No. 772,841. PATENTED OCT. 18, 1904.

R. W. SMITH.

MEANS FOR CUTTING TOOTHED PINIONS, SPROCKET WHEELS, OR THE LIKE.

APPLICATION FILED FEB. 17, 1904.

NO MODEL. 2 SHEETS—SHEET 1.

Fig. 3.

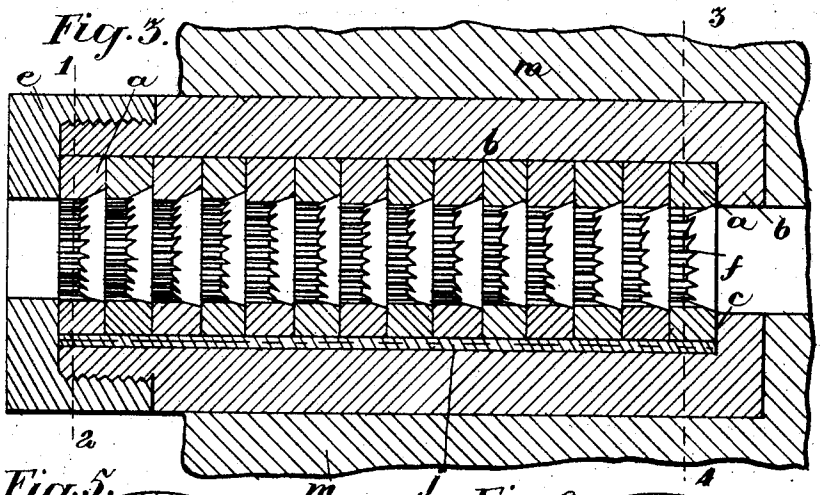


Fig. 5.

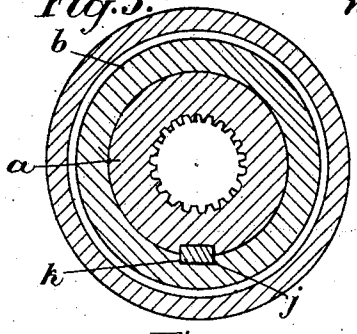


Fig. 2.

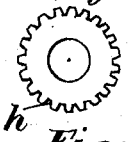


Fig. 6.

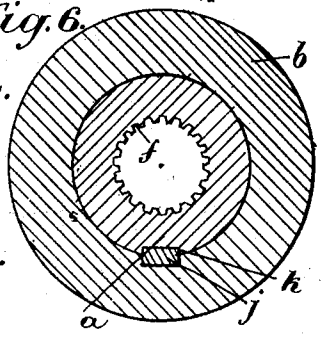


Fig. 1.

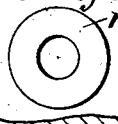
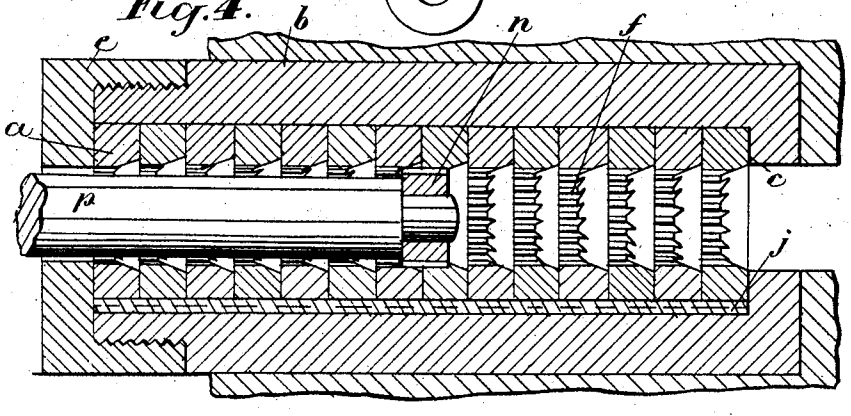


Fig. 4.



Witnesses.
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his attorney

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NO MODEL. 2 SHEETS—SHEET 2.

FIG. 7.

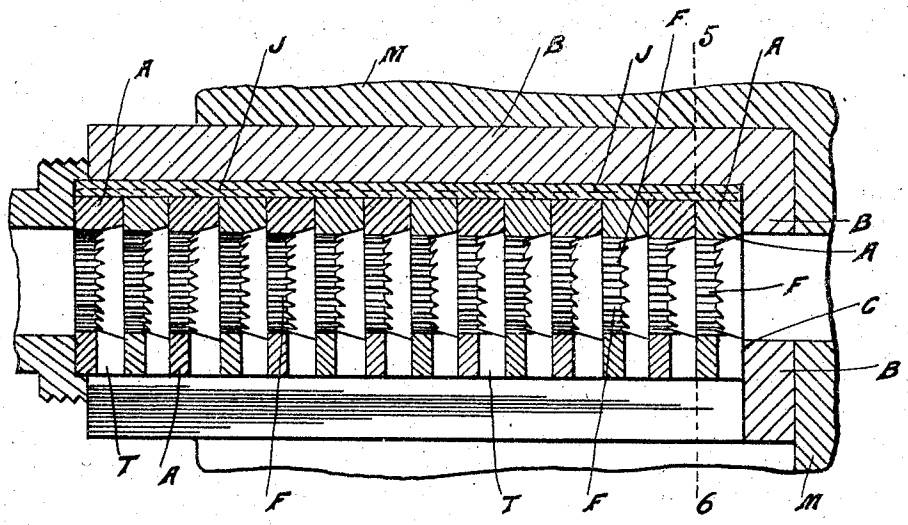
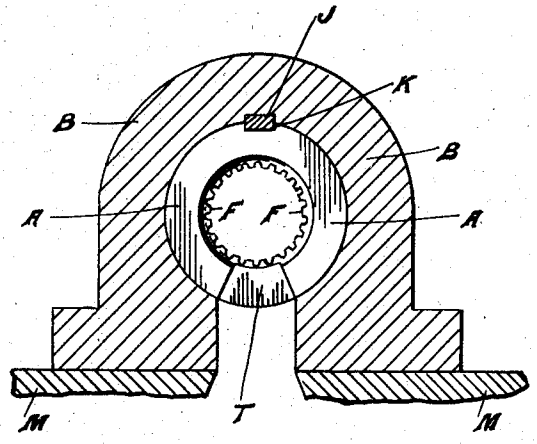


