No. 647,264. Patented Apr. 10, 1900.

J. D. HODGE.

FEATHER SPLITTING MACHINE.

(Application filed Sept. 14, 1899.)

(No Model.)

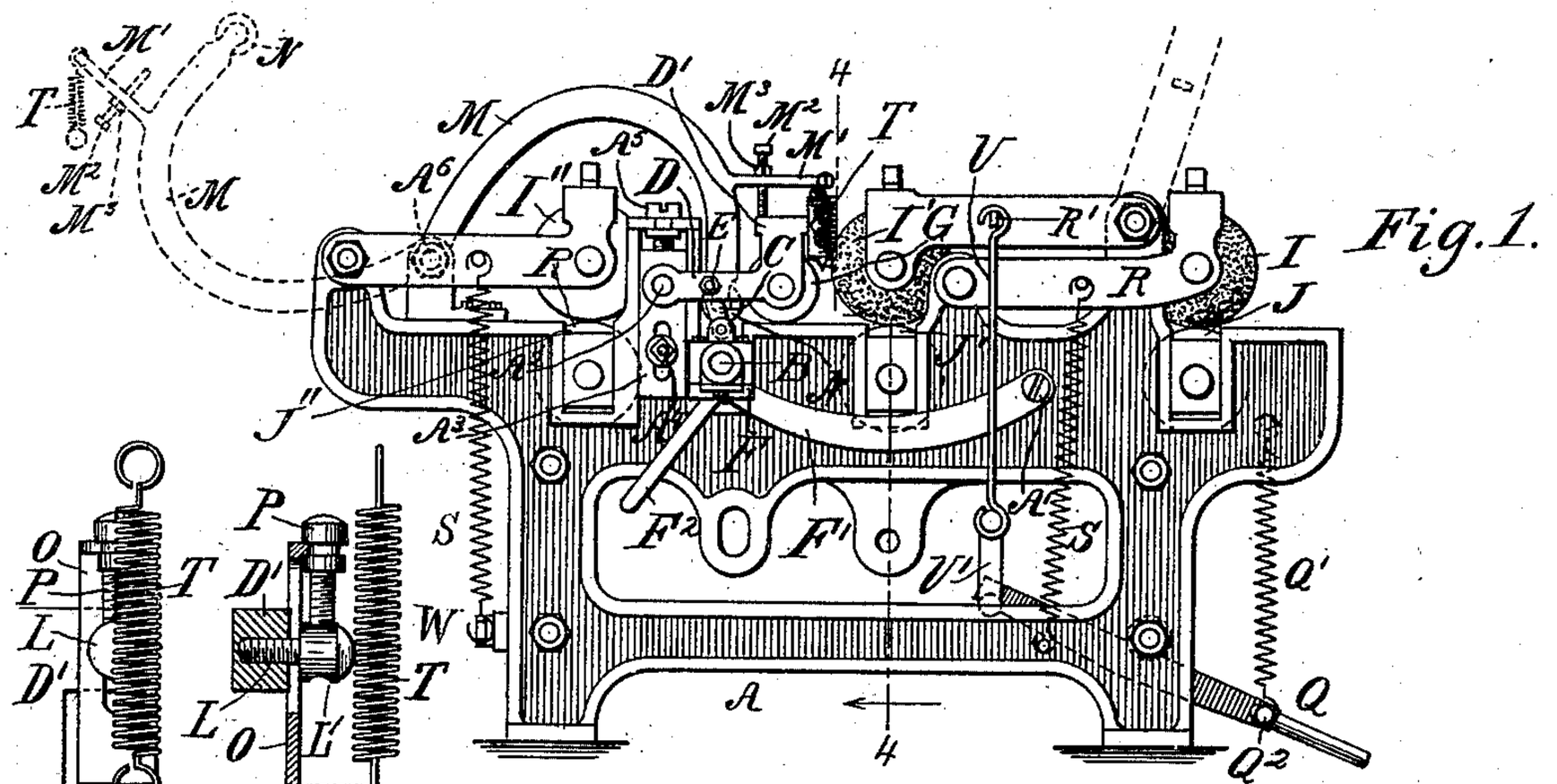

Fig. 1.

