(No Model.) 2 Sheets—Sheet 1.

B. E. PARKS.

LINK GRINDING MACHINE.

No. 339,010. Patented Mar. 30, 1886.

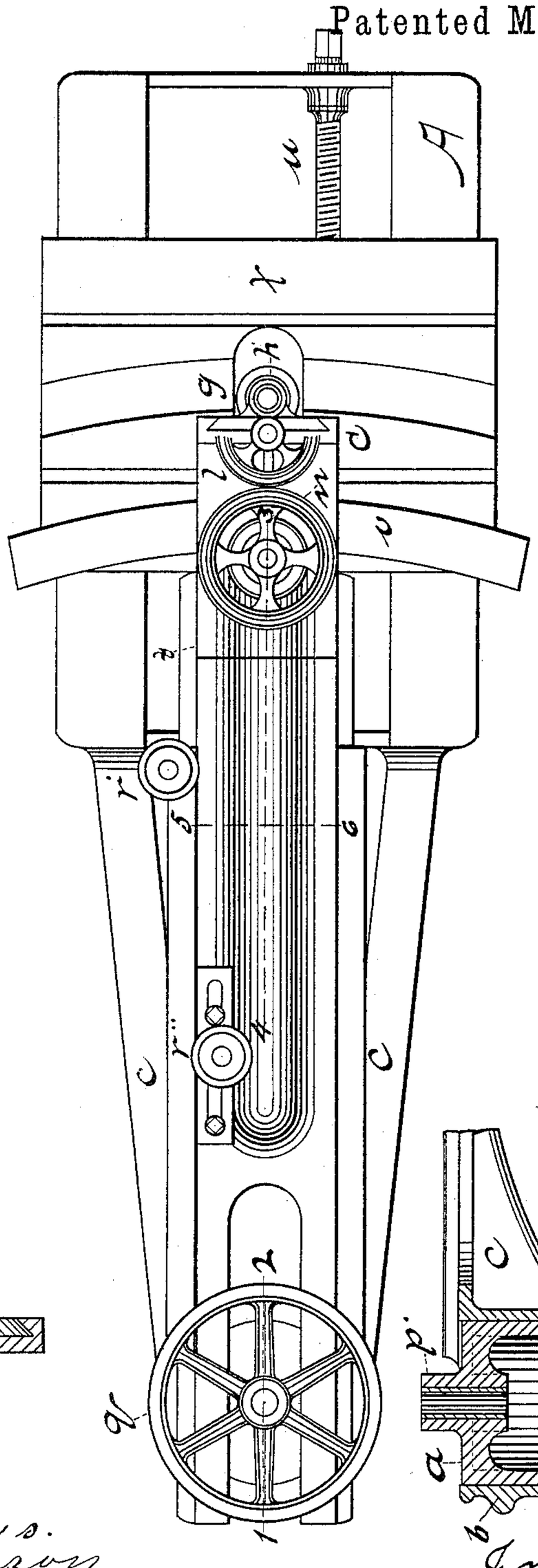

Fig. 1.

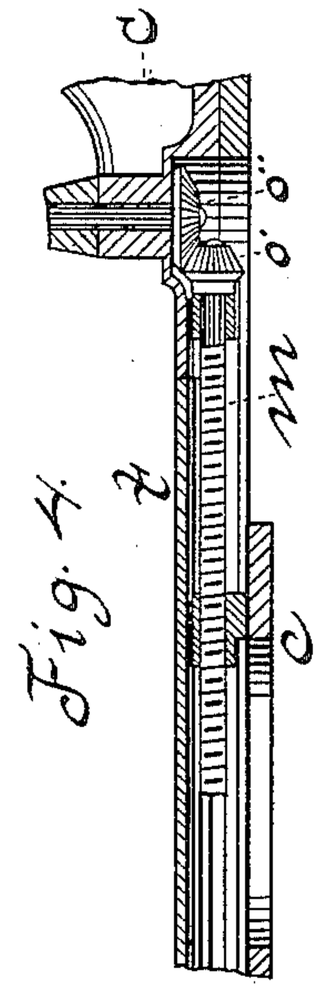

Fig. 4.

