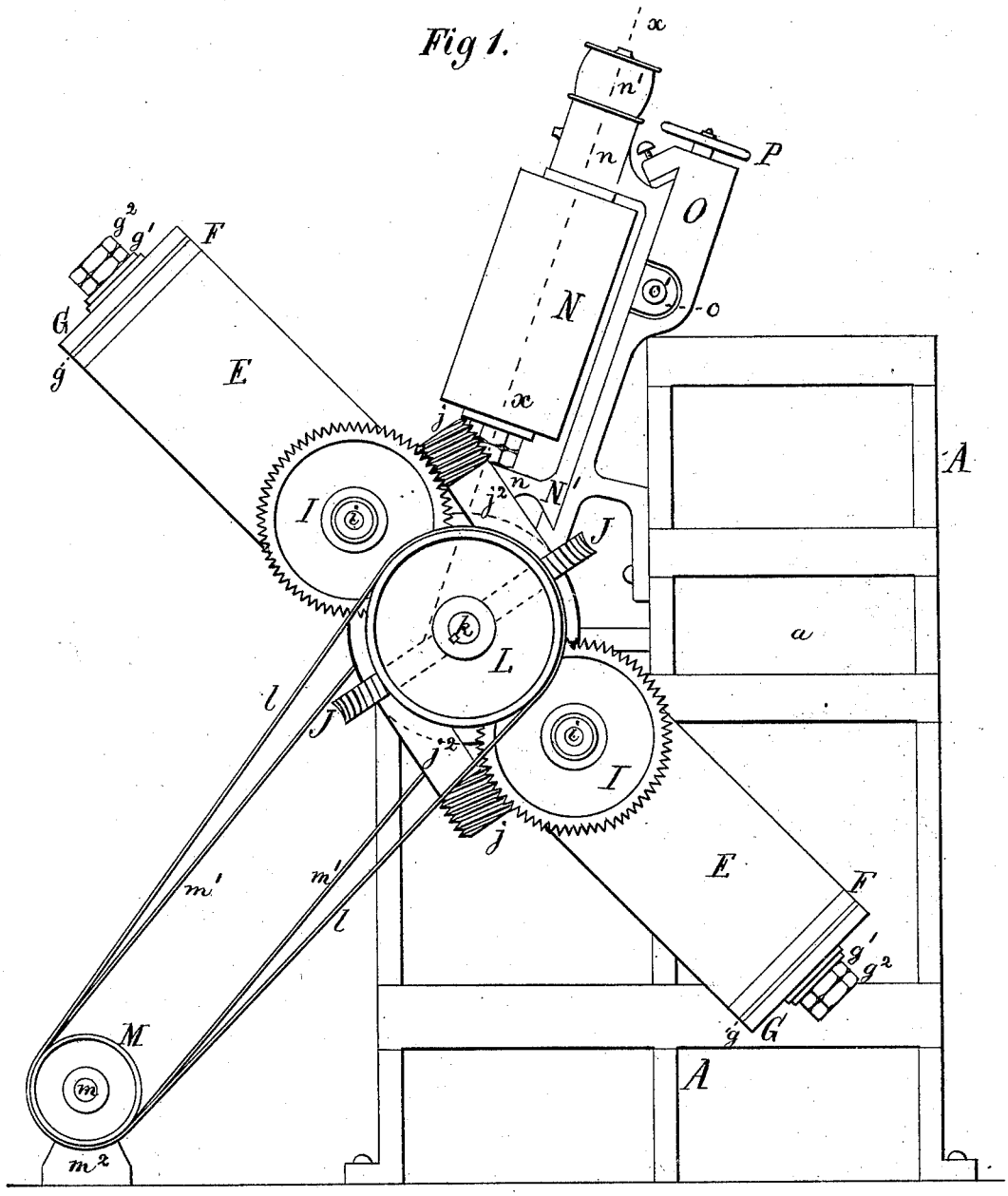
4 Sheets—Sheet 1.

