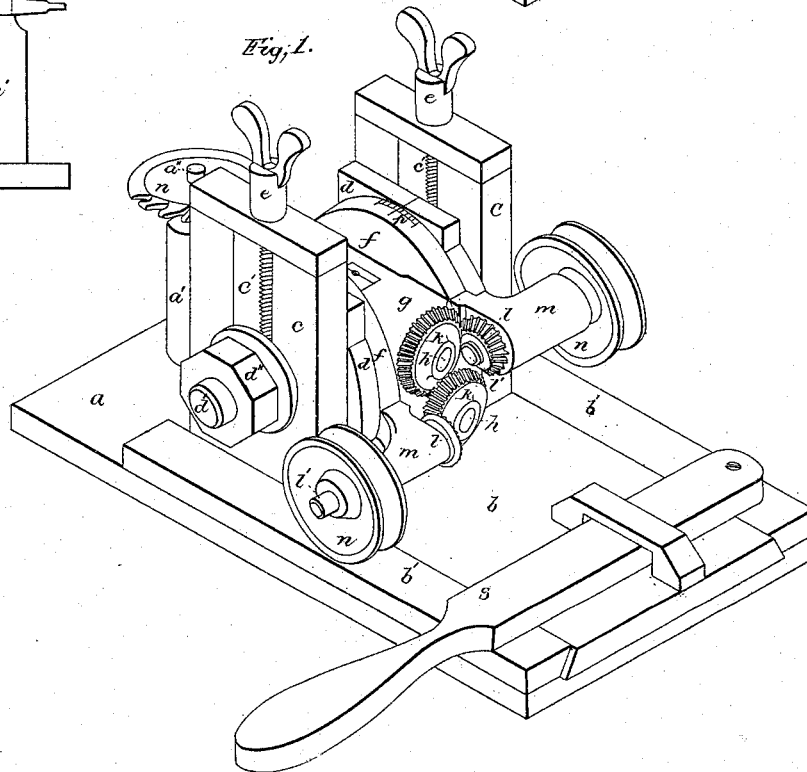
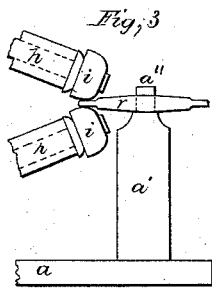
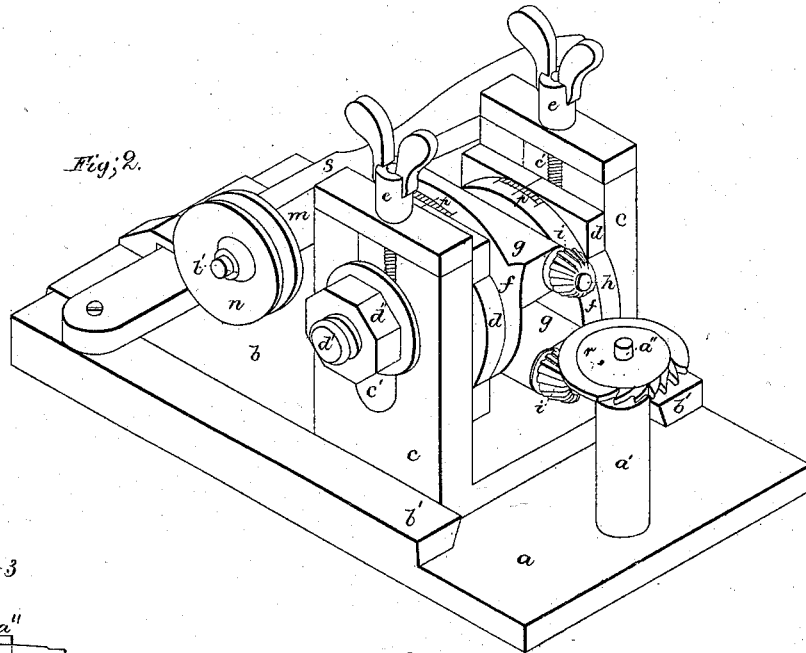


A. JENNINGS.
 MAKING CUTTERS FOR GEAR CUTTING ENGINES.

No. 7,219.

Patented Mar. 26, 1850.



UNITED STATES PATENT OFFICE.

ANDREW JENNINGS, OF FALL RIVER, MASSACHUSETTS.

MACHINE FOR FORMING ROTARY CUTTERS.

Specification of Letters Patent No. 7,219, dated March 26, 1850.

To all whom it may concern:

Be it known that I, ANDREW JENNINGS, of Fall River, in the county of Bristol and State of Massachusetts, have invented a new
5 and Improved Machine for Making Cutters for Gear-Cutting Engines; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the annexed drawings making a
10 part of this specification, in which similar letters refer to like parts in all the figures.

