Dec. 19, 1939. H. J. MANKOFF 2,184,123

REVERSIBLE HOOD AND CHUTE FOR GRINDING MACHINES

Filed March 28, 1938 3 Sheets-Sheet 1

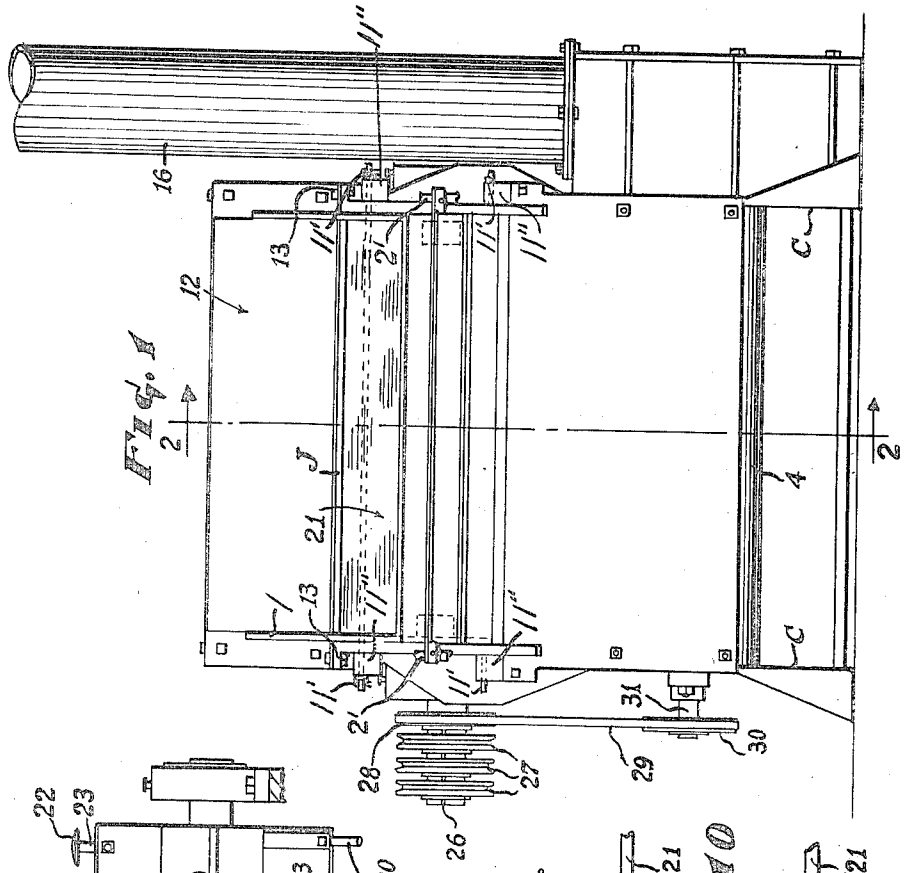

FIG. 1

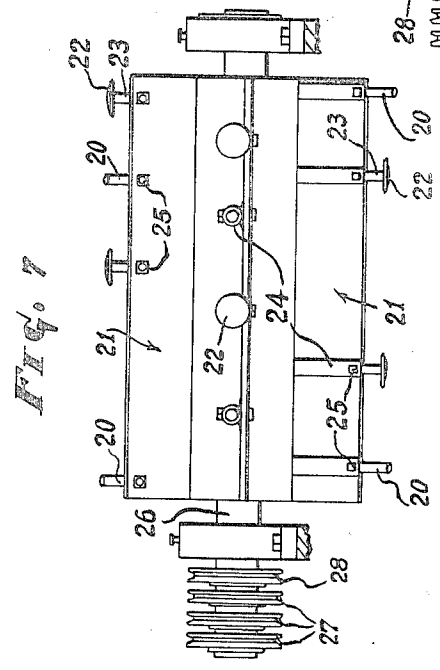

FIG. 7

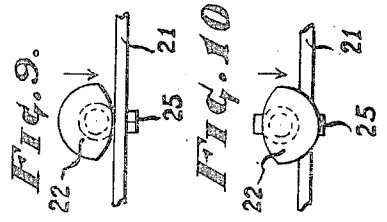

FIG. 9.

FIG. 10

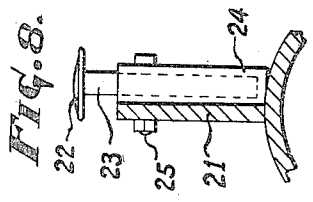

FIG. 8.

