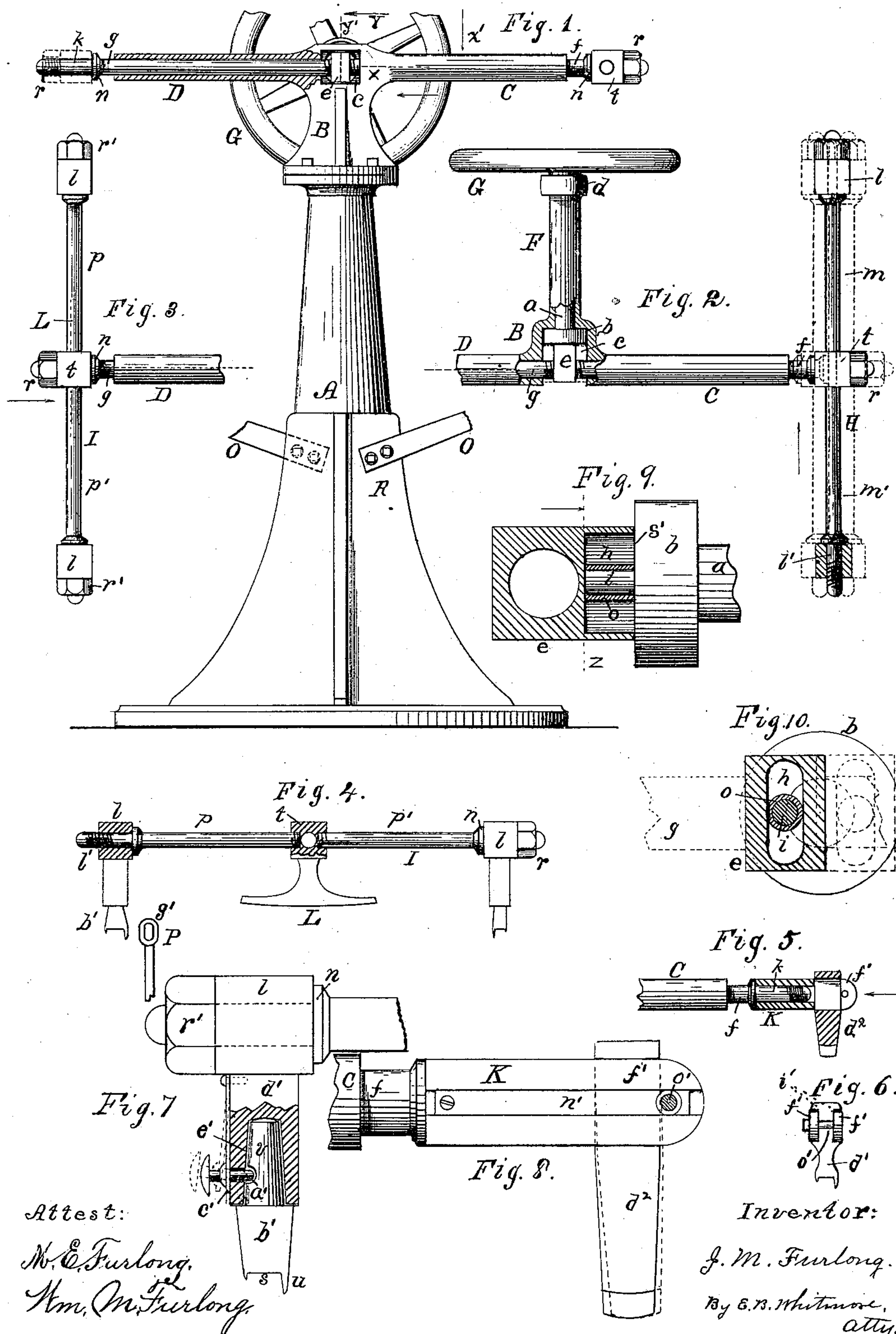


2 Sheets—Sheet 1.

MACHINE FOR PRODUCING RECTILINEAR RECIPROCATING MOTION.

Patented Dec. 22, 1885.



(No Model.)

2 Sheets—Sheet 2.

J. M. FURLONG.

MACHINE FOR PRODUCING RECTILINEAR RECIPROCATING MOTION.

No. 332,708.

Patented Dec. 22, 1885.

Fig. 11.

