(No Model.)

G. HEYMEIER & H. WEHMANN.

CUTTER HEAD.

No. 458,030. Patented Aug. 18, 1891.

Fig. 1.

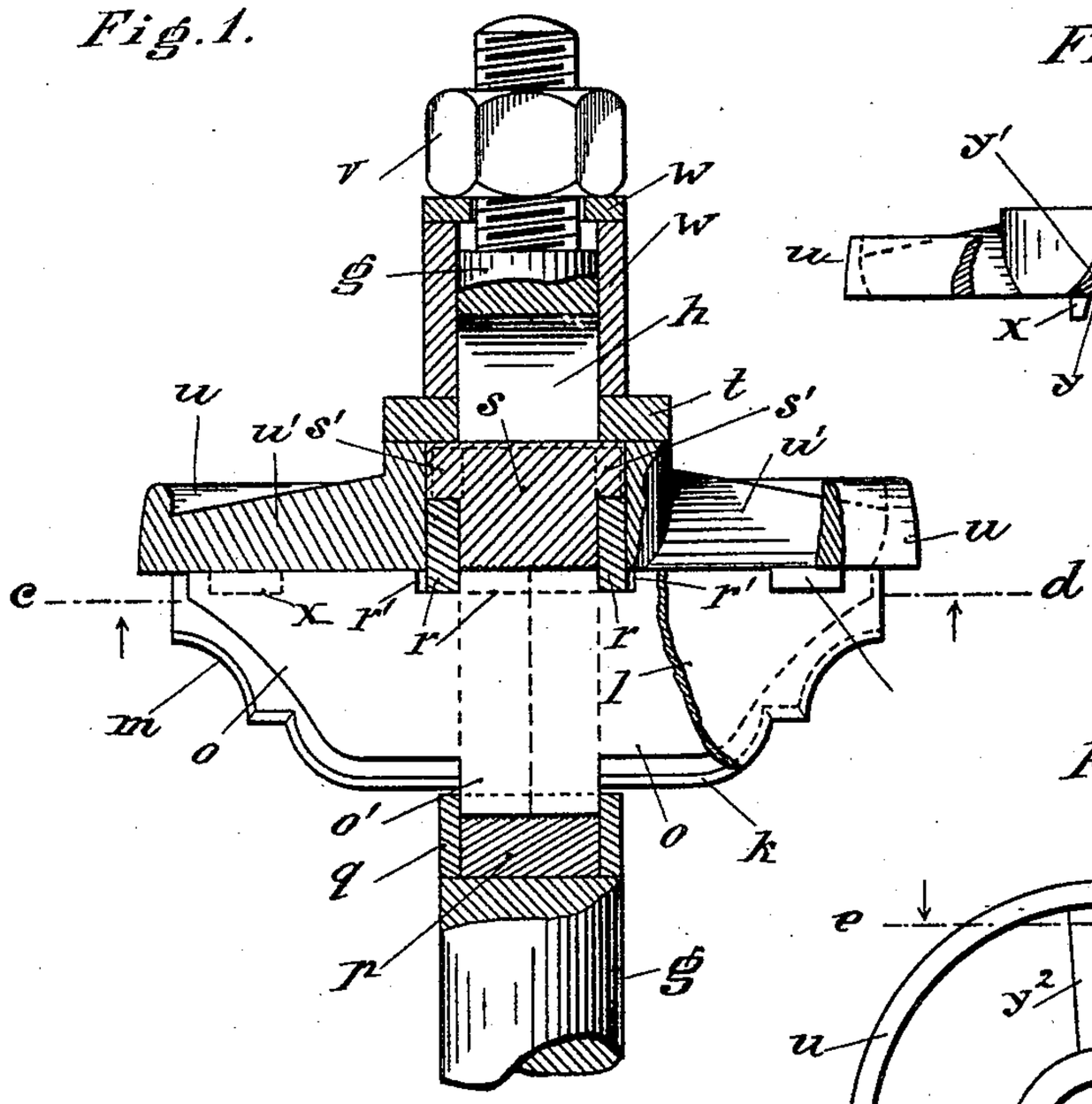


Fig. 4.

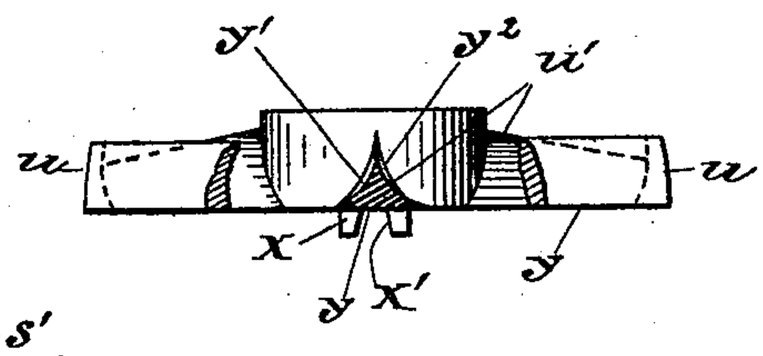


Fig. 3.