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REVERSIBLE HOOD AND CHUTE FOR GRINDING MACHINES

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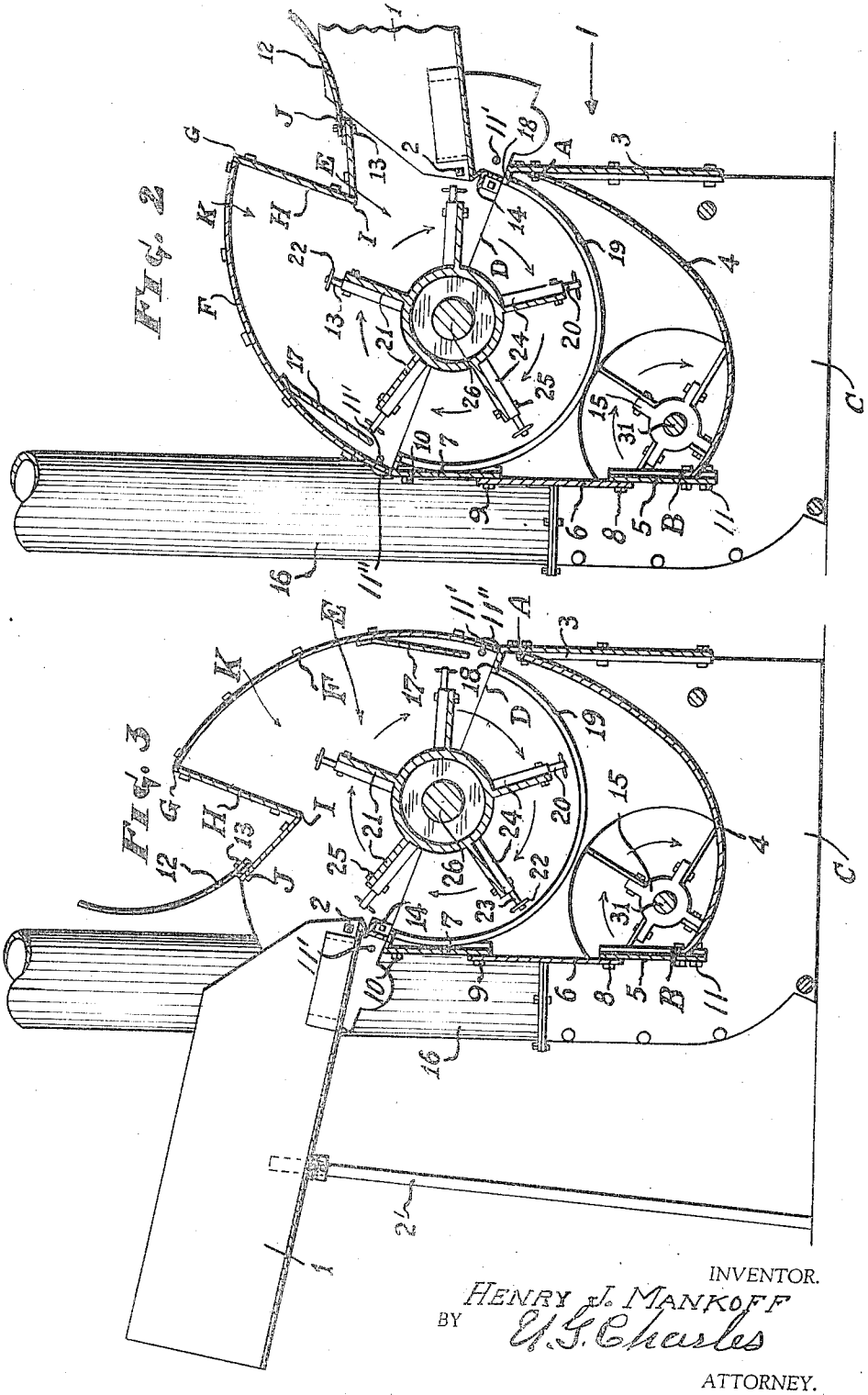

