(No Model.) 4 Sheets—Sheet 1.

M. L. METZGER & A. COOPER.

FEED GRINDER.

No. 345,163. Patented July 6, 1886.

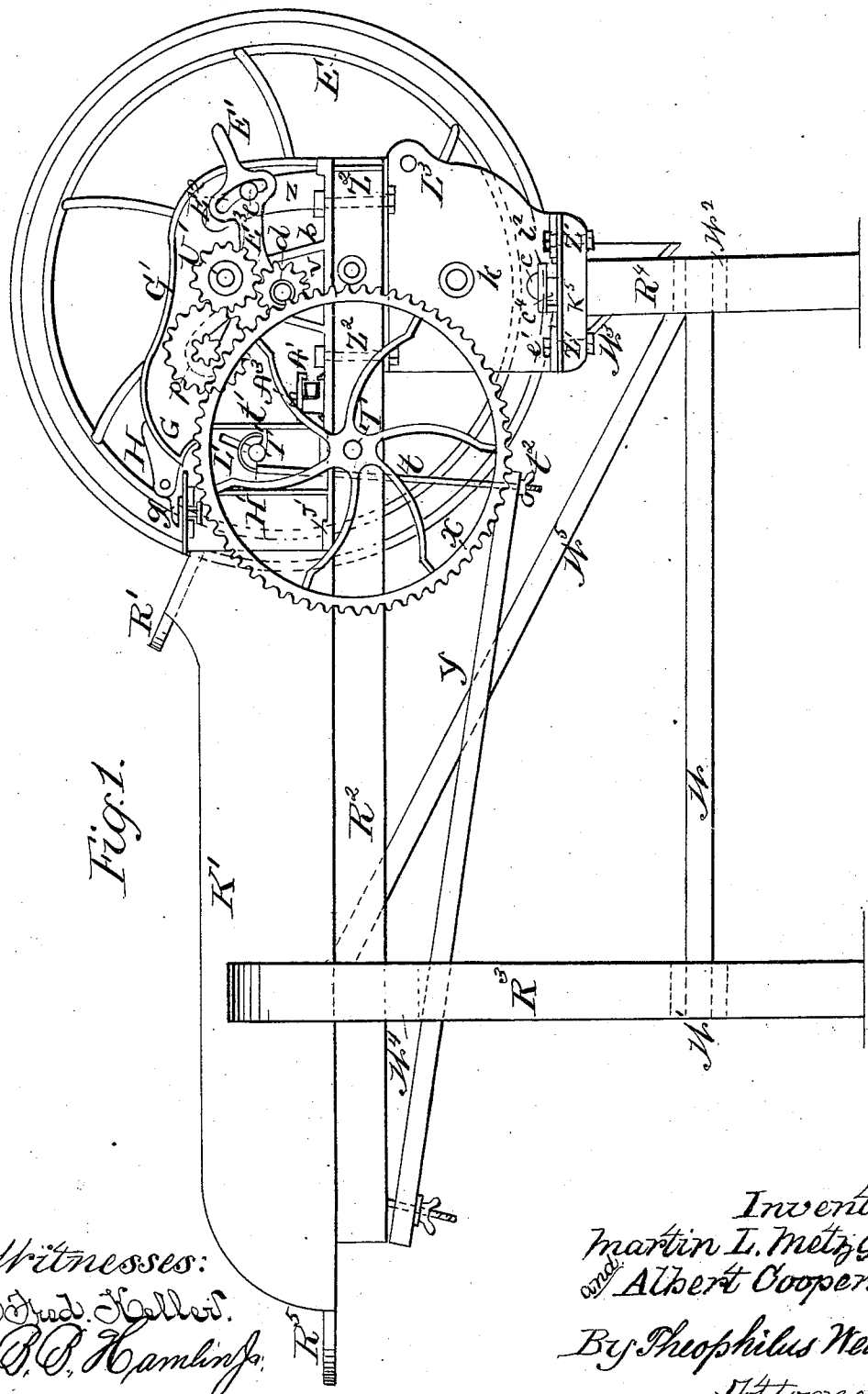

Fig. 1.

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M. L. METZGER & A. COOPER.

