

A. ORVIS.  
GRINDING MILL.

No. 24,266.

Patented May 31, 1859.

Fig: 1.

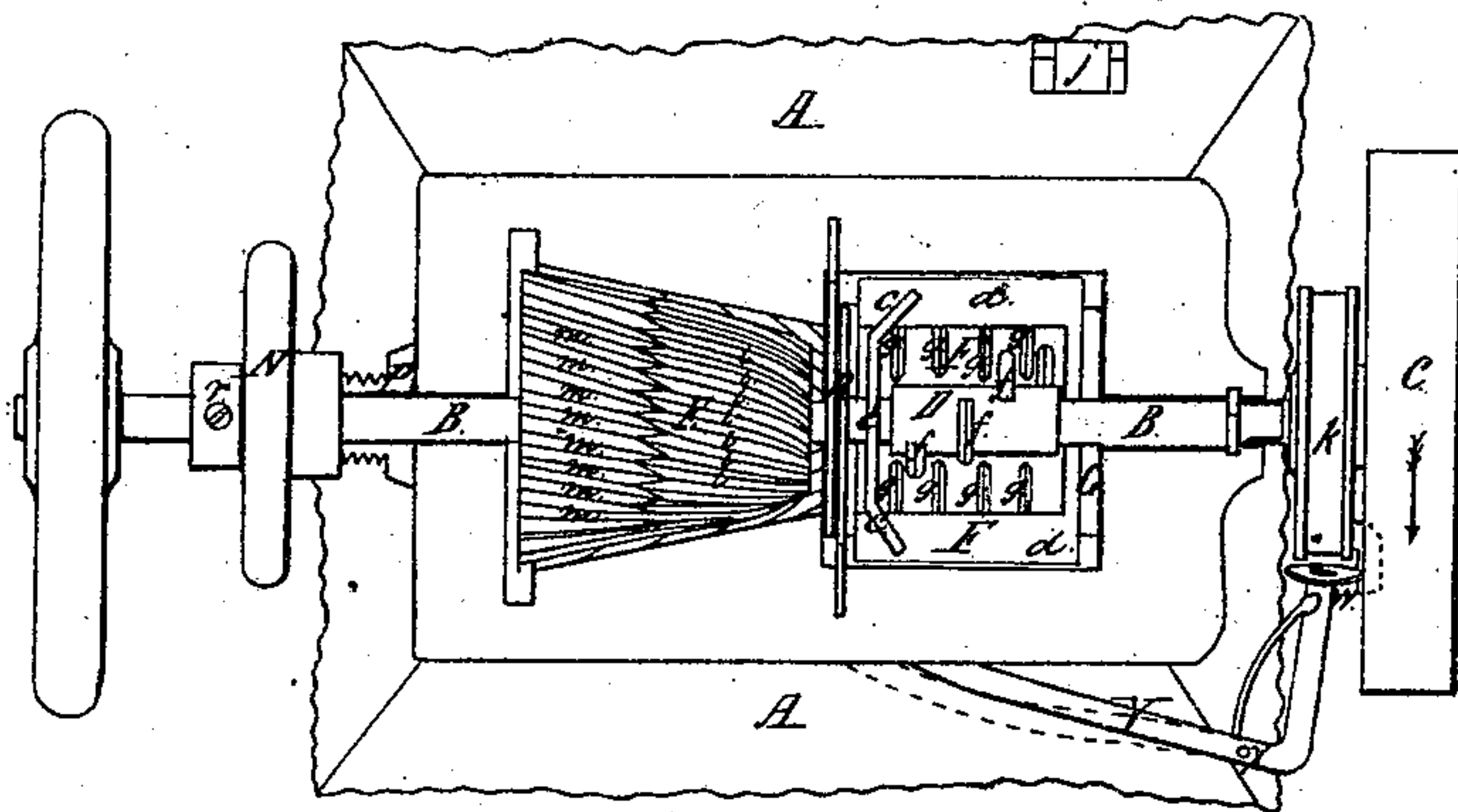


Fig: 4.



Fig: 3.

