

H. SIDDALL.
Grain Separator.

Patented June 30, 1863.

No. 39,073.

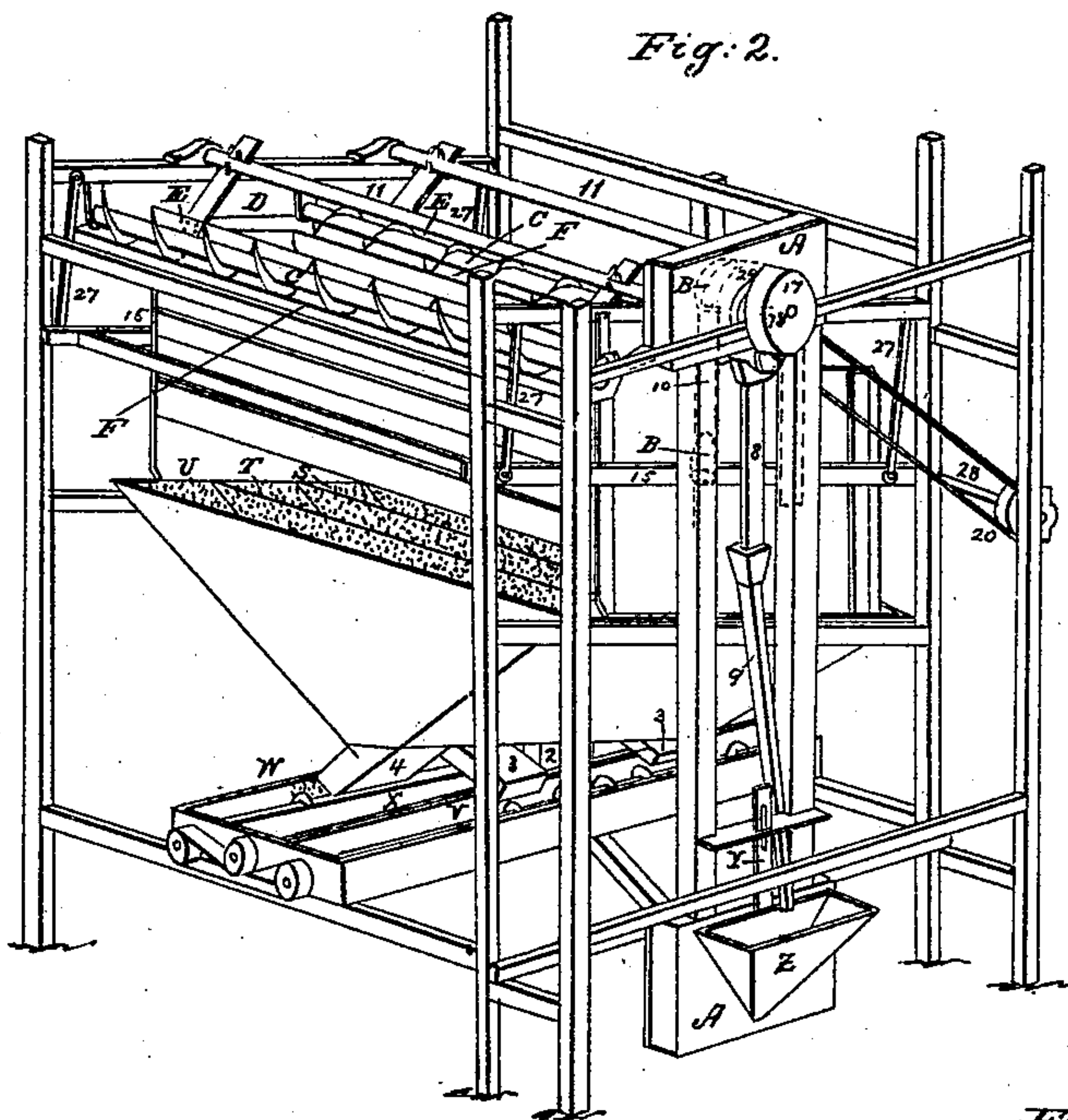


Fig. 6

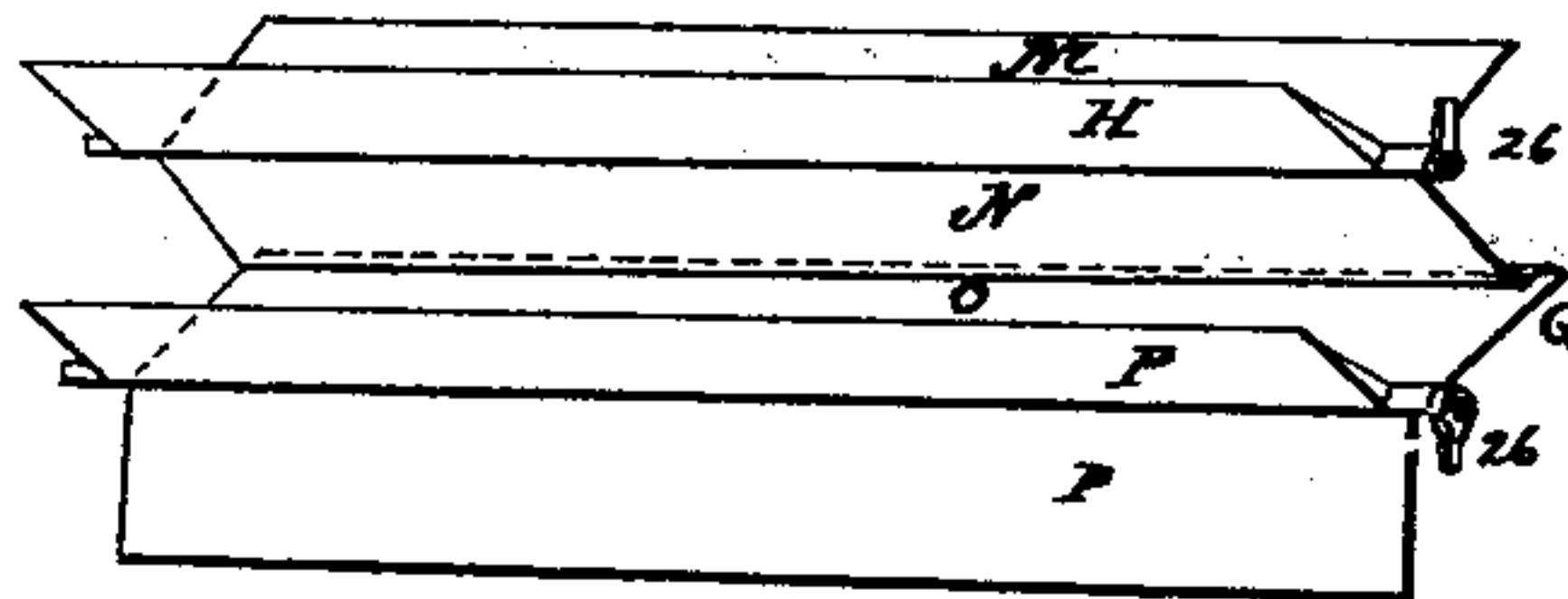
