

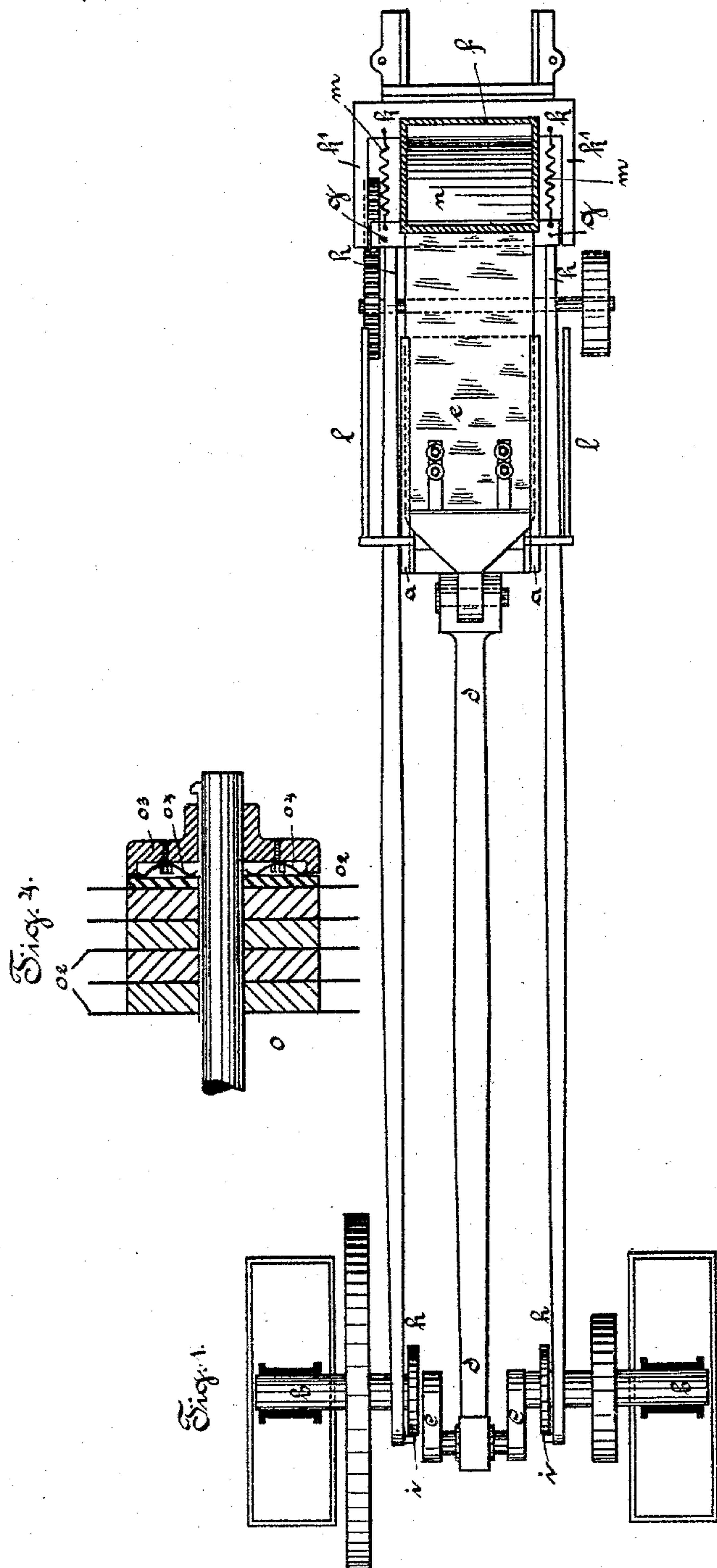
(No Model.)

2 Sheets—Sheet 1.

E. E. BIRKNER.  
WOOD CUTTING MACHINE.

No. 546,294.

Patented Sept. 17, 1895.



Witnesses:  
H. K. Poulter  
C. Thompson

Inventor:  
Edward E. Birkner,  
By Wm. E. Poulter,  
attorney.