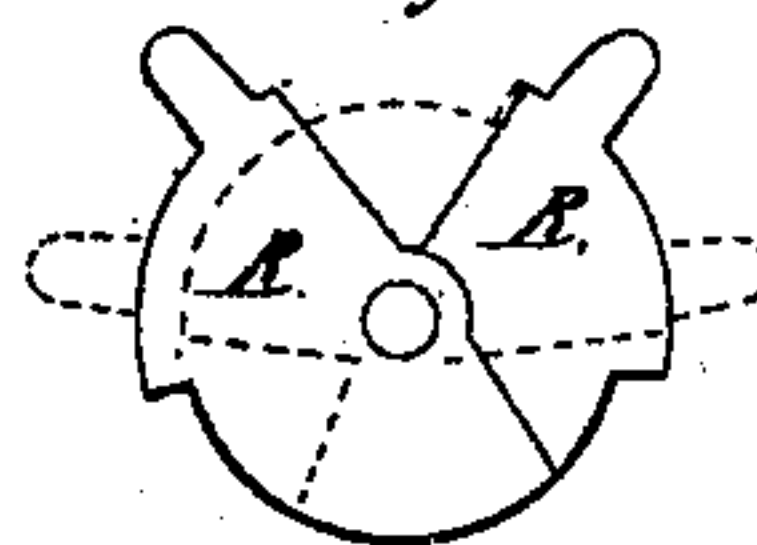
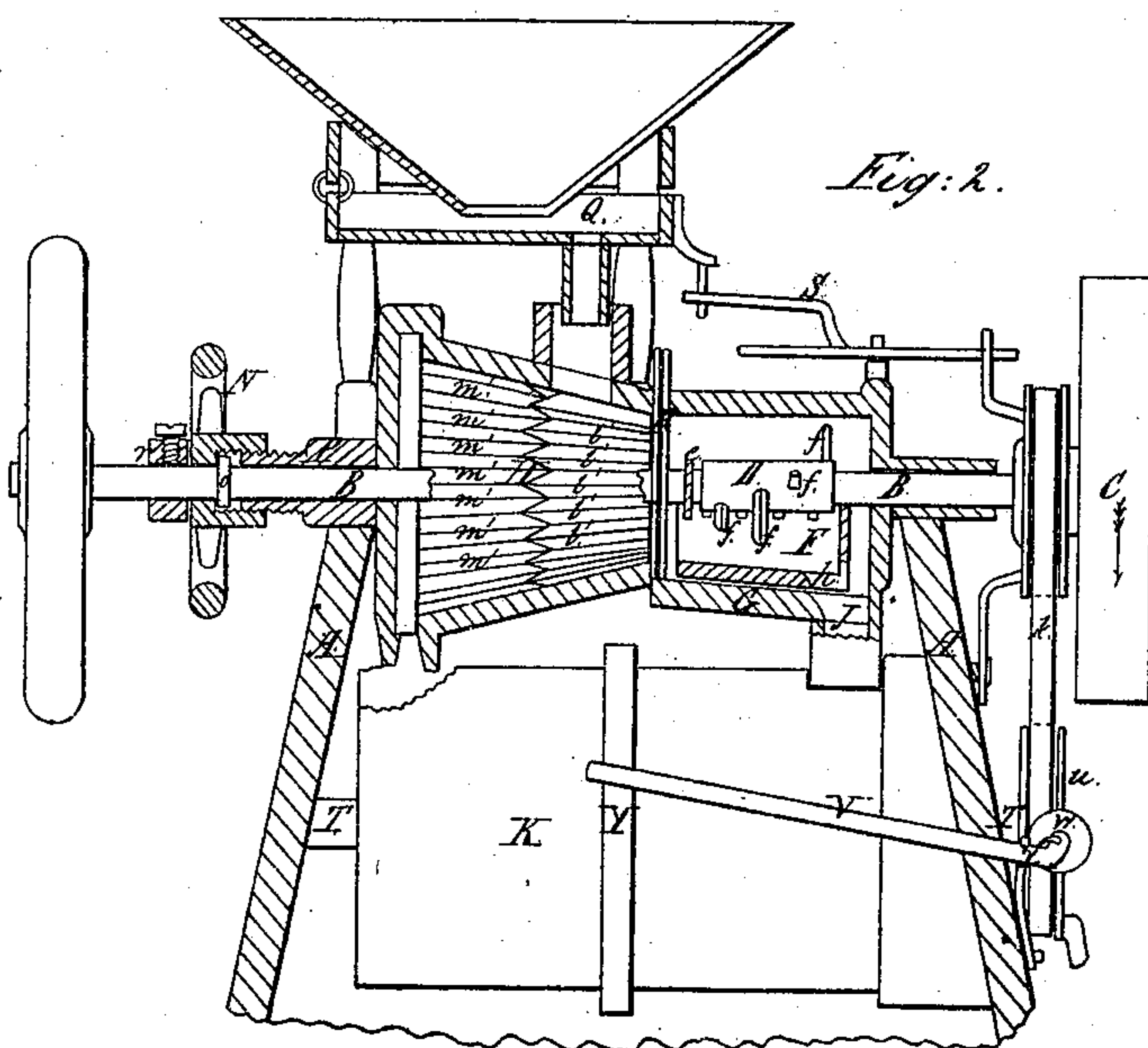


