(No Model.) 2 Sheets—Sheet 1.

J. DICK.

FODDER CUTTER.

No. 433,521. Patented Aug. 5, 1890.

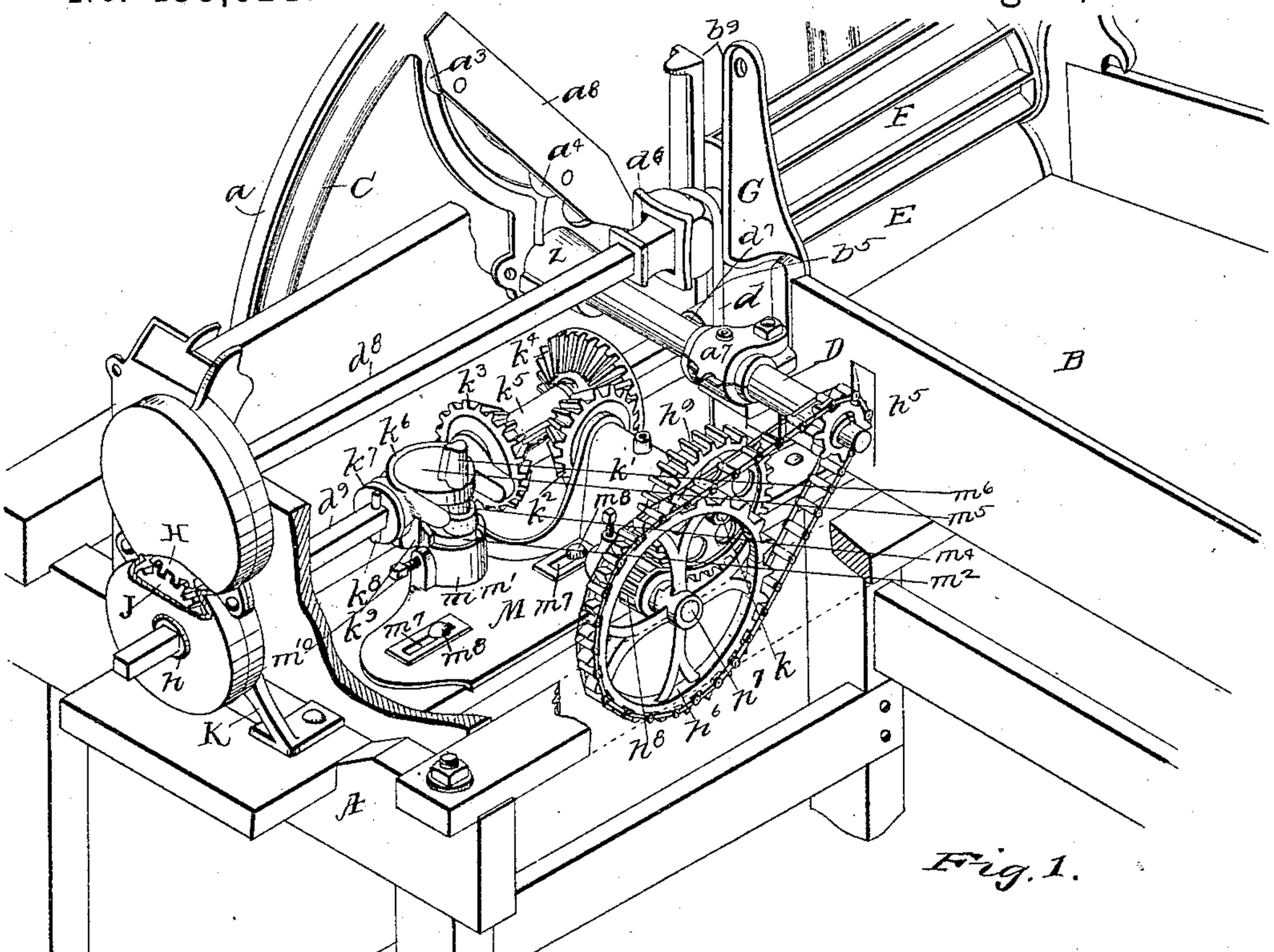

Fig. 1.

