

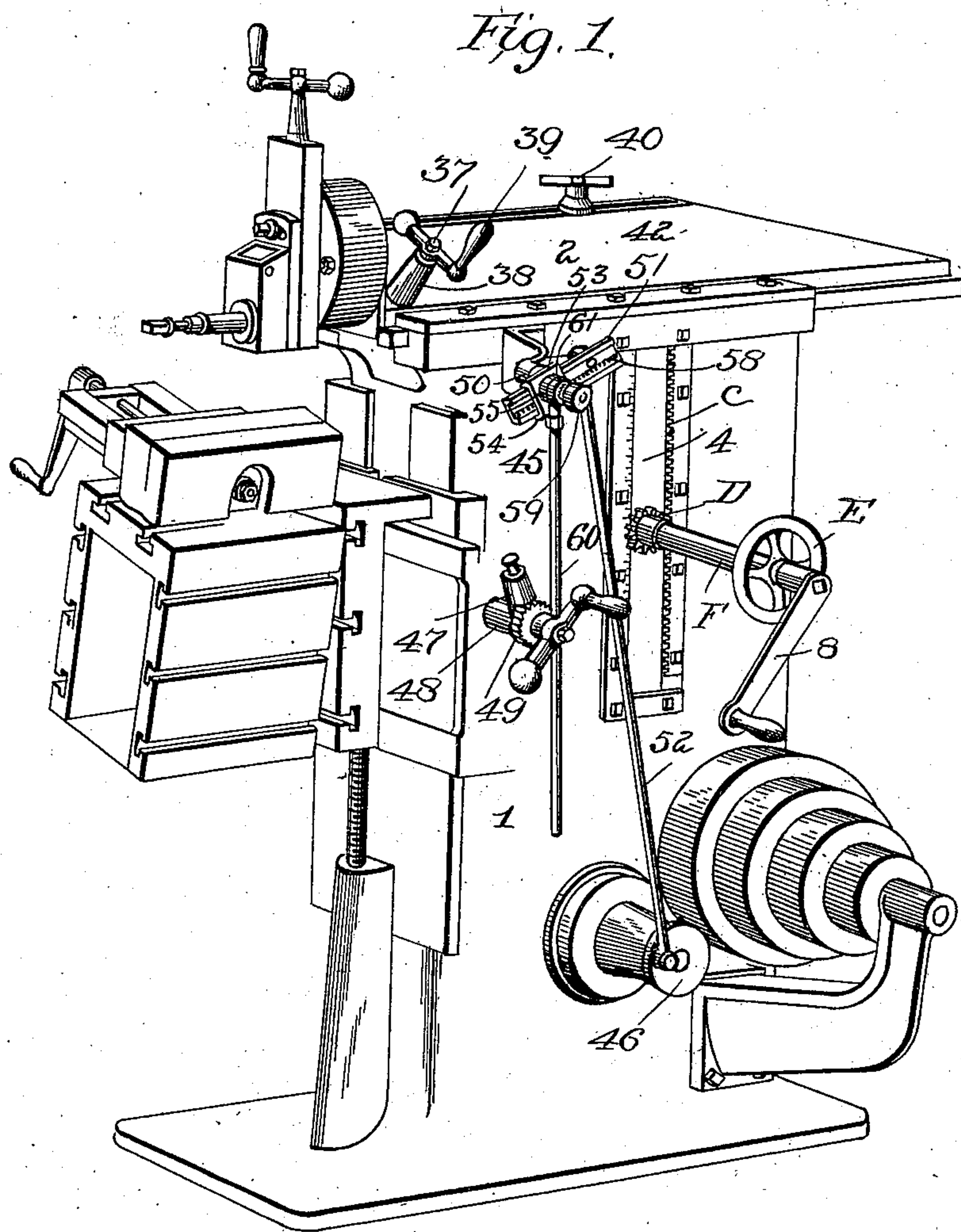
(No Model.)

W. R. FOX.
SHAPING MACHINE.

4 Sheets—Sheet 1.

No. 502,621.

Patented Aug. 1, 1893.



