C. H. MORGAN.

Lathes for Turning Irregular Forms.

No. 148,895. Patented March 24, 1874.

Fig. 1.

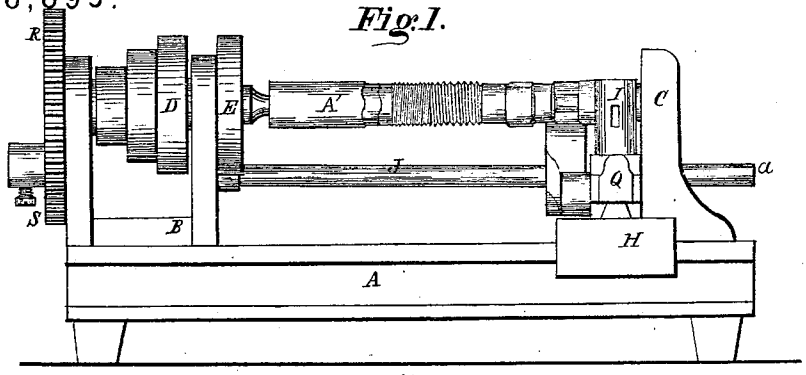


Fig. 2.

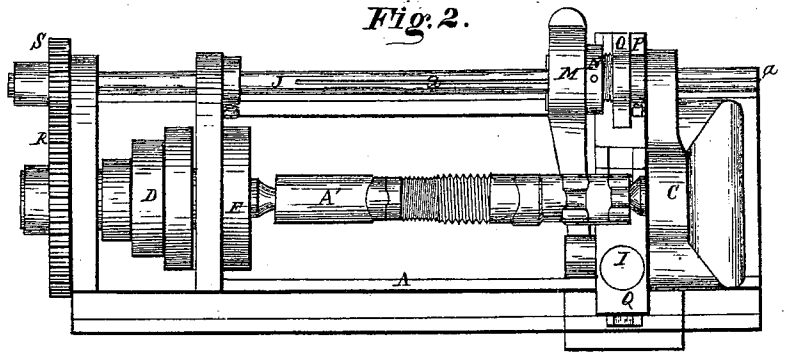


Fig. 3.

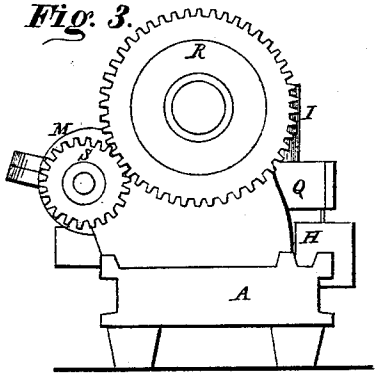


Fig. 4.

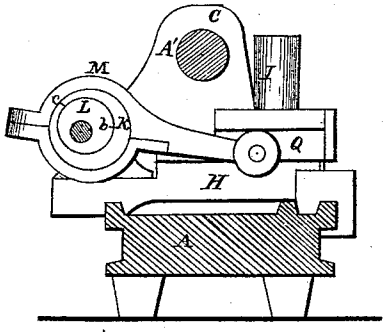


Fig. 5.

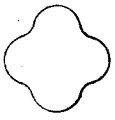
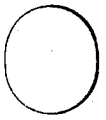


Fig. 6.

Fig. 7.



Witnesses.
A. F. Cornell.
E. W. Olds

Inventor.
Charles H. Morgan.
Per. Burridge & Co.
Attorneys.

UNITED STATES PATENT OFFICE.

CHARLES H. MORGAN, OF CLEVELAND, OHIO.

IMPROVEMENT IN LATHES FOR TURNING IRREGULAR FORMS.

Specification forming part of Letters Patent No. **148,895**, dated March 24, 1874; application filed February 12, 1874.

To all whom it may concern:

Be it known that I, CHARLES H. MORGAN, of Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and Improved Lathe, of which the following is a full and complete description, reference being had to the accompanying drawings making part of this specification.

Figure 1 is a side elevation of the lathe. Fig. 2 is a plan view. Fig. 3 is an end view. Fig. 4 is a transverse section. Figs. 5, 6, and 7 will be referred to.