FEED GRINDER.

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Fig. 2

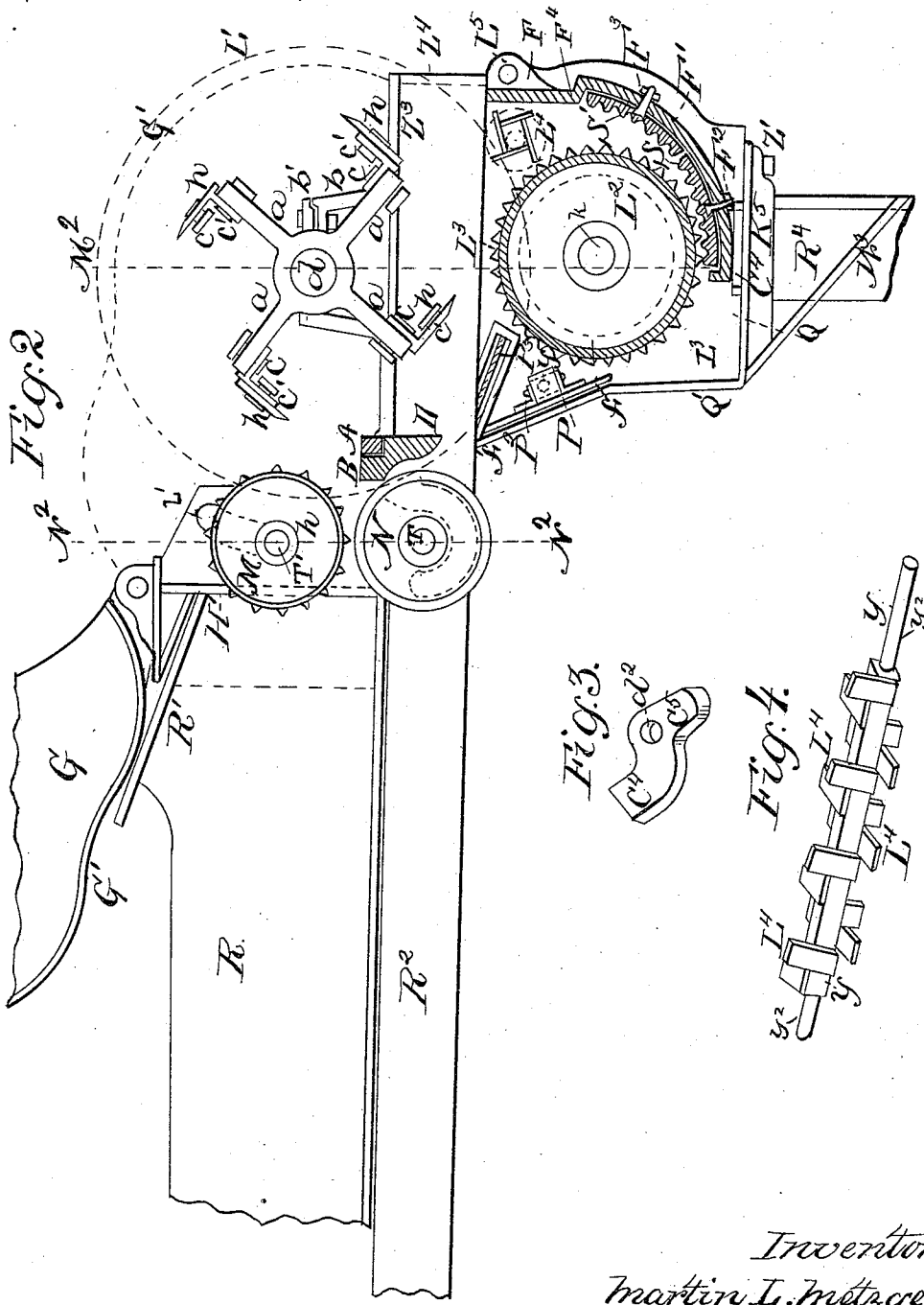

Fig. 3.

Fig. 4.

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(No Model.) 4 Sheets—Sheet 3.

M. L. METZGER & A. COOPER.

FEED GRINDER.