E. B. McINTOSH.

Tobacco-Cutter.

No. 212,859. Patented Mar. 4, 1879.

Fig 1.



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Inventor:
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by
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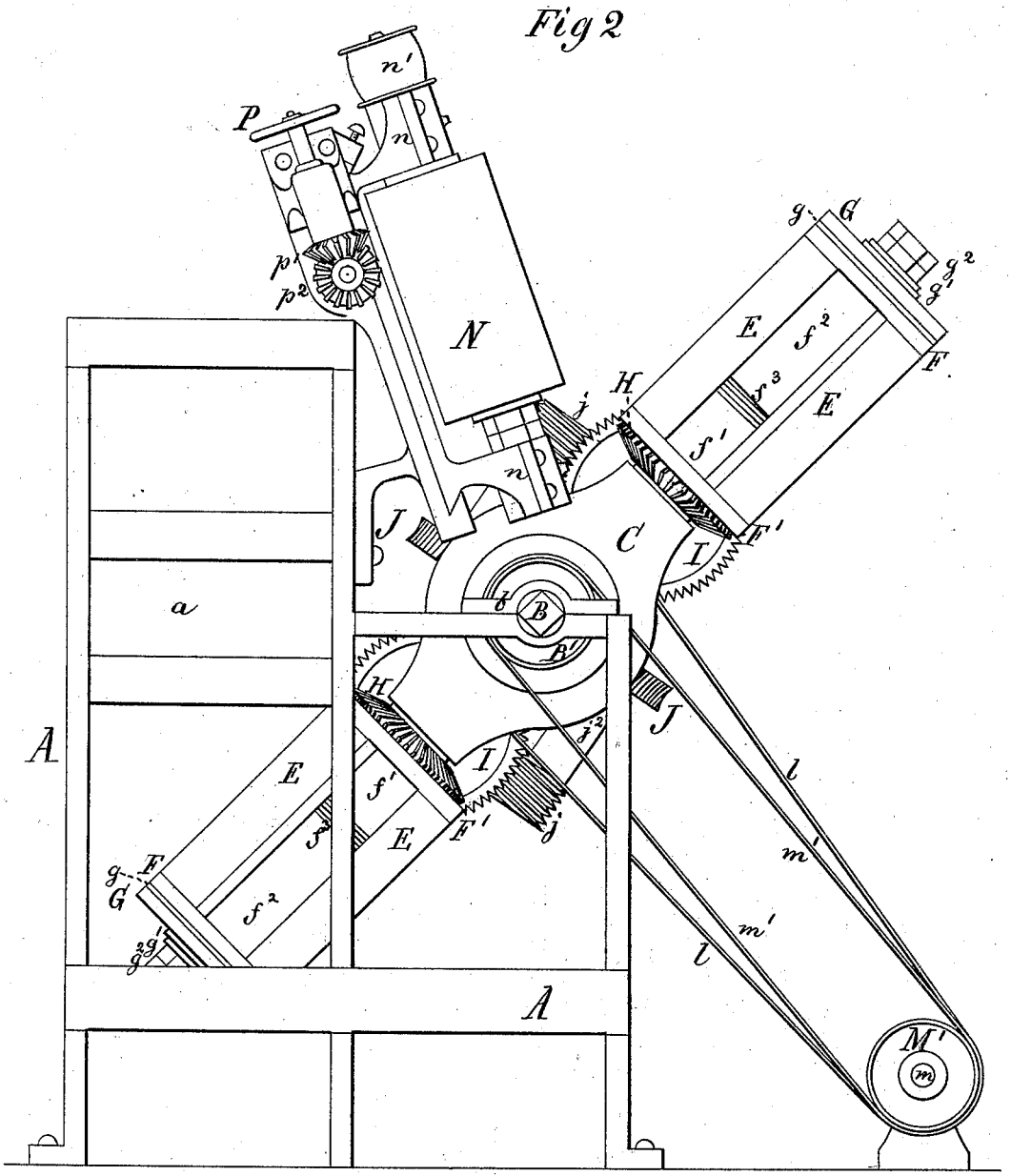
Fig 2



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Tobacco-Cutter.