Fig: 2.



Witnesses  
J. Fraser  
S. J. Allen

Inventor  
A. Orvis.



# UNITED STATES PATENT OFFICE.

A. ORVIS, OF NIAGARA, NEW YORK, ASSIGNOR TO HIMSELF, AND DOWNS & CO., OF  
SENECA FALLS, NEW YORK.

## GRINDING-MILL.

Specification of Letters Patent No. 24,266, dated May 31, 1859.

*To all whom it may concern:*

Be it known that I, A. ORVIS, of Niagara, in the county of Niagara and State of New York, have invented a new and Improved  
5 Grinding-Mill; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, in which—

Figure 1, is a plan view with the top of  
10 the case removed to show the cracking and grinding cylinders; Fig. 2, is a vertical section with the grinding cylinder removed to show the concave H; Fig. 3, is a detached view of the winged partition R; Fig. 4, is a  
15 section showing the teeth of the cracking cylinder and concave.

Similar letters refer to like parts in all the figures.

My invention has for its object the pro-  
20 duction of a cheap but efficient farm mill, which can be employed with a small amount of power, and used both for cracking corn and feed, and for grinding finer grains, either separately or at the same time, the  
25 operations being kept distinct.

Upon a frame A, inclosing the bolting apparatus, contained in the cylindrical case (which may consist of any of the improved kinds in use,) I mount a central shaft B,  
30 provided with a band pulley C, by which it may be driven by water, wind, steam, or horse-power, whichever is most convenient. On this shaft I attach two cylinders D and E, the first of which is designed for crushing  
35 and cracking corn and cobs, and is provided with a set of spiked teeth  $f$  of a curved rhomboidal form. A concave F, is provided, having teeth of a similar form  $g$ , set at proper intervals on each side. This is  
40 fitted loosely within another concave G, Fig. 2, which allows it to slide longitudinally of the shaft for a little distance. The flanges  $d$  rest on ledges at the sides of the lower concave, while a metallic rod or strap  $c$  ex-  
45 tends from side to side of F, at or near one end, encircling and forming a collar on the shaft at  $e$ . This holds the concave firmly to the shaft, and in a suitable relation to the cylinder. The collar is loose enough to slide  
50 on the shaft, which motion is limited by the ends of the hub of the cylinder D. By means of this arrangement the concave F, is adjusted to the teeth of the cylinder by the revolutions of the latter in consequence of the pe-

culiar rhomboidal form of the teeth of both, 55  
as shown in Fig. 4 which act by the sharpness of their angles and the obliquity of the surfaces presented, to move the concave laterally as they come in contact, as indicated by the arrow in Fig. 4, sufficiently to allow  
60 them to pass freely, and yet act efficiently on the corn. The crushed material descends through the aperture  $h$  into the second concave, and thence is conducted off by the spout  
65  $j$ ; or it may be passed through the grinding surfaces of the cylinder E and its concave, if required, as will be hereafter explained.