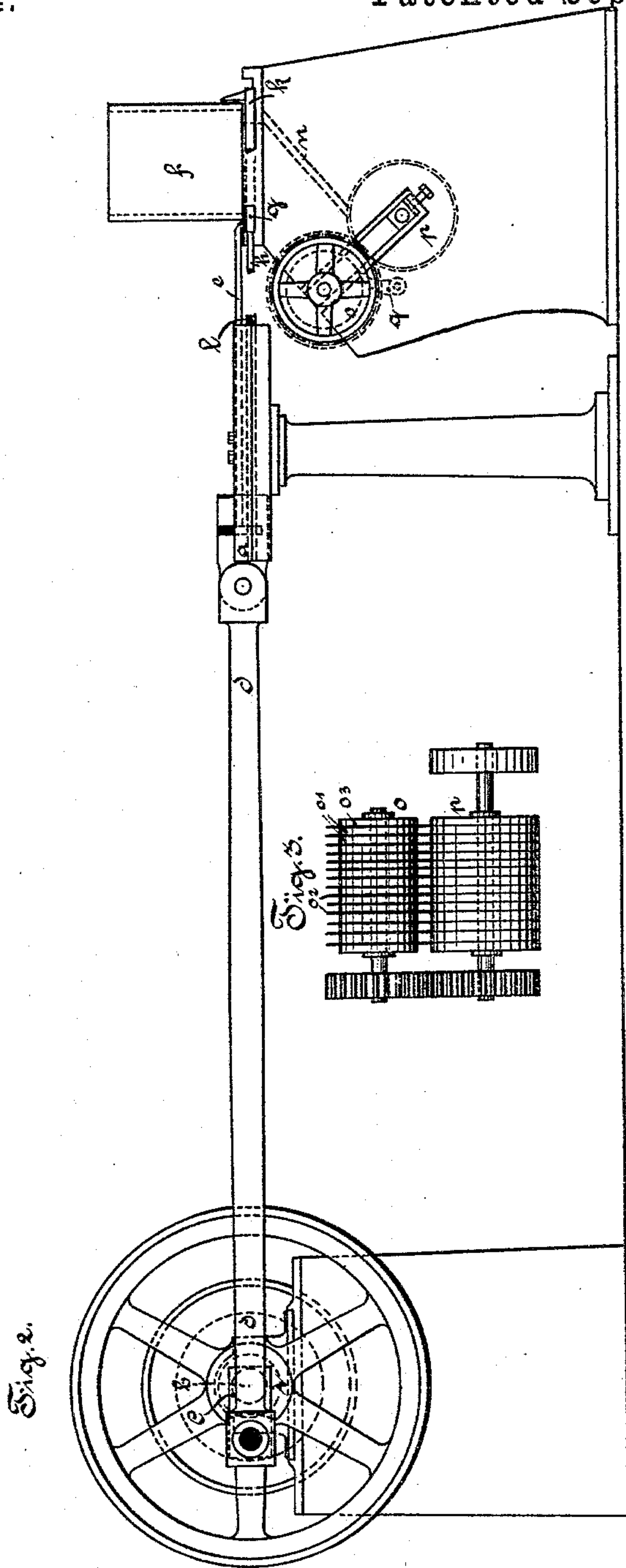
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# UNITED STATES PATENT OFFICE.

EDUARD EUGEN BIRKNER, OF CRIMMITZSCHAU, GERMANY.

## WOOD-CUTTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 546,294, dated September 17, 1895.

Application filed May 25, 1895. Serial No. 550,626. (No model.)

*To all whom it may concern:*

Be it known that I, EDUARD EUGEN BIRKNER, a subject of the King of Saxony, residing at Crimmitzschau, in the Kingdom of Saxony, Germany, have invented certain new and useful Improvements in or Relating to Wood-Cutting Machines, of which the following is a specification.

This invention relates to wood-cutting machines.

The machine which is the subject of this present invention has for its object the performance of such operations as cutting up of forest-logs into fire-wood. This takes place in the following manner: From the bottom of a log or billet of wood fed into the hopper-body of the machine is cut a plate by a knife working in guides, which plate passes then under a cutter, which cuts it into strips (small sticks or blocks) fit for use in the household.

In the accompanying drawings, Figure 1 is a plan, and Fig. 2 an elevation, of the machine. Fig. 3 represents the cutter-head with the feed-roller, and Fig. 4 shows the details of the knives in the cutter-head.

In straight guides *a* moves a knife *e*, driven by the shaft *b*, crank *c*, and connecting-rod *d*, in a horizontal plane, to and fro. In its forward movement—i. e., toward the right of the drawing—the knife *e* passes through a slot in a hopper *f* of the framing of the machine, into which hopper have been introduced the logs or billets which are to be cut up into fire-wood. The block of wood so introduced (but not shown in the drawings) is laid in such manner as to offer an end section to the knife, so that the subsequent cut is made in the direction of the grain. Below the plane in which the knife travels there are two sliding bars *g* and *k*, which serve to carry the block of wood at the time of the cut. During the cut one of these bars *g* is drawn backward out of the hopper by the connecting-rods *h* and the crank-pin cam-disks *i* toward the driving-shaft *b*. The other bar *k* is pushed away from the hopper *f* by the push-rods *l*, which are affixed to the cross-head of the knife *e* and strike against the ends *k'* of the arms *k*, prolonged to *g*, so as to meet them when the knife has been thrust forward sufficiently far in making the cut. Springs *m* unite the two sliding bars *g* and *k* and allow them, when thus