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Fig 3.

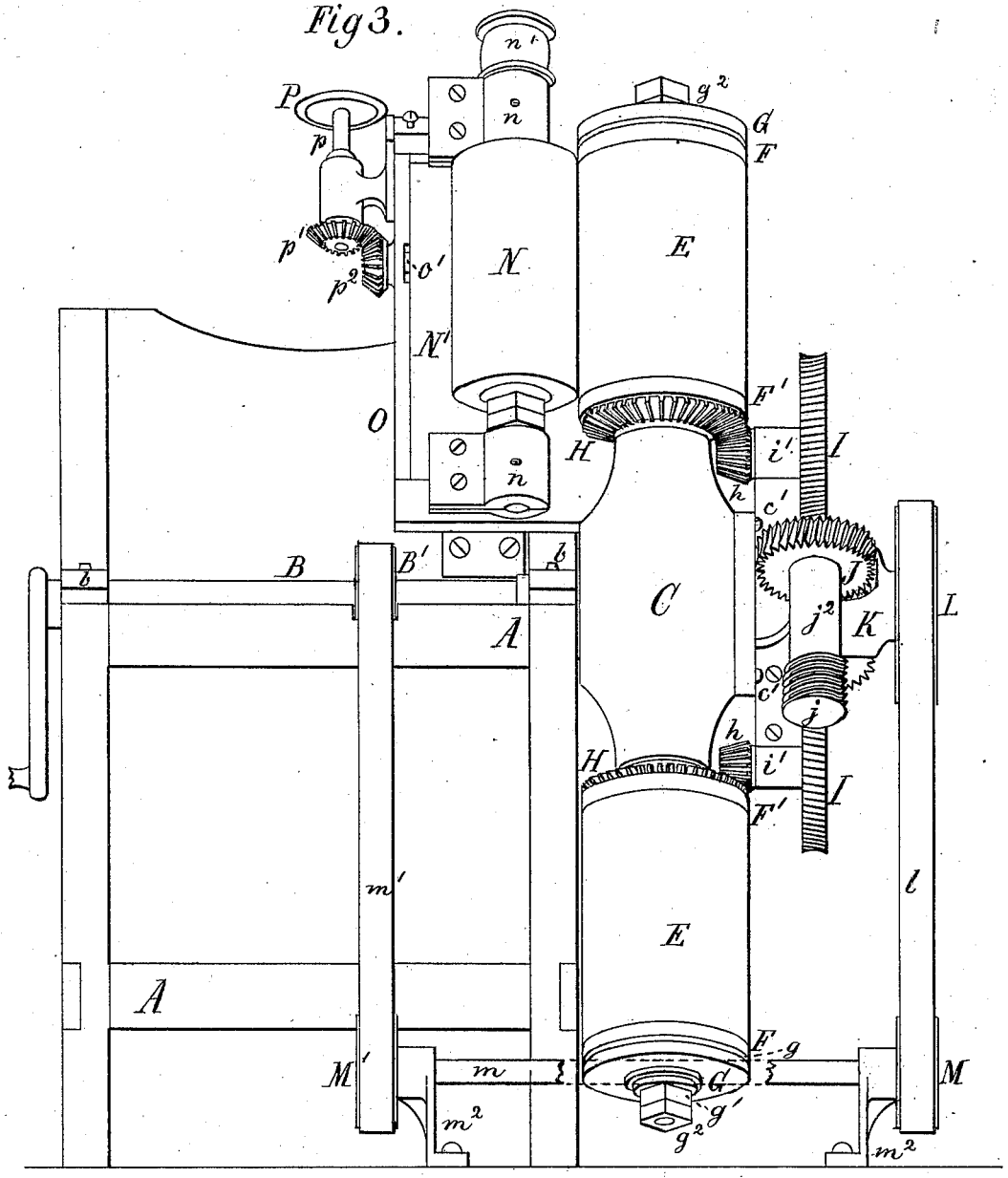

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Fig 4.