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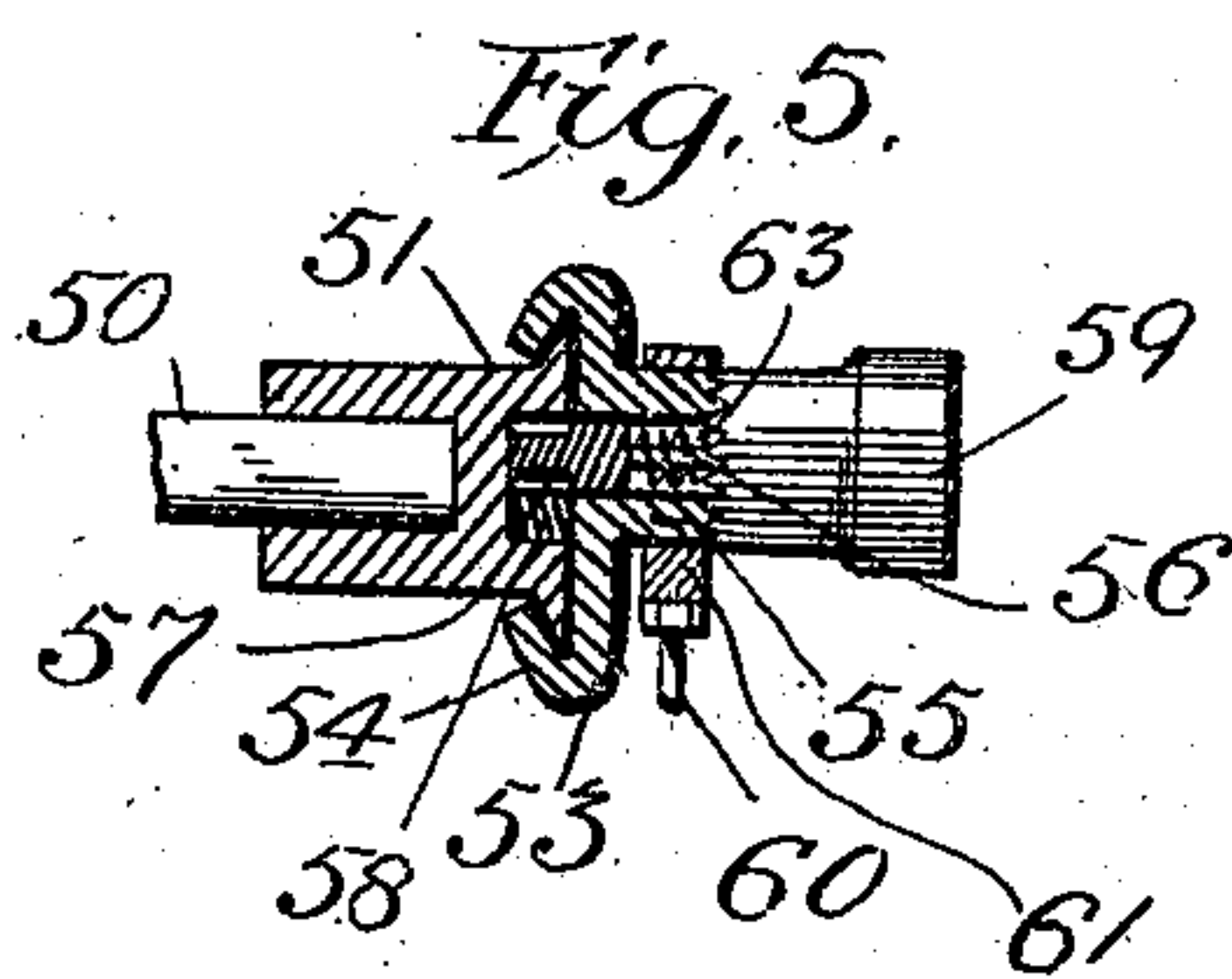
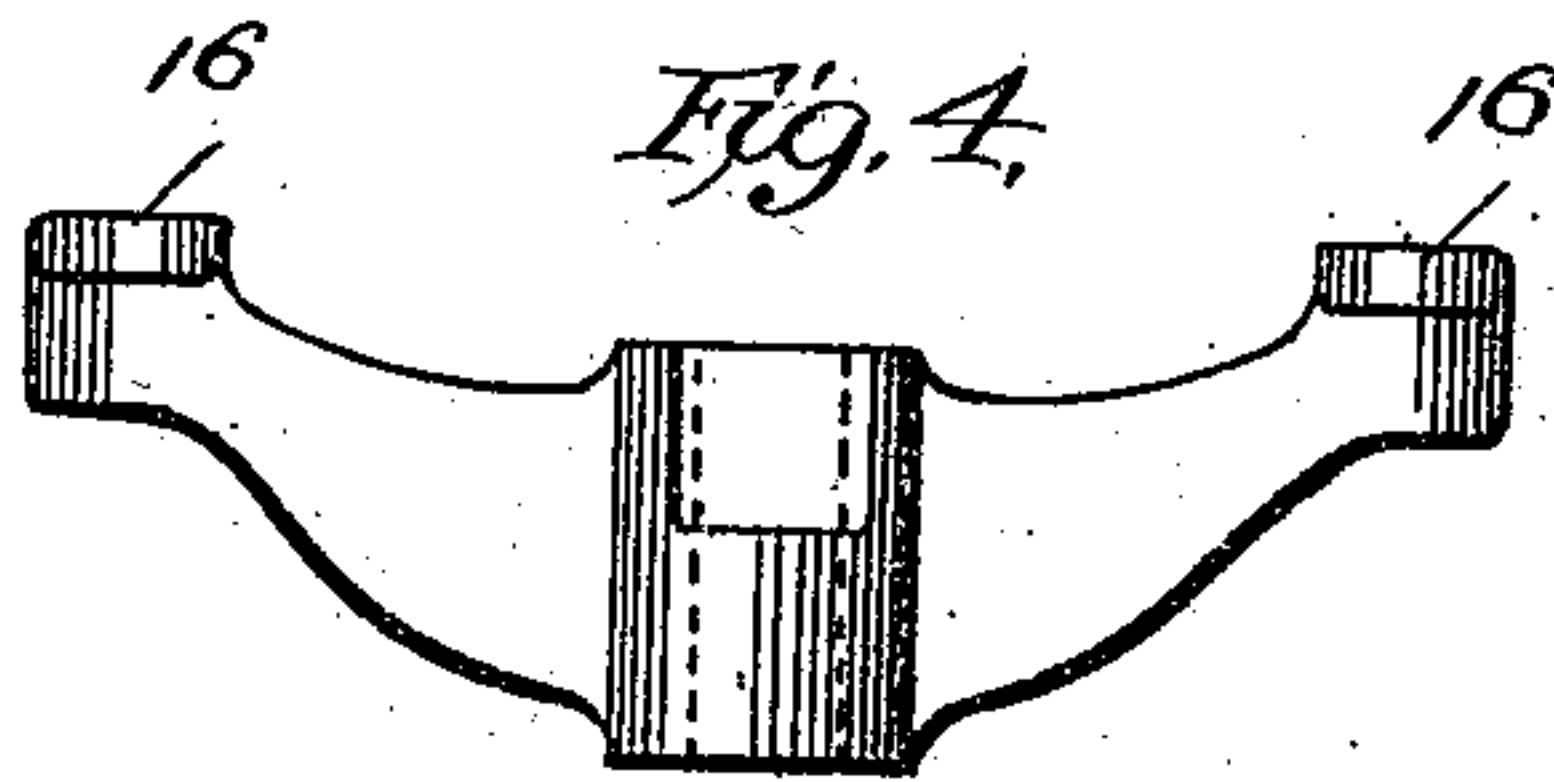