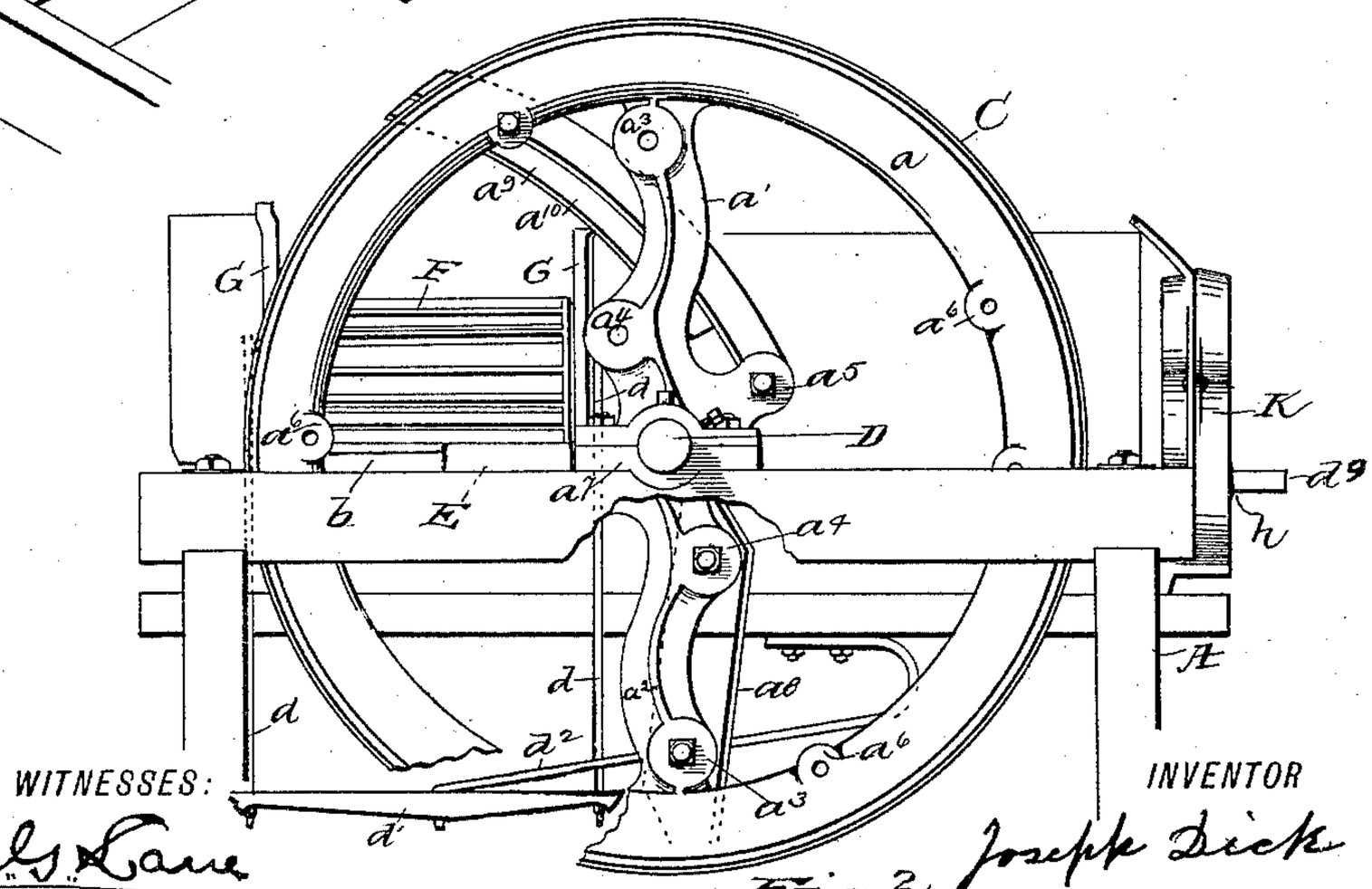

Fig. 2.