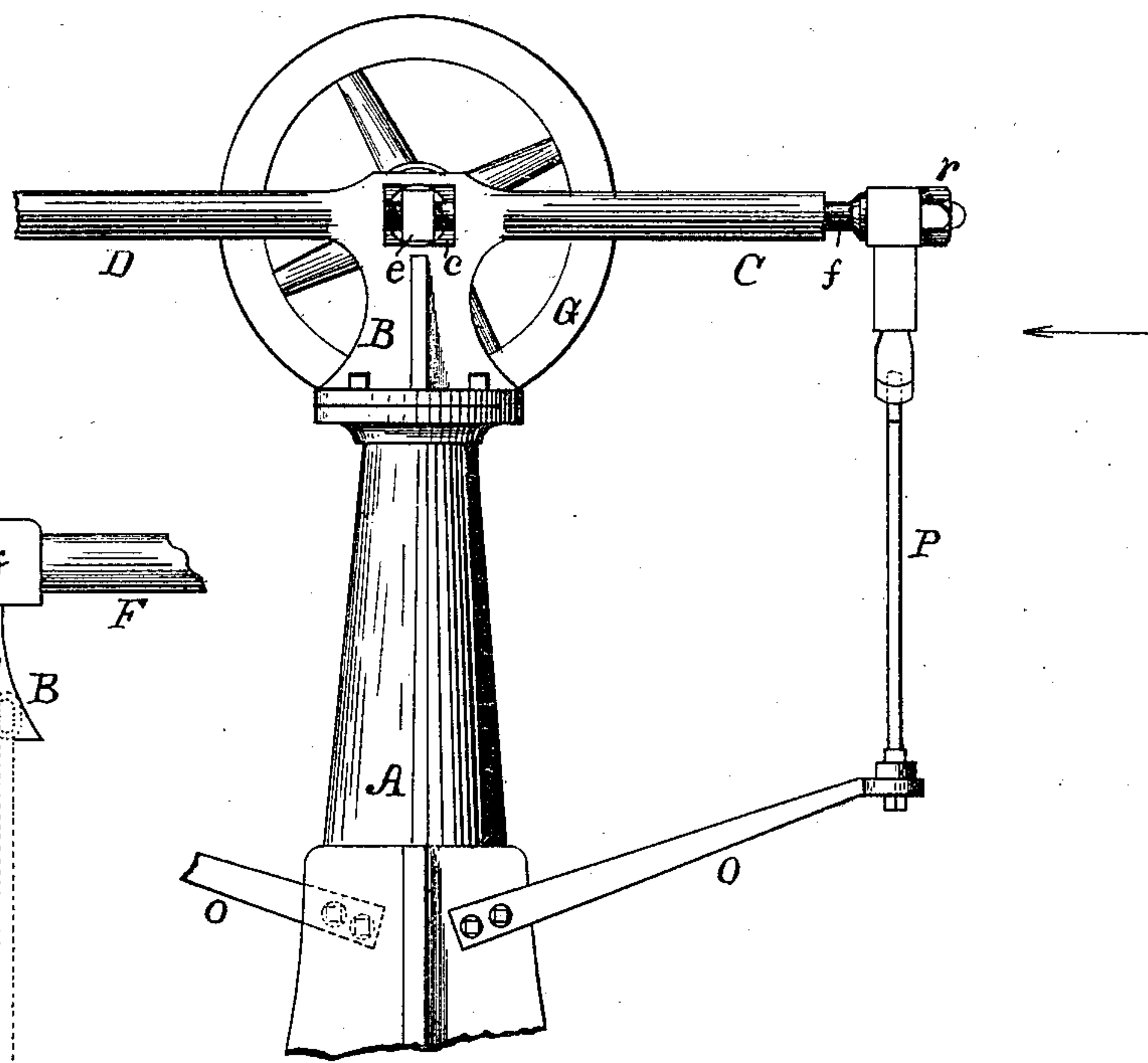
