

(No Model.)

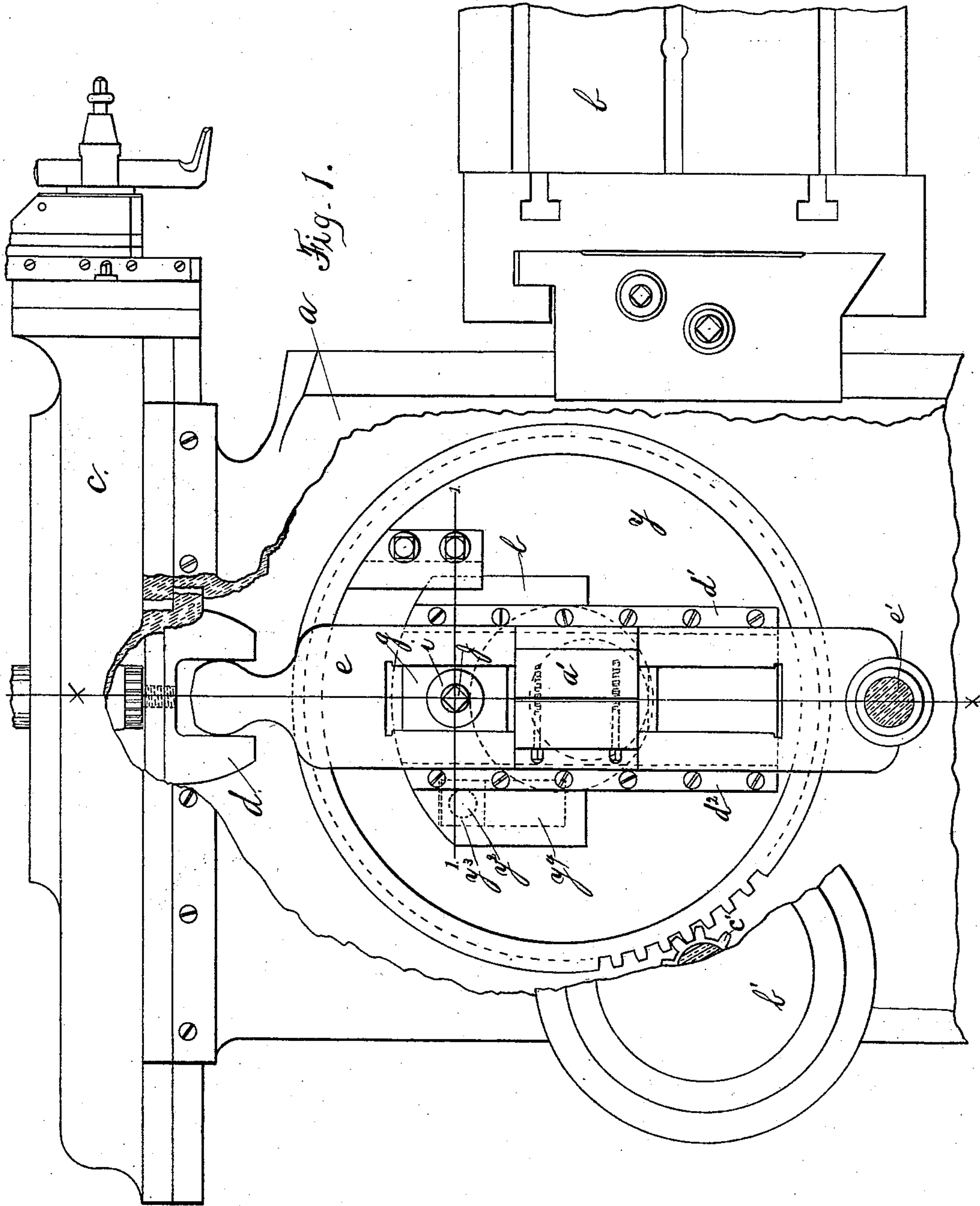
2 Sheets—Sheet 1.

M. & E. J. FLATHER.

QUICK RETURN MOTION FOR SHAPING MACHINES.

No. 543,598.

Patented July 30, 1895.



Witnesses.
W. J. Elliott.
W. W. Russell.

Inventors.
Mark Flather
and Ernest J. Flather.
by R. P. Elliott,
Attorney.

