

(No Model.)

W. J. PERKINS.
CONSTRUCTION OF INTERMESHING TEETH.

No. 598,436.

Patented Feb. 1, 1898.

Fig. 1.



Fig. 7.

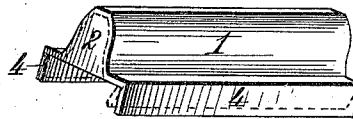


Fig. 2.



Fig. 8.

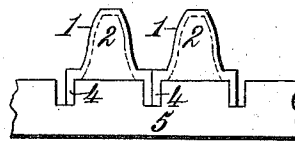


Fig. 3.

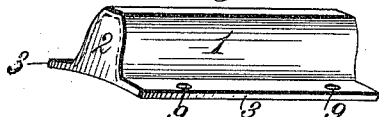


Fig. 9.

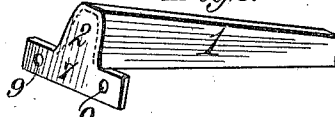


Fig. 4.



Fig. 10.

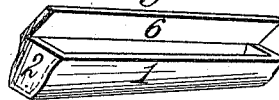


Fig. 5.

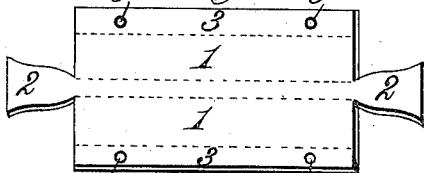


Fig. 11.

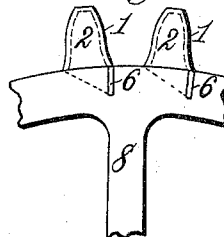
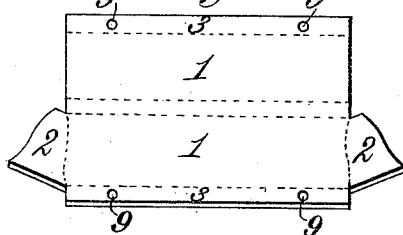


Fig. 6.



Witnesses.
Robert Everett.
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UNITED STATES PATENT OFFICE.

WILLIS J. PERKINS, OF GRAND RAPIDS, MICHIGAN.

CONSTRUCTION OF INTERMESHING TEETH.

SPECIFICATION forming part of Letters Patent No. 598,436, dated February 1, 1898.

Application filed July 24, 1896. Serial No. 600,431. (No model.)

To all whom it may concern:

Be it known that I, WILLIS J. PERKINS, a citizen of the United States, residing at the city of Grand Rapids, in the county of Kent and State of Michigan, have invented a certain new and useful Construction of Intermeshing Teeth, of which the following is a specification.

This invention relates to a new and useful construction of intermeshing teeth to be attached to pattern bodies or backing in making patterns for gearing of all characters and forms. The teeth are adapted for attaching to the body, disk, segment, or other support, thereby forming patterns from which any desired form of cog, gear, or tooth rack mechanism may be cast or molded; and the objects of my invention are to construct a pattern gear or rack tooth from sheet metal, papier-mâché, or other suitable material, which shall, preferably, be light and which, therefore, can be cheaply transported; to make such pattern-teeth of a material of sufficient consistency to retain their shape and not liable to become split, bruised, abraded, or dented by use and not injured by the vent-wire or other appliances used in molding from the finished patterns; also to furnish accurately-fitting intermeshing teeth, thereby producing a more perfect gearing, each tooth having an exact counterpart as to form, shape, dimension, and spacing of every other tooth and space in the cooperating gear; also to lessen the work of the pattern-maker by furnishing him with finished gear-teeth which are absolutely accurate and on scientific rolling curves, furnishing in themselves a measurement for the pattern-blank and entailing no labor in spacing and adapted to be readily attached to the pattern-body; also to increase the durability of patterns and to furnish a standard tooth for a standard pitch, so that gearing may be interchangeable, like bolts and nuts of any adopted standard; also to furnish teeth having uniform draft and mathematical accurate curves for rolling motion; also to diminish the cost of the finished pattern by lessening the amount of skilled labor required to complete it. These objects are accomplished by means of the elements illustrated in the accompanying drawings, although I do not limit myself to the exact forms therein shown, but

reserve the right to modify same as the occasion and experience may require.