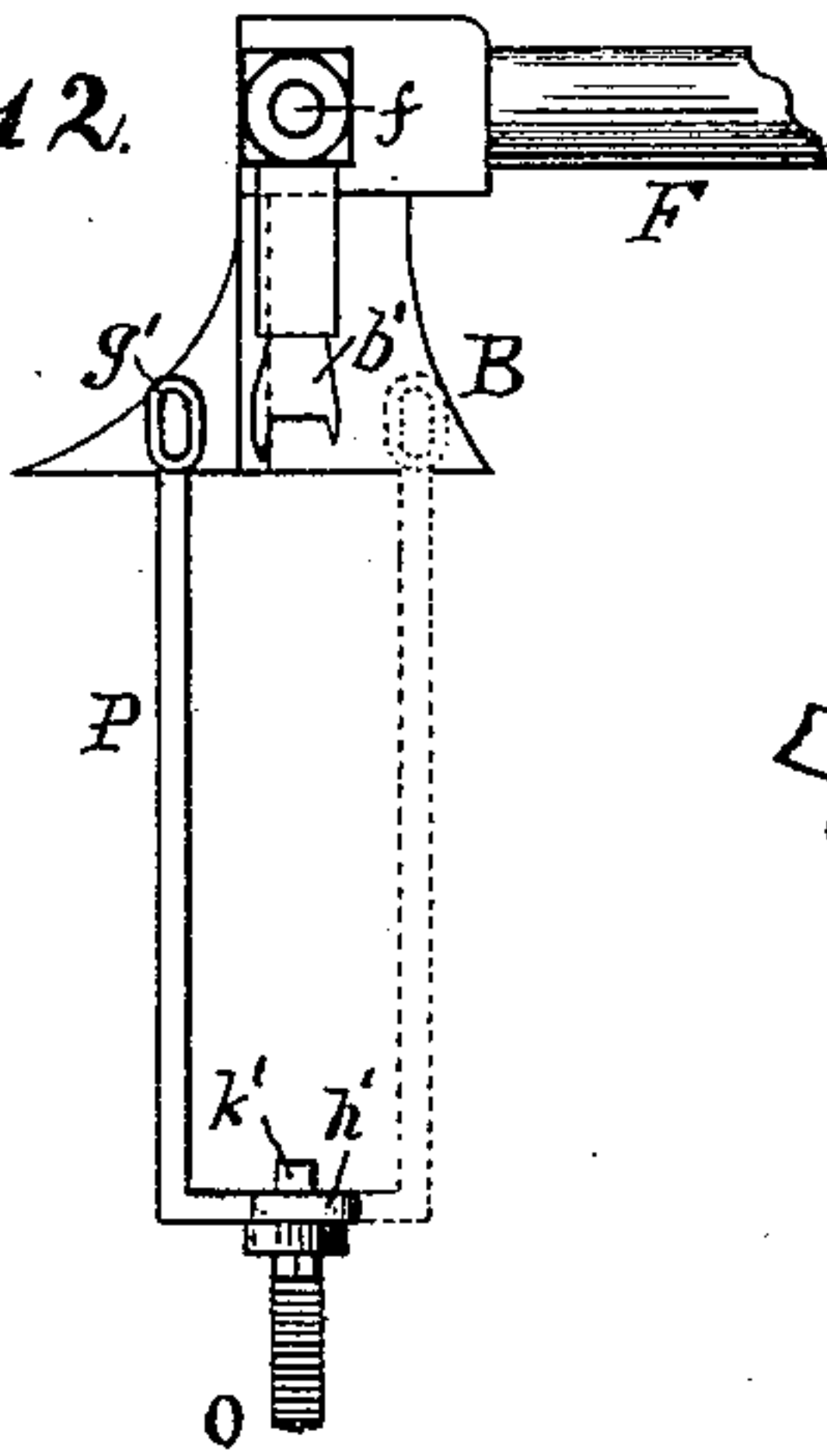


