

(Model.)

2 Sheets—Sheet 1.

G. A. RAASCH.
GRAIN SEPARATOR.

No. 257,186.

Patented May 2, 1882.

Fig. 1.

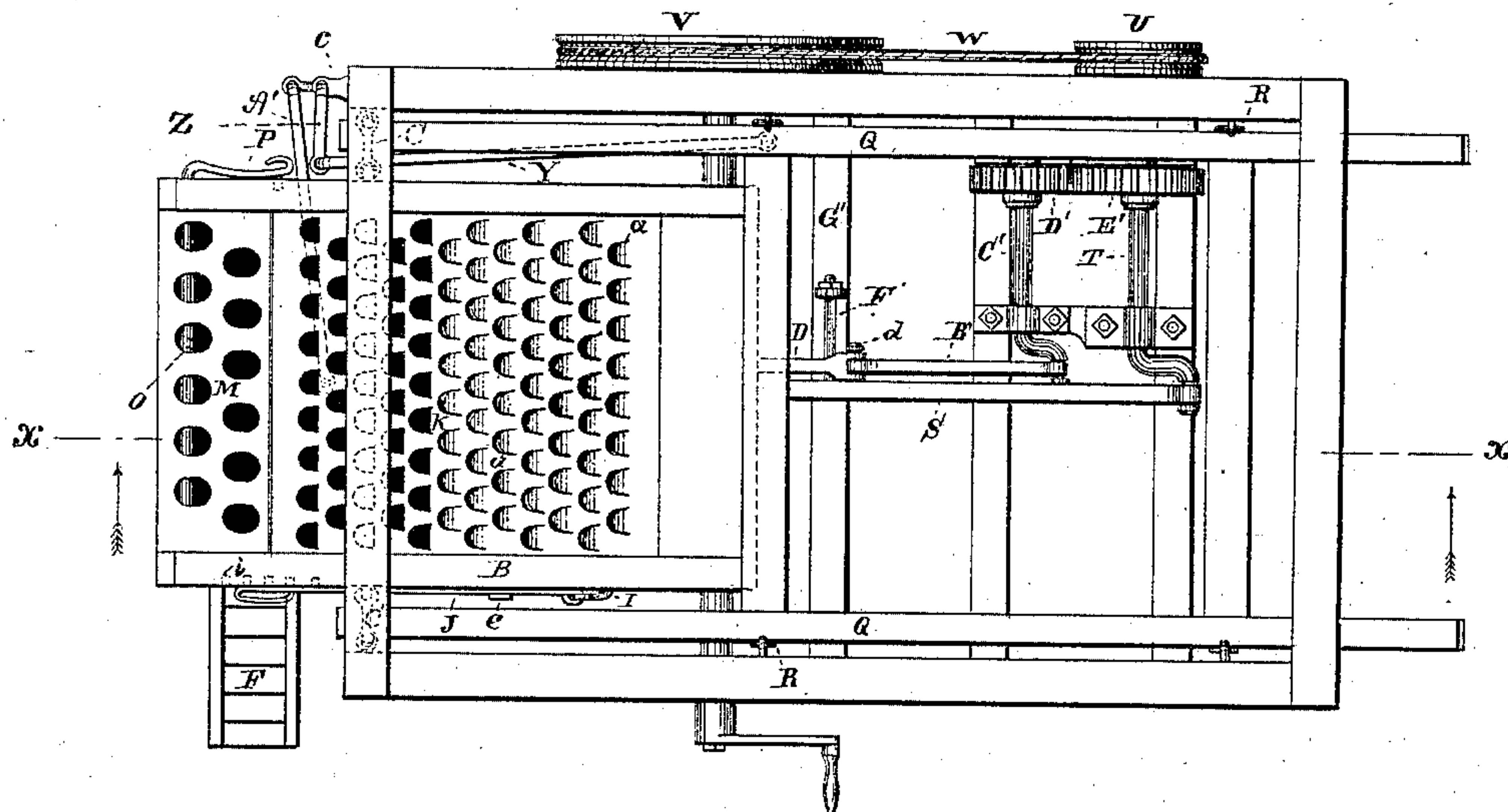
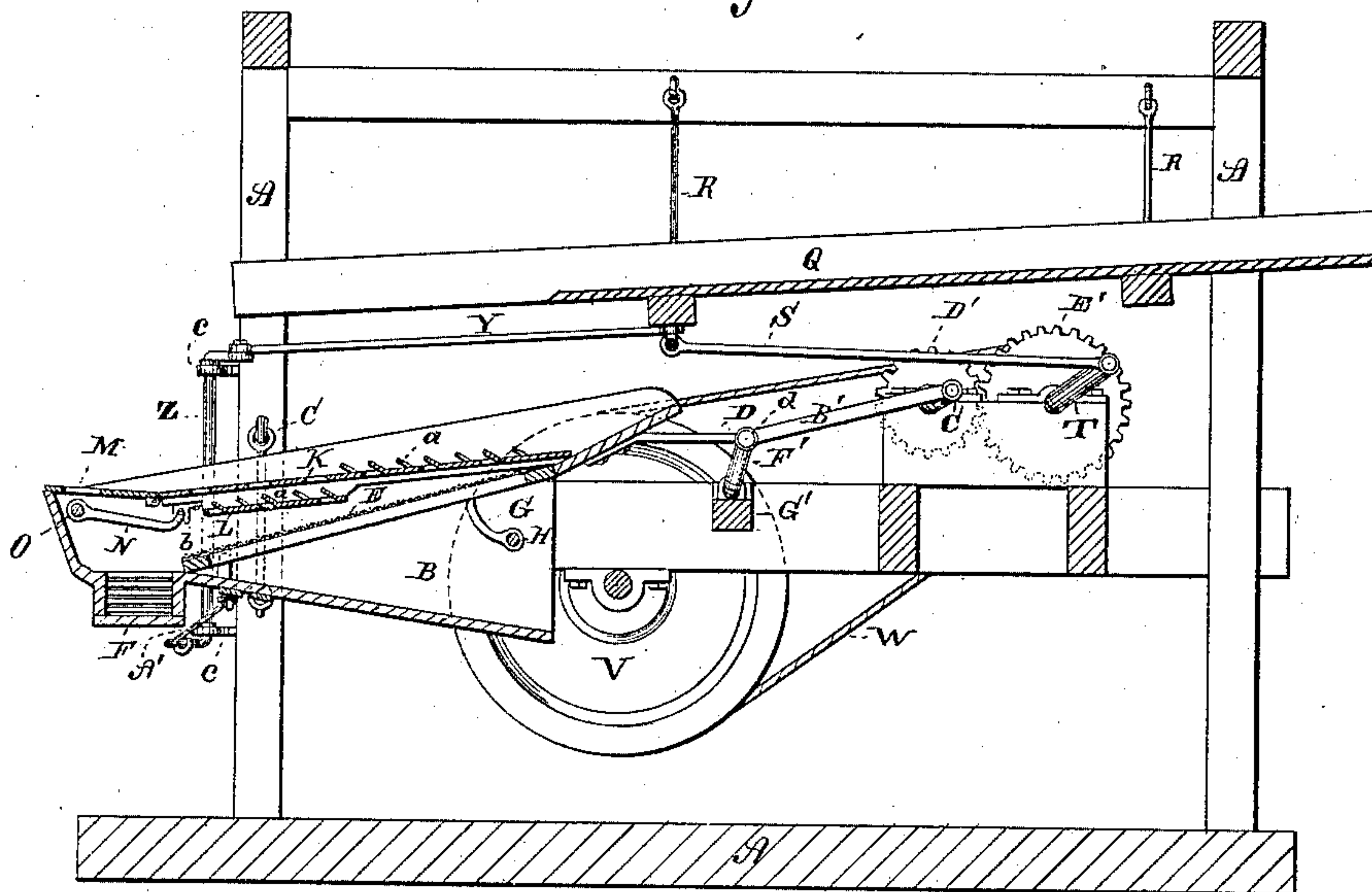


