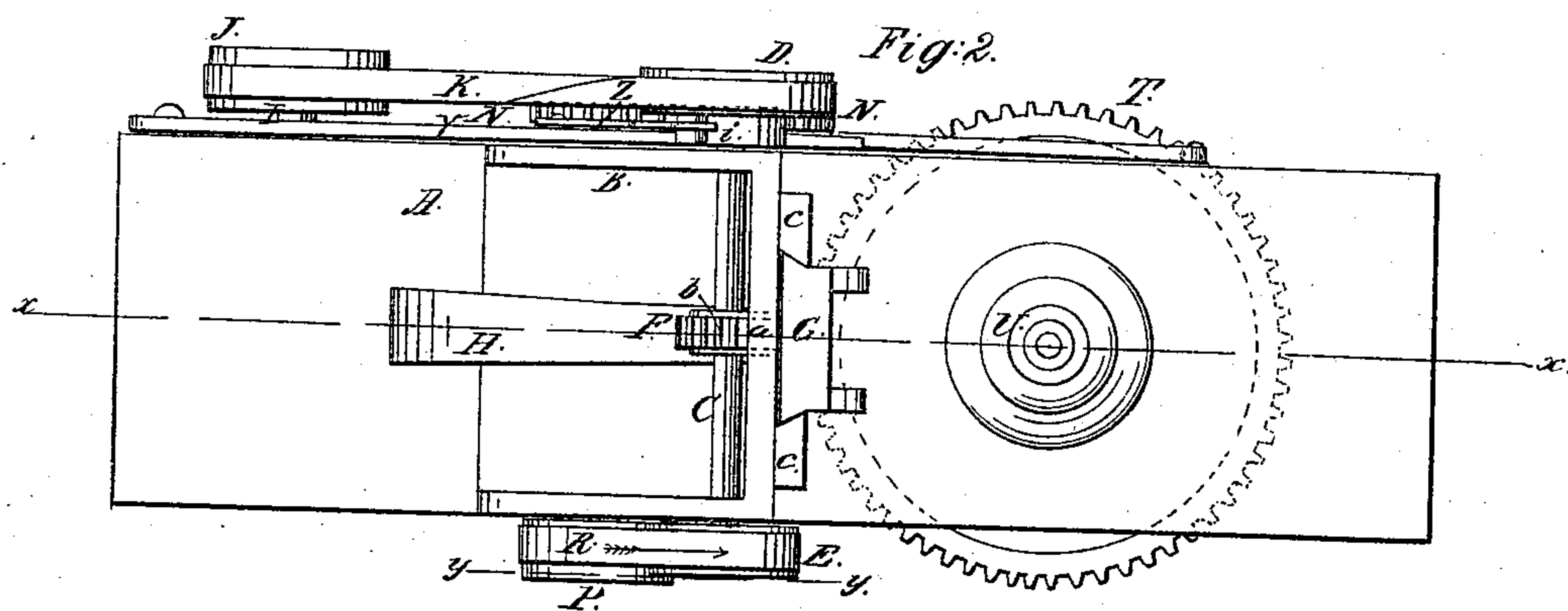
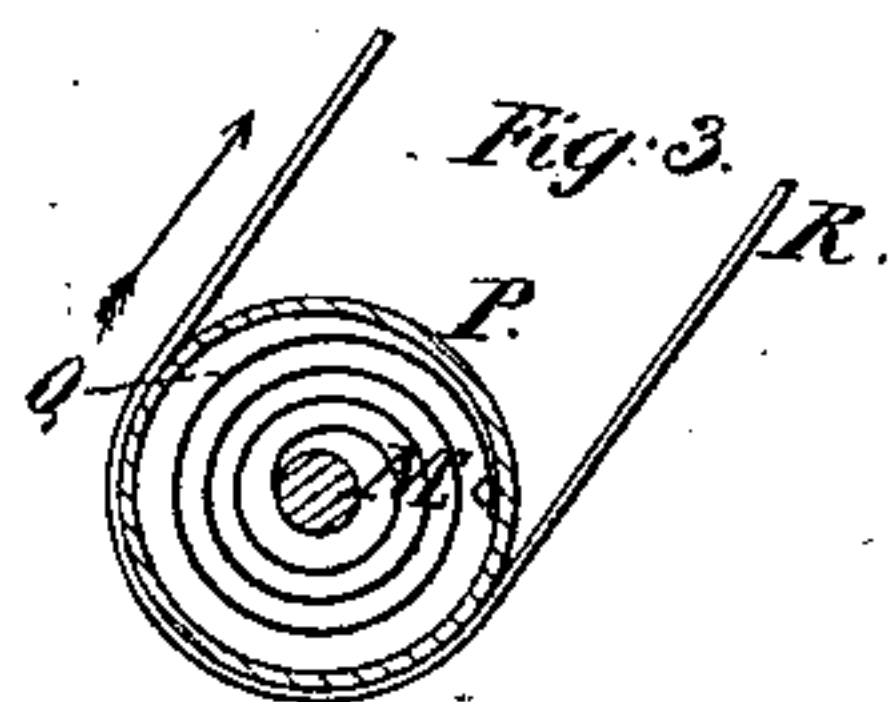


Patented Nov. 20, 1855.

N^o 13,813.



UNITED STATES PATENT OFFICE.

G. W. BIGELOW, OF NEW HAVEN, CONNECTICUT.

CUTTING TEETH OF GEAR-WHEELS.

Specification of Letters Patent No. 13,813, dated November 20, 1855.