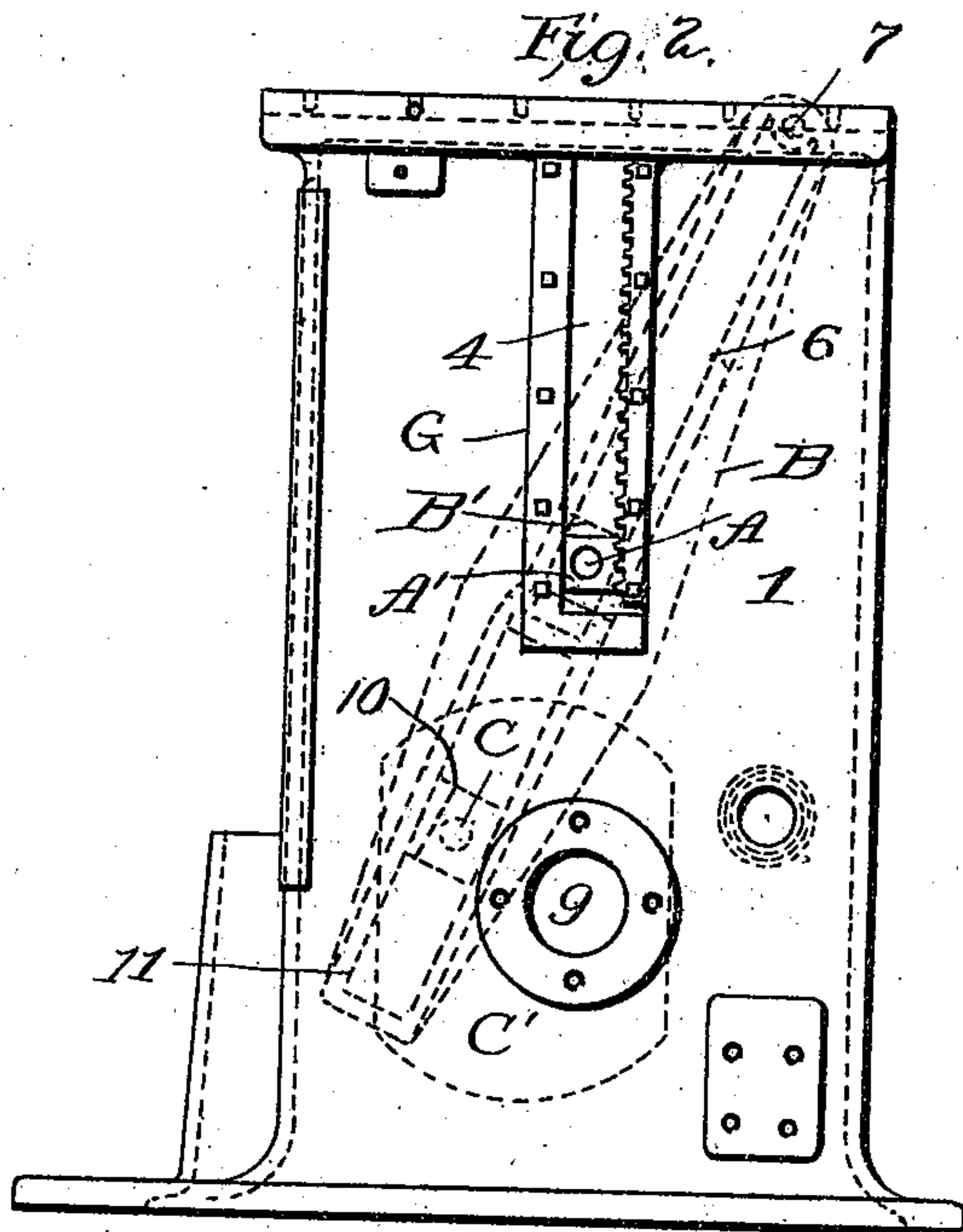
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W. R. FOX.
SHAPING MACHINE.