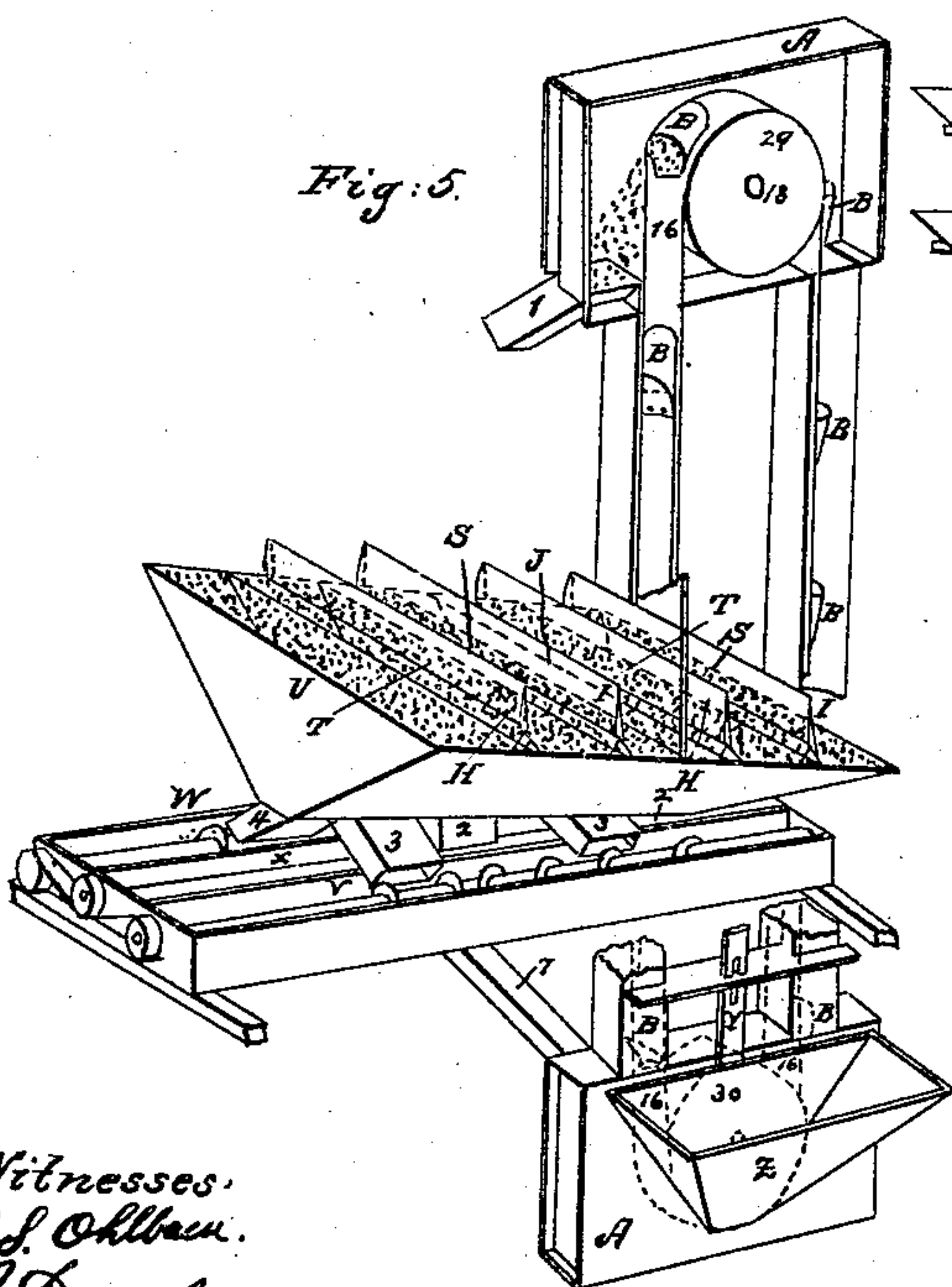
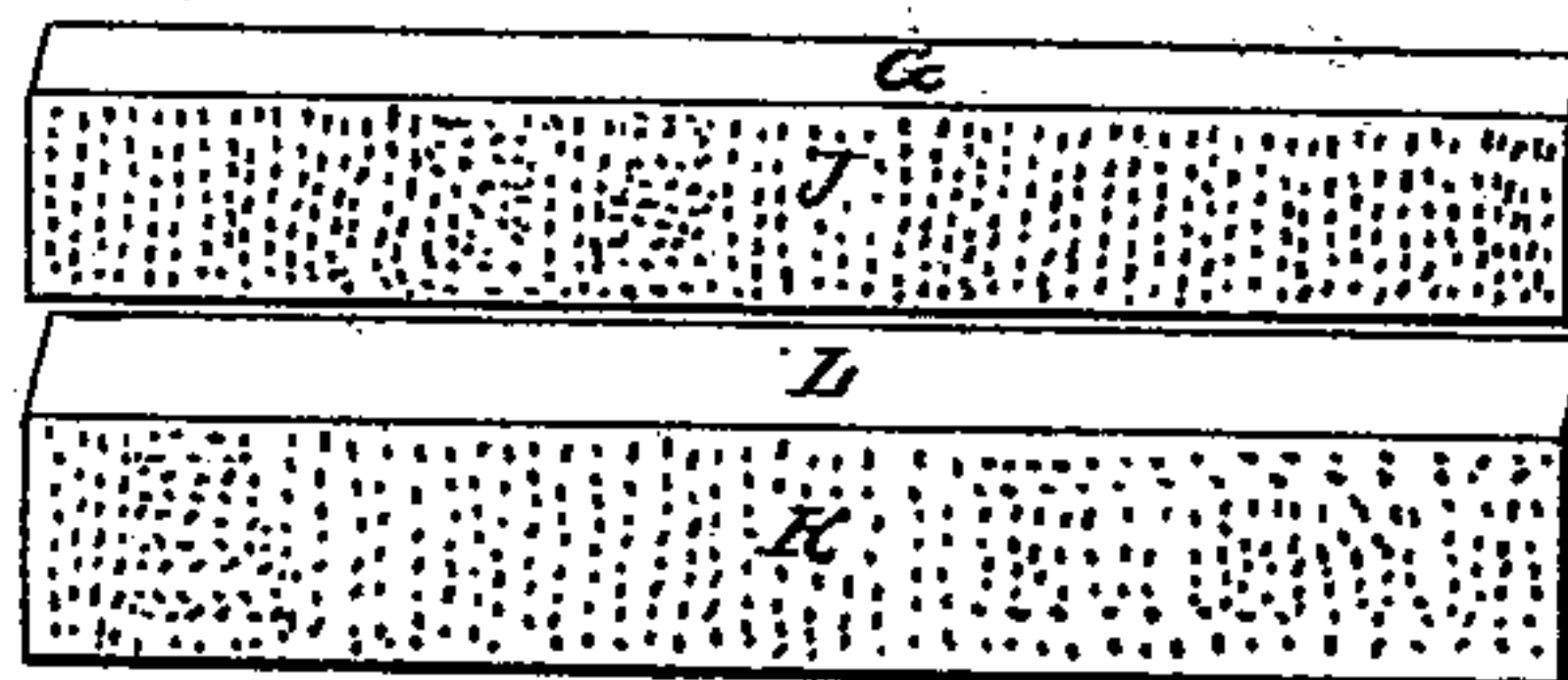