Fig. 12.



Attest:
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UNITED STATES PATENT OFFICE.

JAMES M. FURLONG, OF ROCHESTER, NEW YORK.

MACHINE FOR PRODUCING RECTILINEAR RECIPROCATING MOTION.

SPECIFICATION forming part of Letters Patent No. 332,708, dated December 22, 1885.

Application filed April 13, 1885. Serial No. 162,053. (No model.)

To all whom it may concern:

Be it known that I, JAMES M. FURLONG, of Rochester, in the county of Monroe and State of New York, have invented a new and useful
5 Improvement in Machines for Producing a Rectilinear Reciprocating Motion, which improvement is fully set forth in the following specification and shown in the accompanying drawings.

10 The object of my invention is to produce an improved machine by which a regular rectilinear reciprocating motion may be produced for the purpose of burnishing, sawing,
15 drilling rock, pumping water, and for other uses, said machine being composed of parts and devices as fully set forth in the following specification, and more particularly pointed out in the claims.

As shown in the drawings this machine is
20 represented as being supplied with tools for the purpose of setting the edges of the soles of shoes and burnishing the bottom surfaces of said shoe-soles.

Referring to the drawings, Figure 1, Sheet 1,
25 is a side elevation of the machine, parts being broken away and omitted, and one of the sleeves centrally longitudinally sectioned to show one arm of the reciprocating shaft as it rests in said sleeve; Fig. 2, a plan of the cen-
30 tral part of the same with the right sleeve and cross-arm viewed as indicated by arrow x' in Fig. 1, parts being horizontally and centrally sectioned, as on the dotted line x in Fig. 1, to expose to view some of the interior
35 parts of the machine; Fig. 3, a similar view of the left sleeve and cross-arm; Fig. 4, an end elevation of some of the upper parts of the machine, viewed as indicated by arrow in Fig. 3, serving to show more fully the manner
40 in which the edge setting and burnishing irons are held; Fig. 5, an elevation of a portion at the end of the right sleeve, seen as in Fig. 1, showing an edge-setter, instead of the cross-arm, secured to the end of the main recipro-
45 cating arm, parts being centrally and vertically sectioned; Fig. 6, a view of the parts shown in Fig. 5, viewed as indicated by arrow in said latter figure, showing, further, the manner of securing in place the tool stock or
50 head; Fig. 7, an elevation of a headed socket for holding an edge-setting or other tool,

drawn to a larger scale, said socket being in part vertically centrally sectioned to show the manner of fitting the tool, the retaining-spring, and pin for the tool, shown in full and dotted
55 line positions; Fig. 8, a side elevation of the tool and holder shown in Fig. 5, drawn to a larger scale to show more clearly some of the minor parts of said holder, the loosely-fitting tool being shown in full and dotted line posi-
60 tions; Fig. 9, a vertical central section of the slotted head for the reciprocating arms, sectioned as on the dotted line y' in Fig. 1, and viewed as indicated by arrow y , drawn to show more clearly the crank-pin and friction-
65 sleeve as they occupy the slot in the head; Fig. 10, a vertical section of the same head cut as on the dotted line z in Fig. 9, and viewed as indicated by the arrow therein, the crank-pin and head being shown in full and
70 dotted lines on opposite sides of the axis of the shaft, a portion of the reciprocating arms being also shown in dotted lines on each side of the head; Fig. 11, Sheet 2, an elevation of the upper part of the machine, similar to that
75 shown in Fig. 1, Sheet 1, drawn to show the adjustable finger-rest for the operator, near the edge-setting tool, and a manner of holding the same; and Fig. 12, a view of the fin-
80 ger-rest and combined parts viewed as indicated by arrow in Fig. 11, showing the rest in dotted lines as turned or adjusted to the opposite side of the edge-setting tool.

Referring to the parts, A is a suitable stand-
85 ard or pedestal for supporting the working parts of the machine, which, as shown in Fig. 1, stands upon the floor of the room, but may be made shorter and placed upon a work-
bench; B, a sleeve-block carrying the reciprocating arms f and g , crank-shaft a , and other
90 working parts of the machine, resting upon and secured to the upper end of the pedestal A. The sleeve-block is provided with three sleeves, C, D, and E, having their axes in the
95 same horizontal plane, the sleeves C and D being equal and extending in opposite directions from the sleeve-block in a right line, the sleeve F being made shorter than the other sleeves and forming right angles therewith.

a is a shaft resting in the caliber of the
100 sleeve F, provided at its inner end with a crank-disk or crank, b , resting within or oc-

cupying a cavity, *c*, in the sleeve-block, and at its outer end provided with a band-wheel, *d*, and inertia-wheel *G*, as shown in Fig. 2.

The inner ends of the arms *f* and *g* are secured to a reciprocating head, *e*, occupying the cavity *c* in the sleeve-block contiguous to the crank and being moved or reciprocated laterally within said cavity by the crank. This reciprocation of the head by the crank gives to the edge setting and attached tools their proper motion, the reciprocated arms *f* and *g* moving along their bearings in the sleeves *C* and *D*. The head *e* is formed with a face, *s'*, turned next the face of the crank, as shown in Fig. 9, and the slot *h* in the head opens out only at that face, or is turned toward the face of the crank, as shown. The cavity or recess *h* is not cut through the head at any point, but is inclosed on all sides, excepting as it opens out at the face *s'* of the head, and this face being turned toward the face of the crank and being contiguous therewith, entirely incloses the said cavity. A friction-sleeve, or roller, *o*, fits the pin so as to turn freely thereon, and also fits between the sides of the slot *h*, the employment of which sleeve greatly reduces the friction between the parts in contact.