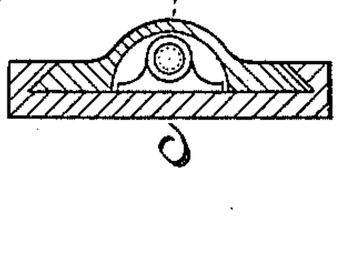

Fig. 5.

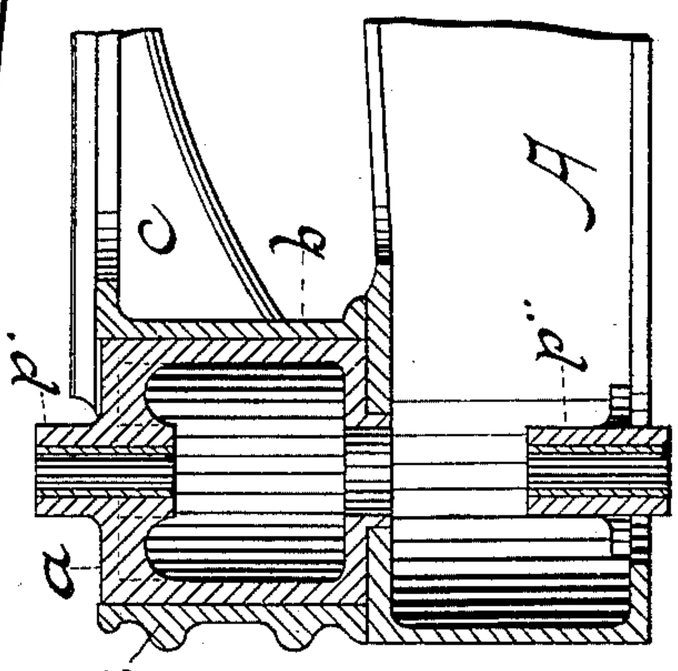

Fig. 3.

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(No Model.) 2 Sheets—Sheet 2.

B. E. PARKS.

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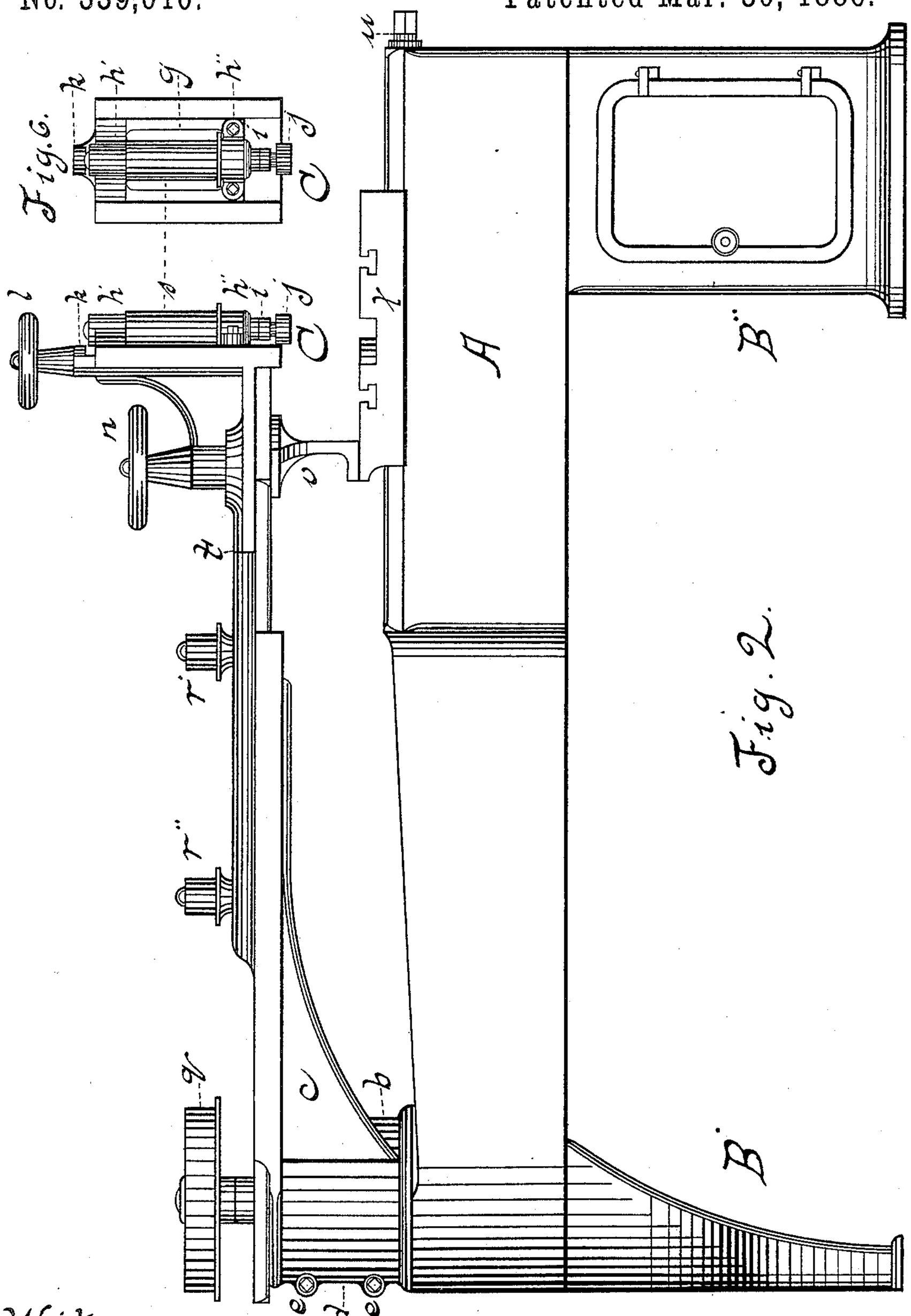