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Fig. 5.

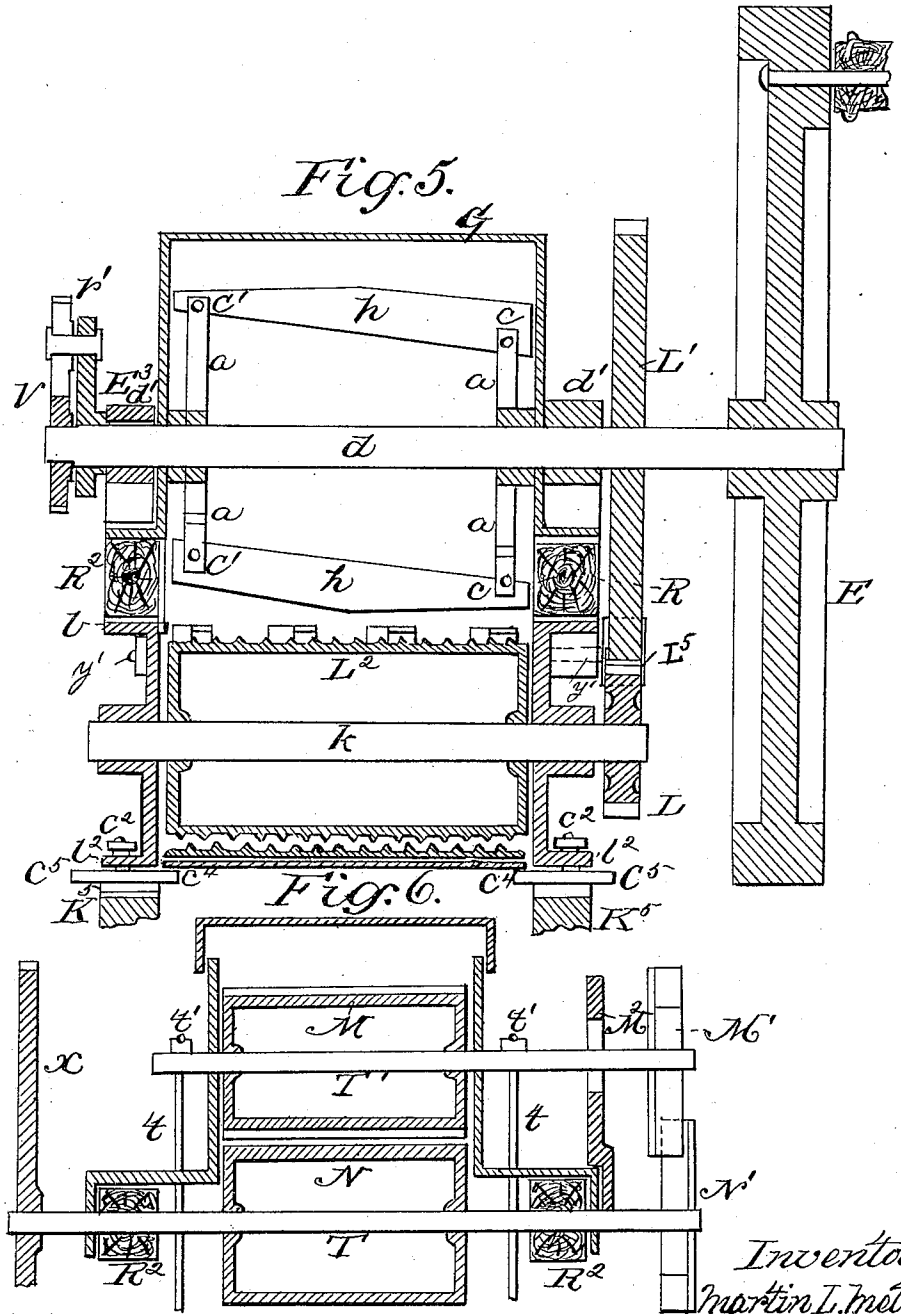

Fig. 6.

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(No Model.) 4 Sheets—Sheet 4.

M. L. METZGER & A. COOPER.

FEED GRINDER.

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Fig. 7.