Fig. 7.



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Fig: 1.

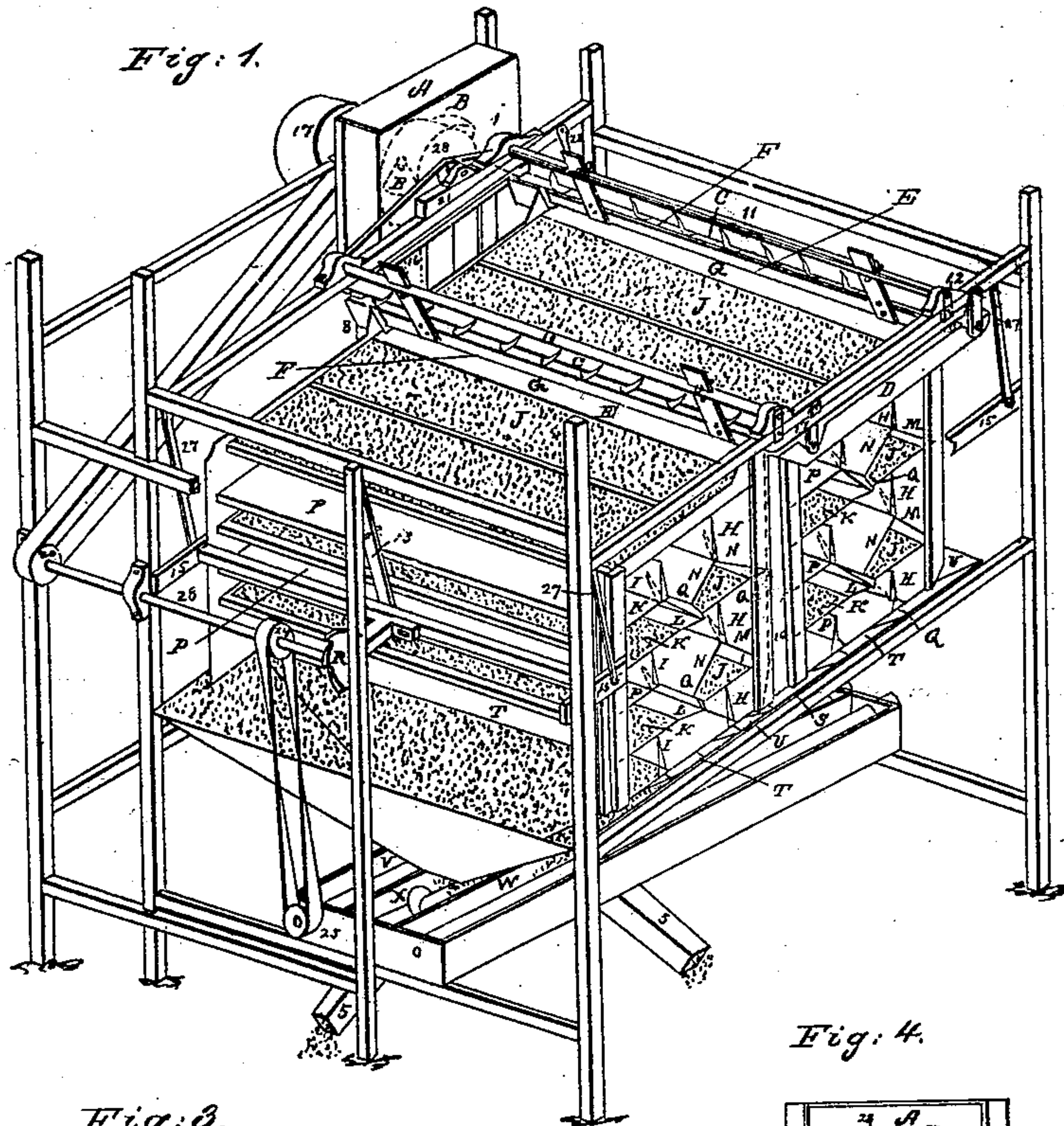


Fig: 4.