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REVERSIBLE HOOD AND CHUTE FOR GRINDING MACHINES

Filed March 28, 1938 3 Sheets-Sheet 3

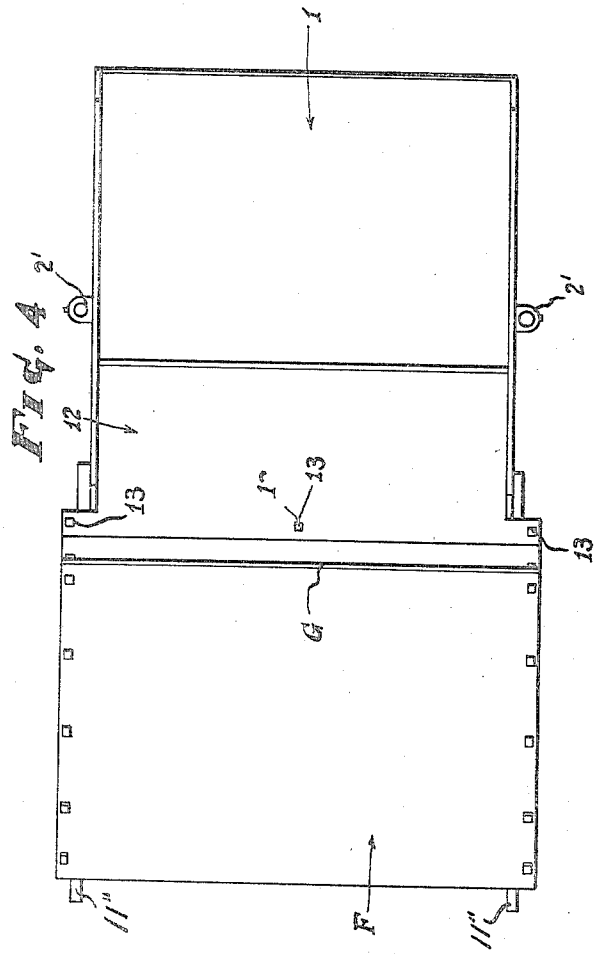

FIG. 4

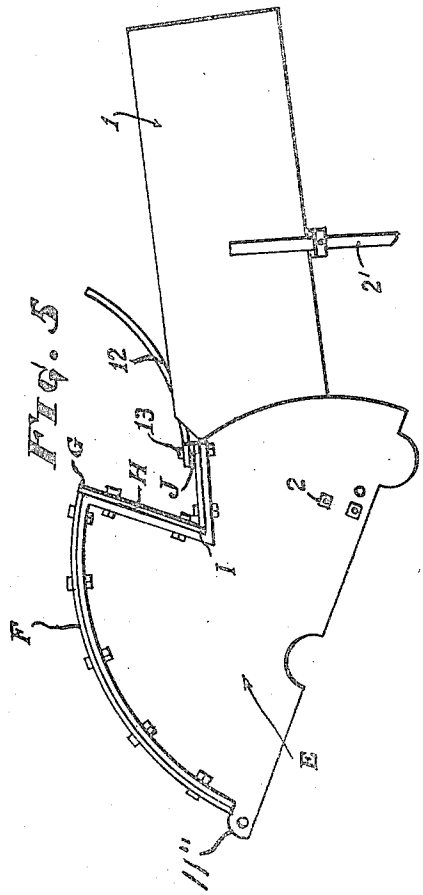

FIG. 5

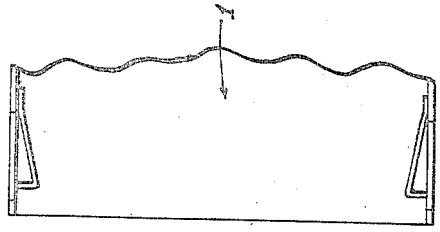

FIG. 6

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UNITED STATES PATENT OFFICE

2,184,123

REVERSIBLE HOOD AND CHUTE FOR GRINDING MACHINES

Henry J. Mankoff, Wichita, Kans.

Application March 28, 1938, Serial No. 198,471

2 Claims. (Cl. 83—11)

My invention relates to a reversible hood and chute for grinding machines and has for its principal object a means by which brittle material is easily ground to a desired comminution and a means by which pliable withy material, or green vegetation may be chopped or ground.

A further object of my invention is to provide in the construction of a grinding machine a method of assembly that is simple, efficient and easily converted to the purposes above mentioned and hereinafter explained.

A still further object of my invention is to provide a cylindrical grinder having a series of cutting discs and hammers distributed thereon and carried by blades functioning as a fan, the hammers reversible with respect to end engagement while the discs may be reversed by a turn of one hundred eighty degrees substituting the sharp portion of the peripheral edge for the dull or worn portion.