moved in contrary directions, to pull against each other, so as to draw each other back to their original places when the separating forces cease to act. The same result may be attained by an arrangement of separate springs for each sliding bar—i. e., the result that the two bars are, after separation, drawn in from each side into the hopper *f*. The curvature of the crank-pin cam-disks *i* limits the shifting of the bar *g*, while the movement of *k* is limited by the end of the groove in which it travels. Thus in the drawn-back position of the knife (see drawings, Fig. 1) both the sliding bars are at the inner limits of their travel, so as to support the wooden billet or block. As the knife is pressed forward into the block the bar *g* is first drawn out of the hopper, and this is followed by the drawing back of the bar *k*, and the severed section or plate of wood drops downward, turning on the edge at *k*; but the billet or block cannot drop, as it is carried upon the knife *e*. On the return stroke, when the knife has returned so far that the push-rods *l* have quitted the slide-bar *k* and left it free, the bar *k* first returns to its place, and later on, but before the knife has been withdrawn quite out of the hopper *f*, the bar *g* resumes its former position. Then the billet once more rests upon the bars *g* and *k*.

Underneath the hopper-body *f* is placed the inclined plane *n*, down which the piece or section cut from the billet slides into the grasp of two rollers *o* and *p*, which are specially illustrated in Fig. 3 and are driven from the main shaft *b* by means of a belt. The roller *p* serves as feed-roller, being provided for that purpose with rows of projecting points which are pressed into the wood. Upon the roller *o*, however, are mounted, with interposed disks *o'*, a number of circular disk-formed knives *o''*. Owing to the direction in which the wood-section coming from the severed block presents itself to the rollers it is cut by the rotating knives *o''* of the roller *o* into strips parallel with the grain. By taking out and exchanging the interposed disks *o'* for others of different dimensions in thickness the breadth of the severed and dissected strips or sticks can be regulated at will. A rake or comb *q*, Fig. 2, projecting with its teeth between each pair of blades on the roller *o*, prevents the strips from lodging between the



knives and being carried round with the roller. Furthermore, in order to prevent the severed wood-segments from sticking fast between the knife-blades the following device or arrangement is adopted: The knives and interposed disks, which between the endmost disks  $o^3$  are held fast upon the shaft, so as to turn always therewith, are not tightly pressed together; but inside the endmost disks  $o^3$ , fixed on the shaft, are inserted strong springs  $o^4$ , Fig. 4, which permit the knives and interposed disks to have a slight axial or endwise motion, so that the knife-disks may be slightly displaced. The roller  $p$  is carried in adjustable bearings so that the distance between the centers of the two rollers may be altered and regulated as required. On the other hand, the thickness of the piece severed from the billet at each stroke of the knife may be regulated in the following manner—viz., by using cross-bars  $g$  and  $k$  of various thicknesses, so that a greater or lesser distance may be obtained at will between the bottom of the billet and the under side of the knife-blade.

25 In the machine as described there are other alterations which may be made—*e. g.*, the conveyance of the severed piece to the rollers  $o$  and  $p$  may be effected by a toothed endless

web of lattice-work, suitably driven, or by a swinging plate in lieu of the fixed inclined plane hereinbefore described.

I claim—

1. In a wood-cutting machine the combination with an open bottomed hopper, of a knife  $e$ , guides therefor, reciprocating ledges  $g$  and  $k$ , driving shaft  $b$ , push rods  $l$ , mechanism operatively connecting the knife  $e$  and ledge  $g$  with the driving shaft, springs  $m$ , cutting roller  $o$ , feed roller  $p$ , and mechanism for operatively connecting said rollers with each other substantially as set forth.

2. In a wood cutting machine, the combination with an open bottomed hopper, of a knife  $e$ , guides therefor, reciprocating ledges  $g$  and  $k$ , driving shaft  $b$ , push rods  $l$ , connecting rod  $d$ , cams  $e$ , rods  $h$ , springs  $m$ , cutting roller  $o$ , feed roller  $p$ , and toothed gearing operatively connecting said rollers with each other substantially as set forth.

In testimony whereof I have hereto set my hand in the presence of the two subscribing witnesses.

EDUARD EUGEN BIRKNER.

Witnesses:

LOUIS AUGUST DE VEER,  
KARL EMIL ZEINER.