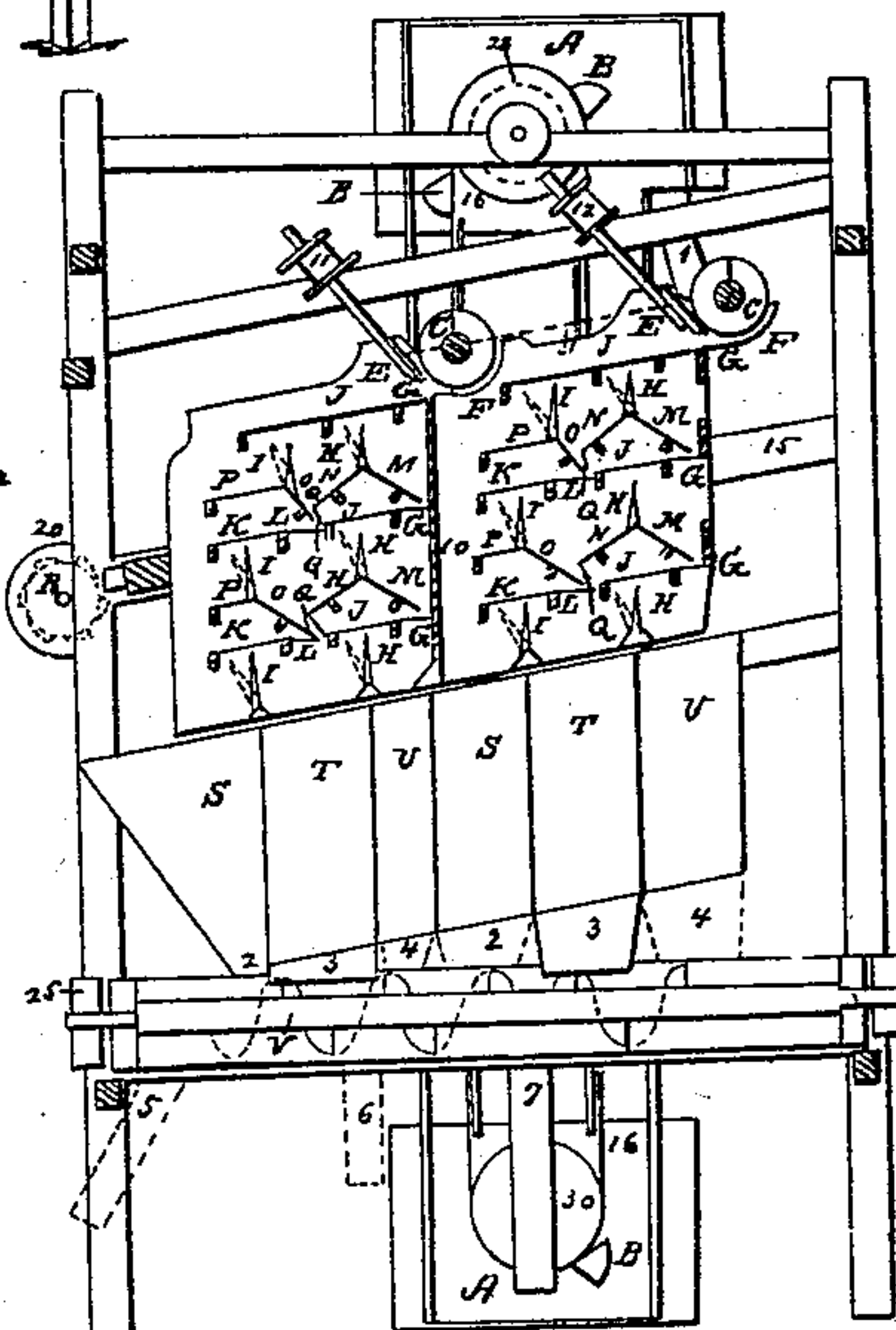
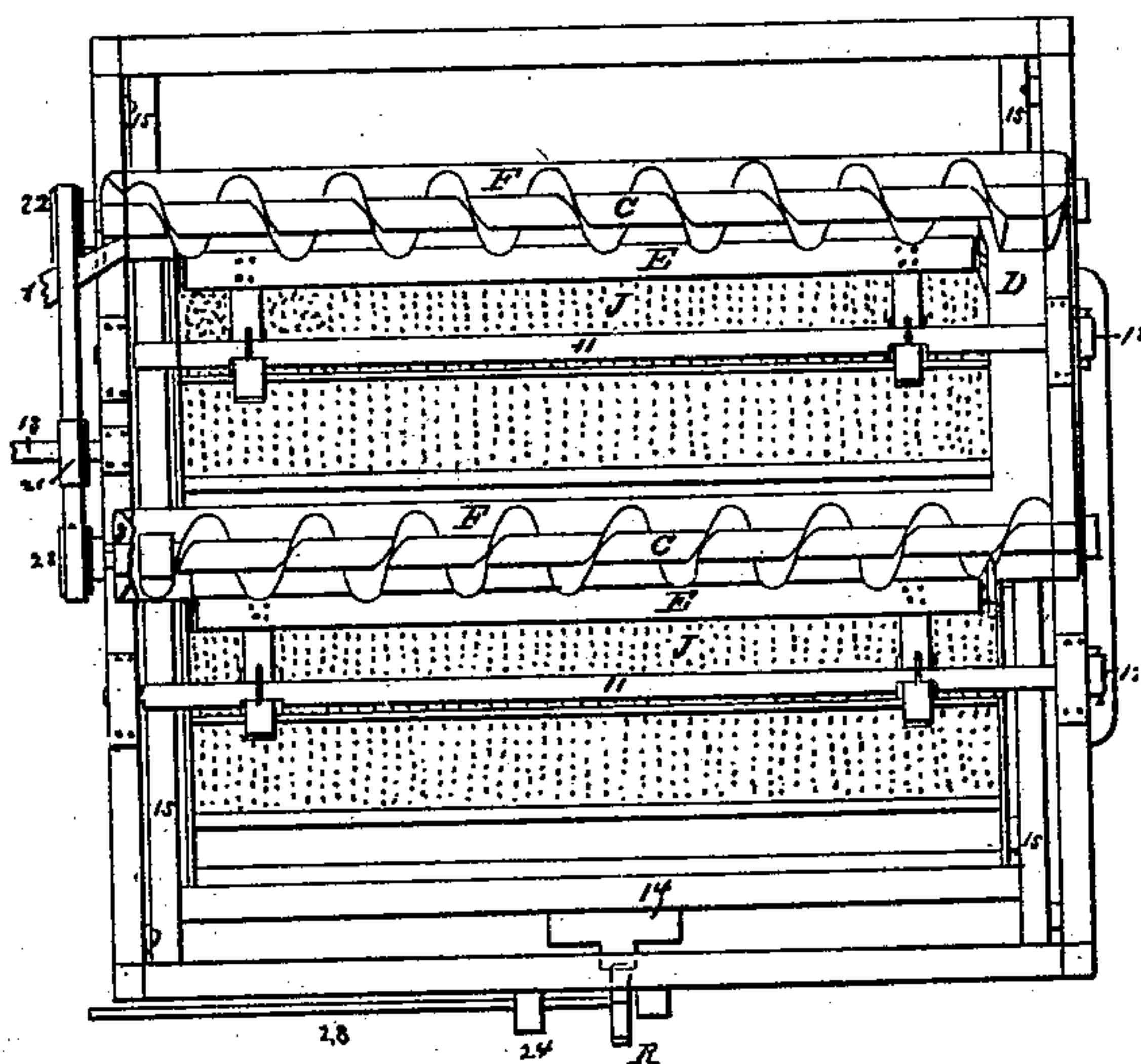