Figures 1 and 2 represent perspective views of a detached tooth adapted to be attached to a pattern-blank or form in order to produce a tooth proper. Figs. 3 and 4 represent perspective views of a tooth adapted to be applied to a blank form in making a pattern for a cog-wheel. Figs. 5 and 6 are blanks cut from sheet metal of suitable form for the after-construction therefrom of cogs or teeth substantially similar to those shown by Figs. 1 and 2. Fig. 7 shows a perspective view of a modified form of tooth having flanges attached to hold the teeth upon the pattern-body and to equalize the spacing between the teeth. Fig. 8 shows an end view of two cogs constructed in accordance with the cog-tooth shown in Fig. 7 attached to a rack or straight support, although a modified form would adapt them to complete a gear-wheel. Fig. 9 shows a perspective view of a bevel or miter cog having a flange at one end for attaching the same to the pattern-body. Fig. 10 shows a perspective view of a cog or tooth having a flange at one side. Fig. 11 shows an end view of two cogs or teeth constructed in form like the cog or tooth shown in Fig. 10 and attached to the pattern-body. The dotted lines in Fig. 11 are designed merely to show the direction of the strain which holds the teeth to the blank.

Similar figures refer to similar parts throughout the several views.

The cog or tooth is made, preferably, of a sheet-metal blank cut out of a sheet of suitable shape and size and pressed or struck up in dies of suitable form, although it may be formed from solid metal by the drop-forging process. The body of the cog is shown by 1, the flanges are shown by 3 3, and the end of the cog by 2. The cog or tooth may be attached to the pattern-blank by means of pins, nails, or screws passing through suitable holes in the flanges, or by means of friction or spring contact of the flanges 4 and 6 either on the wood or against each other. I have shown the holes in the flanges by 9 9.

The blank from which the tooth is to be made may be cut into suitable form for the required form of pattern-tooth and then be fashioned into suitable form by means of proper dies, or a tooth may be formed out of

material of any suitable shape or form by means of dies and pressure for drawing or forcing the material into suitable form, or, if preferred, the hollow pattern-tooth may be
5 molded and cast into the required form.

In Figs. 7 and 8, 4 4 show a form of flange used in attaching the tooth to the pattern-blank without the use of nails, screws, or pins. In Fig. 8, 5 represents the pattern-body for the
10 tooth proper or rack 1. In Fig. 9 there is a flange at one end, (shown by 7,) the design of the flange being to facilitate the attachment of the pattern-tooth to the pattern-body or to the backing used on the rack. In Fig. 10
15 the attaching-flange is shown at 6. By having this flange bent to the proper shape it will engage with the groove in the pattern-body, as shown in Fig. 11, and will by its bite or cramp retain the tooth in position upon
20 the pattern-body. The pattern-body is shown by 8 in Fig. 11.

In the drawings I have shown but a few of the many forms of pattern-teeth that may be made in accordance with my invention; but
25 it will be understood that the form of the tooth may be varied to adapt it to all forms of cog-gearing—as spur, miter, bevel, and other forms in which the tooth has its central axis on a straight line—and also to all sizes.
30 The teeth may be made of metal or other non-fibrous material.

The flanks of the teeth may also be made to exact curves of involute, cycloid, epicycloid, or hypocycloid form. The pitch and
35 length of the tooth may be varied to suit.

The gearing-teeth may also be used for in-

ternal and disk gearing, and I do not limit myself to the exact forms shown and described. It is my design to manufacture a
40 line of pattern-teeth complete of forms and sizes required for gearing mechanism and to furnish the same to the pattern-makers and others throughout the country in order to enable the pattern-makers to finish and complete
45 patterns of superior excellence in their accuracy and finish, and also to cheapen the production, as well as to improve the quality, of the patterns or castings or moldings made therefrom.

Having thus described my invention, what
50 I claim to have invented, and desire to secure by Letters Patent, is—

1. The combination with a pattern-body having a curved periphery, of a series of pattern-teeth detachably secured to and spaced
55 apart on the periphery of said pattern-body and each tooth having its central axis in a straight line, substantially as described.

2. The combination with a pattern-body, of a series of pattern cog-teeth provided at
60 the base with flanges projecting from the sides for attachment of said teeth to said pattern-body in series and to serve as spacing-bearings for the teeth in the formation of a
65 complete pattern for molding cogged gear mechanism, substantially as described.

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

WILLIS J. PERKINS. [L. S.]

Witnesses:

EDWARD TAGGART,

CHRISTOPHER HONDELINK.