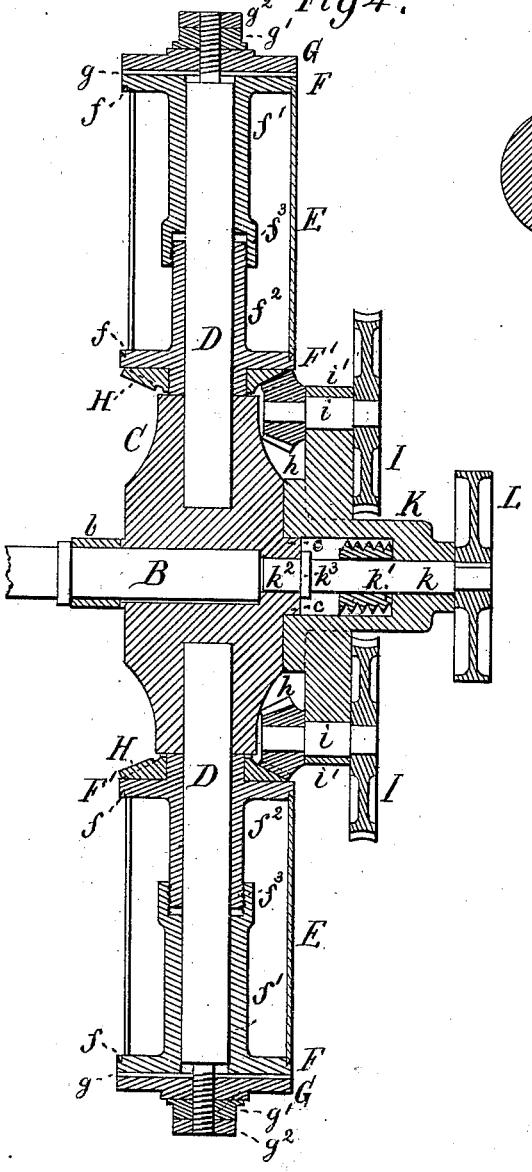


Fig 5.

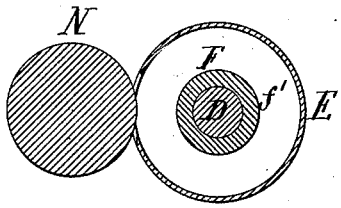
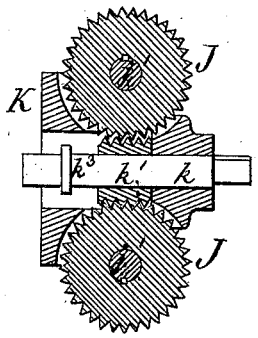


Fig 6.



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UNITED STATES PATENT OFFICE.

EDWARD B. McINTOSH, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN TOBACCO-CUTTERS.

Specification forming part of Letters Patent No. **212,859**, dated March 4, 1879; application filed May 27, 1878.

To all whom it may concern:

Be it known that I, EDWARD B. McINTOSH, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Tobacco-Cutters, which improvement is fully set forth in the following specification and accompanying drawings, in which latter—

Figure 1 is a front elevation of my improved tobacco-cutter. Fig. 2 is a rear elevation of the same. Fig. 3 is a side elevation of the same. Fig. 4 is a central longitudinal section through the main shaft and cutter-arms of the same. Fig. 5 is a transverse section through a grinding-cylinder and cylindrical knife of the same. Fig. 6 is a detail view of a shaft, screw, and worm-wheels of the feed-motion used for the cylindrical knives.

My invention relates chiefly to a mechanism used for cutting the tobacco, and may be used on any tobacco-cutting machine of known construction. It is specially adapted for machines having a very slow feed-motion for the production of "fine-cut" tobacco.