Like letters of reference refer to like parts in the several views.

This invention is a lathe for turning irregular forms or variations in the number of sides required in a bar of iron, as a two-sided or oval form, three, four, or more sides on a straight bar, by the employment of a combination of eccentrics working one within the other, as herein more fully described.

In the drawings, A represents the bed of the lathe; B C, the head and foot-blocks; D, the pulleys; and E, the face-plate, all of which are or may be constructed in the ordinary way, or such modification thereof as may be suitable for the special purpose of the lathe. H is a tool-carriage, and I the tool-post. J is a shaft on which is fitted loosely, so as to slide thereon, an eccentric, K, Fig. 4, which, however, is carried around with the shaft as it revolves, by a feather held in the groove *a*, Fig. 2. To the eccentric K is closely fitted an eccentric, L, of which M is the eccentric strap or yoke in which it revolves. The face of the eccentric L is slightly tapering, so that the eccentric K will crowd or wedge thereon on being forced on by the nut or collar N fitted to the eccentric L. To the eccentric L is loosely attached the carriage H, by means of the standard O and collar P. To the tool-rest Q is pivoted the end of the eccentric-yoke, whereby it is moved toward and away from the work in the lathe, for a purpose presently shown. R is a cog-wheel made to engage the pinion S for operating the eccentric. The relative size of the wheel to the pinion may be varied according to the number of sides that the article in the lathe is required to have; for instance, if the bar A′ in the lathe is to be turned an oval, then the relative proportion of the wheel and pinion must be as two to one; if the article is to be turned three or four sided, then the changing of the wheel and pinion must be as three to one or four to one, &c., as the case may be.

The above-described lathe is especially intended to turn taps for threading nuts, though it is equally well adapted to turn other irregular or flat-sided work having length and a uniform thickness as a bar of iron.

The operation of the lathe is thus: A piece of round iron, A′, is centered and hung on the centers of the lathe in the usual way. If said piece of iron is to be turned of an oval or two-sided, as shown in Fig. 7, the relation of the wheel R to the pinion must be as two to one, causing the pinion to make two revolutions to one of the wheel.

The relation of the eccentric K to the eccentric L, when the mark *b* and *c*, Fig. 4, are together, is such as to cause no vibration of the tool-rest, for the reason that the shaft will be in the center of the eccentric K. Now, the distance that the tool will be required to move back from and toward the work will depend on the size of the bar or the amount to be turned off from the sides of it. This is regulated by the throw of the eccentric, which may be shortened or lengthened by turning the eccentric L more or less in the eccentric K away from the zero-mark *c*.

The eccentrics, on being properly adjusted for the movement of the tool, and the wheel and pinion having a relation of two to one, the work will be turned with flattened sides or oval, as seen in Fig. 7.

The degree of flatness or the extent of the oval will be in proportion to the amount cut away from the sides of the bar, and that amount will be as the throw of the eccentric, which, as above said, may be more or less, as the relation the two eccentrics are made to hold in respect to each other.

This mode of regulating the movement of the tool to the work is easily effected by simply loosening the nut or collar N, which will allow the eccentric L to be loosened in the eccentric K, and be turned therein, and be tightened again by screwing up the nut, thereby drawing back the tapering eccentric into the outer one K.

In the event the bar or iron in the lathe is required to be turned three-sided or four-sided or more, the wheel and pinion must have that relation to each other in order to obtain the necessary number of vibrations of the tool-rest to bring the tool to the face of the bar during one revolution the number of times that the bar is to have sides. Thus a wheel three to one of the pinion will turn a form like Fig. 6, and a wheel having a proportion of four to one of the pinion will give a form like unto Fig. 5, &c.

What I claim as my invention, and desire to obtain by Letters Patent, is—

The eccentric L, as arranged in relation to the eccentric K and yoke M, for operating the tool-rest, in combination with the differential gearing R S and shaft J, arranged substantially as and for the purpose set forth.

CHAS. H. MORGAN.

Witnesses:

J. H. BURRIDGE,

A. F. CORNELL.