

(No Model.)

3 Sheets—Sheet 1.

W. KRÜGER.

GRAIN CLEANING AND ASSORTING MACHINE.

No. 260,996.

Patented July 11, 1882.

Fig. 1.

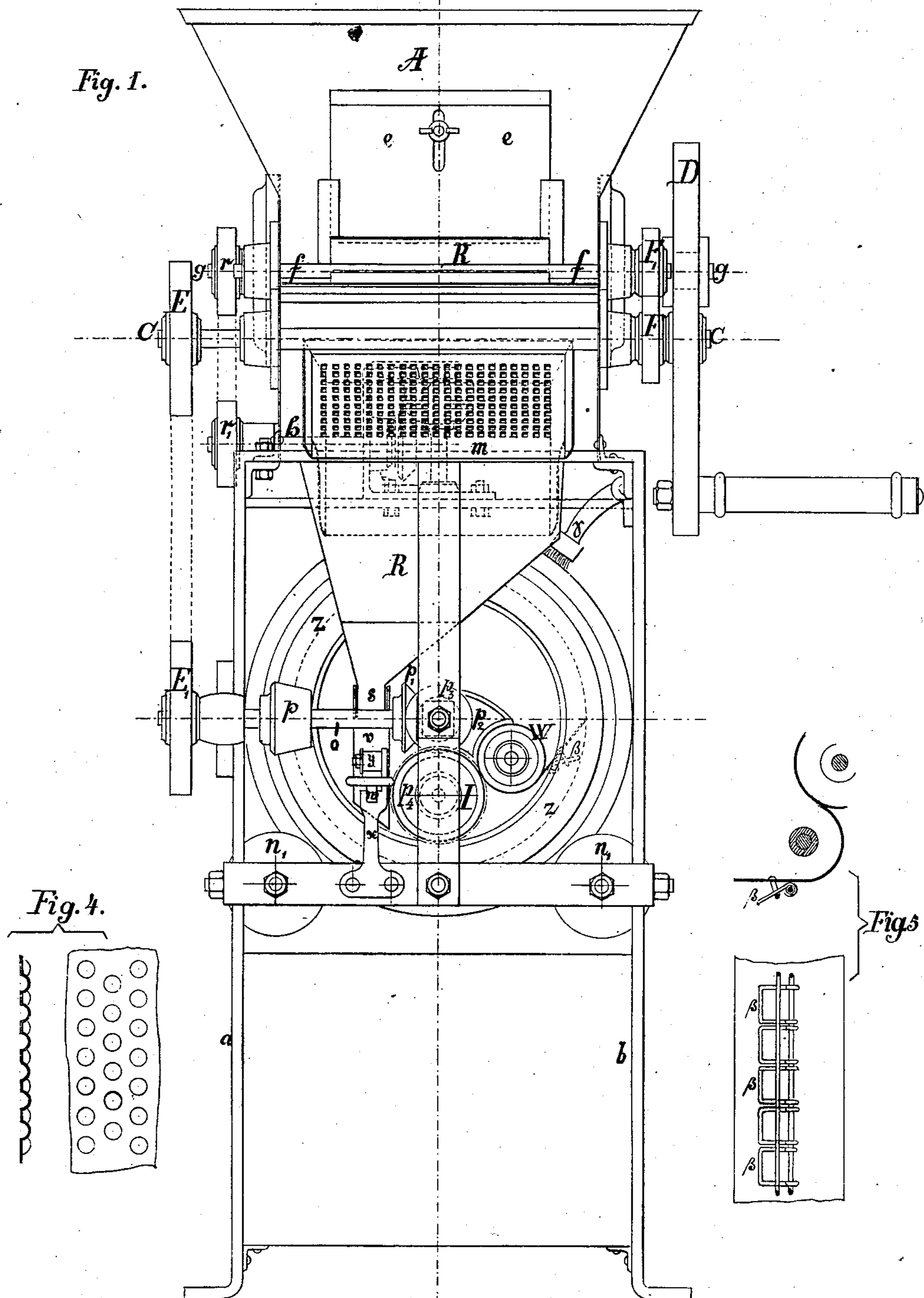


Fig. 4.