The nature of my invention consists in certain constructions, combinations, and arrangements of parts hereinafter fully described and specifically claimed, whereby a device for cutting tobacco is produced by which the necessity of removing the knives for the purpose of grinding is obviated.

The object of my invention is to keep the knives of a tobacco-cutting machine in good cutting order by grinding them over each time before they cut the tobacco and while they are in operation.

In the drawings, A represents the frame of a tobacco-cutting machine, and *a* in Fig. 1 the opening through which the tobacco is passed or fed by suitable machinery toward the knives. The main shaft B is secured to the frame A by means of journal-bearings *b*, and its free end provided with a head, C, having one or more radial shafts, D, which bear the knives E. Each knife E is in form of a hollow cylinder, except that at the point where the beveled cutting-edge is formed a small segment of the cylinder is cut away, as shown in Fig. 5 of the drawings. These knives are secured between two clamp-heads, F F, which are, near their circumferences, provided with annular V-shaped grooves *f*, into which the ends of the knives are fitted. The clamp-heads F F′ are also provided with hubs f^1 and f^2, which are, by means of a screw-thread, fastened together at f^3, and thus cause the knife to be firmly clamped between the heads. The hubs f^1 f^2 are fitted upon the shaft D, and the united clamp F F′ is secured in position and prevented from "playing" by means of a leather or rubber washer, *g*, a disk, G, and a nut, g^1, and check-nut g^2, screwed to the end of the shaft D, whereby sufficient friction between the heads F′ and C and between the head F and washer *g* can be produced, to make the heads F F′ work as firmly as desirable, in order to prevent loose or dead motion of the knife. The head F′ is provided with a toothed gear-wheel, H, which is operated by a pinion, *h*, on one end of a shaft, *i*. The shaft *i* is secured in a proper bearing, *i′*, and has at its other end a worm-wheel, I, which gears into a worm, *j*, on a shaft, j^1, which is properly secured in a bearing, j^2, and has at its other end a worm-wheel, J. The bearings *i′* and j^2 are fastened to or united with a hood, K, which is centrally fastened to the face of the head C, and which is provided with a central shaft, *k*, and a worm, k^1, into which latter all the wheels J are made to gear. The shaft *k* is in line with the shaft B, and may have a journal or end bearing, k^2, in the head C.

In order to keep the hood K in a central position with the shaft B the head C is provided with a concentric step, *c*, upon which the end of the hood is fitted before it is fastened by screws or bolts *c′* to the head C.

The shaft *k* is provided with a collar, k^3, which bears against the head C and prevents longitudinal slipping of the shaft in one direction, while the worm k^1, by bearing against the inner end of the hood K, prevents longitudinal slipping of the said shaft in the opposite direction.

In order to enable the worm-wheels J to gear into the worm k^1, the hood K is provided with slots, wherein the wheels J may freely move, as seen in Fig. 6.

The shaft k projects beyond the hood K outside, and is there provided with a pulley, L, which is operated by means of a belt, l, and a pulley, M, on a shaft, m, to which another pulley, M′, is fastened, which is operated from a pulley, B′, on the shaft B by means of a belt, m^1.

The shaft m is suitably hung, by means of standard-bearings m^2 or otherwise, to any part of the shop.

I have made and shown the pulleys B′ M M′ all of the same diameter and the pulley L of larger diameter, whereby a motion of the shaft k is produced, which is, to a very small degree, slower than the motion of the shaft B; and as the worm k^1 on the shaft k is the motor of the feed-gear for the several knives of the machine, their motion around the shafts D is exceedingly slow, so that under ordinary circumstances this motion will amount to about one-sixteenth of an inch in ten working-hours. By this said feed-motion the knives, in proportion as they are worn away, are constantly advanced about their own axes toward the range of a grinding-cylinder, N, the shaft of which has a pulley, n^1, at its free end, and is secured in two journal-bearings, n, upon a slide or carriage, N′. The slide N′ is dovetailed into a stationary bed-plate, O, suitably fastened to the frame A, and is moved or adjusted by means of a nut, o, and screw o', which latter is secured to the bed-plate, and may, by way of convenience, be operated by means of a hand-wheel, P, on a suitably-inclined shaft, p, and a miter-wheel connection, p^1 p^2.