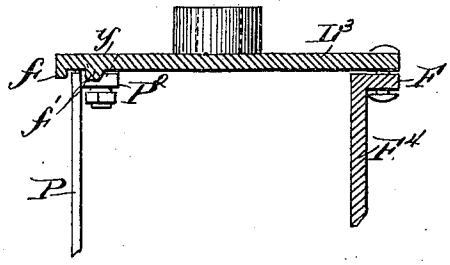


Fig. 8.

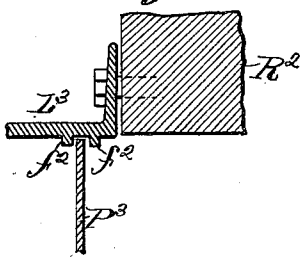
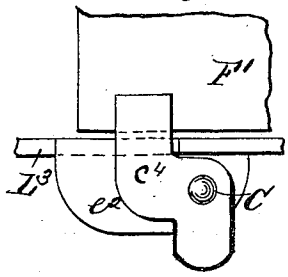


Fig. 9.



Witnesses:
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UNITED STATES PATENT OFFICE.

MARTIN L. METZGER AND ALBERT COOPER, OF HARRISBURG, PENNSYLVANIA, ASSIGNORS TO WILLIAM O. HICKOK, OF SAME PLACE.

FEED-GRINDER.

SPECIFICATION forming part of Letters Patent No. 345,163, dated July 6, 1886.

Application filed May 11, 1885. Serial No. 165,155. (No model.)

To all whom it may concern:

Be it known that we, MARTIN L. METZGER and ALBERT COOPER, citizens of the United States, residing at Harrisburg, in the county of Dauphin and State of Pennsylvania, have invented certain new and useful Improvements in Feed-Grinders; and we do hereby declare that the following is a full, clear, and exact description of that part of our invention which relates to the fodder-grinding mechanism or masticator, the fodder-cutting mechanism being the subject of another application for patent filed September 11, 1885, Serial No. 177,219.

Our fodder-grinding mechanism is auxiliary to the fodder-cutting mechanism, which is adapted to deliver the cut fodder directly to the picker, or the means in the grinding mechanism which delivers the cut fodder to a toothed grinding-cylinder operating in conjunction with toothed concaves to masticate or grind the cut fodder, as hereinafter set forth and claimed.

Our said grinding mechanism is operated by the fodder-cutting mechanism analogous to that partially illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of our fodder-grinding mechanism attached to our feed-cutting mechanism. Fig. 2 is a longitudinal vertical section of the same. Fig. 3 is a perspective view of one of the two corresponding stops or buttons for securing the free end of the swinging wall of the masticator adapted to release said end of the wall at will. Fig. 4 is a perspective view of the cut-feed picker. Figs. 5 and 6 are vertical cross-sections of said machine, taken on the lines M^2 and N^2, respectively, in Fig. 2. Fig. 7 is a transverse section of the grinder-casing, taken horizontally through the bearings for the picker. Fig. 8 is a similar section taken at right angles to the inclined delivery-plate; and Fig. 9 is a bottom view of the lower end of the swinging wall and of one of its supporting stops on the end wall of the casing.

Similar letters denote the same parts throughout the several views.

Our cut-fodder-grinding machine is herein shown as attached to the supports of the rotary feed-cutting machine of our said pending application, and a detailed description thereof is here omitted, as it is evident that our grinding-machine may be applied to other constructions of rotary feed-cutters. It is essential only that the cutting-machine shall have its exit adapted to deliver the cut-feed directly into the inlet of the grinder-casing, and that the cutting mechanism shall propel the grinding mechanism.

In our grinder-casing the end walls, L^3, are joined together in the rear by the transverse brace or plate P, having notched lugs P^2 thereon, in which the screw-bolts *y*, provided with nuts, hold the ends of the brace abutted against said walls inside, and the parallel ledges *f f'* on the walls keep the brace laterally up to said bolts. The delivery-plate P^3 is also kept laterally between parallel ledges on the insides of said end walls. It is set inclined to the grinding-roll L^2, so as to deliver the cut fodder onto it, its lower edge being abutted close to said roll to prevent fodder passing out without being ground. The plate Q' is also supported between parallel retaining ledges on said end walls. It serves as a dash at the rear side of the casing, whereat the ground feed is stopped and dropped onto the chute W^3, which is arranged below, as shown.