Fig. 5. Fig. 6.

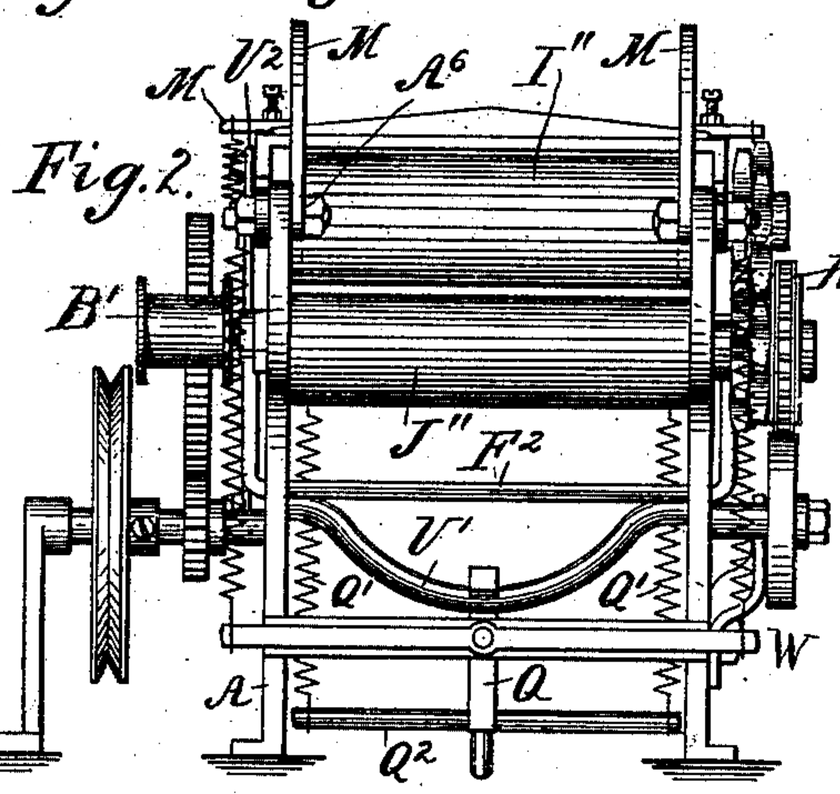

Fig. 2.