Figs

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Ad. Müller

Inventor:
Wilhelm Krüger

(No Model.)

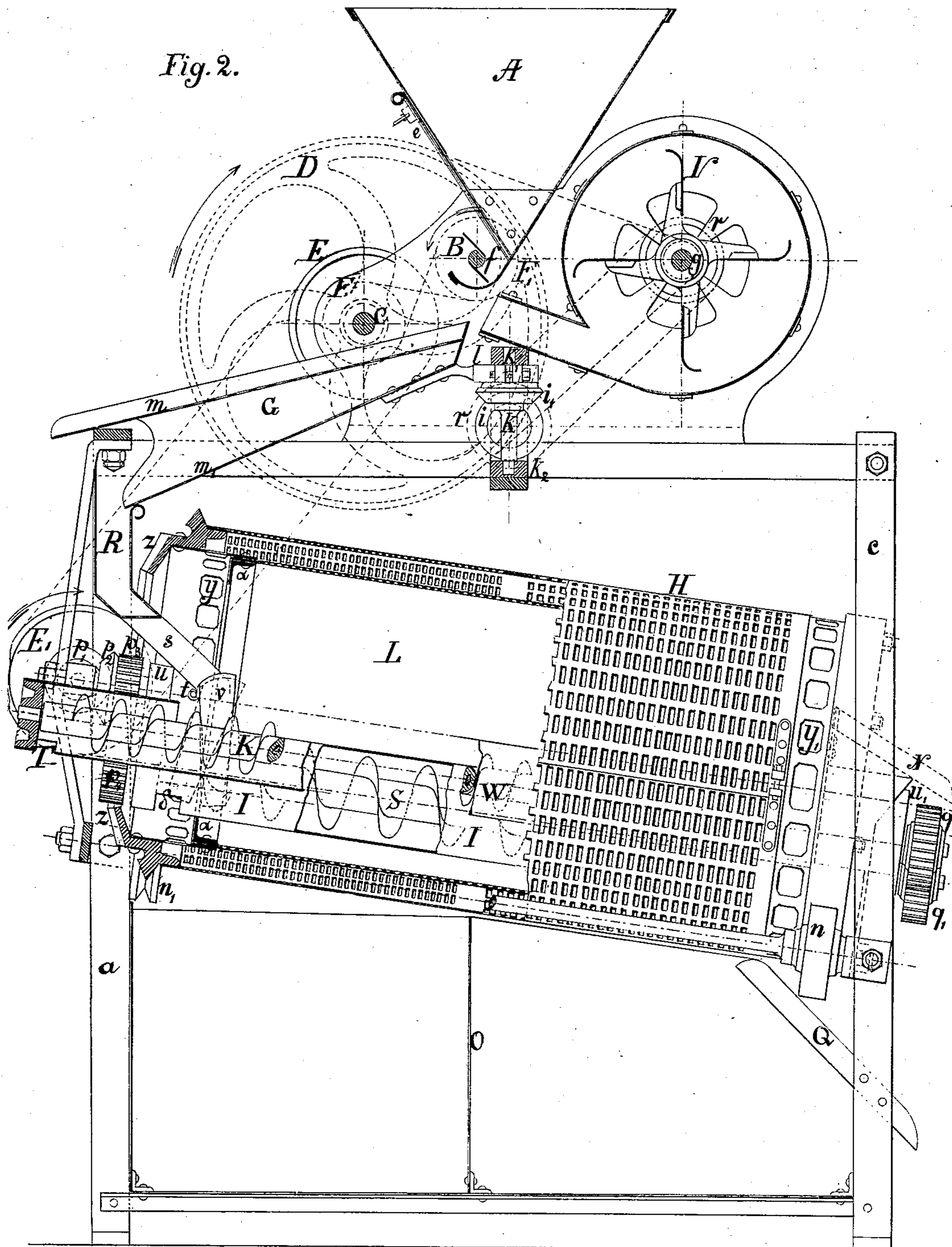
3 Sheets—Sheet 2.

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Fig. 3.