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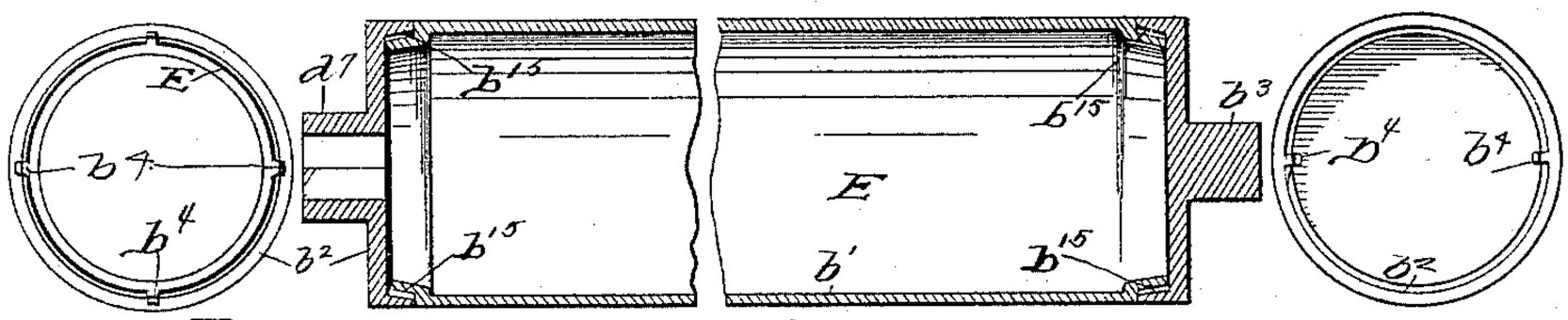