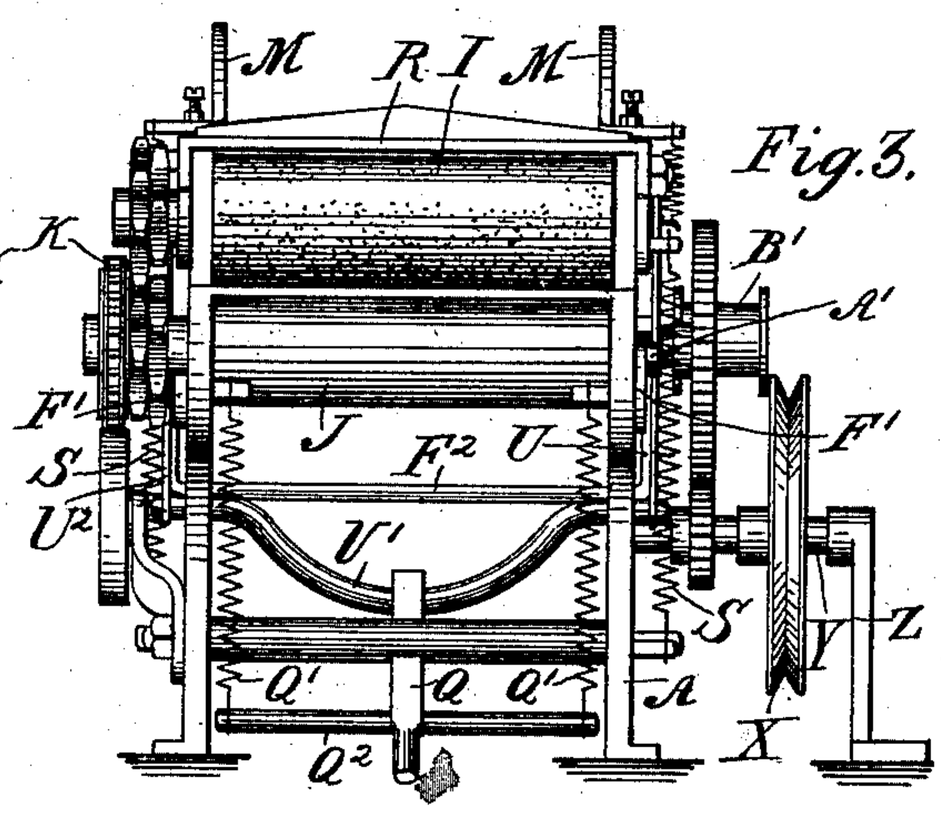

Fig. 3.

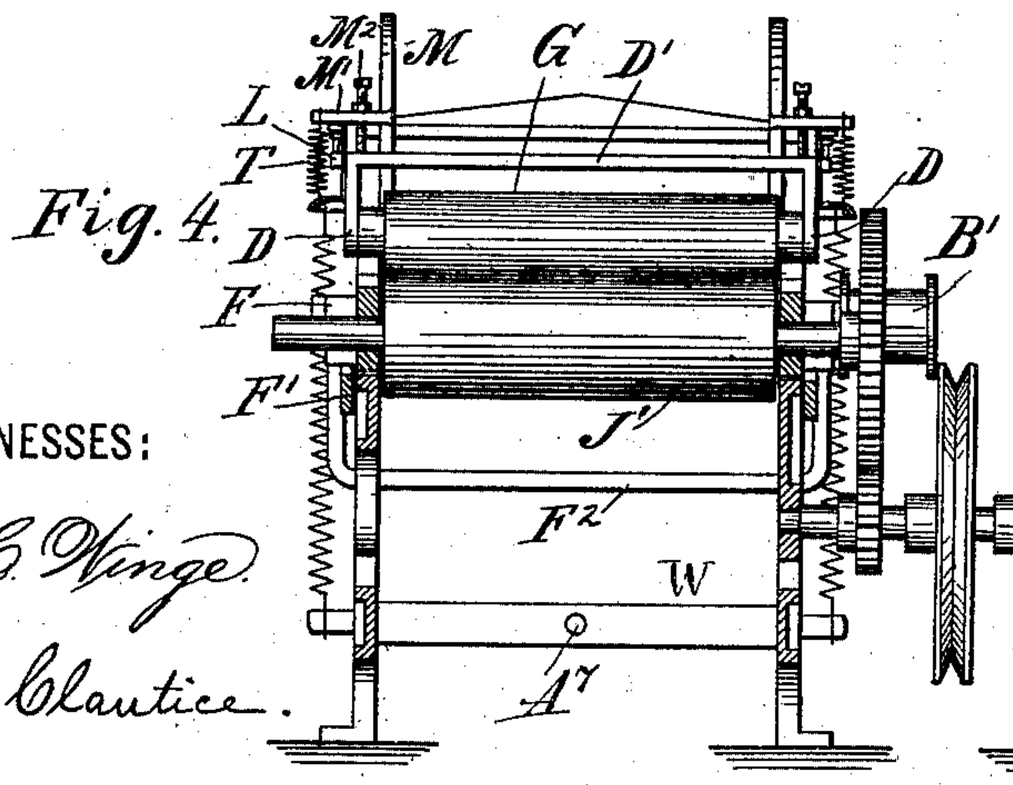

Fig. 4.

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FEATHER-SPLITTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 647,264, dated April 10, 1900.

Application filed September 14, 1899. Serial No. 730,419. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. HODGE, a citizen of the United States, residing at Kearny, in the county of Hudson, in the State of New Jersey, have invented a certain new and useful Improvement in Feather-Splitting Machines, of which the following is a specification.