To all whom it may concern:

Be it known that I, G. W. BIGELOW, of New Haven, in the county of New Haven and State of Connecticut, have invented a new and Improved Machine for Cutting the Teeth of Gear-Wheels; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the annexed drawings, making a part of this specification, in which—

Figure 1, is a longitudinal vertical section of my improvement, (*x*), (*x*), Fig. 2, showing the plane of section. Fig. 2, is a plan or top view of ditto. Fig. 3, is a detached section of the coil spring and pulley (*y*), (*y*), Fig. 2 shows the plane of section.

Similar letters of reference indicate corresponding parts in the several figures.

The nature of my invention consists in giving the "blank" or wheel to be cut an automatic feed motion as will be presently shown and described.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction and operation.

A, represents a bed plate supported by legs or a suitable framing and B, represents a head placed or secured on the bed plate so that it may be adjusted at different points thereon. In the head B, there is placed transversely a shaft, C, having a pulley D, on one end and a pulley E, on the opposite end. On the shaft C, at about its center there is placed a pinion F, the periphery of which has two smooth portions (*a*), (*a*). At opposite points the other portions of the periphery are provided with teeth (*b*), as shown clearly in Fig. 1. The front side of the head B, has two vertical guides (*c*), (*c*), attached to it between which a slide or cutter stock, G, is fitted and allowed to slide freely up and down. The back side of the slide or cutter stock has a rack (*d*), cut in it in which rack the teeth of the pinion F, gears when the slide or cutter stock is forced downward the periphery of the pinion projecting through a slot cut in the front plate of the head B.

H, is a spring the back end of which is attached to the bottom plate of the head B. The front end of the spring bears against the under side of the slide or cutter stock, G. The cutter which is of the usual "bur" form is placed on a small shaft in the slide or stock, G.

I, is the driving shaft placed at one end

of the bed A, and having a pulley, J, upon it around which a cross belt K, passes, said belt also passing around the pulley D, at one end of the shaft, C.

Transversely underneath the bed, A, there are placed two shafts, L, M, which are connected by gear wheels, N, N, at one end. The end of the shaft, M, has a circular or cam shaped plate, O, attached to it adjoining its gear wheel. This plate has two shoulders or projections (*e*), (*e*) at opposite points of its periphery. The opposite end of the shaft M, has a hollow pulley, P, placed loosely upon it and a coil spring, Q, is placed within the pulley the inner end of the spring being attached to the shaft, M, and the outer end to the inner periphery or side of the pulley, P, as clearly shown in Fig. 3.

R, is a belt which passes around the hollow pulley, P, and around the pulley, E, at the end of the shaft, C.

Upon the shaft, L, at about its center there is placed a screw S, which gears into a worm wheel, T, attached to the lower end of a shaft, U, which passes vertically through the bed, A. The shaft U, has a boss, V, upon it which boss rests upon a collar, W, which encompasses the shaft and rests upon the bed A, see Fig. 1.

X, is a pawl attached by a pivot (*f*), to one side of the bed, A. This pawl has a spring (*g*), bearing under its outer or back end which spring keeps the front end of the pawl bearing upon the periphery of the circular plate, O, on the shaft, M.

Y, is a bar one end of which is attached by a pivot to the side of the bed A. This bar has projections on its opposite end which projection bears upon the outer end of the pawl X, see dotted lines Fig. 1. The bar Y has an arm Z, attached to it, the upper end of which bar has a recess (*h*), made in it, in which recess pins (*i*), (*i*), on the inner side of the pulley D, catch at certain times as will be presently shown.

Operation: The blank or wheel to be operated upon, shown in blue Fig. 1, is placed upon the upper end of the shaft U, the edge of the blank or wheel will then project the requisite distance underneath the cutter in the slide or stock G the head B being adjusted so as to bring the cutter in the proper position. Motion is then given the driving shaft I, in any proper manner and the shaft C, will rotate and the pinion F, will force

down the slide or stock G, and the cutter will cut a recess in the periphery of the blank, and when the cutter has performed its work one of the smooth portions (a) of the periphery of the pinion F, will come in contact with the rack (d), and the spring H, will throw up the slide or stock G, to its original position. Just previous to the termination of the downward stroke of the slide or stock G, one of the pins (i), will catch into the recess (h) in the upper end of the arm Z, and will raise the bar Y and the belt R, while the slide or stock G, is descending will wind up the coil spring Q, the shaft M, being prevented from turning in consequence of the pawl X, bearing against one of the shoulders or projections (e), on the circular plate O. As soon as the slide or stock G, is thrown up by the spring H, the pin (i), will pass out of the recess (h), in the arm Z, and the bar Y will fall and strike upon the outer end of the pawl X, and throw the inner end free from the shoulder or projection (e), and the coil spring Q, will then rotate the shaft M, about half a revolution or until the pawl catches against the other projection or shoulder (e), and the shaft L, will also be rotated in consequence of the gear wheels N, N, and the screw S, will turn the worm wheel T, and the "blank" will be turned a requisite distance according to the size of the "blank" or the thickness of the teeth

upon the "blank." The blank may be turned a greater or less distance at each stroke of the slide or cutter stock by placing different sized wheels N, N, upon the shafts L, M.

By the above invention the teeth of wheels are cut solely by the machine. The attendant merely putting the "blank" upon the shaft U, and taking the finished wheels therefrom. The machine works rapidly and well. The machines in use have no automatic feed movement the "blank" being moved around by hand.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is,

Giving the blank or wheel to be cut an automatic feed motion by means of the pulley P, on the shaft M, said pulley having a coil spring Q, within it the screw S on the shaft L, the worm wheel T, on the lower end of the shaft U, and the circular plate O, having projections (e), (e), upon its periphery and the pawl X, and bar Y, provided with the arm Z, the arm being operated by the pins (i), on the inner side of the pulley D, the above parts being arranged substantially as shown and described.

G. W. BIGELOW.

Witnesses;

CHARLES IVES,
HOBART B. BIGELOW.