Fig. 2.



Attest:

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H. J. Abbot.

Inventor:

Gustav A. Raasch
by J. G. Henderson
Attorney

(Model.)

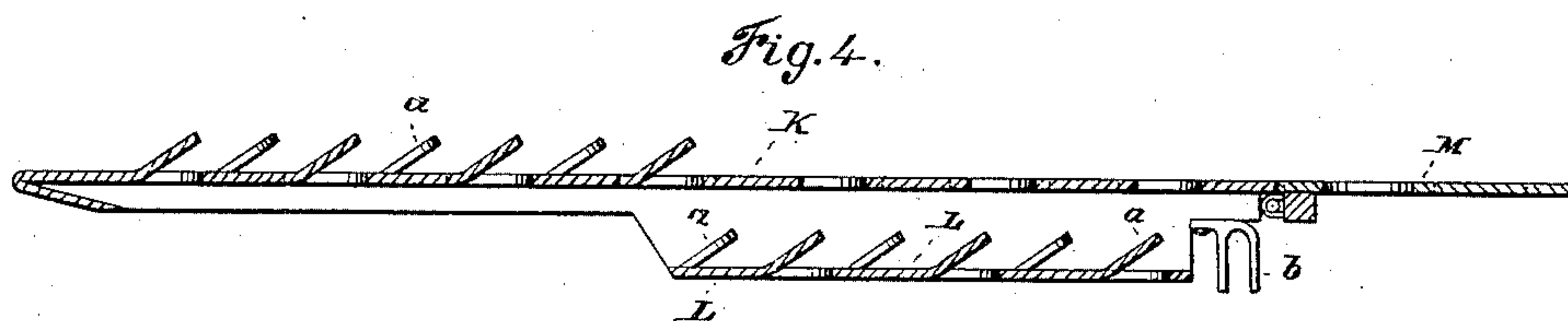
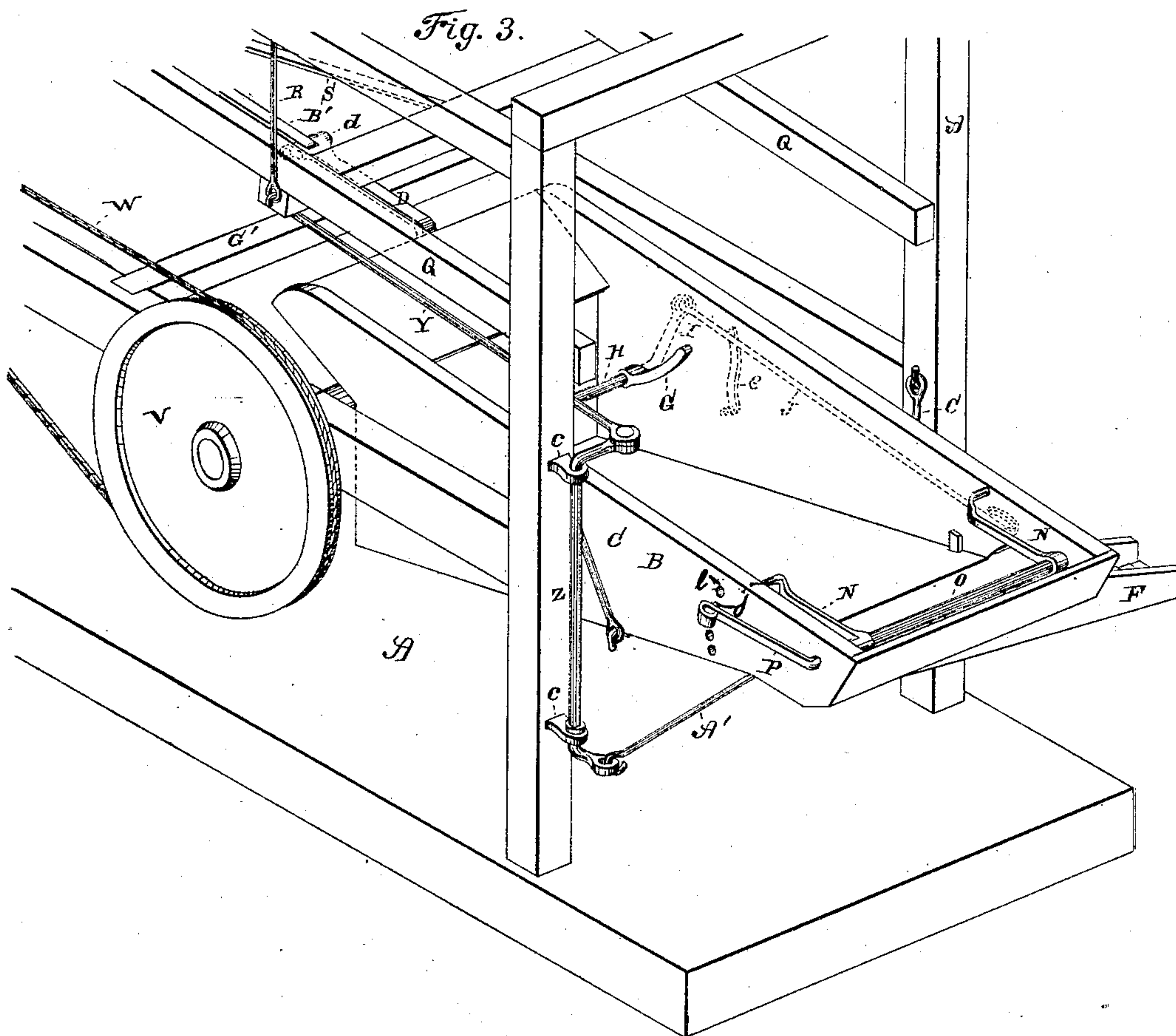
2 Sheets—Sheet 2.