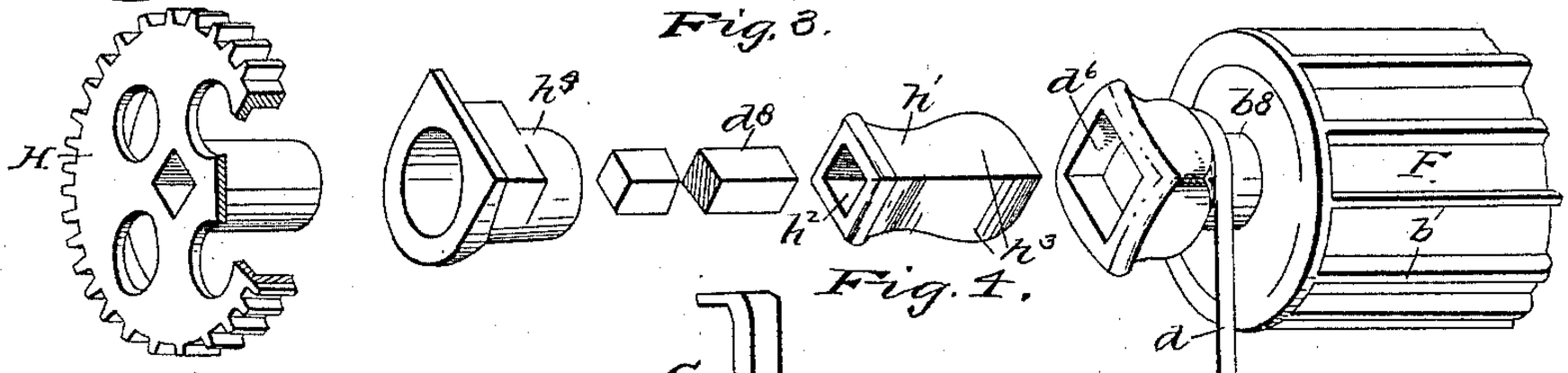
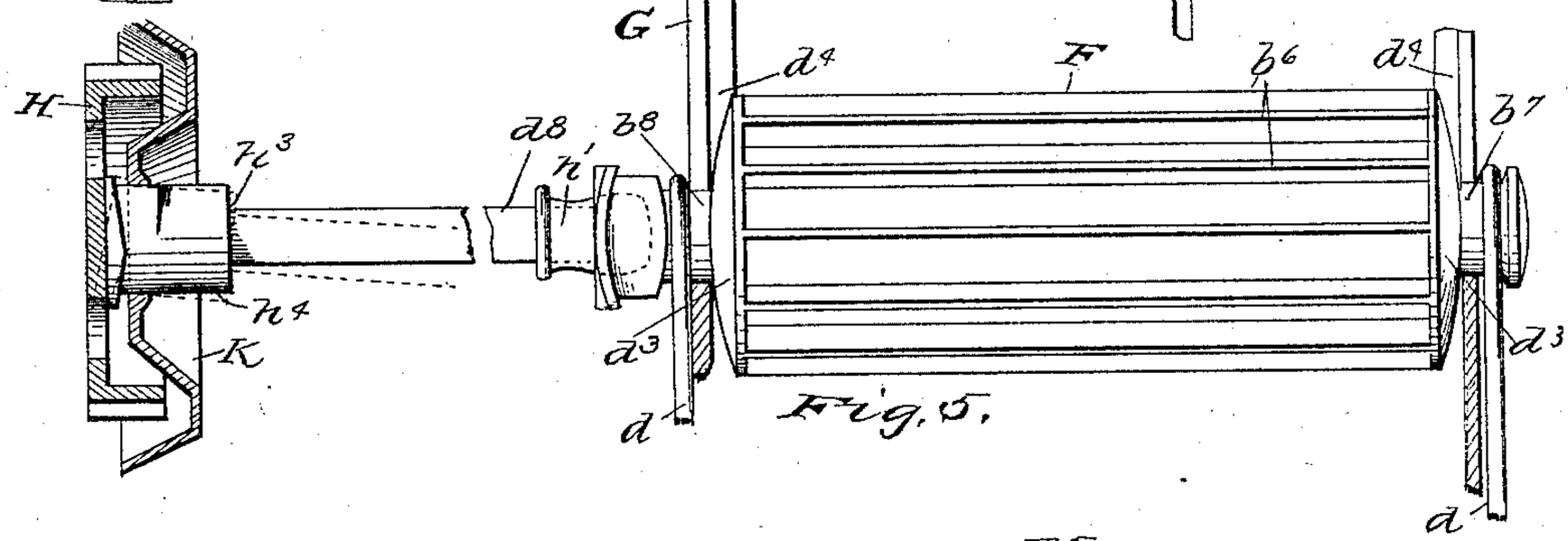