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Byron E. Parks

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UNITED STATES PATENT OFFICE.

BYRON E. PARKS, OF FERRYSBURG, MICHIGAN.

LINK-GRINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 339,010, dated March 30, 1886.

Application filed April 20, 1885. Serial No. 162,869. (No model.)

To all whom it may concern:

Be it known that I, BYRON E. PARKS, a citizen of the United States, residing at Ferrysburg, in the county of Ottawa and State of Michigan, have invented a new and useful Link-Grinding Machine, of which the following is a specification.

My invention relates to a machine for finishing links (for the valve-motion of reversing-engines) to a true arc of a desired radius by means of a revolving emery-wheel at the outer end of a swinging arm of variable length. I attain this object by the mechanism illustrated in the accompanying drawings.

Figure 1 is a plan view of the entire machine, and Fig. 2 a side elevation. Fig. 3 is a vertical section of a part of the machine on a line, 1 to 2, Fig. 1. Fig. 4 is a longitudinal section through the center of the swinging arm from 3 to 4, Fig. 1. Fig. 5 is a cross-section of the swinging arm from 5 to 6, Fig. 1. Fig. 6 shows a front elevation of the head C, that carries the grinder-spindle.

Similar letters refer to similar parts throughout the several views.

The bed A and standards B′ B″ constitute the frame-work of the machine. To the bed is bolted the cylindrical piece *a*, Fig. 3, which will be termed a "center piece," as it forms a pivotal center and support around which the rest of the working parts of the machine will swing. To the outside of the center piece, *a*, is fitted another cylindrical piece, *b*, which is cast in connection with the arm *c*.

The cylindrical piece *b* has a slot planed longitudinally through on the back side in the center of the lugs, (shown at *d*,) and the binding-screws *e′ e″* are inserted for the purpose of taking up wear.

The arm *c* is planed on top, and the sliding arm *f* is fitted to it, as shown in Fig. 5. On the outer end of the sliding arm *f* is bolted the head C, to which is fitted the vertically-sliding piece *g*, with the journal-bearings *h′ h″* attached, for the purpose of carrying the grinder-spindle *i*. On the lower end of the grinder-spindle *i* is secured an emery-wheel, *j*, which does the grinding.

The vertical movement of the sliding piece *g*, which has the journal-bearings *h′ h″*, carrying the grinder-spindle *i*, attached, is controlled by a screw which passes through the lug *k* on the top of the head C and engages a nut attached to the sliding piece *g*. The screw has a hand-wheel, *l*, attached to its upper end, by which it is operated when giving the emery-wheel its vertical adjustment.