4 Sheets—Sheet 2.

No. 502,621.

Patented Aug. 1, 1893.



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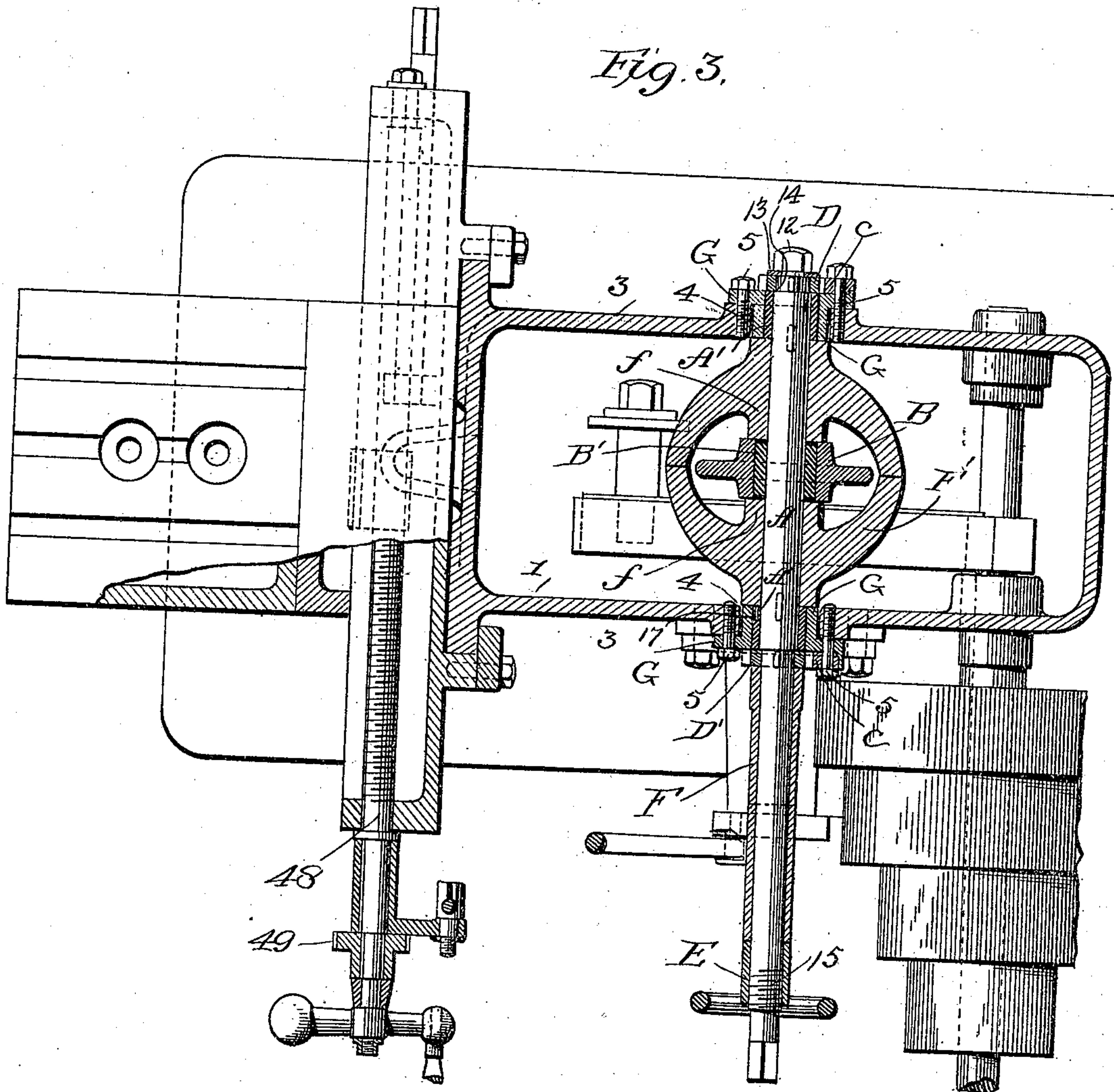
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W. R. FOX.
SHAPING MACHINE.