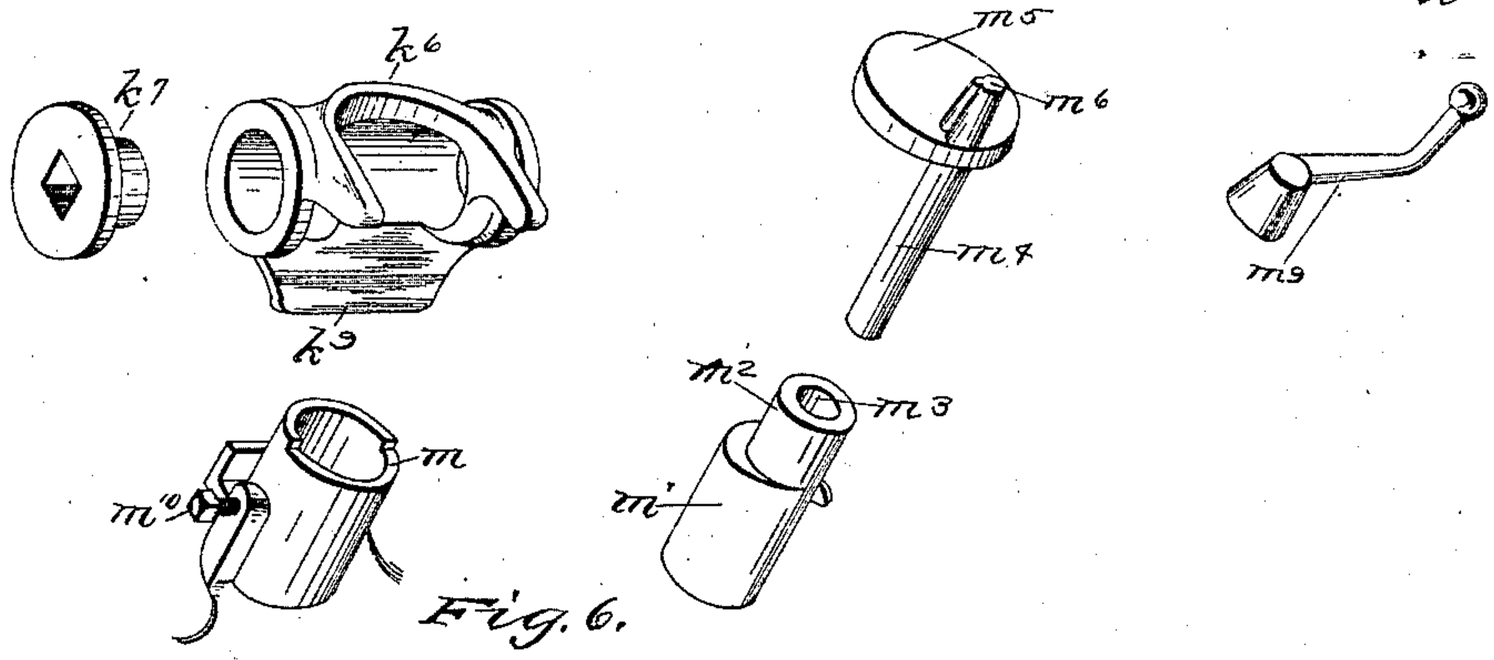
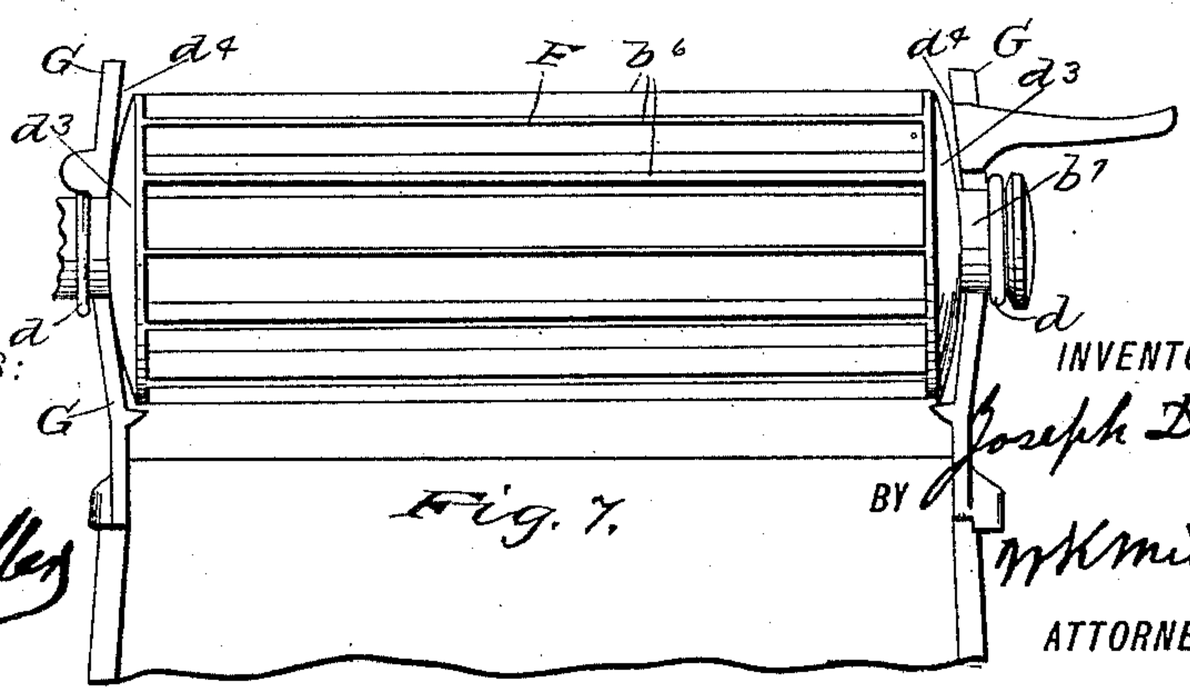