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Attest:

Herrn. Lauter.
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Inventor:

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UNITED STATES PATENT OFFICE.

GUSTAVUS A. RAASCH, OF ATCHISON, KANSAS.

GRAIN-SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 257,186, dated May 2, 1882.

Application filed March 2, 1881. (Model.)

To all whom it may concern:

Be it known that I, GUSTAVUS A. RAASCH, a citizen of the United States, residing at Atchison, in the county of Atchison and State of Kansas, have invented certain new and useful Improvements in Grain-Separators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters or figures of reference marked thereon, which form a part of this specification, and in which—

Figure 1 is a plan view of the separator, with the bottom of the feed-trough removed to show parts below; Fig. 2, a vertical section through the line *xx* of Fig. 1, with the bottom of the feed-trough added and shown in section; Fig. 3, Sheet 2, a perspective with the riddles and bottom of feed-trough removed, and Fig. 4 a longitudinal section through the upper riddle.

My invention relates to separators for cleaning grain after it has been thrashed, and is used generally in connection with thrashing-machines, although it may be used independently thereof; and it consists in means for imparting to the shoe what may be termed a "reversible rotary shake," whereby the grain may be the more effectually separated from the chaff, and also in the further combination of parts, as hereinafter particularly described, and sought to be defined by the claims.

In the accompanying drawings, the letter A indicates the frame-work, and B the shoe, which is suspended near its rear end from the posts of the frame-work by means of the straps C, and at the other end by means of the rod D, and is allowed an end and a side movement. In this shoe there is supported a wire screen or riddle, E, one end of it resting upon the bottom of the shoe, near the chute F, the other end being supported by the arms G, connected to the shaft H, which has a crank, I, on its end, to which is jointed a rod, J, held against the side of the shoe by a spring, *e*, and provided with a pin at or near its free end, which fits into any one of several holes, *i*, made in the side of the shoe for the purpose of holding up the rod. These several parts constitute a lever by means of which the screen can be raised and lowered, so as to be made to incline more

or less, as may be required, to control the air-blast and feeding forward of the grain. The lever is operated from the outside, and by means of it the inclination of the screen can be changed without stopping the working of the separator.

The second or upper riddle, K, is made of sheet metal and is perforated, a portion of the perforations (or all of them, if desired) being provided with upwardly-inclined lips *a*, which project in the direction of the movement of the grain over the surface of the riddle. The section of the top riddle provided with the lips is that nearest the end onto which the grain is first directed, the other section being by preference provided with unlippered perforations; and beneath this section, as a part of the screen, there is placed a secondary perforated and lippered plate, L, the lips to which project in the same direction as those to the upper section.

To the lower end of the riddle there is hinged a tail-plate, M, which is perforated, the perforations being larger than those in the other section of the screen, in order that the air-blast may have more effect on the accumulated chaff at the tail of the screen; but the perforations may be no larger than the others.

To the under side of the riddle K, near to the joint between it and the tail-plate, there are secured hooks *b*, which fit over the laterally-bent ends of arms N, by means of which the main portion of the riddle is supported, the other end resting upon the shoe, while the free end of the tail-plate rests on the rear end of the shoe. These arms N are connected to the shaft O, which is journaled in the sides of the shoe, and is provided at one end with a crank, P, which is provided with a pin, *j*, adapted to fit into any one of a series of holes, *l*, made in the side of the shoe, in order to hold the arms at the adjustment given by turning the shaft. This shaft, in connection with the arms and crank, constitutes a lever by means of which the riddle and its tail-plate can be raised and lowered, and thereby made more or less inclined. The object in making these riddles or screens adjustable within the shoe, as described, is to regulate the force of the wind or blast from the blower or fan back of the shoe on the riddles. By elevating the end of the lower riddle or screen next to the blower the draft is taken from the upper riddle to a great extent and directed more forcibly against the lower

riddle, because the space between the two riddles at the end is lessened. By lowering the same end the draft, or rather some of it, is taken from the lower riddle and directed against the upper one, because the space between the two riddles at the end is increased. In other words, the lower riddle is made to act as a valve or damper for controlling the force of the blast against either riddle. By lowering the lever of the upper riddle that riddle is made to incline from the end next to the blower down to its connection with the tail-plate, and the latter is made to incline from that point up to its free end, so that by increasing or decreasing the inclination of the riddle the passage of the grain over it can be hastened or slackened and the force of the air-blast thereon regulated in the separation of the grain from the chaff. The change is made without stopping the machine.

If desired, both regulators or levers can be used for one riddle by causing one end of the riddle to rest on one lever and the other end on the other.