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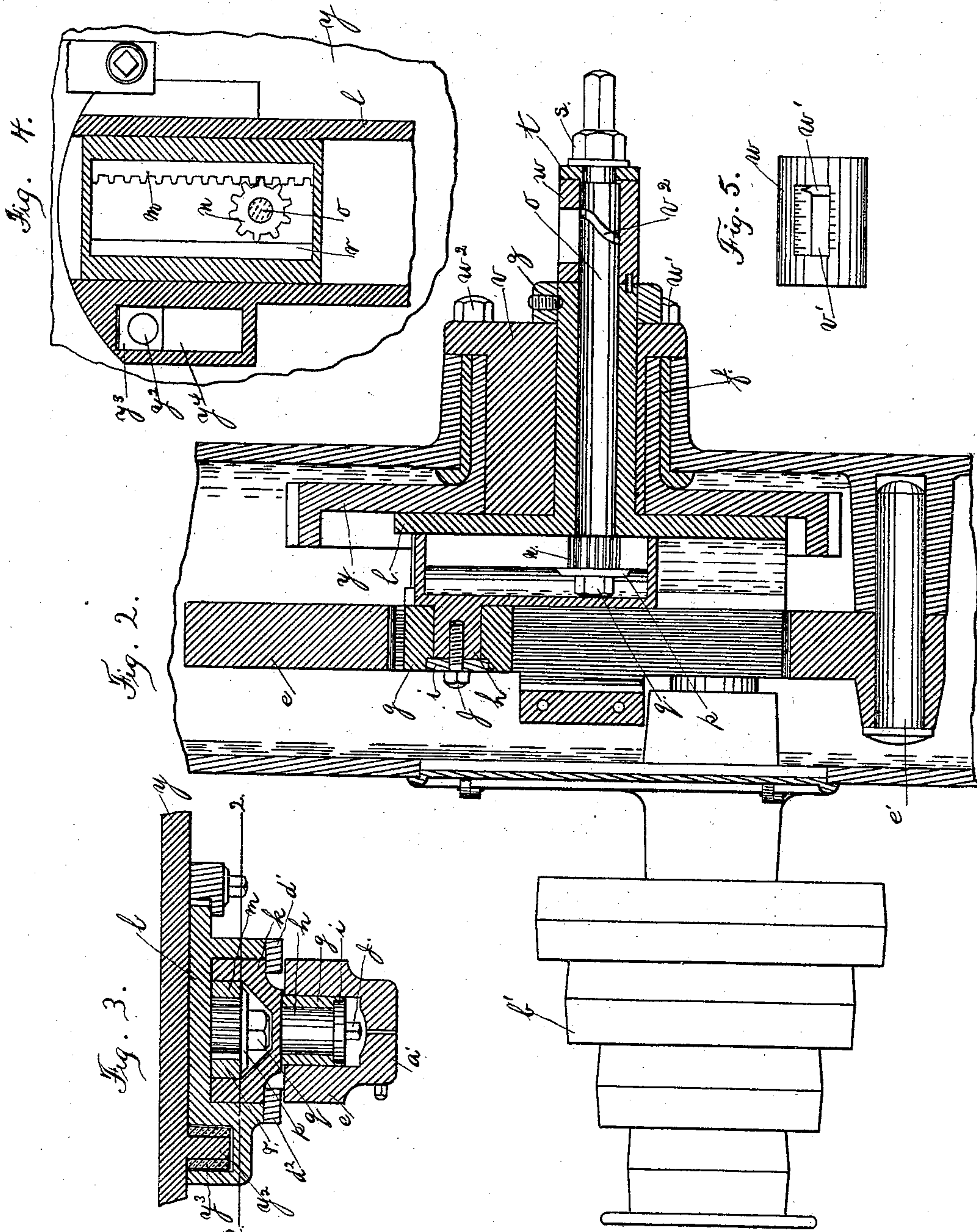
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Mark Flather and
Ernest J. Flather.
by Richard P. Elliott
Atty.

UNITED STATES PATENT OFFICE.

MARK FLATHER AND ERNEST J. FLATHER, OF NASHUA, NEW HAMPSHIRE.

QUICK-RETURN MOTION FOR SHAPING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 543,598, dated July 30, 1895.

Application filed August 20, 1894. Serial No. 520,750. (No model.)

To all whom it may concern:

Be it known that we, MARK FLATHER and ERNEST J. FLATHER, of Nashua, in the county of Hillsborough and State of New Hampshire, have invented certain new and useful Improvements in Quick-Return Motions for Shaping-Machines, of which the following is a specification.

Our invention relates to an improvement in the mechanism employed to give a quick return to the ram which carries the cutting-tool in shaping-machines. Among the various mechanisms employed are the so-called "Whitworth Quick-Return" and those having a pitman vibrating on a fulcrum and a link-block sliding longitudinally in a slot in said pitman, both of which give a quick return, but are subject to the following objection, which is as follows: When the tool begins and ends the cut it is traveling at a much less rate of speed than it does in the middle of the cut, thereby causing a loss of time, as the operator is obliged to run the cutting-tool at a lower rate of speed at the beginning and ending of the cut than is necessary, in order to get the proper rate at the middle. We also find that a quicker return motion is desirable.

The object of our improvement is to so construct a quick return that it will overcome the objections above stated and at the same time give a quicker return than has been possible heretofore.