4 Sheets—Sheet 3.

No. 502,621.

Patented Aug. 1, 1893.



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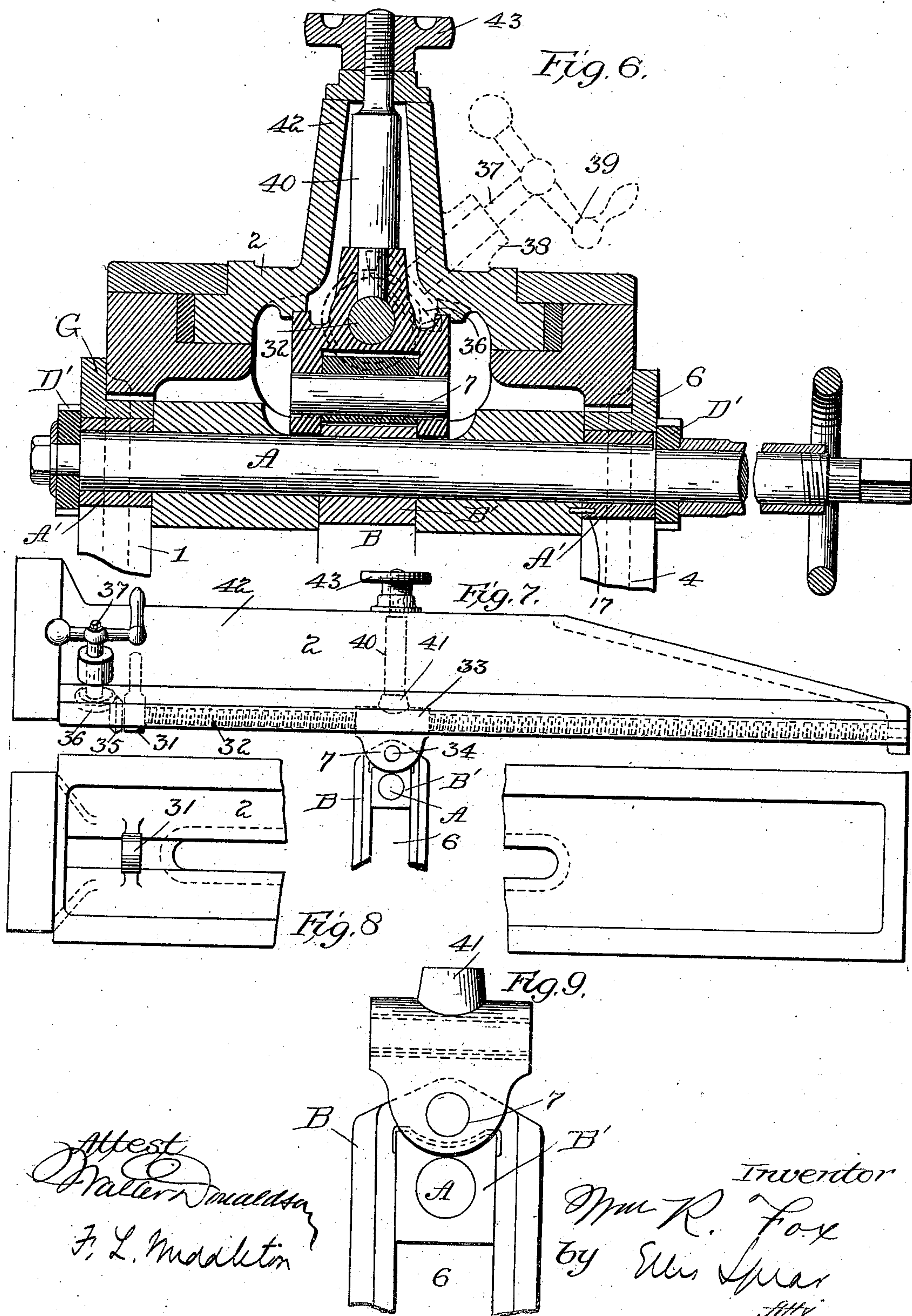
(No Model.)

