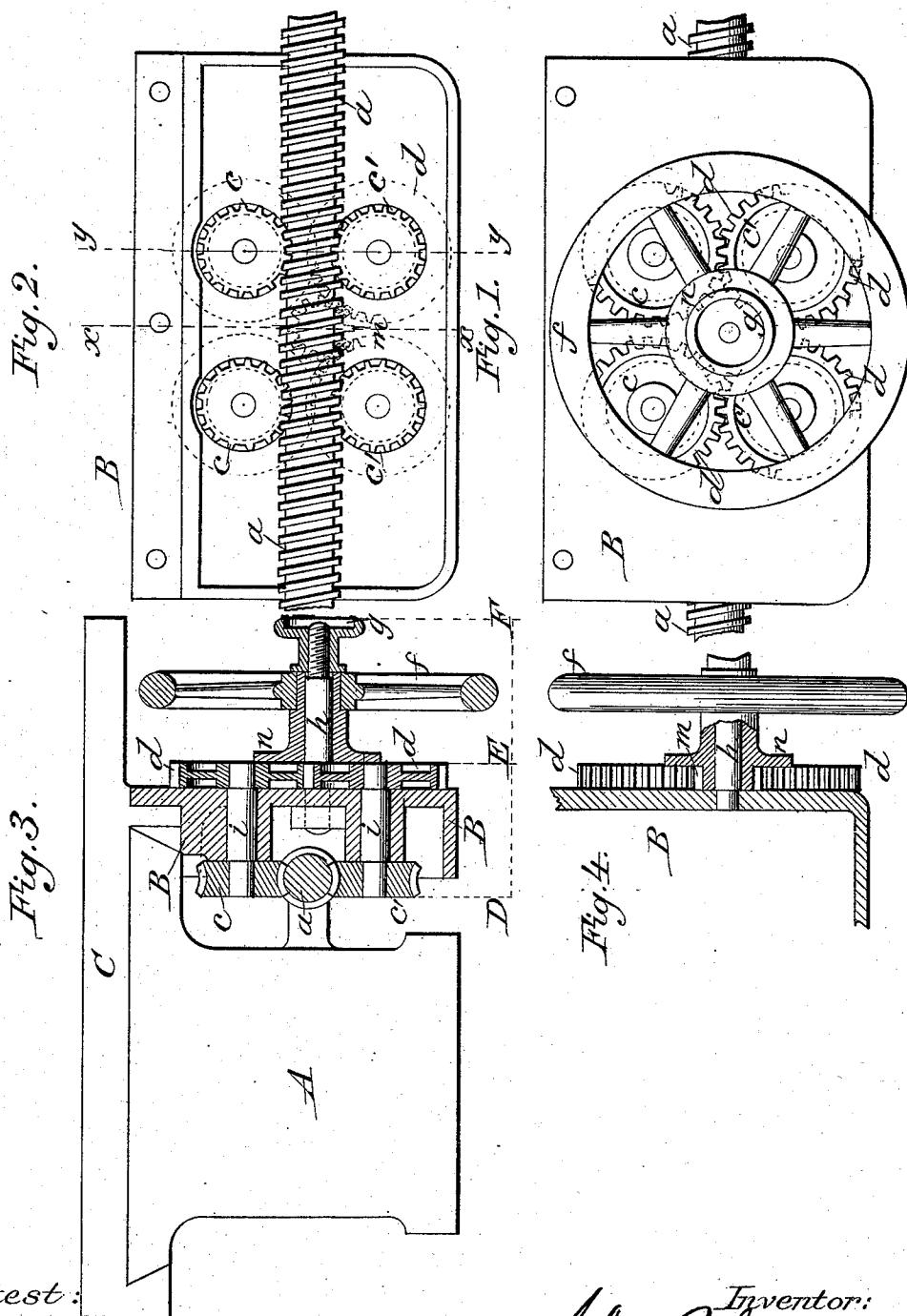


(No Model.)

J. RICHARDS.
ENGINE LATHE.

No. 258,121.

Patented May 16, 1882.



Attest:
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UNITED STATES PATENT OFFICE.

JOHN RICHARDS, OF SAN FRANCISCO, CALIFORNIA.