It will be readily understood from Fig. 10 that a rotation of the crank will result in moving the head *e* laterally across by the end of the shaft *a*, while there will be no vertical motion of the head from the fact that the pin is permitted to move freely up and down in the slot, the latter being sufficiently long to accommodate the pin in its vertical movement. The reciprocating arms *f* and *g* project beyond the ends of the sleeves, and are provided near their outer ends each with a fixed collar, *n*, the extreme ends of the arms being threaded to receive screw-nuts *r*. A blank space, *k*, is left between each nut and collar to form a seat upon which to receive a square tool-stock, *t*, as shown, the latter being pinched and firmly held between said nut and collar. When thus constructed, a tool may be held at the outer end of each of the two arms *g* and *f*, enabling two operatives to work at the machine simultaneously.

H and *I* are two similar cross-arms, each composed of two short arms, *m m'* and *p p'*, secured to opposite sides of heads or blocks *t*, the two arms secured to the same head forming a horizontal right line at right angles with the line of the arms *f* and *g*. At their outer ends these cross-arms are provided with fixed collars *n*, and screw-threads like those on the reciprocating arms *f* and *g*, and screw-nuts *r'*, there being seats *l'*, upon which to receive tool-stocks *l*, the same as the seats *k* on the arms *f* and *g*, above described. The heads *t* are of the same size as the tool-stocks *l*, made so to be interchangeable with said tool-stocks, so that the latter may be removed from the reciprocating arms *f* and *g*, and the heads slipped thereon instead and held by the said

screw-nuts *r*. When these cross-arms are put upon the arms *f* and *g*, an operator may be employed at work at each of the four outer free ends of the two cross-arms, the reciprocating motion given the arms *f* and *g* by the crank moving all four tools alike. The cross-arms *H* and *I*, when secured to the ends of the reciprocating arms *f* and *g*, move or reciprocate laterally or sidewise, as indicated by dotted lines in Fig. 2.

b' are edge-setting tools, or tools used for shaping and burnishing the edge of the soles of the shoes, the blades *u* of the tool bearing upon the bottom face of the sole of the shoe, while the surfaces *s* burnish the edge of the sole. The motion of the edge-setting tool, when being used, is in a line substantially parallel with the plane of the blade *u* of the tool. This tool may be formed with a taper-shaft *v*, as shown in Fig. 7, and fitted in a tapering socket, *d'*, of the tool-stock *l*, with a retaining-pin, *a'*, and slender spring *c'*, secured to the socket in position to hold the point of the pin in a cavity, *e'*, of the shank. The pin and spring are made light, as their only duty is to prevent the tool dropping out of the socket or holder. The shank *v* of the tool is purposely fitted loose in the socket, as it is found better to give the tool a slight lost motion than to have it rigid in its socket or holder.

Another manner of holding the edge-setting tool is shown in Figs. 5, 6, and 8, in which a horizontal tool-holder, *K*, is bored and internally threaded to fit the end of the reciprocating arm *f* or *g* in the place of a screw-nut, and vertically slotted at its outer end to receive the tool.

The manner of securing the tool to the holder is clearly shown in Figs. 5 and 6, the sides of the tool being recessed to receive the jaws *f'* of the holder. A pin, *o'*, crossing the space between the jaws on the outside of the tool and entering orifices in both of the jaws, serves to hold the tool from moving horizontally out of said jaws. Sufficient looseness is given the tool in its bearings within the holder to allow of a slight play therein, as indicated by dotted lines in Fig. 8.

At *L*, Fig. 4, is shown a tool for burnishing the soles of shoes, shown also in dotted lines in Fig. 3. This tool is shown as held to the end of the reciprocating arm *g*, and from its position moves sidewise.