Fig. I is a perspective of one end of my machine. Fig. II is a perspective of the reverse of my machine. Fig. III is a section
15 through the cutting parts showing their angle &c.

My invention consists mainly in an improved method of making the cutter, or tool, for a gear cutting engine; and I use a
20 "head" having two steel cutters so placed and operated, as to be susceptible of a greater degree of nice adjustment, and consequently am capable of producing a more perfectly formed tool for cutting gear, than
25 any method hitherto in use.

The construction of my "head" is as follows—On a suitable bed (*a*) I place near one end, and perpendicular to it, a standard (*a'*), on a pin (*a''*) at the top of which, the
30 tool to be shaped, is to be placed or held. A plate (*b*) is made to slide longitudinally on the bed (*a*), and is confined within guides (*b'*, *b''*). This plate has an upright piece at each side (*c*, *c'*) which sustain the moving
35 parts of the machine. On the inner side of each of these uprights, a plate is attached (*d*) which is confined to the upright by a bolt (*d'*) passing through it, and working in a slot (*c'*) in the upright; a nut (*d''*)
40 on this bolt secures the plate (*d*) at any desired height. A thumb-screw (*e*) working through the top of the upright and into the shaft of the bolt (*d'*) is used for more readily adjusting the plate to a proper position.
45

The inner side of each of the plates (*d*) has on it a circular piece or disk (*f*); the bolt (*d'*) passes through the center of this disk, and the head of it (not seen in the
50 drawing by reason of intervening parts,) confines the disk to the plate. Across the inner face of each disk, either made solid with it, or firmly fixed to it, is a box (*g*), projecting far enough to bring a shaft (*h*)
55 which revolves in each of these boxes, into the same perpendicular plane, which plane

also passes through the center of the standard (*a'*). On the end of each shaft (*h*, *h'*) nearest to the standard is fixed a wheel (*i*) which is the cutting instrument. It is of
60 tempered steel, and the cutting parts are arranged across the edge of it to which such shape is given as will produce in reverse the desired angle or epicycloidal curve when brought into contact with the face of the
65 tool to be formed, and which angle or curve will be directly represented on the sides of teeth made by cutters prepared by my method.

On the opposite ends of each shaft (*h*, *h'*)
70 is a bevel wheel (*k*, *k'*) which gears into another (*l*) placed at right angles with its axis. The shaft (*l'*) of the bevel wheel (*l*) revolves in a box (*m*) firmly fixed on the edge of the disk (*f*) in such position that
75 the shafts (*l'*, *l''*) shall be parallel to the axes of the disks. On the end of each of these shafts opposite to the bevel wheels (*l*) is a pulley (*n*) over which passes the cord or band conveying the motion by
80 which the operation is effected. A scale is laid off on the edge of the disk (*p*) in order to determine more accurately the relative angle given to the steel cutters, which angle is given by turning each disk, and of course
85 the parts fixed to it, around its center which is the bolt (*d'*). The operation of my invention will be thus: The tool or cutter (*r*) to be shaped, is placed on the pin (*a''*) forming the prolongation of the standard
90 (*a'*) which is of a size corresponding to the hole in the cutter (*r*). By raising or lowering the plates (*d*, *d'*) and turning the disks (*f*, *f'*) on their centers, the steel cutters (*i*, *i'*) are brought with their respective axes
95 at such an angle with, and their cutting edges at such a distance from, each other, as will reduce the tool (*r*), when it comes between them, to the required form. Motion is then given by cords or bands to the
100 pulleys (*n*, *n'*) which motion is transmitted by the intermediate shafts and bevel wheels to the steel cutters (*i*, *i'*) causing them to revolve in opposite directions.

The sliding plate (*b*), to which is attached the moving parts of my machine, is moved up toward the standard (*a'*) by a
105 lever (*s*), or by equivalent mechanical means, until the steel cutters (*i*, *i'*) are, the one above, and the other below, the edge of
110 the tool (*r*), when the work of properly shaping it commences. The steel cutters

moving in opposite directions cause the tool
between them to revolve on the pin (*a''*);
they are gradually fed up by the lever (*s*),
and the operation continues until the re-
5 volving steel cutters (*i, i,*) have reduced
that part of the tool which is between them
to the shape and size for which they were
arranged.

What I claim as of my own invention and
10 for which I desire Letters Patent of the
United States, is—

The arrangement upon puppet heads hav-
ing a sliding motion upon a bed-plate, of
adjustable slides, supporting disks to which

are attached the boxes in which the cutter- 15
shafts revolve; the disks being capable by
means of vibratory motion on their axes, of
adjusting the cutter-shafts to any required
angle with the horizon, and the whole ma-
chine being for the purpose of shaping at 20
the same time both faces of a revolving
cutter, substantially as herein described.

ANDREW JENNINGS.

Witnesses:

NATHAN D. DEAN,
ADMIRAL I. WARREN,
DAVID TOWLE.