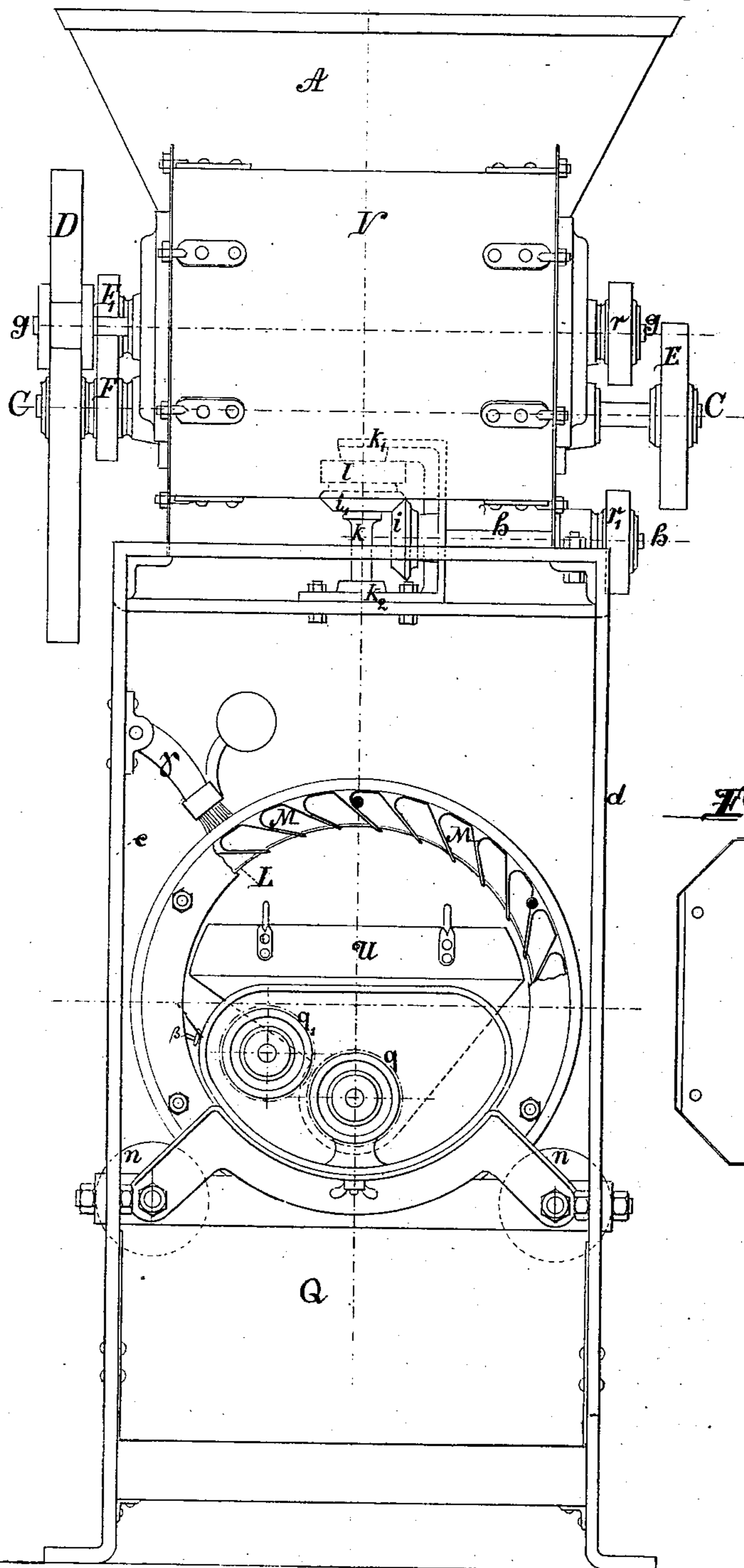