P, Figs. 11 and 12, shows a rest for the index-finger of the hand of the operator, to be used while operating upon the toe portion of the shoe-sole. This rest is formed with an eyelet, *g'*, at its upper end to receive the finger of the operator, and a foot, *h'*, reaches laterally to receive a vertical pivot-bolt, *k'*, which latter secures the finger-rest rigidly to a supporting-arm, *o*, reaching out from the pedestal, as shown. The axis of the bolt *k'* is designed to coincide with the line of the axis of the tool *b'* over it, so the rest may be turned

horizontally upon the bolt to a corresponding position on the opposite side of the tool, as indicated in dotted lines in Fig. 12, thus being adjustable. This is to permit an operator to work at the edge-setter facing in either of two directions, which choice of directions in which he faces is frequently of great importance.

When the finger-rest is shifted from one side of the tool to the other, as stated, the tool is of course rotated or turned one-half around upon its axis by the tool-stock or head being removed from the arm and replaced thereon facing in the opposite direction.

It will be seen from Figs. 9 and 10 that the slot *h* opens out of no part of the head *e*, excepting at the face *s'*, next the crank *b*, so that when the parts are together said slot is wholly inclosed and unseen, which prevents dust or other extraneous matter from collecting therein and clogging or interfering with the working of the crank-pin and friction-sleeve in the slot.

What I claim as my invention is—

1. In a machine for producing a rectilinear reciprocating motion, the combination, with the pedestal, of the sleeve-block B, formed with a cavity, *c*, and provided with the straight sleeves D C F, set at right angles to each other in the same plane, substantially as shown.

2. In combination with the sleeve-block B of a machine for producing a rectilinear reciprocating motion, formed with a cavity, *c*, and provided with the horizontal sleeves D, C, and F, substantially as shown, a crank-shaft, *a*, provided with crank *b*, reciprocating arms *g* and *f*, and head *e*, formed with an inclosed cavity or recess, *h*, substantially as described.

3. In combination with the sleeve-block B of a machine for producing a rectilinear reciprocating motion, formed with a cavity, *c*, and provided with the horizontal sleeves D, C, and F, substantially as shown, a crank-shaft, *a*, provided with crank *b*, reciprocating arms *g* and *f*, and head *e*, formed with an inclosed cavity or recess, *h*, the respective arms *g* and *f* being formed with collars *n* and seats *k*, for receiving tool stocks or heads *t*, and clamping-nuts *r* for holding the same to place, substantially as described and shown.

4. In a machine for producing a rectilinear reciprocating motion, the sleeve-blocks B,

formed with the cavity *c*, and an actuating-crank, *b*, occupying the said cavity, in combination with a reciprocating head, *e*, occupying the said cavity contiguous to and operating with said crank, the said head being formed with an inclosed cavity or recess, *h*, opening out to or turned toward the face of the crank, substantially as and for the purpose set forth.

5. The combination, in a machine for producing a rectilinear reciprocating motion, of the sleeve-block B, formed with sleeves D, C, and F, crank *b*, recessed head *e*, reciprocating arms *f* and *g*, and tool stocks or heads *t*, with means, substantially as shown, for securing said tool stocks or heads to the arms, for the purpose specified.

6. The combination, in a machine for producing a rectilinear reciprocating motion, of the sleeve-block B, formed with sleeves D, C, and F, crank *b*, recessed head *e*, reciprocating arms *f* and *g*, and stock or head *t*, secured to a reciprocating arm, as *f*, provided with arms *m* and *m'*, secured rigidly to the head *t*, and formed with rest *t'* for tool-stocks, substantially as shown and described.

7. In a machine for producing a rectilinear reciprocating motion, in combination with a reciprocating arm, *f*, a tool-stock, K, for holding a burnishing or other tool, *d'*, said tool-stock being formed with jaws *f'*, inclosing a slot or space, *i'*, in which to receive said tool *d'*, and provided with a spring, *n'*, and retaining-pin *o'* for the tool, substantially as shown and described.

8. In a machine for producing rectilinear reciprocating motion, in combination with a burnishing-tool, *d'*, a finger-rest, P, held by a support, O, in position to receive the finger of the operator, said support being formed with a foot-piece, *h'*, turned laterally at about right angles thereto, said foot-piece being held by a pivot-bolt, *k'*, at a point in line with the tool upon a base, R, by means of which said finger-rest may be turned or adjusted to occupy a position on either side of said tool, substantially as and for the purpose set forth.

JAMES M. FURLONG.

Witnesses:

E. B. WHITMORE,
M. E. FURLONG.