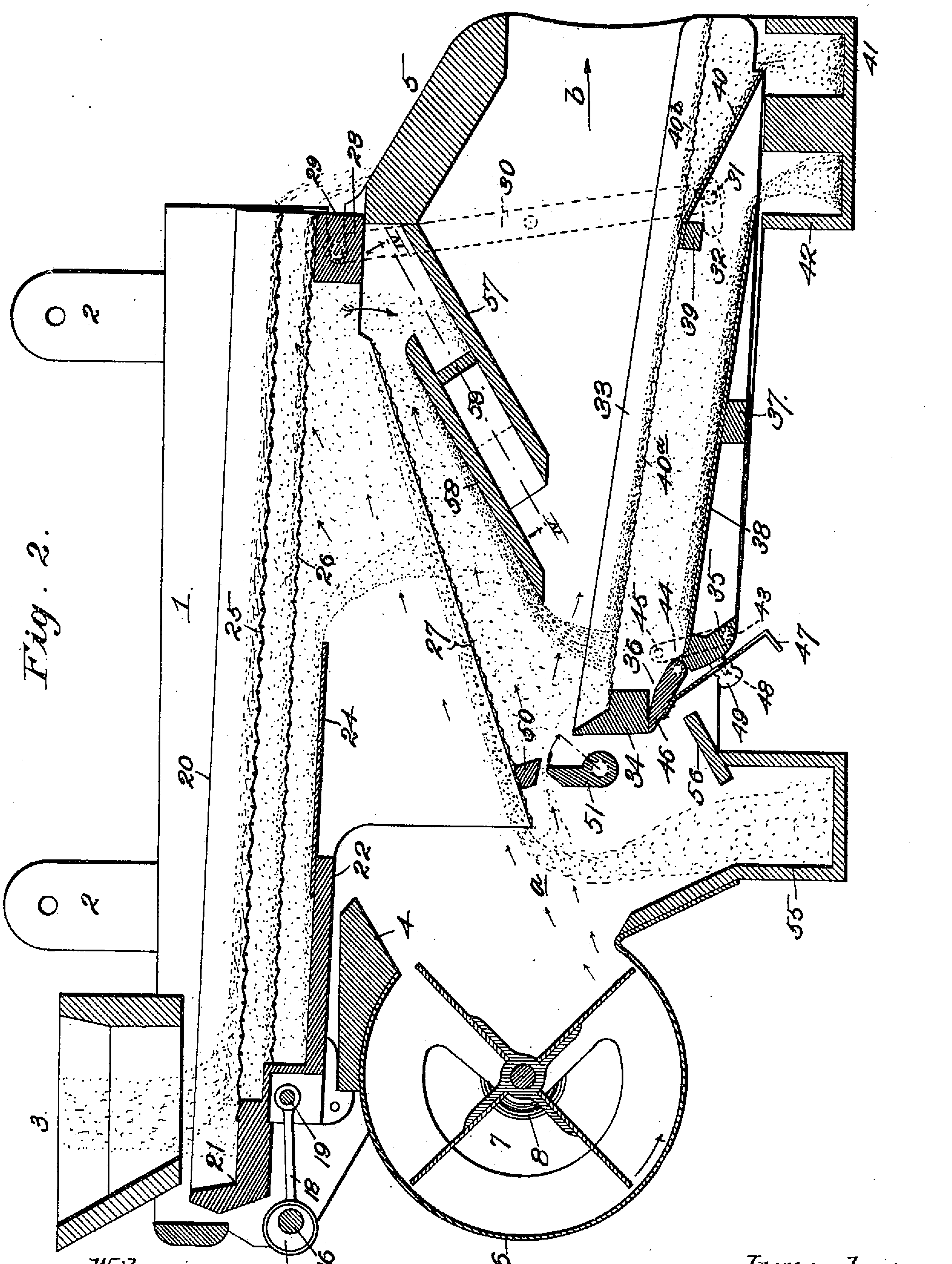
(No Model.) 3 Sheets—Sheet 2.