Fig. 8.









WITNESSES:

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JOSEPH DICK, OF CANTON, OHIO.

FODDER-CUTTER.

SPECIFICATION forming part of Letters Patent No. 433,521, dated August 5, 1890.

Application filed March 28, 1890. Serial No. 345,673. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH DICK, a citizen of the United States, and a resident of Canton, county of Stark, State of Ohio, have invented a new and useful Improvement in Fodder-Cutters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, making part of this specification.

My invention relates to improvements in fodder-cutters; and it consists in certain features of construction and combination of of parts, as will be hereinafter described, and pointed out in the claims.

Figure 1 of the accompanying drawings is a broken perspective of fodder-cutters illustrating my invention. Fig. 2 is a broken front elevation showing knife-wheel and knives secured thereto. Fig. 3 is a longitudinal sectional view of the bottom feed-roller and a view of the roller-heads. Fig. 4 is a perspective of detail mechanism for driving the top feed-roller; Fig. 5, a rear elevation of top feed-roller and driving mechanism; Fig. 6, a perspective comprising the parts in detail of gear-shipper. Fig. 7 is a plan view of top feed-roller, showing the convex end portions of the roller and concave cheeks of supporting-frame.

Similar letters of reference indicate corresponding parts in all of the figures of the drawings.

A represents the gear-supporting frame, B the fodder-box, and C the knife-wheel, said wheel having a peripheral portion a and arms a' and a^2, the arms a' connecting the hub portion z with the rim, said arms having perforated boss portions a^3 and a^4, the latter being adjacent the hub portion of the wheel and in advance of the former. There is also an arm a^5 projecting outwardly from the hub z, and on the rim a are perforated bosses a^6. The wheel C is mounted on the front end portion of the shaft D, said shaft being supported in journal-boxes a^7.

In some of the machines as heretofore constructed straight knives, as a^8, have been provided and secured to the arm a, as shown in Figs. 1 and 2, the inner end or heel portion of the knife a^8 being secured to the boss portion a^4 of the arm a and the outer end portion to the boss a^3, the heel portion in advance, or a curved knife has been substituted.

In the operation of machines of this class the cut or rake of the straight knife is downward and outward, causing by such movement not only a compacting of the fodder from the center of the knife-wheel, thereby requiring more power to do the cutting, but in addition the compactness of the fodder has a tendency to and does to some extent spring the knife out, so as to render the cut at that portion of the box imperfect, and as a result the fodder is only flayed or split, and not separated or cut off (until after it has been fed out two or more times) the length required. To obviate this difficulty a second knife a^9 is provided having an inwardly-curved cutting-edge a^{10}, the heel portion of said knife secured to the outer end portion of the short arm a^5 and the front or outer end portion to the rim of the wheel, as shown in Fig. 2, by which position the front end will pass down and over the fodder with a downward and inward rake or cut, compacting the fodder at the inside of the fodder-box, or just opposite that caused by the straight knife a^8, the short arm a^5 raising the heel of the knife a^9 up and over the fodder at the inside portion of the box, by which movement of the oppositely-cutting knives the fodder is held more evenly spread across the box as fed by the rolls and mangling and cutting a portion of the fodder longer than is desired avoided.