The axis x x of the grinding-cylinder N is inclined, so that its lower end stands a suitable distance forward of the center or axis of the shaft k, which is in line with the shaft B, as seen in Fig. 1, and thus the edges of the knives E pass the grinding-cylinder with a drawing movement and are gradually ground from end to end. The cutting-edges so produced are much keener than those produced by a grinding-cylinder standing parallel with the edges during the grinding operation, in which latter case the knife-edge, being simultaneously ground from end to end, becomes so heated as to lose a good deal of its toughness and cutting quality.

It depends on the direction of the thread of the worm k^1 whether the shaft k must move slower or faster than the shaft B, and accordingly the pulley L might be larger or smaller than the pulleys B M M′ without affecting the principles of my invention.

Operation: The tobacco is fed through the discharge-opening a in a suitable manner while the shaft B is revolving and successively passing the knives E across the said opening, thereby cutting the tobacco. After cutting the tobacco the knife E moves around to the other side and toward the grinding-cylinder N, which is quickly revolved by means of a driving-belt and the pulley n'. During this time the above-described differential motion of the shaft k has moved the connections J j^1 I h H, and consequently the knives E, sufficiently ahead about their own axes to enable the grinding-cylinder N to renew their cutting-edges while they pass it, and before they arrive at the discharge-opening a. As the grinding-cylinder wears off by degrees the operator, by turning the hand-wheel P, moves it again into its proper position.

I claim—

1. The combination of a cutter or knife, E, a revolving head, on which the knife is fitted to turn, a feed mechanism, which turns the knife while it is revolving, a grinding and sharpening cylinder, and a stationary cutting-box, substantially as and for the purpose described.

2. The combination of the revolving head C, shaft or shafts D, the clamp-heads F F′, having hubs f^1 f^2 and grooves f, and the knife or knives E, substantially as and for the purpose set forth.

3. The combination of the head C, shaft or shafts D, clamps F F′, wheel or wheels H, washer or washers g, disk or disks G, and nuts g^1 g^2, substantially as and for the purpose set forth.

4. The combination of the pulleys B′ M M′ L, belts m^1 l, shafts B and k, and connections k^1 J j I h H, and a knife or knives, E, on a rotating head. substantially as set forth.

5. The combination of the adjustable revolving grinding-cylinder N and the revolving cylindrical knives E, constructed and operating substantially as set forth.

6. The combination of a cutter, E, a revolving head, on which the cutter is fitted to turn, and a feed mechanism, which feeds the cutter toward the grinding-cylinder, and thereby turns it around its own axis while it is revolving with the arm of the cutter-head, substantially as and for the purpose described.

7. The cutter E, fitted to revolve upon the arm of the cutter-head during the operation of cutting, substantially as and for the purpose described.

8. The knife E, in form of a hollow cylinder, which has a small segment cut out of it for the purpose of forming a cutting-edge, and the blade of said knife being beveled at its ends and clamped between grooved end pieces, all substantially as and for the purpose described.

9. The knife E, revolving around its own axis, the cutter-head revolving with the driving-shaft and carrying the cutter E with it, and a grinding and sharpening cylinder, the whole combined and operated substantially as and for the purpose set forth.

10. The combination, in a tobacco-cutting machine, of the mechanisms for producing differential motions of the knife or knives which cut the tobacco, said mechanisms pro-

ducing, respectively, a relatively fast advance of the knife and its head around the shaft for the operation of cutting the tobacco, and a slow advance of the cutter-blade for the operation of sharpening it upon the grinding-cylinder, both of said motions being simultaneously produced by power from the same driving-shaft, substantially as and for the purpose described.

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