Fig. 2.



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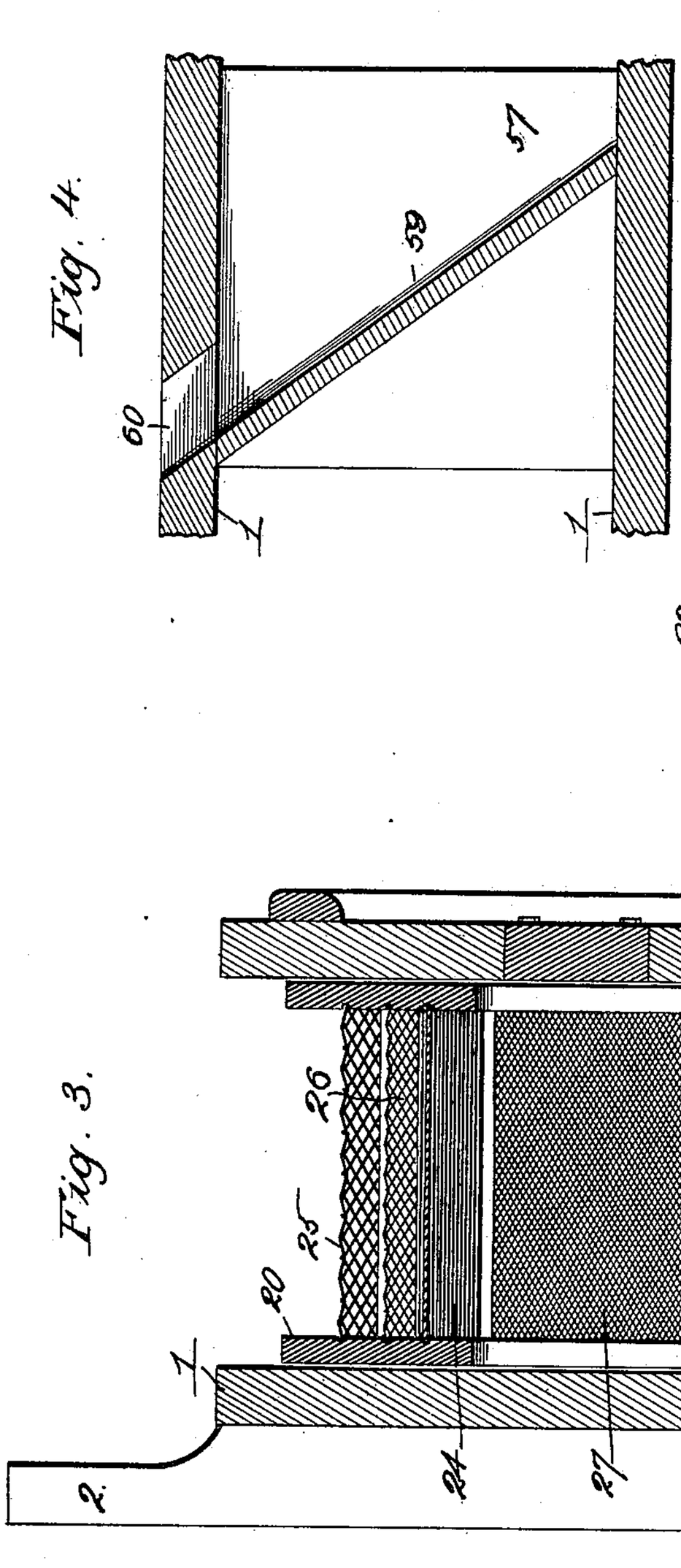

Fig. 4.