It has been found to promote the usefulness of feathers for plumes, dusters, &c., to remove a large portion of the material on the under or soft side. This has long been effected by knives mounted on a horizontal shaft and rapidly revolved while the feathers are successively carried over them. Both the cutter-shaft and the surface against which the upper face of the feather presses in the act of being cut are movable and are moved automatically, but to varying extents, as the thick and thin portions of the feathers successively follow each other, so that the feathers are split uniformly, or nearly so, from the thick to the thin end. I employ such mode of operation. I have devised important improvements in the mechanism, whereby the cutter-shaft is more firmly supported and more accurately raised and lowered, a roller is presented to give a frictionless pressure on the upper face of the feather at the proper varying distance from the axis of the cutters, the machinery is less liable to be clogged by the separated material, technically known as "featherine," and other important ends are attained, as will be fully described below and recited in the claims.

The accompanying drawings form a part of this specification and represent what I consider the best means of carrying out the invention.

Figure 1 is a side elevation presenting the left side of the machine. The dotted lines show certain parts in the positions which they will assume when thrown out of use to allow of examination and repairs or to facilitate the clearing away of the featherine. Fig. 2 is a rear elevation, a view from the left in Fig. 1. Fig. 3 is a front elevation, a view from the right in Fig. 1. Fig. 4 is a cross-section on the line 4 4 in Fig. 1, seen from the right. Figs. 5 and 6 show a small portion on a larger scale. Fig. 5 is an elevation corresponding to Fig. 1, and Fig. 6 is a section taken transversely relatively to the machine.

Similar letters of reference indicate corresponding parts in all the figures where they appear.

The machine in many points resembles that set forth in the patent to Franklin H. Beers, dated January 24, 1893, No. 490,468, and I will, to facilitate comparison, use corresponding letters of reference so far as practicable.

A is a frame, of cast-iron or other suitable material.

B is the cutter-shaft, revolved rapidly by the aid of a pulley B', receiving motion through a belt. (Not shown.) The shaft revolves in opposition to the feather feed and carries knives (not shown) which effect the dressing off of the under portion of the feather as it is passed over it.

The feathers are introduced by hand or by machinery between the front rolls I and J, the upper roll of the pair guided by the levers R and depressed by springs S. Each feather is next seized by a second pair of feed-rolls I' J', correspondingly guided similarly, but nearer the cutter, these portions of the mechanism being similar to those in the said Beers patent, except that I facilitate the lifting of the top roll of the second pair, as will appear farther on. A third pair of rolls I'' J'' in the rear of the cutter and correspondingly guided constitute delivery-rolls for receiving the feather after it has been reduced by the cutting action and hasten its removal from the machine.

K is a pitch-chain running on sprocket-wheels on the lower shafts of the several pairs of feed-rolls. The proper rotatory motion being communicated by gears (not shown) to the lowermost, J', of the middle pair, the front and rear pairs are worked at the same rate. These parts are fully shown and described in the said Beers patent and are also in dicated in their correct positions, Figs. 2 and 3.

The bearings of the cutter-shaft B are carried in boxes F, which are each stiffly bolted to a lever F', extending horizontally along the

exterior of the framing and centered on a screw A′. The two boxes F are also connected by a rigid yoke F^2, which is U-shaped and deflected rearward, so that it extends across in a clear space in the machine sufficiently in the rear of the cutting-knives to allow the free descent of the featherine detached by the latter.

A short nearly-upright link C connects the box F with a pivot-pin E in the lever D on each side, which lever is connected to a slide A^3 by a pivot-screw A^2. Each slide is adjustable vertically by a screw A^5 and firmly held by a bolt A^4.

The lever D carries a roller G, which is of metal and smooth-surfaced. The several feathers being fed into the machine in succession from the front—the right side in Fig. 1—move over the plane polished upper surface of the framing A and, being traversed under the roller G, lift it and allow it to sink again, according to the thickness of the several portions of each feather as it passes under it.