Fig: 3.



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UNITED STATES PATENT OFFICE,

HENRY SIDDALL, OF SAN FRANCISCO, CALIFORNIA.

IMPROVEMENT IN GRAIN-SEPARATORS.

Specification forming part of Letters Patent No. 39,073, dated June 30, 1863.

To all whom it may concern:

Be it known that I, HENRY SIDDALL, of the city and county of San Francisco, in the State of California, have invented a new and useful Machine for Separating and Cleaning Grain, entitled "Siddall's Vibrating Grain-Separator;" and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1 is a perspective view with the side of the vibrating apparatus shown open, the red colored space showing the course of the clean grain, the yellow color the course of the return-grain, the purple color the course of the refuse substances. The black dottings represent the screens. The elevator, belt, and cups are shown by dotted lines. Fig. 2 is a perspective view opposite to that of Fig. 1. Fig. 3 is a top view, with the elevator omitted. Fig. 4 is a sectional view, representing the machine cut through vertically at the center and lengthwise of conveyer V. The side of the elevator ends are shown open. Fig. 5 is a perspective view of the third pieces H and I, the chambers U T S, spouts 3, conveyers V X W, spout 7, and the elevator. Fig. 6 is a perspective view of the pieces H and I, with their handles for adjusting the same; also the pieces M N O P, showing their relative position. Fig. 7 is a top view of screens J and K and unperforated surfaces L and G.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A is an elevator, in which are placed pulleys 29 and 30 and belt 16, to which are secured cups B, and, when revolving, carry the grain upward. Said elevator A B may be set up in any convenient place, and the communications between the same and the screening apparatus may be effected by means of spouts or otherwise.