It will be understood that the knives hereinafter referred to cut against a fixed blade b, partly removed to show the bottom feed-roller.

The mechanism for feeding the fodder to the knives consists, first, of the peculiarly-constructed rolls E and F, as shown in Figs. 3 and 5. For convenience and to reduce the initial cost, the roll E is formed of three parts—a cylindrical body portion b' and two head portions b^2—said head portions overlapping a portion of the ends of the cylinder, as shown. The heads have journals b^3 integral therewith to support and upon which the rolls may be rotated, and grooves, as b^4, to engage ribs b^{15} on the end portions of the cylinder, the heads being held in position by the cheeks of the metal frame-piece G and the

journal-boxes b^5. A top roller is provided having peripheral longitudinal ribs b^6 and journals b^7 and b^8, said journals placed in the jaw portion b^9 of the frame-piece G. Engaging-hooks d are placed over said journals, the other ends of which are secured to a spring-bar d', which is pivotally secured to spring d^2, the energy of which is exerted downwardly. The connection between the bar and the spring is to allow either end of the bar to rise independently of the other to allow the roller F to adapt itself, or either end thereof, to the fodder passing between the rolls.

To provide for the independent movement of the ends of the top roll F, the end portions d^3 are made convex and the inside cheek portions d^4 of the frame-piece G are correspondingly concaved, the object of which is to provide against the heads moving away from the cheeks of the frame and thereby forming an opening or space between the head and the cheek into which fodder may be passed and thereby defeat the object and operation of the machine. As a means of rotating said rollers, there is provided at the inner end thereof square sockets d^6 and d^7, into which fit the inner ends of the driving-shafts d^8 and d^9, the other or outer ends being supported in the hubs h of engaging gear-wheels H and J. The hub of wheel J rests and rotates in a suitable journal-box in the frame-piece K. On the inner end of the shaft d^8 is provided a knuckle h', having an aperture h^2 at one of its ends adapted to receive the end of the shaft d^8, the other end being truncated and forming oval sides h^3, the larger portion thereof to engage the sides of the socket d^6, thus forming a flexible connection between the shaft and the rollers. The outer end of the shaft d^8 is passed into the hub h^3 of wheel H, said hub supported by and rotated in journal-box h^4, said box loosely secured in an aperture in the frame-piece K, thus providing for a slight rocking movement of the box, as shown by the dotted lines. The gear-wheels are purposely made loose at the pitch-line to provide for this rocking movement of the wheel. By this arrangement of the shaft d^8 and roller F the roller may rise at either end without cramping or binding to adapt itself to the fodder between the rolls.

Motion is communicated from the main shaft D, having a sprocket-wheel h^5, which has a chain engagement with a similar wheel h^6, supported on a stud h^7, secured to the frame-plate M, the hub of wheel h^6 having a clutch engagement with a pinion h^8, supported on stud h^7, engaging a similar wheel h^9, mounted on the outer end of shaft k, journaled in a suitable box k' at the top portion of frame-plate M. On the inner end of said shaft is mounted a bevel-pinion k^2, that alternately engages corresponding bevel-wheels k^3 and k^4, mounted facing each other on roller-driving shaft d^9. The said wheels are spaced apart by a sleeve k^5 such distance as to allow the pinion to rotate between and out of engagement with either, for the purpose hereinafter described.

On the shaft d^9 is placed a yoke k^6, loosely mounted on sleeves k^7, placed at each end thereof and secured by pins k^8, said yoke having a downwardly-extended portion k^9, that has a sliding engagement with the frame-plate M, by which it is held against rotation.

On the plate M is provided a socket m, in which is placed a stud m', having an eccentric portion m^2, said portion having a central aperture m^3, in which is placed the vertical shaft m^4, said shaft having near its upper end portion an eccentric portion m^5, and its upper end having a portion m^6 adapted to be embraced by some suitable form of wrench, as m^9. These parts are shown apart in Fig. 6 and assembled in Fig. 1, in which it will be seen that the stud m' is secured in the socket m by a set-screw m^{10}, the shaft m^4 in the aperture m^3, and the eccentric m^5 in the yoke k^6. In the plate M is provided elongated apertures m^7, through which bolts m^8 are passed to secure said plate in desired adjustment to the frame and other engaging parts of the machine. N is a cover for the gear-wheels H and J.