M M are curved levers, their rear ends pivoted to the framing at the points A^6. Their front ends form bearings for a small nicely-finished roller N. (Shown clearly by the dotted lines in the raised position when out of use in Fig. 1.) An arm M′, extending forward from each lever M, carries an adjustable screw M^2 and jam-nut M^3. The point of each screw M^2 rests on an elevated portion D′ of the corresponding lever D. When in position for use, the roll N should be depressed very exactly. The levers M and their attachments have but little gravity. Their gravity is reinforced by a spring T on each side. I provide for adjusting the tension of these springs T, and thus the pressure of the roller N upon the feathers passing thereunder. Referring to Figs. 5 and 6, O is a slotted plate or slide adjustably attached to the corresponding lever D by the aid of a holding-screw L, the large head L′ of which is tapped transversely and receives a set-screw P, which is collared in the upper portion of the slide O. Each spiral spring T, attached to the corresponding arm M′, is engaged with the bottom of the slide O, and its tension may be adjusted with great delicacy by turning the screw P so as to raise and lower the slide. It will be understood that each holding-screw L is inserted through a long vertical slot in the slide O and when in position to receive the transverse screw P exerts but a gentle pressure on the slide, so as to support it, but not prevent its being adjusted upward and downward. It will be seen that this construction is compact, is adapted for great nicety, and allows each side to be adjusted independently. The setting of either slide O downward stretches the corresponding spring T and increases the force, depressing the roller N on that side of the machine without affecting the pressure on the other side.

Ordinarily the roller N will remain in the lowest position to which it is elevated by the rising of the levers D or to which it is gradually lowered by the sinking of these levers as the thinner portion of each feather comes under the roller G; but the springs T are capable of yielding to allow this roll to rise higher if occasion require without lifting the roller G or the levers D.

The roller N and its attachments are easily thrown out of use by detaching the springs T and simply turning the levers M over into the position shown in dotted lines in Fig. 1.

It is often required to lift the uppermost, I′, of the inner pair of feed-rollers.

U, Figs. 1 and 3, are links which engage with projections R′ on the outer faces of the levers R, carrying said roller I′. Such links extending downward engage with a curved cross-yokes U′. A single lever Q in the center line of the machine engages the center of this cross-yoke, with liberty for the yoke to turn thereon. The front portion of this lever Q carries a cross-bar Q^2, which is drawn upward by springs Q′, finding their abutments on the inner face of the framing A, as shown in Fig. 3. The lever Q extends farther forward and affords a convenient handle. When it is required to liberate the upper feed-roll I′ of this (the inner) pair, the operator applies one hand to the front end of the lever Q, depressing that end, and consequently overcoming the tension of the springs Q′. In this condition of the parts the links U may by the other hand be easily disengaged from the levers and the levers thrown up into the position shown in dotted lines in Fig. 1 and allowed to remain there for any period required to effect the cleaning or repairs. I attain uniformity in the pressure at the two bearings of the upper delivery-roll I″ by connecting the spiral springs which serve such pairs with a tilting cross-lever W, turning on a pivot A^7. (See Fig. 4.)

The upper rollers I I′ in the pairs of feed-rolls which act on the feathers before their reduction by the cutter are covered with a sufficiently-thick surfacing of soft vulcanized rubber or other elastic material to insure a strong hold without crushing; but both the rolls I″ J″ of the last pair—those which effect the delivery of the feather after its treatment—are hard, so that they take a firm hold on the thin remaining portion of the feather.

By reference to Figs. 2, 3, and 4, it will be observed that the power or master wheel X is mounted on a short horizontal shaft Y, bearing at one end in one of the side members of the main frame of the machine, while the other end is supported in a short standard or bearing located at one side, but close to the machine. By this arrangement the driven shaft is located at one side only of the framing, thus avoiding such obstruction of the descent of the feather refuse as would be occasioned if the shaft extended transversely across the framing. Moreover, the gear strain incurred

by the shaft by reason of the gear-wheel it carries is sustained between two closely-located bearings.

Modifications may be made without departing from the principle or sacrificing the advantages of the invention.

The invention is not confined to the treatment of any particular kind of feathers or to prepare them for any particular use.

I claim as my invention—

1. In a feather-splitting machine, the combination with means for singly feeding the feathers, of a cutter revoluble in a direction opposite to that of the feather feed, and a roller located in vertical alinement with said cutter, and supported in movable bearings to rise and sink during the passage of each feather, the arrangement being such that the feather is only braced back of that point where the cut is to be made and such brace in the form of the roller is antifrictional to promote the movement of the feather notwithstanding the retarding action of the cutter, substantially as herein specified.