The hanging of the supplementary or interior concave, F, to the cylinder shaft, and rendering it self-adjusting, is designed to  
70 admit of the free adjustment of the grinding cylinder E, without disarranging the operation of the former cylinder, and is very effectual, as well as indispensable, when the  
75 same shaft is made to perform the two functions simultaneously.

Cylinder E, is designed for grinding flour, meal, &c., and consists of a cast iron frustum or truncated cone, the surface of which is grooved with two series of channels,  $l$  80  
and  $m$ , the former starting from the head and the latter from the base of the cone, and continuing in a somewhat spiral direction until they meet in the center, where the  
85 grooves of one series intersect the raised angles of the other, thus alternating the ribs and channels without changing the direction of either. The first series,  $l$ , receives the grain and cracks it, and thence, by the peculiar confluence of their angles, carries it  
90 on to the second or grinding series,  $m$ , where the pulverization is completed.

The corrugations present obtuse angles both of elevation and depression, and these lines being continued through the alternate  
95 intersections described, occasion a depression in the surface of the cylinder at that point, which favors the passage of the grain which is being operated upon, and insures the equal and minute pulverization of all its  
100 particles.

The concave has a grinding surface formed with the same intersecting channels,  $m'$  and  $l'$  Fig. 2. These surfaces are adjusted for  
105 coarse or fine grinding by moving the shaft bearing the runner E, longitudinally, which is effected by the hand wheel N, the hub of which, being hollow, incloses the collar  $o$ ,



and by means of a screw or other equivalent appliance on the box, P, of the shaft moves it forward into closer connection with the concave. An additional collar *r* adjustable  
5 by a set screw regulates the movement in one direction.

An adjustable partition, R, is placed between the two cylinders. It is divided vertically, each half inclosing the shaft so as  
10 to admit of the two parts or wings being separated, to open or close communication between the two concaves. This done, by closing the discharge of concave F, coarse grain may be cracked in this cylinder pre-  
15 paratory to grinding it finely in the next, through which it passes. Or, by closing this partition, both cylinders may be employed for the separate purposes of grinding flour in one, and cracking or shelling  
20 corn in the other. This is a great convenience as it not only saves time and power by performing two operations at once, but it enables the farmer to crack his feed and grind it finely at the same time, by using  
25 the two conjointly. Suitable hoppers are provided for feeding both cylinders, and a shaker at Q, for facilitating the discharge of the grain, may be operated by the rod S, which is connected with a cam or eccentric  
30 or by any other convenient means.

A band *k* from a pulley on the shaft B drives the bolt on the shaft T, by means of pulley U. A spur on this pulley, at each  
35 revolution, strikes the friction roller, *w*, on the short arm of the rapping lever *v*, which, being pivoted to the frame at *x*, and held in a proper position by the spring *z*, gives a smart blow with the long arm on the center band Y. This causes a vibration in the  
40 bolting apparatus which prevents the flour from accumulating and clogging the bolt,

and materially accelerates the process of bolting.

The construction is compact, simple and durable the wearing parts being all made  
45 of iron, and from its cheapness and efficiency it supplies a great want to the agricultural producer.

What I claim as my invention is;

1. The construction and arrangement of  
50 cylinder D, and concave F, with supplementary cylinder G, whereby the rhomboidal teeth *f* and *g* serve to adjust the parts to efficient action by means of the longitudinal movement of the collar *e* on the shaft  
55 B, substantially as set forth.

2. I also claim the peculiar conformation of the grinding surfaces of the cast iron cylinder E, and concave H, consisting of  
60 the alternate intersection of the raised and depressed corrugations thereof, in the manner and for the purpose shown and described.

3. I do not claim the employment of two cylinders on one shaft for cracking and  
65 grinding, but I claim the combination and arrangement of the two concaves F, and G, spout *j* and divided winged partition R, or its equivalent, whereby the operation of cracking and grinding in said concaves may  
70 be conjoint or separate, substantially in the manner and for the purposes shown and described.

4. I further claim the automatic rapper  
75 *v*, arranged and operated substantially as described, for the purpose of keeping the bolt free from obstructions and rendering its action efficient, as set forth.

A. ORVIS.

Witnesses:

J. FRASER,  
S. J. ALLIZ,