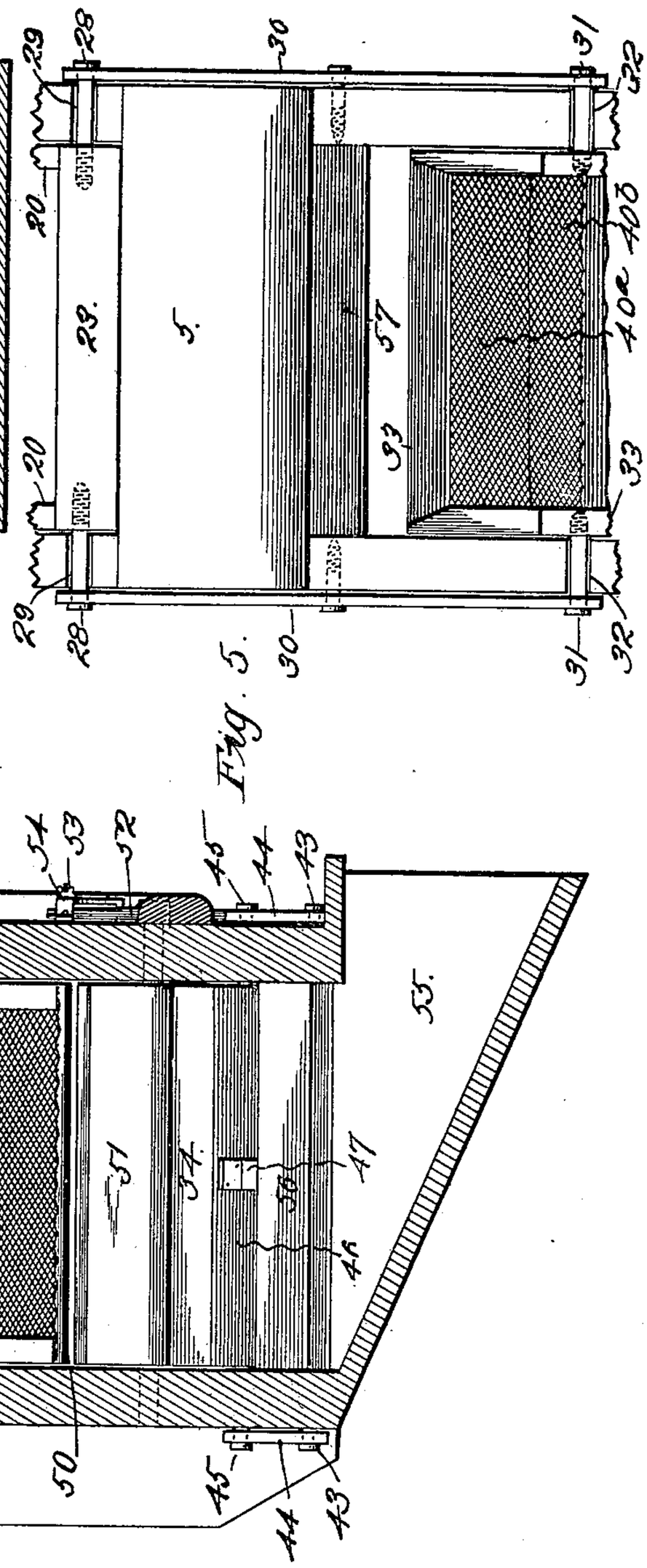

Fig. 5.

Fig. 3.

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UNITED STATES PATENT OFFICE.

ALFRED D. FERGUSON, OF ODESSA, MISSOURI.

GRAIN OR SEED RECLEANER AND GRADER.

SPECIFICATION forming part of Letters Patent No. 621,912, dated March 28, 1899.

Application filed May 15, 1897. Serial No. 636,641. (No model.)

To all whom it may concern:

Be it known that I, ALFRED D. FERGUSON, of Odessa, Lafayette county, Missouri, have invented certain new and useful Improvements in Grain or Seed Recleaners and Graders, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to recleaners and graders for threshing-machines; and it consists in certain novel and peculiar features of construction and combinations of parts hereinafter described and claimed.

The object of the invention is to produce a device of this character which is positive and reliable in its separating and grading action and simple, durable, and inexpensive of manufacture.