2. In a feather-splitting machine, the combination, with a front pair of feed-rolls I and J, the upper of which is hung in a pivoted bearing, links detachably engaging said bearing, depending and connected to a normally-depressed lever, of a revolving cutter and a pair of forwardly-extending levers pivoted at the rear of the frame and carrying a roller in juxtaposition to the cutter, substantially as herein specified.

3. In a feather-splitting machine, the combination, with a front pair of feed-rolls I and J, the upper roll of which is hung in a pivoted bearing, links detachably engaging said bearing, depending and connected to a normally-depressed lever, of a revolving cutter, a pair of forwardly-extending levers pivoted at the rear of the frame and carrying a roller in juxtaposition to the cutter, and spring means for yieldingly depressing the roller end of the levers, substantially as herein specified.

4. In a feather-splitting machine, the combination, with a front pair of feed-rolls I and J, the upper of which is hung in a pivoted bearing, links detachably engaging said bearing, depending and connected to a normally-depressed lever, of a revolving cutter, a pair of forwardly-extending levers pivoted at the rear of the frame and carrying a roller in juxtaposition to the cutter, and means for adjustably and yieldingly depressing the roller end of the levers, substantially as herein specified.

5. In a feather-splitting machine, the combination, with means for feeding the feathers, of a revolving cutter, a pair of levers pivotally carrying a roller in juxtaposition to said cutter, plates O finely adjustable independently of each other and of the levers, and springs attached to said plates and levers, substantially as herein specified.

6. In a feather-splitting machine, the combination, with means for feeding the feathers, of a revolving cutter, a pair of pivoted levers carrying a roller in juxtaposition to said cutter, holding-screws L, plates O, movable up and down on said screws, spring T attached to said lever and plates, adjusting-screws P P engaging said plates and tapped transversely through the heads of said screw L, substantially as herein specified.

7. In a feather-splitting machine, the combination, with a front pair of feed-rolls I and J, the upper of which is hung in a pivoted bearing, and links detachably engaging said bearing, depending and connected to a normally-depressed lever, of pivoted side levers F′ F′, a revolving cutter-shaft mounted in journal-boxes F F carried by the free ends of said pivoted side levers, and a suspending connection for said journal-boxes, substantially as herein set forth.

8. In a feather-splitting machine the combination, with a front pair of feed-rolls I and J, the upper of which is hung in a pivoted bearing, and links detachably engaging said bearing, depending and connected to a normally-depressed lever, of pivoted side levers F′ F′, a revolving cutter-shaft mounted in journal-boxes F F, carried by free ends of said pivoted side levers, and suspending means for said journal-boxes, the suspending means being raised and lowered by mechanism automatically actuated by the passage of each feather, substantially as herein specified.

9. In a feather-splitting machine, the combination with means for feeding the feathers, of pivoted side levers F′ F′, a revolving cutter-shaft mounted in journal-boxes carried by the free ends of said pivoted side levers, suspending connections for said boxes, and the rearwardly-deflected **U**-shaped yoke F^2 rigidly connecting said boxes for securing unitary movements of the same, substantially as herein specified.

10. In a feather-splitting machine, the combination with a revolving cutter, of feeding means including an upper roller hung in pivoted bearings having projections R′, a pivoted lever having a normally-spring-depressed portion, and links U U connected to said lever and detachably engaging the projections, substantially as herein specified.

11. In a feather-splitting machine, the combination with a revolving cutter and a roller in alinement therewith and supported in movable bearings and adapted to rise and sink during the movement of each feather, feeding mechanism comprising upper and lower feed-rollers, upper and lower delivery-rollers at the rear of the cutter, the upper feed-roller being yielding-surfaced and that at the rear being hard and unyielding, and an equalizing spring-tension provision for the bearings of the latter, substantially as set forth.

12. In a feather-splitting machine, the combination with a revolving cutter, and feeding mechanism, of a driven shaft located at the

side only of the framing, and bearing at one end in the latter, and at the other in a supplemental bearing, whereby the obstruction by the shaft of the descending feather-refuse is avoided, and the gear strain is sustained between the two bearings, substantially as herein specified.

In testimony that I claim the invention above set forth I affix my signature in presence of two witnesses.

JOHN D. HODGE.

Witnesses:
J. B. CLAUTICE,
C. A. WEED.