ENGINE-LATHE.

SPECIFICATION forming part of Letters Patent No. 258,121, dated May 16, 1882.

Application filed January 17, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOHN RICHARDS, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Engine-Lathes, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to engine-lathes; and it consists in a new and simple method of operating the carriages of such lathes by means of two or more tangent gear-wheels meshing into the lead-screw, and so arranged as to perform four functions—namely, to support the screw from flexure, to answer as a rack and pinion for moving the carriage, as a nut for feeding the carriage, and as an instantaneous friction feed motion that starts at any point, as hereinafter more fully described.

In the annexed drawings, Figure 1 is a front view of an engine-lathe apron provided with my improved gearing. Fig. 2 is a reverse or back view of the same. Fig. 3 is an end view of a lathe frame and carriage, showing the method of attaching the apron and gearing, said apron and gearing being in section on the lines *x x* and *y y*. Fig. 4 is a sectional detail on the line *x x*.

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

A is an ordinary lathe-frame; B, an apron; and C is the carriage.

Referring to Fig. 3, the apron and gearing are shown from D to E as being in section on the line *y y*, and from E to F as a section on the line *x x*.

a is the lead-screw. Gearing into this screw are four tangent-wheels, *c c* and *c' c'*, two of which are shown in section in Fig. 3. These wheels are attached to the shafts *i i*, on the other end of which are fastened the four common spur-wheels, *d d d d*, two of which are shown in section in Fig. 3. The pair of wheels *d* placed in the same line vertically gear together, as shown in Fig. 1, while the two lower wheels *d* are connected in a horizontal line by an intermediate pinion, *m*. In this way it will be seen that the four tangent-wheels inside the apron are all connected by the screw *a*, that meshes into each, and the four spur-

wheels *d* outside the apron are all connected also. The small pinion *m* answers a double function by connecting the two lower wheels *d*, and moves the whole train by means of the hand-wheel *f*, to which this pinion is connected. By revolving the screw *a* all these wheels *c* and *d* are set in motion, also the intermediate pinion, *m*, and hand-wheel *f*. When these are in motion the carriage C and apron B will be stationary; but as soon as the motion of these wheels, either *c* or *d*, is arrested, then the front wheels, *c* and *c'*, become in effect a screw-nut, and the carriage C is moved along the same as in the case of a common lathe. The pinion *m* and flange *n* are formed solid, and together with the hand-wheel *f* are mounted loose on the stud *h*, being kept on by the thumb-nut *g*. If this nut *g* is screwed up, the flange *n* presses on all four of the wheels *d*, pressing them against the face of the apron B and arresting their motion by friction. This retards or stops the whole train of wheels *c*, *c'*, and *d*, converting the wheels *c c'* into a screw-nut, as before explained. In this way it will be seen the carriage C can be moved back or forward by the wheel *f* the same as if a rack and pinion were employed, and that by arresting their motion the carriage starts instantly, but not positively unless the thumb-nut *g* is screwed up firmly.

Having thus described my invention, what I claim is—

1. In combination with the carriage of an engine-lathe, two or more tangent-wheels meshing into the lead-screw, substantially as shown and described.

2. In combination with the carriage of an engine-lathe, two or more tangent-wheels connected by spur-wheels, substantially as shown and described.

3. In combination with an engine-lathe carriage, an outer and inner train of gearing, connected and operating substantially as shown and described.

4. In combination with the carriage of an engine-lathe, two or more tangent-wheels connected with friction devices for retarding or arresting their motion, substantially as shown and described.

5. In combination with the carriage of an

engine-lathe, a train of connected spur and tangent wheels and a friction-clutch, substantially as shown and described.

5 6. In an engine-lathe, the combination, with the carriage C, apron B, and lead-screw *a*, of the tangent gear-wheels *c c'*, meshing with said screw, and provided with shafts *i i*, carrying spur-wheels *d d*, the pinion *m*, gearing with the lower pair of spur-wheels, and pro-

vided with flange *n*, and the hand-wheel *f* and nut *g*, substantially as shown and described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN RICHARDS.

Witnesses:

E. R. STEVENS,

D. J. PADDOCK.