4 Sheets—Sheet 4.

W. R. FOX.
SHAPING MACHINE.

No. 502,621.

Patented Aug. 1, 1893.



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UNITED STATES PATENT OFFICE.

WILLIAM R. FOX, OF GRAND RAPIDS, MICHIGAN, ASSIGNOR TO THE FOX MACHINE COMPANY, OF SAME PLACE.

SHAPING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 502,621, dated August 1, 1893.

Application filed March 3, 1893. Serial No. 464,524. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. FOX, a citizen of the United States of America, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Shaping-Machines, of which the following is a specification.

It is the object of my invention to provide adjustable driving mechanism for use in reciprocating the rams of shaping machines or like movable parts, the length of stroke of which it is desirable to vary quickly and with accuracy and while the machine is in motion.

While I have shown my invention as applied to a shaping machine, I do not wish to limit myself in this respect as the improvements can be used to advantage in other situations.

My invention includes an oscillating pitman connected to the ram or other part to be reciprocated, said pitman being fulcrumed on a shaft which is adjustable toward and from the end of the pitman in order to vary the stroke of the ram, the said shaft having means for adjusting it and clamping means for holding it in any desired position.

It includes also a bracing yoke arranged to bind the parts and hold the frame against springing or collapsing under the strain of the clamp and other features of construction and arrangement whereby perfect lubrication may be effected at the driving crank and the wear of said crank distributed and reduced to a minimum.

In the drawings Figure 1— is a view of the entire machine. Fig. 2— is a side view of the supporting column with parts omitted and parts shown in dotted lines. Fig. 3— is a sectional plan view taken along the adjustable fulcrum shaft of the pitman. Fig. 4, is a detail of a different form of brace yoke. Fig. 5, is a detail sectional view of the adjustable connection for changing the length of feed. Fig. 6, is a transverse sectional view through the ram and the upper part of the supporting column showing the adjustable connection between the ram and the driving pitman or lever. Fig. 7, is a side view of the ram with said adjustable connection. Fig. 8, is a bottom plan view of the ram partly

broken away, and Fig. 9, is a detail view of the connection between the ram and its driving pitman.

In the drawings 1— is the supporting column for the ram 2 or other moving part. It has parallel sides 3 slotted at 4— and along the edges of these slots the angle wearing plates G are secured by the bolts 5, Fig. 3. The pitman B connected at 7, to the ram is slotted along its upper portion at 6, and a sliding box B' is fitted to move in said slot. Through this box the adjustable fulcrum shaft A, passes and also through similar boxes A' arranged to slide vertically in the slots 4, of the column. When the shaft is moved vertically up or down in the slots 4, of the column the fulcrum of the pitman is changed to vary the length of the upper arm and therefore the stroke of the ram and this vertical adjustment are secured by rotating the shaft by a crank 8 at its front end which rotation through the gear wheels D, D' on the shaft meshing with the racks c fixed rigidly to the frame causes the shaft to travel up and down and thus changes its position in the slot of the pitman to vary the fulcrum point and the length of stroke. The racks c, are bolted in place by the bolts 5 passing through the angle plates into the frame. The pitman is oscillated by a crank pin C, on an arm or disk C' secured to a shaft 9—, which pin has a block 10— fitted to slide in a slot 11— at the lower end of the pitman. From this arrangement it will be seen that the bottom of the pitman and the crank may be operated in a bath of oil to afford perfect lubrication at this point and further by arranging the crank at the lower end with the fulcrum between it and the upper point of connection with the ram, the movement of the crank pin along the slot of the pitman will always be the same without regard to the length of stroke of the ram and the wear on the pitman, due to the crank's movement will be uniform all over. Another advantage arising from this driving movement is that it is not necessary to provide a loose or sliding connection between the upper end of the pitman and the ram as the pitman is free to slide up or down on the box B' as it oscillates.