FIG. 8.



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No. 772,841. Patented October 18, 1904.

UNITED STATES PATENT OFFICE.

ROBERT WALKER SMITH, OF STONELEIGH, REDDITCH, ENGLAND.

MEANS FOR CUTTING TOOTHED PINIONS, SPROCKET-WHEELS, OR THE LIKE.

SPECIFICATION forming part of Letters Patent No. 772,841, dated October 18, 1904.

Application filed February 17, 1904. Serial No. 194,099. (No model.)

To all whom it may concern:

Be it known that I, ROBERT WALKER SMITH, works managing director, a subject of the King of Great Britain, and a resident of Stoneleigh, Redditch, in the county of Worcester, England, have invented certain new and useful Improvements in Means for Cutting Toothed Pinions, Sprocket-Wheels, or the Like, (for which I have applied for a patent in Great Britain, Patent No. 16,928, dated August 4, 1903,) of which the following is a specification.

This invention relates to improvements in the mode of and means for cutting toothed pinions, sprocket-wheels, and the like, and has for its object a means whereby the whole of the teeth of a pinion or sprocket can be cut at one process, thus very materially reducing the cost of manufacture of such articles and at the same time producing a pinion or sprocket-wheel which is perfectly true in every respect.

In order that this invention may be clearly understood and more easily carried into practice, I have appended hereunto two sheets of drawings, upon which I have illustrated the nature of my said invention, together with the mode of carrying the same into effect.

Figure 1 is an elevation of the blank from which the pinion is to be formed. Fig. 2 is an elevation of the pinion complete after being passed through the tool. Fig. 3 is a longitudinal sectional elevation through the tool for cutting the pinions. Fig. 4 is a similar longitudinal sectional elevation to that of Fig. 3, but showing the operation of cutting the pinion. Fig. 5 is a cross-section on the line 1 2, Fig. 3, but illustrating one of the hardened-steel rings of cutters, such as provided at or near the entrance end of the tool. Fig. 6 is a similar cross-section to Fig. 5, but on the line 3 4, Fig. 3, and illustrating one of the hardened-steel rings of cutters, which are provided at or near the exit end of the tool. Fig. 7 is a longitudinal sectional elevation similar to Fig. 3 and illustrating a means for enabling the cuttings to escape from the tube. Fig. 8 is a cross-section of the tool shown in Fig. 7 upon the line 5 6.

In carrying this invention into effect the tool consists of a series of hardened-steel rings A contained within a tube or casing B, which is provided with the flange or shoulder C at the one end, against which flange or shoulder the end ring A butts, while the whole of the rings A are preferably retained in the casing by the screw-cap E. The internal circumferences of all of the steel rings are shaped to form the projecting cutters F, which correspond in number to the numbers of spaces between the teeth required in the sprocket or pinion to be cut, while the diameter of the ring between the cutting edges F, as also the shape of such cutting edges, are varied in each ring, commencing with shallow and broad cutters F, with the larger diameter of the ring of cutting edges similar to those illustrated in Fig. 5, and graduating in the intermediate rings so as to finish with cutters such as illustrated by Fig. 6, which are shaped as required to finish the sides of the teeth and which project sufficiently from the rings to complete the cutting of the spaces between the teeth H of the pinion.

A key J is fixed longitudinally in the tube or casing B, while each of the rings is slotted at K, so as to fit the key, and thus insure the perfect alinement of the cutters.

In the process of cutting the teeth the tool is preferably fixed on the bed M of a machine, while the blank N is forced straight through the rings of cutters, such forcing action being effected by the one end of a reciprocating rod P, the other end of which may be mounted upon a traveling carriage, actuated by a screw in the case of the smaller pinions or by hydraulic pressure in the case of the larger class of toothed wheels.

A portion of the rings may be cut away or recessed on the lower sides intermediately between the cutters, as illustrated by Figs. 7 and 8, and a corresponding slot T provided in the under side of the casing B in a position linable with the recesses to permit of the cuttings dropping through.

Having now described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

In a means for cutting toothed pinions, sprocket-wheels and the like the combination of a tubular casing, a plurality of annular cutting-rings contained therein, and graduated alining cutters for the internal faces of the cutting-rings arranged successively from the initial to the finishing rings and a discharge-outlet for each ring.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

ROBERT WALKER SMITH.

Witnesses:

WALTER H. E. BARTLAM,

JUSTUS JONES.