A still further object of my invention is to provide in the structure a means whereby the hood is reversible carrying the chute therewith to feed substance to the grinding cylinder at either side thereof, and when the chute is positioned on one side of the grinding machine, the inner end thereof will be approximately in the horizontal plane of the axis of the cylinder for a downward stroke of the hammers severing pliable substance fed into the grinder and by reversing the position of the said chute and hood with respect to the grinder, substance of a brash texture subject to being pulverized or finely comminuted will enter the grinding machine on a horizontal plane above the axis of the grinding cylinder, in which case, the hammers of the cylinder will contact the substance by an upward stroke, the reversible feature of the chute and hood being for a definite purpose which cannot otherwise be accomplished efficiently.

A still further object of my invention is to provide a grinding cylinder having fan blades positioned thereon coacting with an exhaust fan discharging ground substance from the grinding machine to a place of storage.

These and other objects will hereinafter be more fully explained, reference being had to the accompanying drawings forming a part of this specification and in which like characters will apply to like parts in the different views.

Referring to the drawings:

Fig. 1 is a view of the grinding machine looking in the direction of arrow 1 in Fig. 2, the conveyor pipe partly removed.

Fig. 2 is a cross section through the grinding machine taken on line 2—2 in Fig. 1 looking in the direction of the arrows, the said view showing one position of the chute and hood.

Fig. 3 is a similar sectional view to that of Fig. 2, the chute and hood being in a reversed position to that shown in said Fig. 2.

Fig. 4 is a plan view of the hood and chute.

Fig. 5 is a side view of Fig. 4.

Fig. 6 is a fragmentary plan view of the inner end of the chute.

Fig. 7 is a side view of the grinding cylinder.

Fig. 8 is an enlarged side view of the disc and its supporting means.

Fig. 9 is an end view showing the disc having one portion of its peripheral cutting edge worn away as moved in the direction of the arrow.

Fig. 10 is a similar view to that of Fig. 9 showing the disc reversed for better result, the arrow indicating the direction of travel.

My invention herein disclosed relates to a hood later described and a chute 1, the chute rockable on a pivot point 2 and the free end of which is supported by adjustable standards 2' to vary the slant of said chute from a horizontal plane. The said hood is seated on a frame 3 in which is positioned a container for ground substance comprising a bottom 4 arcuate in form terminating at points A and B, and a vertically disposed wall from point B consisting of plates 5, 6 and 7, said plates secured at their adjacent edges by bolts 8 and 9, while the outer edges of plates 5 and 7 are secured by bolts 10 and 11. Each end of the container is closed by end wall C of the frame. The upper extremities D of said end walls are slantingly positioned with respect to a horizontal plane, as shown in Figs. 2 and 3, and upon which are seated the end walls E of said hood, coinciding therewith and reversible thereon as shown in said Figs. 2 and 3. The means to secure the hood when selectively reversed is through the medium of rods 11' in parallelism with the axis of the grinder, said rods engaging in ears 11'' respectively. The said hood has an arcuate top F and a V-shaped portion with respect to cross section to close the top, the arcuate portion F extending from the upper extremity of plate 7 to a point G and from thence a wall H obliquely extends downward and inward to form a ridge at point I and from said point outward terminating as at J at which point the edge of an arcuate guard 12 is secured by bolts 13, said guard extending upward and outward and across the inner end of said chute 1 functioning also as a guide for material conveyed through the chute

into the grinding cylinder, the axis of which is at the longitudinal center of the slanting upper extremity D of said end walls C of the frame at which point the grinding cylinder is trunnioned, and when said hood is positioned as shown in Fig. 2 the inner end of the chute carried thereby is approximately alined horizontally with the axis of the grinding cylinder, but when the said hood and chute is reversed as shown in Fig. 3 the inner end of the chute is on a higher plane than the axis of the grinding cylinder, the different planes being due to the slant of the joint between said hood and frame of the grinding machine, the purpose of which is to meet conditions of materials varying in texture, for example when ensilage is being ground such as green corn, alfalfa or the like, and such material being withy or difficult to grind I find it best to position the chute on the lower plane as shown in Fig. 2 so that the grinding and cutting elements will impinge the ensilage in their downward stroke and near a horizontal plane with the grinder axis cutting the same as supported by a bar 14 that is in parallelism and adjacent the inner end of the chute, said bar being secured to the ends of said hood, movable therewith and in close proximity to the bottom of the chute and supporting the same. Said bar and ridge are positioned respectively at the upper and lower extremity of a feed mouth for the hood. The ensilage as severed will deposit in said container and be ejected therefrom by coaction of the grinder blades and a fan 15, upward and outward through a pipe 16 to a place of storage; furthermore the position of the chute and hood last referred to is for coarse grinding and when said hood and chute is reversed as shown in Fig. 3 dry, brittle substance may be finely comminuted by the upward stroke of said grinding elements, the particles being forced in contact with the ridge as at I, above referred to, and from thence into cavity K of the hood and onward in contact with a plate 17 and in inturned edge 18 of the front portion of said frame, the plate being secured to the arcuate top of the hood, slanting toward and in close proximity to the outer ends of the grinding elements. Being finely comminuted the substance may be discharged as above described.