The front wall, F' F^4, is provided with lugs or ears F exteriorly, by which it is pivoted to the end walls, L^3, at the top, as shown, in manner to allow its lower end to swing away from or be set up to the centrally-located grinding-roll, L^2, which is a toothed cylinder having its shaft *k* journaled through said end walls in line axially with the cutter-shaft *d*. Said swinging wall is sustained below in correct proximity to said roll by the stops C^4, which are pivoted to the under sides of flanges e^2 in the recessed bases of said end walls, L^3, and are adapted to project under the foot end of said swinging wall, or, when reversed, to stand free from said foot end and let it hang away from said roll when the grinding is to be intermitted. Said swinging wall is curved eccentrically to come closer to said roll below than above, thus

forming a throat between them, into which the cut feed is forced to be masticated. Said wall is provided on its inner side with interchangeable or like toothed concave plates S S′, which are held in place by ledges on said wall and by bolts and nuts F^2 F^3, inserted and arranged as shown. The concaves may be interchanged when the lower one wears smooth before the upper one is worn out. The grinding roll or cylinder L^2 is so toothed that in conjunction with the teeth of said concaves the cut fodder may be crushed or ground. Said roll is driven by the pinion L on its shaft *k*, in communication with the gear L′ on cutter-shaft *d*, as shown. For certainly delivering the cut fodder into the throat between said roll and concaves, the rotary picker L^4 *y* is provided, it having wings or paddles L^4 to catch and push the cut fodder as it drops from the cutters and pack or crowd it into said throat. Said picker rotates in the same direction as said roll, and the cut fodder is forced into said throat by way of the upper part, F^4, of said wall F′ F^4. Without the aid of the picker the cut fodder will not travel into said throat promptly, because the rapid rotation of the cutters creates a suction which retains the cut fodder in the casing containing the cutters, and causes it to choke up. If the grinding mechanism were to be run as a separate machine, the said picker might be omitted, as then cut fodder could be simply dropped into said throat.

The combined mechanism for grinding, consisting of the toothed roll or cylinder, the toothed concaves secured on the swinging wall, the picker and the casing constitute a distinct structure that may be handled as a whole.

Our grinding mechanism is to crush the cut fodder thoroughly without pulverizing the pithy portion, or to hull the same without grinding it low, as in milling. For this purpose a single toothed roll run at moderate speed is better than would be two rolls run at different high speeds close together. When hay or straw is being cut, said swinging wall is disengaged below or let hang.

We claim—

1. A fodder-grinding machine comprising the roll L^2, the concaves S S′, an inclosing-casing having the delivery-plate P^3, abutted close to said roll, the adjustable front wall having said concaves supported thereon and the inlet at the top, the picker L^4 *y*, mounted in said inlet, and means for rotating said roll and picker, as and for the purpose set forth.

2. A machine for grinding cut fodder, comprising the grinding-roll L^2, having its shaft *k*, provided with the pinion L, the picker L^4 *y*, having its shaft y^2 provided with a pinion, the shafts of said roll and picker being journaled axially parallel with each other, the rear wall or brace, P, the end walls provided with ledges, the delivery-plate P^3, supported between said ledges, the swinging front wall, F′ F^4, pivoted to said end walls above, the reversible stops c^4, supporting said front wall below, the concaves S S′, arranged upon said swinging front wall eccentric to said roll, and mechanism for propelling said pinions L and L^5, substantially as and for the purposes set forth.

3. In a machine for grinding cut fodder, the combination of the toothed roll L^2, the casing having the shaft of said roll journaled in its ends L^3, the delivery-plate P^3, secured to said ends and abutted close to the rear side of said roll, and the swinging front wall, F′ F^4, having pivotal connection at top with said ends, the pivoted stops c^4, adapted to hold the foot end of said front wall in adjusted position, and the concaves S S′, secured on the inside of said front wall, all adapted to co-operate for grinding and to intermit the grinding at will, as described.

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