C C are conveyers, made with a shaft and spiral flanges, but may be constructed in any convenient manner and are placed in the cavities or spaces formed by the shoes F and feeding-blades E, and revolve therein for the purpose of conveying the grain along and distribute the same while being shaken out of said cavities. The journal-boxes of said conveyers

C are attached to the stationary frame-work, but these boxes may be attached to the vibrating apparatus, if desirable.

F F represent shoes for holding the grain while it is being carried along by the conveyers C, the grain being vibrated or shaken therefrom. These shoes are fastened upon support-timbers, which are parts of the vibrating-screen frame, the end pieces being so constructed as to form an end or side to the feeding-blades E E.

E E represent feeding blades fastened upon frames connecting with rollers 11, which are attached to the stationary frame-work to prevent them from vibrating, and are placed on an incline above the shoes F, reaching partly under the conveyer C, but may be placed in any convenient manner. Said feeding-blades are for the purpose of detaining the grain in the shoes F, and regulate its flow therefrom. Rollers 11 and their handles 12 serve in raising or lowering said blades for adjusting the quantity of grain to be admitted upon the screens. Said feeding-blades E and shoes F may, however, be so constructed that the blades E will vibrate and the shoes F remain stationary, or both may vibrate.

D is a trough or gutter formed in connection with the ends of the shoes F, and is for the purpose of transmitting any residue of grain from one conveyer, C, to the other.

G are depressions in the unperforated surfaces which are attached to the screens J, for receiving the grain, and prevent its rolling and cause it to settle before reaching the screens.

L⁴* are unperforated surfaces placed between the screens J and K, for the purpose of receiving the return-grain previous to its passing upon screens K, and are depressed or dropped down a given distance, forming a jet or ledge at the lower edge of the screens J for the grain to roll against and prevent its bounding upon the screens, but the same may be made straight from screens J to screens K. The surfaces L and screens K may, however, both be dropped down a given distance to form said ledge, if desirable.

J⁶ represent screens for sifting the grain and separating it from its impurities.

K⁴ are screens for sifting that portion of the grain which is to be returned.

* The small figures indicate the number of such pieces.

H⁶ are cut-off or dividing pieces, placed under the screens for the purpose of dividing the clean grain from the grain that is to be returned, and are so constructed as to be movable, forming adjustable partitions between said grain; but may be built immovable, forming unadjustable partitions. Said pieces H may be placed at any point or in any manner below any of the screens.

I⁶ are cut-off pieces, similar to those marked H, placed under the screens, and are constructed adjustable for cutting off or dividing the refuse matter from the grain at any desirable point of the screens.

M⁴ are inclined pieces for receiving the grain which has been sifted through on the upper side of the dividing-pieces H, delivering the same upon surfaces G.

N⁴ and O⁴ are inclined pieces for receiving the return-grain and gathering the same into openings or throats Q. Said openings deliver the grain upon the unperforated surfaces L.

P⁴ are pieces for receiving the refuse matter which is sifted through on the lower side of the cut-off pieces I, and preventing the same from falling upon the screens K.

The aforementioned pieces H I M N O P may all, or any of them, be built in connection with the vibrating-apparatus, as seen in the accompanying model; or the same may be constructed independent of the vibrating apparatus and remain stationary.

T T are gathering and returning chambers, for the purpose of gathering the return-grain into spouts 3 3.

U U are chambers for collecting the clean grain into spouts 4 4.

S S are chambers for gathering the refuse substances into spouts 2 2.

V represents a conveyer for collecting the return-grain from the chambers T T and transmitting the same to spout 7.

W is a conveyer for gathering the clean grain from spouts 4 4 to 6.

X is the conveyer for gathering the refuse substances from spouts 2 2 to 5.

Z represents a hopper for holding the grain before it passes through the machine. The same may be set up in any convenient place, and communication between it and the elevator A B may be effected by means of spouts or otherwise.

Y is the slide-gate for regulating the flow of grain from the hopper Z.

1 represents the spout for carrying the grain to the screening apparatus.

8 and 9, Fig. 2, are spouts for the purpose of carrying back the surplus grain from the last conveyer C to hopper Z in case there should be too great a flow of grain admitted at the slide-gate Y. Spout 8 is attached to the end piece of the lower or last shoe, E, and delivers the grain into spout 9, thence into hopper Z; but spout 8 might extend down to hopper Z, thus dispensing with spout 9; or spout 9 may extend upward for the reception of the grain, thereby doing away with spout 8.