The gear D on the rear end of the fulcrum

shaft is fixed thereto by a nut 12— the flange or washer 13— of which bears on the face of the wheel and presses it against the shoulder 14— on the shaft.

5 The forward gear D' is feathered or splined to the shaft and against the front face of the gear the end of a sleeve F bears which extends about the shaft to near its front end where it is in contact with the hub of a hand
10 wheel E, said hub being screw threaded to correspond with the thread 15— on the shaft. By turning the hand wheel properly, the shaft will be drawn forward while the sleeve will be forced back so that both gears will be
15 drawn toward each other to bear hard against the frame or the angle plates and bind the same against the ends of the transverse yoke F', thus serving to clamp the shaft securely in place. The shaft may thus be adjusted to
20 any desired height by turning the crank and it can then be rigidly fixed in any position whatever by the clamping action just described. The entire adjustment may be effected quickly and while the machine is run-
25 ning, and in order that the adjustment may be accurate, a graduated scale is formed along one of the bearing plates G and any suitable indicator may be provided to determine the proper adjustment.

30 The yoke F' which serves to bind the parts together during the clamping action also serves to prevent the column sides from being sprung or collapsing and it has hubs *ff* through which the fulcrum shaft passes it
35 being also formed with a central opening for the pitman and having the ends of its hubs *f* bearing respectively upon the inner faces of column sides or the angle plates G, and upon the sides of the pitman. This yoke acts as a
40 transverse brace between the sides and resists all strain and also acts to stiffen the shaft A in the center, where the strain comes upon it. The yoke may be formed in sections bolted together at 16— as in Fig. 4. A
45 dowel pin 17— projects from the yoke hub into one of the sliding boxes A' and this keeps the yoke in proper position relative to the pitman and shaft, it sliding up and down with said shaft when it is adjusted.

50 Referring to Figs. 1, 6, 7, 8 and 9, the ram 2 carries a bearing 31, in which is journaled the forward end of a screw threaded shaft 32, the rear end of which is journaled at the rear of the ram. By turning this shaft the nut 33,
55 is adjusted forward or backward in relation to the ram and as this nut is pivotally connected at 34 with the upper end of the pitman or lever the ram and lever will be adjusted in relation to each other. The ram may thus
60 be set forward or backward in relation to the work. The screw shaft is turned through the beveled gear 35 on its forward end meshing with the gear 36, on the lower end of the inclined spindle 37, journaled in the boss 38, of
65 the ram and provided at its upper end with a crank or handle 39. The nut when adjusted to proper position may be fixed rigidly

in place by the binding spindle 40, projecting up from the boss 41, on the nut between the upwardly extending flanges 42 of the ram, its
70 upper end being engaged by a hand nut 43.

Referring to Figs. 1 and 5 I have provided an adjustable connection at 45 adapted to vary the amount of movement imparted from
75 the feed disk 46, to pawl 47, which operates the feed shaft. The feed shaft 48 may be of any suitable form and connected with the work support in any ordinary manner. The
80 pawl and ratchet 49 may be arranged in the well known manner and the feed disk may be driven as ordinarily. The adjustable connection comprises a rock shaft 50 carrying a
85 channeled arm 51, to which the pitman 52 of the feed disk is connected to oscillate the arm. This arm carries a sliding block 53 having overlapping flanges 54 engaging the arm. The
90 block has a boss 55, in which is journaled the spindle 56, carrying on its inner end a pinion 57 to engage a rack 58, in the channel of the arm. The spindle may be turned by the
95 handle 59 on its outer end and when so turned the sliding block will be moved toward or from the center of oscillation and as the sliding block carries the upper end of the pawl
100 and ratchet pitman 60 the amount of movement of the said pawl and ratchet will depend upon the position of the sliding block. The pitman 60 is connected to the collar 61,
105 and this collar surrounds the projecting boss 55, of the slide. The inner edge of the handle has V shaped teeth adapted to engage corresponding teeth on the boss 55, and when these
110 teeth are in engagement they lock the handle against rotary movement and consequently prevent the slide from moving. A spring 63, may be employed to cause the teeth to engage
115 each other.