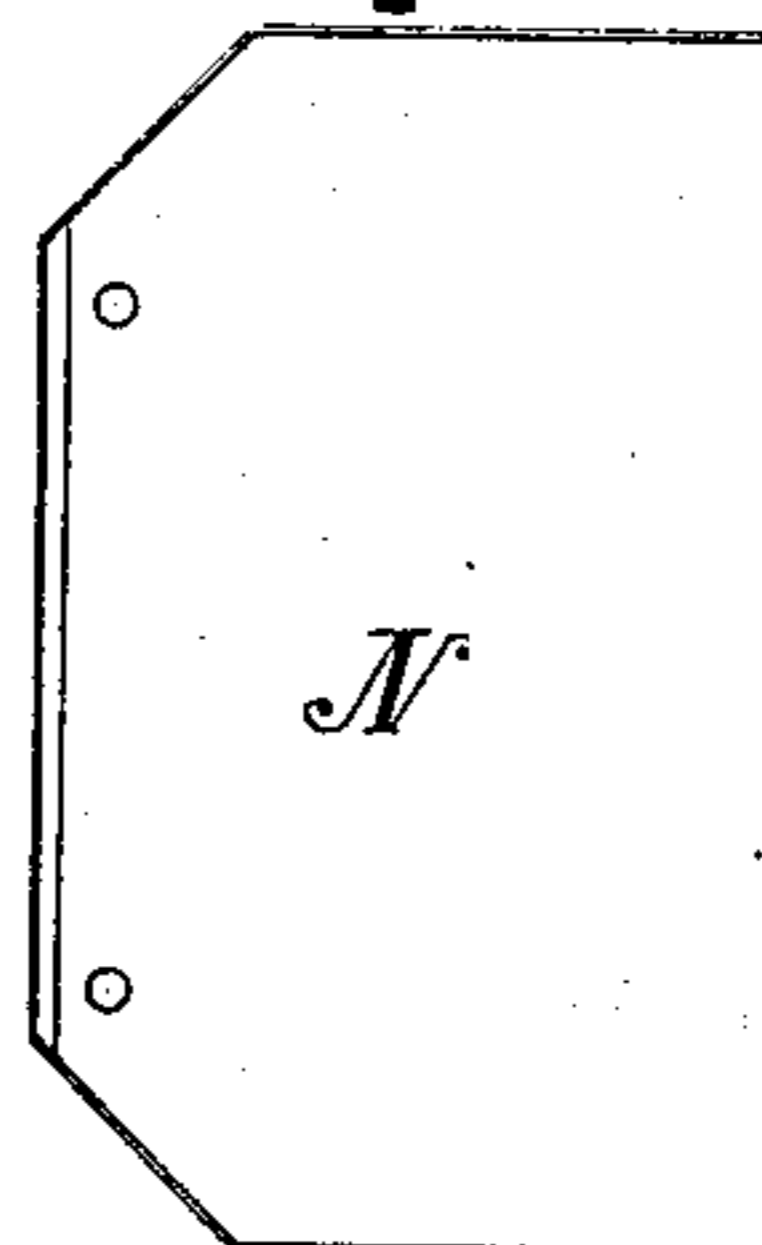