7 is a spout for transmitting the remaining grain into elevator A B, or the same may empty into hopper Z, if found more convenient.

10, Fig. 1, represents a partition between the two sets of screens.

13 is a spring for regulating the force of stroke of the screening apparatus against the cam-wheel R.

14 is a tie-timber, reaching across the machine, against the center of which the cam-wheel R works.

15 15 are timbers, to which the screen-frames are secured and suspended.

R, the cam wheel, causes the vibratory or shaking motion of the screening apparatus.

27 27 are straps for suspending the screening apparatus to the frame-work.

Power is applied by belt to the driving-pulley 17, turning main shaft 18, upon which are secured the elevator pulley 29 and pulleys 19 and 21. Pulley 19 communicates by belt to pulley 20, propelling-shaft 28, and cam-wheel R, causing the screening apparatus to vibrate. Pulley 21 communicates by belt to pulleys 22 and 23, driving conveyers C C; but any other means for driving the machinery may be made to answer. The grain is introduced into hopper Z, and should be cleaned by some blast-separator previous to its passing through the screening apparatus. The flow of the grain from hopper Z is regulated by the slide-gate Y, and is carried upward by elevator A B, thence into spout 1, thence into the first or upper shoe, F. The upper conveyer, C, carries it along and distributes it, while the feeding-blade E regulates the flow therefrom, thence falling upon the unperforated surface G. Should a residue of grain remain in the shoe, it is still further conveyed into the trough or gutter D. The vibratory motion will cause it to run into the lower conveyer, C, where it undergoes the same mode of feeding and distribution as in the upper conveyer. Should a surplus of grain remain in the lower conveyer, the same will find egress through spout 8, thence through spout 9 and back to hopper Z. When the grain drops upon the first depressed unperforated surfaces G, the vibratory motion will cause it to be carried down upon the first screens, J, the greater portion of the grain will drop through on the upper side of the first dividing-pieces, H, thence following the red color and falling upon the inclined pieces M, thence upon the second unperforated depressions, G, thence upon second screens, J. The greater portion of the grain will again fall through on the upper side of the second dividing-pieces, H, thence falling upon second, M, thence upon the third, G, thence upon third screens, J. The greater portion of the grain will again drop through on the upper side of the third dividing-pieces, H, thence into gathering-chambers U U, thence into conveyer W, finally out of spout 6. The remaining grain, which does not sift through the upper or first screens, J, on the upper side

If the first dividing-pieces, H, is vibrated along and drops through between the first pieces, H and I, following the yellow color. This I call the "return-grain." A portion of the refuse matter or impurities will also fall through with this grain, thence falling upon the first inclined pieces, N and O, thence through the first openings or throats, Q, thence upon the first unperforated surfaces L, where it meets a portion of grain that passes over second screens, J. All of this grain is vibrated upon and is sifted through the first screens, K, on the upper side of the second cut-off pieces, I, thence falling upon the second inclined pieces, O, and that portion of grain which sifts through on the lower side of the second dividing-pieces, H, drops upon second pieces, N, all of which passes through second openings, Q, thence upon second unperforated surfaces, L, where it meets grain not sifted through third screens, J, thence passing upon and is sifted through second screens, K, on the upper side of the third cut-off pieces, I, and that portion of grain which is sifted through third screens, J, on the lower side of the third dividing-pieces, H, all of which drops into returning-chambers T T, thence through spouts 3 3, thence into conveyer V, which transmits the same to spout 7, finally to elevator A B. This grain, being yet imperfectly cleaned, is returned to pass through the screening apparatus again, at the same time and with the regular supply of grain, thus keeping a part of the grain continually returning. By this process a more thorough

separation can be effected than in any other manner. The refuse substances, following the "purple color," pass over screens K, and that portion which is sifted through on the lower side of the cut-off pieces I will fall upon the surfaces P, thence into gathering-chambers S S, thence into conveyer X, finally out of spout 5.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The conveyer C, when used as and for the purpose set forth.

2. The trough or gutter D, or an equivalent thereto, for the purpose described.

3. The cut-off or dividing-pieces H and I, when made as described and used for the purpose set forth.

4. Pieces N and O, in combination with pieces M, for the purpose set forth.

5. The unperforated surfaces L and screens K, in combination with screens J, for the purpose set forth and described.

6. The return-chambers T, spouts 3, conveyer V, spout 7, and elevator A B, for the purpose of returning a part of the grain, as set forth and described.

7. The process of returning a part of the grain to pass through the screening apparatus again at the same time and with the regular supply of grain, as herein set forth.

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Witnesses:

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