What I claim is—

1. In combination, the ram, the pitman pivotally connected thereto at its upper end and
110 depending from and supported by said pivot, the crank having a sliding connection with the lower end of the depending pitman and the adjustable fulcrum arranged between the
115 crank and the upper pivoted end of the pitman, substantially as described.

2. In combination, the ram or moving part, the oscillating pitman pivotally connected
120 thereto at its upper end, and depending therefrom, the fulcrum for the pitman, and the operating means, said pitman having longitudinal movement in relation to its fulcrum, and being supported by its pivot, substantially as described.

3. In combination, the ram, the pitman pivotally connected thereto at its upper end, the
125 fulcrum shaft passing through the pitman and the rectangular box or bearing thereon having a shifting connection with the pitman, substantially as described.

4. In combination the ram, the pitman pivotally connected thereto at its upper end and
130 depending from and supported by said pivot, the crank having a sliding connection with

the lower end of the pitman, the vertically adjustable fulcrum for the pitman the means adapted to be positively operated for lifting or lowering the fulcrum and the clamp for
5 fixing the fulcrum in any desired position, substantially as described.

5. In combination, the moving part, the pitman connected thereto with means for oscillating the same, the adjustable fulcrum comprising the rotary shaft carrying a gear and adapted to travel lengthwise of the pitman, the rack on the frame engaging the gear and the means for rotating the shaft, substantially as described.

15 6. In combination, the moving part, the pitman connected thereto with means for oscillating the same, the adjustable fulcrum comprising the shaft with means for moving the same up or down and the clamping means
20 comprising the sleeve on the shaft and the nut on the shaft engaging the same, substantially as described.

7. In combination, the moving part, the pitman connected thereto, with means for oscillating the same, the adjustable fulcrum comprising the shaft with means for adjusting it up or down and the clamping means for drawing upon the shaft longitudinally to clamp it to the frame, substantially as described.

30 8. In combination, the moving part, the pitman, the means for oscillating the pitman, the adjustable fulcrum comprising the shaft movable vertically in ways of the frame, and lengthwise of the pitman, the racks on the
35 frame, the gears on the shaft engaging the same, the means for rotating the shaft, and the clamping sleeve and nut on the shaft, substantially as described.

9. In combination, the moving part, the pitman for operating the same with means for oscillating the pitman, the frame comprising the sides having ways, the shaft movable vertically in said ways, the means for clamping the shaft and the yoke within the frame and
45 extending from side to side thereof, substantially as described.

10. In combination, the moving part, the pitman with operating means therefor, the shaft movable vertically in said ways, the clamping
50 means and the yoke carried by the shaft and movable therewith to bear on the inner sides of the frame, substantially as described.

11. In combination, the moving part, the pit-

man with operating means, the shaft movable vertically in said ways, the blocks in said
55 ways receiving the shaft, the clamping means, the yoke and the pin connection between the same and one of the boxes, substantially as described.

12. In combination, the column having
60 ways, the pitman slotted at its upper and lower ends, the rotary fulcrum shaft passing through the upper part of the pitman, the means for adjusting the shaft, and the crank having a sliding connection with the slotted
65 lower end of the pitman, substantially as described.

13. In combination, the ram having the opening extending longitudinally thereof, the means for driving the ram, the adjustable
70 connection thereto comprising the screw shaft and nut, the binding spindle engaging said nut and extending through the longitudinal opening in the ram and the hand wheel on the upper end of said spindle, substantially
75 as described.

14. In combination, the ram, the work table, the feed shaft and feed disk and the adjustable driving connection comprising the oscillating arm, the block adjustable thereon and
80 the pitmen connected with the block and arm respectively substantially as described.

15. In combination the ram, the work table and the adjustable feed mechanism therefor comprising the oscillating arm having a rack,
85 the sliding block carrying a pinion, and its shaft the handle on the pinion shaft for turning and holding the same, and the pitman connected to the sliding block, substantially as
90 described.

16. In combination, the ram, the work table and the adjustable feed mechanism therefor comprising the oscillating arm having a rack, the sliding block having a boss, the spindle passing through the same and having a pin-
95 ion at its inner end and a toothed handle at its outer end and the pitman having a collar at its upper end surrounding the boss of the sliding block, substantially as described.

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

WILLIAM R. FOX.

Witnesses:

JOHN DUFFY,
EARL STOKOE.