In order that the invention may be fully understood, reference is to be had to the accompanying drawings, in which—

Figure 1 represents in side elevation a recleaner and grader embodying my invention. Fig. 2 represents a longitudinal section of the same. Fig. 3 represents a cross-section taken on the line III III of Fig. 1. Fig. 4 represents a section taken on the line IV IV of Fig. 2. Fig. 5 represents an end view of a part of the device.

Referring to the said drawings in detail, 1 designates the casing proper of the recleaner. 2 designates arms by which it is secured to the side of the threshing-machine (not shown) at the proper point.

3 designates a hopper at the front upper end of the recleaner and grader, which is properly arranged to receive the grain from the threshing-machine.

4 designates a cross-bar near the front end of the device and below the hopper 3, and 5 designates a cross-bar at the rear end of the device.

6 designates the fan-casing at the front end of the device and below the cross-bar 4 and adapted to receive or take in air at its opposite ends in the customary manner. 7 designates the fan located therein, and 8 a belt-wheel mounted externally of the casing upon one end of the fan-shaft. Motion is imparted to said wheel by a belt (not shown) connected to the threshing-machine or to any other suitable motor. Upon the opposite end of said shaft is a small wheel 9. One end of the fan-casing is preferably formed as a door 10, pivoted as at 11 and held in its closed position by a pin or hook, as at 12. It is provided with a handle 13, which is grasped to manipulate it.

14 designates a chain or belt to connect the sprocket wheel or pulley 9 to a larger sprocket wheel or pulley 15 above the fan-casing and mounted upon a shaft 16, journaled in the front end of the recleaner framework. 17 designates an eccentric upon said shaft, and 18 a strap or link connecting the same pivotally with the cross-bar 19 of the upper shoe 20. Said shoe 20 is almost equal in length to the recleaner, and its framework comprises side walls, a front end wall 21, which is provided at its lower margin with an extension 22, just above the cross-bar 4, a cross-bar 23 at its rear end, which rests upon the supporting-bar 5, and an imperforate extension 24 of the bottom or horizontal extension 22, hereinbefore referred to, said bottom consisting of the parts 22 and 24, extending rearwardly about half the length of the machine. This bottom of course may be formed in a single piece, if desired.

25 designates a coarse screen of wire-gauze or equivalent material, the interstices of said screen being of such size that all of the grain, both clover and timothy, may pass freely through it, but which will conduct most of the large husks and twigs rearwardly and discharge them upon the inclined or deflecting surface of the supporting-bar 5, from which they fall to the ground.

Arranged below the screen 25 is a somewhat-finer screen 26. This screen is adapted also to permit all of the grain to pass through, but to prevent any foreign particles of larger size passing through it, such foreign particles being discharged from the rear end of the screen upon the deflecting cross-bar 5, as before described.

In practice as the grain is fed downwardly through the hopper 3 upon the front end of the shoe 20 it is obvious that the greater part of the seed and fine particles will almost immediately sift down upon the imperforate bottom 22 24. This imperforate bottom is arranged and is of suitable length to overhang the third sieve 27, that such fine seed may be

discharged thereon and be given an opportunity to pass through the same and onto another shoe, hereinafter described.

The side walls of the shoe 20 are extended vertically downward from a point just rearward of the fan-casing to a point a short distance forward of the cross-bar 23, and the lower margins or edges of said depending portions slant upwardly and rearwardly, and connecting them is the correspondingly-inclined sieve 27, which consequently has its lower end about in the horizontal plane of the axis of the fan and its upper end about in the plane of but a short distance from the cross-bar 23, so as to leave an opening or space between them for a purpose which will hereinafter be made apparent.