The arm *c*, the sliding arm *f*, the head C, with the vertically-sliding piece *g* and journal-bearings *h′ h″*, carrying the grinder-spindle *i*, attached as previously described, and vertical and longitudinal adjusting-screws, with proper hand-wheels for operating them, constitute the swinging-arm arrangement of the machine, and may be swung through an arc of any number of degrees of a circle, according to the requirements of work being operated upon, the center piece, *a*, forming the pivotal center around which it swings. It will be seen that the emery-wheel *j*, located on the outer end of the sliding arm *f*, will swing in an arc whose radius shall equal the distance from the center of piece *a* to the center of the grinder-spindle *i*, and as the arm *f* has a longitudinal adjustment the radius of the arc in which the emery-wheel *j* will swing can be varied to suit the work being operated upon.

The manner of adjusting the arm *f* longitudinally to suit different requirements of work is illustrated in the section, Fig. 4. The screw *m* within the arm *f* engages a nut attached to the arm *c*, the screw *m* being operated by means of the hand-wheel *n*, the shaft to which the hand-wheel *n* is attached being connected with the screw by means of the bevel-gear and pinion *o′ o″*. By this means the emery-wheel may be readily adjusted to the radius of any arc within the compass of the machine.

The manner of belting used on the swinging arm is such that the sliding arm *f* may be moved longitudinally in either direction to its extreme limit without varying the length or tension of the belt.

Running vertically through the machine, and carried by the journal-bearings *p′*, located in the center of the center piece, *a*, and *p″*, bolted to the under side of the bed, (the bearings *p′ p″* being shown in Fig. 3,) is a shaft. On its lower end is to be placed the driving-pulley, which will receive its motion from a counter-shaft conveniently located. On the upper end of this vertical shaft is the pulley *q*, from which the pulley *s* on the grinder-spindle is belted. Starting from the pulley *q*,

the belt runs around the idler-pulley r', located on the outer end of the arm c, then back and around the idler-pulley r'', attached to the sliding arm f, then around the pulley s on the grinder-spindle i, located on the outer end of the arm f, and back to the pulley q. The slots shown on each side of the pulley s, through the head C and vertically-sliding piece g, Fig. 6, are provided for the belt in its passage around the pulley.

The bed A is planed on its top surface, and the platen t, to which work is secured while being operated upon, is fitted to it so as to have longitudinal adjustment by means of the screw u. To the platen t is bolted a support, v, for the outer end of the swinging arm, by which it may be kept on a true parallel line with the bed of the machine.

In using this machine the sliding arm f is adjusted so that the center of the grinder-spindle i on its outer end will swing in an arc of a desired radius, a "link" being secured to the platen t, which is then moved along the bed A by means of the adjusting-screw u until the center line of the opening in the link corresponds with the center of the grinder-spindle i. The emery-wheel on the spindle i being of a diameter slightly less than the opening in the link, is, by means of the vertically-adjusting screw, lowered into it. Then, by means of the longitudinal adjustment, explained previously, the emery-wheel, while in motion, is brought into contact with one of the faces in the opening. The arm is then swung around, so that the emery-wheel traverses from one end of the opening to the other, thus finishing the face to a true arc. Then, by a slight turn of the hand-wheel n, the emery-wheel is brought into contact with the opposite face of the opening and the operation repeated, and both faces are finished to a true arc and perfectly parallel with each other.

The link-block may be ground to fit the opening by practically the same method employed in finishing that part of the link.

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

The combination, in a machine for finishing work in metal to a true arc of any desired radius, of the center piece, a, the cylindrical piece b, with the radial arms c attached, the sliding arm f, and its longitudinal adjusting-screw m, with the bevel-gear and pinion o' o'', and the vertical shaft and hand-wheel n, the head C, provided with the vertically-sliding piece g, having the journal-bearings h' h'', carrying the grinder-spindle i, and the vertically-adjusting screw and hand-wheel l, the platen t, and screw u, for adjusting said platen longitudinally, all substantially as set forth, for the purposes specified.

BYRON E. PARKS.

Witnesses:
H. C. PEARSON,
C. A. PEARSON.