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILHELM KRÜGER, OF KALK, NEAR COLOGNE, GERMANY.

GRAIN CLEANING AND ASSORTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 260,996, dated July 11, 1882.

Application filed March 5, 1881. (No model.) Patented in Germany December 29, 1878, No. 6,609, and June 12, 1879, No. 8,955; and in Austria-Hungary July 10, 1879, No. 3,093, and February 28, 1880, No. 411.

To all whom it may concern:

Be it known that I, WILHELM KRÜGER, of Kalk, near Cologne, Empire of Germany, have invented a new and useful Improvement in Grain Cleaning and Assorting Machines, of which the following is a specification.

The present invention relates to that class of machines for cleaning and separating grain in which is employed a revolving cylinder mounted on an inclined axis.

The invention consists in the construction and combination of parts which will be hereinafter more fully described, and then set forth in the claims.

In the accompanying drawings, Figure 1 is a front elevation of my machine. Fig. 2 is a side elevation thereof, partly in section. Fig. 3 is a rear elevation; and Figs. 4, 5, and 6 are detailed views.

The letters *a b c d* represent a frame-work, made generally of wrought-iron, on which all the operative parts of the machine are mounted.

A designates a feed-hopper, which receives the grain, and has a sliding gate, *e*, for regulating the discharge of grain therefrom. The revolving feed-shaft *B* serves to prevent the discharge of grain except in regular or measured quantities; and it consists of a shaft, *f*, having metal wings attached thereto. Said feed-shaft is driven by means of the main shaft *C*, which carries the belt-pulleys *E* and *F*, and serves to communicate motion to said feed-shaft by means of a belt passing around the pulley *F*, and a second pulley, *F'*, on said feed-shaft.

V is a revolving fan, the shaft *g* of which is connected with the fly-wheel *D* by means of a suitable belt, and also serves to operate an intermediate shaft, *h*, by means of a belt and belt-pulleys, *r* and *r'*. The shaft *h* carries a bevel-wheel, *i*, which meshes into a bevel-wheel, *i'*, on the upper end of a vertical spindle, *K*, having its bearings in the cross-bars *k'* and *k''*. An eccentric on said spindle *K* is encircled by the ring *l*, which is directly connected with the shaking-shoe *G*. Said shoe is placed in an inclined position, and has a perforated floor, *m*, and an imperforate portion, *m'*.

A separating-drum, *H*, mounted on an inclined axis, rests at its lower end on the smooth rollers *n* and at its upper end on the grooved

rollers *n'*. The outlet-openings *y'* are located at the lower end of the drum *H*, and the upper end of the latter carries a toothed rim, *z*, for communicating motion to said drum.

o is a short horizontal shaft, driven by the main shaft *C* through the medium of the band-pulleys *E* and *E'* and a suitable belt-connection. The bevel-gear wheel *p*, located on the said shaft *o*, meshes into the toothed rim *z* of the separating-drum, and a second bevel-gear wheel, *p'*, also mounted on said shaft *o*, drives a bevel-gear wheel, *p''*. The latter serves to impart motion to the longitudinal spirally-flanged shaft *S* through the medium of the spur-wheels *p'''* and *p''''*. The spirally-flanged shaft *S* is surrounded by the cylindrical shell *I*, which extends through the entire length of the drum *H*, and is connected and supported by the frame-work of the machine. A spur-wheel, *q*, on the upper end of the shaft *S* meshes into the spur-wheel *q'*. The latter is fitted on the spindle of the worm-shaft *K*, which has its bearings in the heads *u* and *u'* of the trough *W*. Said trough terminates at its upper end in a tube, which is closed at its outer end and has an opening in its bottom. The cylinder *I* is also provided with a bottom opening, *I'*, at its upper end, through which the grain makes its exit in order to enter the separating-drum *H* through the openings *y* made therein.

A cylindrical shell, *L*, arranged concentrically within the drum *H* and fastened thereto, serves to form a space between it and the drum *H*, the communication between said space and the interior of the drum being formed by the openings *y*.

A series of buckets or scoops, *M*, are arranged circumferentially at the lower end of the drum *H*, between an end ring thereto and an inwardly-turned closed flange of the shell *L*, screwed to the inner periphery of the drum *H*.

In place of elevating-scoops *M*, as shown in Fig. 3, I may employ a series of cells pressed in metal plates, as shown in Fig. 4.

The slide or plate *N* (shown in detail in Fig. 6) is intended to be placed inside the separating-cylinder, below the above-mentioned elevating-scoops, for the purpose hereinafter mentioned.

O is a partition-wall of a receptacle or box

placed below the separating-drum in order to form two compartments—one for the reception of light grain passing through the upper half of the drum and the other for the reception of the heavier grain passing through the lower portion thereof.

Q is a tail-board for conducting the seed grain away from the end of the drum.

R is a funnel, which receives at its upper end a shaking-screen, G, and its lower end terminates in the discharge-spout S, which is provided with a movable extension or lower portion, *v*. The latter is pivoted at the point *t*, and can be shifted through the medium of the draw-bar *w*, so that the discharge of the grain can take place either directly into the separating-cylinder H in advance of the barrier *a* or into the cleaning-cylinder L in the rear of said barrier *a*. The draw-bar *w* is provided with two notches, which engage with the fork *x*, through which said bar slides, so as to lock said bar and hold the movable discharge-tube *v* in the two positions above mentioned. A suitable spring, *y*, bears upon the bar *w* and serves to hold it in a locked position.