It will be understood that a perforated plate arcuate in form may be positioned and carried by arcuate cleats 19 secured to each end wall of the frame and through which the finely comminuted substance will sift.

In as much as the grinding machine herein disclosed is designed for two distinct methods of operation with respect to substance varying in texture, to accomplish such I have arranged on the grinding cylinder a plurality of hammers 20 secured to their respective rotor blades 21 and associated therewith on each blade is a plurality of discs 22 secured to the outer end of a shank 23, the said shank being similar in form to that of the hammers with respect to cross section and secured in similar sleeves 24 that are carried by said blades. The said hammers and disc shanks are interchangeable and secured in like manner by bolts 25; and being so arranged the said grinding cylinder may be fully equipped with hammer or disc elements, but the present view as shown in Fig. 7 illustrates the combination of both hammers and discs spaced along said blades in staggered relation, therefore either substance described will be efficiently ground by reversing the hood for its respective purpose. In as much as the said hammer elements are reversible to prolong their grinding capacity, the discs are likewise reversible by turning the same through an arc of one hundred eighty degrees as shown in Figs. 9 and 10 when said discs have become worn by prolonged engagement. On the outer end of the grinder shaft 26 is a plurality of sheaves 27, each to be engaged by a V-belt from a power actuating element, said element and belts not shown in the drawings. On said shaft 26 is another sheave 28, having a V-belt 29 engaged thereon and on a similar sheave 30 which is secured to shaft 31, as turning means for said fan 15 as heretofore described.

Such modifications may be employed as lie within the scope of the appended claims.

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

1. In a reversible hood and chute for grinding machines, a machine of the class described, a frame, and a hood portion removably seated on the frame, the line of separation between said frame and hood being on an incline, a grinding cylinder trunnioned in the frame, the axis of which is approximately at the center of the incline, said grinding cylinder arranged to rotate in one direction only and having a plurality of hammers comprised of shanks, the outer ends of which are at right angles to the shanks longitudinally, and a cutting disc secured axially on the outer end of each alternate shank of the cylinder, means to connect said shanks to the cylinder, and power means to turn the cylinder, the hood having a feed mouth communicating with the cylinder, a bar crossing the hood and carried thereby at the lower extremity of its mouth, and a feed chute rockably carried at the lower extremity of the mouth, an element V-shaped in cross section crossing the hood, the ridge of which defines the upper and inward extremity of the mouth, said bar and ridge being in working relation to the outer extremity of the cylinder hammers as the cylinder rotates, being so arranged, the hood when seated one way on the frame will position its bar to receive a downward stroke of the cylinder hammers to efficiently grind green or withy material as fed through the mouth, and the said hood when seated reversely to that of the aforesaid position is means to efficiently grind dry brittle substance, contacting the substance beneath and impinging the same with said ridge, tossing the ground particles onward and outward to rebound into said grinding cylinder, finely comminuting the same, and means to convey the green or dry material as respectively treated to a place of storage.

2. In a reversible hood and chute for grinding machines, a machine of the class described, a frame, a hood portion removably seated on the frame, the line of separation between said frame and hood being on an incline, a grinding cylinder trunnioned in the frame, the axis of which is approximately at the center of the incline, said grinding cylinder arranged to rotate in one direction only and having a plurality of hammers comprised of shanks, the outer ends of which are at right angles to the shanks longitudinally, a cutting disc secured axially on the outer end of each shank of the cylinder, means to connect said shanks to the cylinder, power means to turn the cylinder, the hood having a feed mouth communicating with the cylinder, a bar crossing the hood and carried thereby at the lower extremity of the mouth, an element V-shaped in cross sec-

tion crossing the hood, the ridge of which defines the upper and inward extremity of the mouth, said bar and ridge being in working relation to the outer extremity of the cylinder discs as the cylinder rotates, being so arranged, the hood when seated one way on the frame will impinge substance being ground at one side of said bar and ridge, and when the hood is reversed the substance will impinge the other sides of said bar and ridge, and means to convey the material ground to a place of storage.

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