28 designates a pair of pins projecting outwardly from the ends of the cross-bar 23 through registering slots 29 in the side walls of the casing, and 30 designates a pair of rock-arms which are mounted upon the casing externally and are pivotally connected at their upper ends to said pins 28. 31 designates a pair of pins which project inwardly from the lower ends of said rock-arms through registering slots 32 in the side walls of the recleaner and into the side walls of the lower shoe 33, said shoe being located within the casing and vertically below the sieve 27. It is of such length and location that its front end terminates short of the front end of the sieve 27, and its rear end projects some distance beyond the rear end of said sieve 27. Its framework comprises side walls, rear end wall 34, and cross-bar 35, the latter being below and slightly forward of the wall 34, so as to leave an opening or space 36 between the two. It also comprises a cross-bar 37 at its middle, an imperforate bottom 38, which slants downwardly and rearwardly and rests upon the cross-bars 35 and 37 and terminates some distance short of the rear end of the side walls. It also comprises a cross-bar 39 above the rear end of the bottom 38, a deflector or inclined plate 40, which extends from said cross-bar downwardly and rearwardly and terminates at the lower edge of the side walls a short distance beyond their rear edge, and a sieve 40^a 40^b, the front section 40^a of very fine mesh, which extends approximately parallel with the bottom 38 and from one end of the framework to the other, being in the plane of the upper end of the deflector or inclined plate 40 and extending over the same, as shown clearly in Fig. 2 at 40^b. That portion of the extension of the screen above the deflector 40 is of coarse mesh as compared with the portion 40^a in order that the seed which cannot pass through the extremely-fine sieve 40^a may positively and reliably pass through the screen 40^b and fall or be directed by the deflector into the spout 41 at the extreme rear and lower corner of the device, while those particles which do not pass through said section 40^b, such as husks and waste, are discharged off the end of said section, as indicated. The seed which passes through the fine sieve 40^a and upon the imperforate bottom 38 is discharged into the spout 42 just forward of the spout 41, as illustrated in Fig. 2.

The rear end of the shoe 33, as hereinbefore stated, is supported by the lower ends of the rock-arms 30. The front end is supported also upon rock-arms—that is to say, 43 designates pins which project outwardly from the ends of the cross-bar 35 below the side walls of the casing, and 44 designates swinging arms which pivotally connect said pins 43 with supporting-pins 45, projecting from the side walls of the casing. Therefore it will be understood that any reciprocatory movement given to the upper shoe will be imparted through the instrumentalities described to the lower shoe.

The opening or space 36 at the rear end of the lower sieve and between the sieve proper and the imperforate bottom is controlled by a hinge-valve 46, and said valve is adjusted so as to expose more or less of said opening by means of the slotted arm 47, mounted upon a screw-bolt 48, projecting from the cross-bar 35 and clamped at any desired point of adjustment by means of a nut 49, engaging the outer end of said screw-bolt, as shown clearly in Fig. 2.

In order to control in a greater or less degree the space between the lower end of the sieve 27 and the upper end of the sieve 33, I provide the former with a depending cross-strip 50 and mount pivotally at the front of the latter the swinging or adjustable valve 51. Mounted externally upon the pivot or shaft of said valve is an arm 52, which is provided with a pin and thumb-nut 53, engaging the slotted bracket 54, said nut being adapted to be screwed in the ordinary manner upon the pin and clamp the arm 52, and consequently the valve 51, at the desired point of adjustment.

Arranged vertically below the lower or discharge end of the sieve 27 and interposed between but also below the fan-casing and the front end of the sieve 33 is a discharge-spout 55, and 56 designates a deflector or windboard which is arranged at the rear side of said spout, so as to deflect air toward and through the opening 36 when the fan is rotating, as indicated by the arrow in Fig. 2.

57 designates a wall which inclines downwardly and forwardly from the cross-bar 5 and terminates short of the front end of the sieve 33. 58 designates a wall above and parallel with the same, which wall, however, at its upper end terminates about vertically below the upper end of the sieve 27, so that any seed passing down through the opening between the sieve and the cross-bar 23 will drop down upon the wall 57 and be conveyed by means of the obliquely-extending bottom 59 of the chamber thus formed between the walls 57 and 58 through the outlet-opening 60 in the side of the casing, from which point it is conveyed back to the thresher in the custom-

ary manner to be rethreshed. The lower end of the wall 58 also terminates short of the front end of the shoe 33, so that it will insure the deposit upon the shoe of any seed which passes through the sieve 27 and falls upon it.