U is a feed-hopper at the lower end of the shell which incloses the spirally-flanged shaft or screw-conveyer S. It has an inwardly-projecting plate, which extends below the scoops M, so as to receive the grain from the same and discharge it into said hopper.

The letter J designates a brush-bar, carried by two weighted levers and bearing upon the outer periphery of the cylinder H.

The operation of the machine can take place in the three ways hereinafter stated, viz: first, it can be freed from light impurities and chaff, separated from cockle, garlic, and other weeds, and assorted according to grade or quality; second, it may only be cleaned and separated from foreign substances; and, third, it may only be cleaned and separated according to grade or quality. These three ways of using the machine depend upon the position of the discharge-spout *v* and the slide N.

If the operation first mentioned is to be carried out, the grain, together with all impurities, is delivered by means of the feed-shaft B upon the shaking-shoe G, and is exposed in its descent upon the same to a blast of air from the fan V, which separates dust and bran. The grain, passing through the perforated floor *m* of the shoe, falls upon the inclined plane, and from thence passes into the funnel R, large impurities and weeds, however, passing over the outer end of the sieve or floor *m*, so as to be discharged outside of the machine. The grain passes through the funnel R, and is discharged through the spout *v* of the same. The latter is in this instance shifted beyond the barrier *a*, hereinbefore mentioned, so as to discharge the grain into the separating-cylinder L. The latter, when turned with its outer assorting-cylinder, H, through the medium of the mechanism hereinbefore described, will cause the grain or material received by the same to roll continuously around said cylinder until

it reaches the lower end of the same, when it is delivered to the elevating device. The round and small seeds of weeds contained in the grain are deposited in the cells formed in said cylinder L, and as the latter is turned fall out of said cells into the trough W. The seeds of weeds falling into this trough are conveyed to the upper end of the cylinder through the medium of the screw-shaft K, and are discharged through the opening in the tube-shaped upper end of the trough W. U-shaped stripping-wires P, movably attached to the wall of the trough W, adjoining the cylinder L, serve to prevent the grain from being carried up by the latter, as said wires will dislodge the grain from the cells of said cylinder by reason of the peculiar formation of the grain.

The elevating device M receives the grain in the manner already stated and delivers it into the funnel *u* of the shell I, and the screw contained in the latter will again transport it to the upper end of the machine. The grain, when it reaches the opening I' made in said shell I, will pass through the same, and enters the assorting-drum H through the openings *y*, when it again gradually rolls to the lower end thereof. The best and heaviest seed grain makes its exit through the openings *y'* and passes upon the tail-board Q into suitable receptacles. On its way from the openings *z* to the openings *z'* the grain rolls or passes over the perforated plates composing the shell H, and as said openings are of varying sizes the grain is properly assorted according to size. The openings in said cylinder are kept open by means of the brush J, located on the outer side thereof. When the grain is only to be cleaned and separated from impurities, and not assorted as to size or quality, the grain pursues the course above stated until it reaches the elevating device M. A plate or board, N, placed in an inclined position upon the funnel U, receives the grain from the elevating buckets and conveys it into receptacles located outside the machine. The assorting of the grain can also be dispensed with by removing the shell or cylinder H altogether, so that the grain will pass through the opening Y' of the cylinder L.

When the grain is only to be cleaned of light impurities and assorted to size or quality, its course until it reaches the funnel R is the same as heretofore stated. In this instance, however, the movable discharge-spout *v* of the funnel R is so shifted and locked in position that the grain issues in advance of the barrier *a* and passes through the openings Y directly into the assorting-cylinder.

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

1. In a machine for cleaning and assorting grain, the combination of an inner cylinder having internal cells for collecting weed-seeds, a trough and conveyer-shaft for discharging said weed-seeds from the machine, and an outer reticulated cylinder for assorting the

grain, and means for conveying the grain from the lower end of the cleaning-cylinder to the upper end of the assorting-cylinder, as and for the purpose set forth.

5 2. In a grain cleaning and assorting machine, the combination of the funnel R, movable discharge leg or tube *v*, the concentric

cylinders H L, and feed mechanism, as and for the purpose set forth.

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