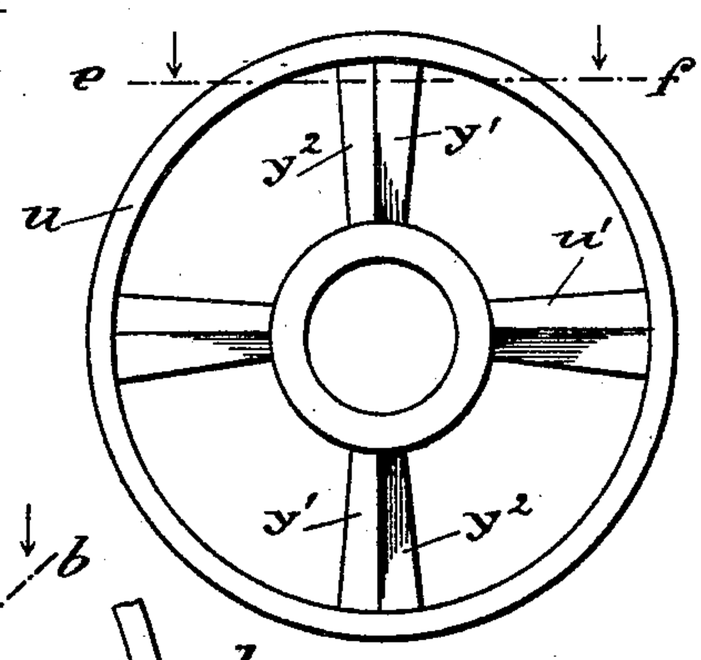
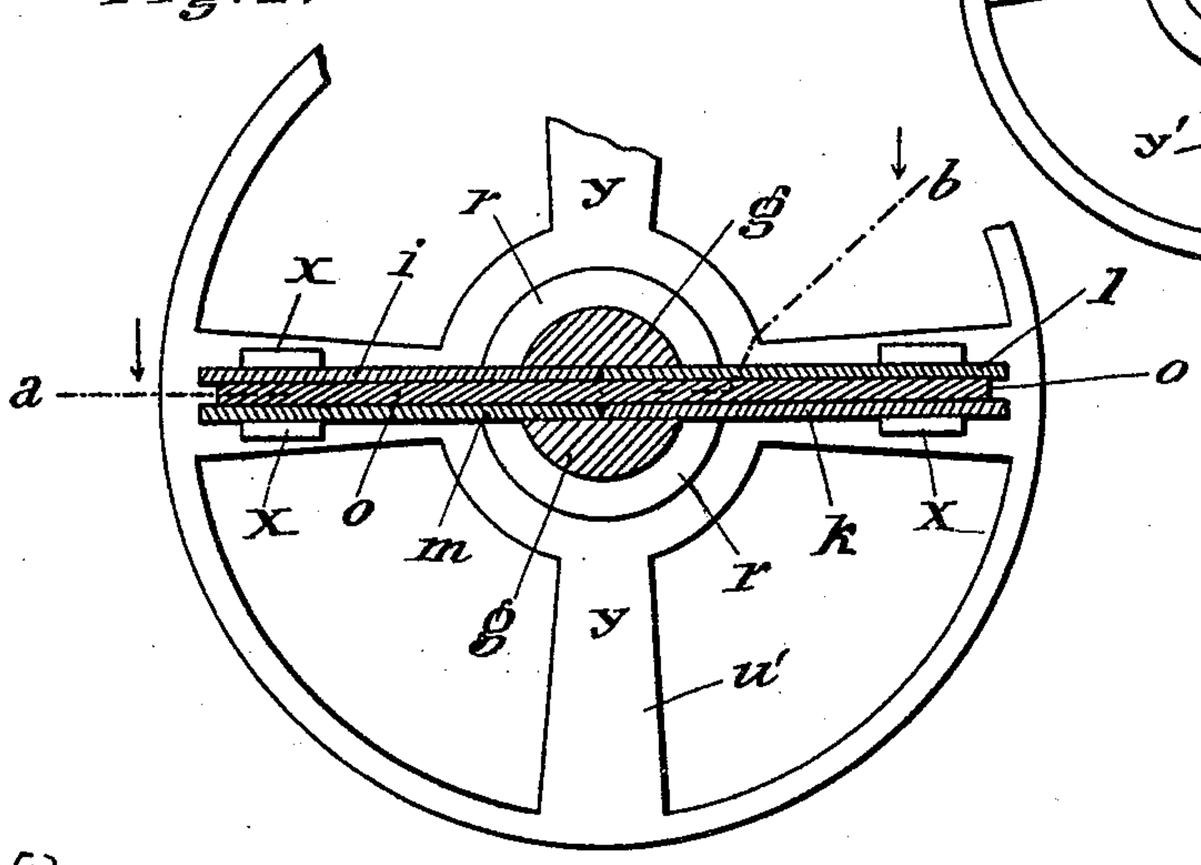


Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

GUSTAV HEYMEIER AND HERMANN WEHMANN, OF BREMEN, GERMANY.