In operation the feed is as shown in Fig. 1, the pinion k^2 and bevel-wheel k^4 intermeshing to stop the feed. A wrench, as m^9, is placed on the end portion m^6 of the shaft m^4, and the eccentric turned inwardly, or to the right, which will carry the wheel k^4 out of engage-with the pinion and stop the rollers, the pinion revolving between the wheels k^3 and k^4. To reverse the movement the eccentric is turned farther on to throw the wheel k^3 into engagement with the driving-pinion k^2, which reverses the feed; and to adjust the throw of the eccentric to adapt it to move the yoke and wheels the desired distance to engage and disengage the wheels and pinion the stud m' may be turned in the socket m to adjust the throw of the eccentric m^5. The advantage of this arrangement will be appreciated by those familiar with the use of such machines, as in their use it frequently happens that the feed should be instantly stopped or reversed to save the operator from injury or the machine from violence.

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

1. In a fodder-cutter, the combination of a knife-wheel having its axis and supporting-shaft parallel with the fodder-box, said wheel having knife-supporting arms $a\,a^5$, a straight-edge blade secured to the arm a, and a curved blade secured to the rim of the wheel and to the short arm a^5 to cut transverse to the axis of said wheel, the cutting-edges of said knives to rake oppositely in their sweep across the stationary knife, substantially as set forth.

2. In a fodder-cutter, a feed-roll comprising a central cylindrical body portion having its ends provided with ribs b^{15}, and heads having journals and flanged edges, which latter are provided with grooves b^4 to receive the ribs

b^{15}, and thereby prevent the heads twisting in their engagement with the body portion.

3. The combination, in a fodder-cutter, of the rollers E and F, the latter having convex end portions, a roller-supporting frame G, having concave cheek portions, and a yielding driving-shaft, substantially as described, and for the purpose set forth.

4. The combination, in a fodder-cutter having rollers E and F, of a yielding shaft d^8 and shaft d^9, having meshing gear-wheels H and J, gear-wheels k^3 and k^4, mounted on the latter shaft and facing inwardly, a driving-pinion between said wheels, and a gear-shipper by which said wheels may be brought into engagement with said pinion alternately, as desired, or held out of engagement, substantially as described, and for the purpose set forth.

5. In a fodder-cutter, the combination, with the main frame A, of the frame-plate M, having a stud h^7 mounted therein, a journal-box k', a shaft k therein geared to the main shaft D, a pinion k^2, mounted on the inner end of shaft k, gear-wheels k^3 and k^4 to engage said pinion alternately on its opposite side, and a gear-shipper to carry said wheel into engagement with said pinion, substantially as described, and for the purpose set forth.

6. The combination, with the actuating mechanism of a fodder-cutter, of a gear-shipper consisting of a stud m', a socket m, adapted to receive and to hold said stud in desired adjustment, said stud having an eccentric end portion perforated longitudinally, a shaft m^4 placed therein, said shaft having at its upper end portion an eccentric portion, a yoke k^6 to embrace said eccentric, and means to rotate said eccentric to engage and disengage said mechanism, substantially as described, and for the purpose set forth.

7. In combination, in a fodder-cutter, a knife-wheel having its axes and supporting-shaft parallel with and to one side the fodder-box, and knives secured to said wheel to cut transversely to the line of its axis, the cutting-edges of said knives to rake oppositely in their sweep across the stationary knife, substantially as described, and for the purpose set forth.

In testimony whereof I have hereunto set my hand this 22d day of March, A. D. 1890.

JOSEPH DICK.

Witnesses:
W. K. MILLER,
CHAS. R. MILLER.