In practical operation the grain or seed is discharged from the thresher into the hopper 3 and upon the upper shoe, as hereinbefore stated, and owing to the fact that said shoe is continuously reciprocated through the medium of the eccentric 17 and its connection, and also because said sieve inclines downwardly and rearwardly, the grain or seed begins to travel immediately toward its rear end, and during such passage all of the seed passes down through the sieves 25 and 26 and through the space between the imperforate bottom and the cross-bar 23. The tailings from the upper shoe drop down through the space between the sieve 27 and cross-bar 23 into the chamber formed between the inclined walls 57 and 58 and pass back through the opening 60 to the thresher, while the waste particles are discharged from the ends of the sieves 25 and 26 upon the deflector 5, and thence fall to the ground. The fine clover and timothy (as these seeds are almost invariably mixed) passes through the sieve 27 after its discharge thereon, while the light clover drops off the lower end of said sieve, as indicated at *a*, and is blown back by the air-blast through the opening formed between the strip 50 and the wind-board 51, as indicated by arrows, and fall upon the lower shoe 33. The heavier or first grade of clover-seed continues down from the point marked *a* into the hopper 55 and passes thence into suitable receptacles (not shown) placed to receive it. The timothy also, which is very fine, is blown back through the space between the strip 50 and the wind-board 51 with the clover-seed and also drops upon the shoe 33, which, as hereinbefore explained, is constantly reciprocated. The timothy being very fine passes through the sieve 40^a and down upon the imperforate bottom 38 and is discharged into the timothy-hopper 42 and then passes into suitable receptacles placed to receive it. The light clover-seed upon the shoe 33 travels rearwardly upon the sieve 40^a until it reaches the extension 40^b, through which it passes and is conducted by the deflector 40 into the rear hopper 41, which receives the second grade of clover-seed, while the waste product is discharged off the end of the extension 40^b down upon the ground. The fine chaff, &c., which passes through the upper shoe and is blown back upon the lower shoe with the timothy and light clover-seed would naturally pass through the sieve 40^a with the timothy, and to prevent this the wind-board 46 at the front end of the shoe 33 is opened slightly to permit a light draft to pass through said seed and chaff as it falls upon the sieve 40^a, which draft blows such chaff through and out of the rear end of the machine, as indicated by the arrow *b*. The draft must be light; otherwise the timothy would be blown out with it. Said draft also intercepts the second grade of clover-seed and cleans that also.

In the practical operation of the machine, the wind board or valve 51 must be adjusted to the kind of grain. The sprouted grain, or that which is too large to pass through the sieve 27 and to light too drop to the bottom and into the hopper, is forced by the blast between the wind-board and the cross-strip of the sieve 27.

The wind-board will be adjusted not only according to the kind, but also according to the condition of the grain being operated upon, but such adjustments of course are dictated alone by practical experience.

When separating the clover alone, three grades may be obtained, but a lighter draft must be employed.

From the above description it will be apparent that I have produced a machine whereby clover and timothy may be effectually separated and the former thoroughly graded.

It is to be understood, of course, that changes in the detail construction and arrangement of the parts and the substitution of mechanical equivalents will not constitute a departure from the spirit and scope of the invention.

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

A recleaner and grader comprising a suitable casing, having an opening, a pair of oblique partitions 57 58 therein, an inclined board 59 connecting said partitions and communicating with the opening in the side of the casing, a reciprocatory sifting-shoe above said partitions and provided with a non-perforated bottom extending about half its length, sieves above said bottom and extending the full length of the shoe and over the open space between the upper ends of the partitions 57 58, and an inclined sieve below the non-perforated bottom and the first-named sieves and having its upper end terminating short of the rear end of the sieve so that part of the grain which passes through the first-named sieves may fall down past the inclined sieve and between the partitions 57 58, substantially as described.

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

ALFRED D. FERGUSON.

Witnesses:
M. R. REMLEY,
G. Y. THORPE.