CUTTER-HEAD.

SPECIFICATION forming part of Letters Patent No. 458,030, dated August 18, 1891.

Application filed November 28, 1890. Serial No. 372,787. (No model.)

To all whom it may concern:

Be it known that we, GUSTAV HEYMEIER and HERMANN WEHMANN, citizens of the free and Hanseatic city of Bremen, Germany, have invented certain Improvements in Cutter-Heads, of which the following is a specification.

Our invention relates to an improved construction of a cutter-head with exchangeable cutters and guards.

Referring to the accompanying drawings, Figure 1 is a vertical section through the improved cutter-head on the line *a b*, Fig. 2. Fig. 2 is a horizontal section through the same on the line *c d* of Fig. 1. Fig. 3 is a top view of the modified guard-wheel, and Fig. 4 is a vertical section through said guard-wheel on the line *e f* of Fig. 3.

All sectional views are seen in the direction of the arrows indicated at the sectional lines.

The mandrel *g* is, as usual, provided with a longitudinal slot *h*, which serves to receive the cutters *i k l m*, and the plate *o* for strengthening said cutters. Said plate in our improved cutter-head is perfectly straight and arranged between the cutters, which cutters, as well as the plate *o*, have lugs *o'* formed on their lower ends to bear upon a hardened-steel block *p*, the upper surface of which is notched by file-cuts. The lower portions of the cutters and strengthening-plate are supported and laterally held by a ring *q*, slipped over the mandrel *g*, the lugs *o'* of the cutters and plate fitting into said ring without play. The block *p* is equally secured in its position by said ring *q*. The upper portions of the cutters and strengthening-plate *o* are secured in position partly by an upper ring *r*, provided to fit without play into the grooves *r'*, and partly by an upper steel block *s*, the lower face of which is hardened and has notches. The said upper block *s* is also held within the slot *h* of the mandrel *g* by the ring *r*. The lugs *s'* of this block project from said slot, and on the said lugs *s'* a disk *t* is laid, which equally covers the hub of the guard-wheel *u*. On screwing the nut *v* downward upon the threaded portion of the mandrel *g* the pressure exercised by said nut will act through rinks *w* and disk *t* upon the block *s* and guard plate or wheel *u*, whereby the cutters and plate *o* are firmly clamped. The inclined inside faces *x'*, Fig. 4, of the lugs *x* of the guard-wheel *u* embrace and act simultaneously as wedges to compress the outer ends of said cutters and plate *o*.

To deflect the undue current of air occasioned by the great speed of rotation of the cutters, we have shaped and arranged the spokes *u'* of the guard-wheel *u* in such a manner as to make them act like a screw-fan, whereby the current of air having a centrifugal motion imparted by the rotation of the cutters is driven toward the upper free end of the cutter-head. To obtain this effect the said spokes *u'* are made of triangular cross-section, as shown in Fig. 4, and so arranged that their lower faces *y* are in a plane vertical to the longitudinal axis of the mandrel *g*, while the sides *y'* and y^2 of said spokes *u'* are curved to form right-hand and left-hand screws, so that the current of air below the guard-wheel *u* and around the rotating cutters will be drawn or forced outward whether the cutter-head be rotated in one direction or the other.

We claim as our invention—

1. In a cutter-head, the slotted mandrel and cutters and strengthening-plate therein, the said cutters and strengthening-plate having lugs *o'* and notches *r'*, in combination with steel blocks for the upper and lower parts of the cutters and plate to bear against, retaining-rings *q* and *r*, embracing the mandrel, steel blocks, and parts of the cutters to retain the blocks and cutters in place, and means for clamping the said parts together, substantially as described.

2. In a cutter-head, the slotted mandrel and cutters and strengthening-plate therein, in combination with a guard-plate *u*, having lugs *x* with inclined faces to embrace and compress the cutters and plate together, and clamping devices to hold the guard-plate on the cutters and plate.

3. In a cutter-head, the combination, with exchangeable cutters, of a guard-wheel *u*, hav-

ing spokes u' with their lower faces y in a plane vertical to the longitudinal axis of the mandrel g and with their side faces y' and y^2 forming right-hand and left-hand screws, substantially as and for the purpose described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GUSTAV HEYMEIER.
H. WEHMANN.

Witnesses:
A. KELLMANN,
H. ROETHIG.