The letter Q indicates the vibrating trough or chute by which the grain and chaff is fed onto the riddle of the shoe. This trough inclines a little from front to rear, and is supported from the horizontal beams of the frame A by means of straps R. It is vibrated by means of the rod S, which is connected to the crank end of shaft T, on the other end of which is a pulley, U, which connects with the drive-pulley V by means of the band or belt W. The shaft of pulley V is operated by a band, crank, or other suitable motive power, and through it and the other parts described motion is given to the vibrating frame. A rod, Y, connects the trough Q with the rod Z, which is journaled vertically in brackets c, secured to one of the perpendicular posts of the frame, as illustrated. The rod Z is bent so as to form an arm at both ends, one arm being at right angles to the other. The rod Y is jointed to the top arm, while the lower arm is connected to the shoe B by the link A'. The movement of the vibrating trough is communicated to the rod Z, which turns and imparts a lateral or side shake to the shoe through link A', both the trough and the shoe having the same vibratory speed.

The end shake is given to the shoe by means of the rod D, pitman B', and crank-shaft C'. This shaft is turned by the pinion D', keyed thereto, the teeth of which mesh with those of the gear-wheel E', which is keyed to the shaft T.

The rod D and pitman B' are jointed to the rocking crank F' by a pin, d, passed through the said three parts. The rocking crank allows the end or reciprocating movement to be given to the shoe B, and at the same time affords the bearing-surface for the rod D, which holds up that end of the shoe to which it is connected. The rocking crank is journaled in boxes secured to the cross-bar G'. The resultant of the reciprocating or end shake and lateral or side shake communicated to the shoe,

as described, is a rotary shake. Now, in order to convert this rotary shake into a reversible rotary shake, the pinion D' is made smaller than the gear-wheel E', so as to gain one revolution in six of the gear-wheel. The result is that the shoe is given three rotary movements in a horizontal plane in one direction and then three in the contrary direction, which movements are consecutively repeated so long as the shoe is operated. This reversible rotary motion of the shoe more thoroughly cleans the grain from the chaff at the expenditure of less wind than other motions heretofore given the shoes, and in effecting it I do not wish to be confined to any details of construction of mechanism. I have for illustration given a description of a very good construction for the purpose; but deviations therefrom may be made without departing from the spirit of my invention.

The operation of the several parts is apparent from the foregoing description of the construction and arrangement of the parts; but still a recapitulation may here be made.

The grain, mixed with the chaff, is fed onto the inclined trough Q, the reciprocation of which feeds forward the grain and chaff and discharges both onto the top riddle of the shoe. They are then, by the movement of the shoe, fed over the surface of the riddle toward its tail end, the lips α preventing the bolls and other chaff from falling in and clogging the perforations in the riddle. The blast of air from any blower located front of the open end of the shoe passes up through one or both riddles with more or less force, according as the end of the lower riddle is more or less elevated, and carries off the chaff from the grain, while the grain falls below and is delivered by the spout F. The open lower portion of the top riddle catches the bolls going to the elevator, and the lower lipped plate separates returning seeds from the bolls and smaller trash.

Having described my invention, what I claim is—

1. In a grain-separator, the combination of a shoe provided with a series of sieves, and mechanism for rotating the shoe first in one direction and then in the reverse direction, substantially as set forth.

2. In a grain-separator, a shoe provided with a series of sieves, and mechanism for rotating the shoe a series of times in one direction and then in the reverse direction, substantially as set forth.

3. In a grain-separator, the combination of a reciprocating feed-trough, a crank connected to the shoe and trough, and adapted, when moved by the trough, to vibrate the shoe at right angles or obliquely to the reciprocation of the trough and at the same speed therewith, and mechanism for reciprocating the shoe and feed-trough together and in the same direction, substantially as set forth.

4. In a grain-separator, the combination of a shoe, a crank for imparting thereto a side shake, a pitman for imparting to it an end

shake, gears for reversing the resultant movement of the end and side shakes, and means for giving motion to the several parts, substantially as set forth.

- 5 5. The combination of shoe B, pinions D' and E', of different diameters, means for connecting the shaft of pinion E' to the shoe and imparting to the latter a side shake, and means for connecting the shaft of pinion D' to the shoe and imparting to the latter an end shake,
10 whereby the several parts will operate to impart to the shoe a reversible rotary shake, substantially as set forth.

6. The combination of shoe B, crank-rod Z, pinions D' and E' and their shafts, reciprocating trough Q, and rods for connecting the several parts, substantially as set forth. 15

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

GUSTAVUS A. RAASCH.

Witnesses:

W. H. HASKELL,
W. L. HASKELL.