In the drawings accompanying and forming a part of this specification, Figure 1 is a side elevation of a section of bed or frame of a shaping-machine, a portion of same being cut away so as to show the pitman, the gear that operates the same, the link-block, and plate that connects the gear with the link-block. Fig. 2 is a cross-section through the line xx in Fig. 1. Fig. 3 is a cross-section through line 1 1 in Fig. 1. Fig. 4 is a cross-section through line 2 2 in Fig. 3. Fig. 5 is a plan of an indicator for showing the length of stroke of ram.

Similar letters refer to similar parts throughout the several views.

a designates the bed or frame of a shaping-machine; b , the work-table to which the work to be operated upon is secured. 50

c is the ram that carries the cutting-tool.

d is the pitman-block which is movably attached to the bottom of the ram and has two projecting members between which the free end of pitman operates. 55

e is a vibrating pitman which has the fulcrum e' at its lower end, upon which it vibrates, and provided with a longitudinal slot in which the link-block g slides. Said link-block g has a bearing in which the stud h revolves and is held in position by the washer i . Said washer is attached to the stud h by means of the cap-screw j . The stud h is integral with the movable slide-block k , which slides in the ways in the quick-return plate l , and is used to adjust the length of stroke of ram through the medium of the link-block g and pitman e . 60 65

m is a rack attached to one side of a recess in the slide-block k and meshes into the gear n , which is attached to the end of adjusting-shaft o . 70

p is a washer of greater diameter than gear n , and is held in position by the nut q . The purpose of said washer p is to frictionally hold slide-block k in position after it has been adjusted. 75

r is a strip of metal secured to the opposite side of recess in slide-block k , and is the same width as the rack m , and is used in connection with the said rack m as a bearing for the washer p . 80

s is a check-nut on the outer end of adjusting-shaft o , and operates to frictionally hold the slide-block k against the plate l through the medium of the washer p , rack m , metal strip r , the hub on said plate l , and the collars t and w . 85

v is an eccentric bushing attached to the frame of shaping-machine by the four bolts w' w^2 w^3 w^4 , and has a bearing eccentric to its axis in which the hub of plate l revolves, its outside forming a bearing on which the gear y revolves. The plate l is revolved by means 90

of the stud y^2 , attached to the gear y . Said stud has a bearing in the square collar y^3 , which operates in the recess y^4 in said plate l .

z is a collar attached to the hub of plate l and operates to hold said plate l in position.

a' represents a lug cast on the middle portion of the pitman e and extends over the slot in same. A groove is cut longitudinally through said lug a' , and two bolts pass through holes in one side of said lug a' and are threaded into the other side. Said groove is filled with a strip of metal. The object of said lug a' is to provide means whereby the wear incident to the friction between the link-block g and the sides of slot in pitman e can be compensated for and is accomplished by loosening the bolts in lug a' , removing the metal strip, and reducing the thickness of same or by inserting another strip enough thinner to compensate for amount of wear. Then by tightening said bolts the sides of said slot in pitman e are drawn together and the slot reduced in width.

d' d^2 represent the two gibs used to retain the slide-block k in its normal position.

b' is a cone-pulley that drives the gear y through the medium of pinion c' .

f represents a Babbitt-metal bushing which fills the space between the frame of shaping-machine and the hub of gear y and forms a bearing for said hub of gear y .

w' is a pointer which slides in slot v' in the collar w , and is operated by means of a projection on lower end of same which fits loosely in the spiral groove v^2 in the adjusting-shaft o . Said collar w is attached to set-collar z and does not revolve with the adjusting-shaft o . Hence by revolving the adjusting-shaft o the pointer w' is caused to slide in the slot v' through the operation of spiral groove v^2 upon the projection on the bottom of pointer w' , thereby indicating the length of stroke of ram c by the position of said pointer w' with reference to the graduation-marks on collar w , because the distance traveled by the pointer w' is proportional to that traveled by the stud h to and from the axis of its revolution.

The operation of the quick-return mechanism herein shown is as follows: First, it should be borne in mind that in the form of construction shown the gear y always revolves in the direction of the forward movement of the ram c . In Fig. 1 the pitman e is shown as being at the middle portion of its movement. As the gear y has a uniform velocity and the plate l has a bearing eccentric to the axis of said gear y , then the path of the stud h will be eccentric to the path of the said gear y , which will cause the said stud h to approach nearer to the fulcrum of the pitman e during the return-stroke and not recede so far from said fulcrum as it would were its axis concentric with the gear y . Consequently the forward movement of the pitman e will occur during that part of a revolution of stud h

which takes place while said stud h is traveling above a horizontal plane drawn considerably below the axis of plate l , thereby causing the return movement of ram c to occupy a much less space of time than the forward movement.

The precise form and arrangement of parts may be somewhat changed without departing from the spirit of our invention, but we prefer the arrangement and forms herein shown.

Having described our invention, what we claim is—

1. In a shaping machine, the combination of a gear driven by a pinion secured to the driving shaft, an eccentric bushing attached to the frame of shaping machine, upon the outside of which the said gear has a bearing, a plate provided with a hub which revolves in a bearing in eccentric bushing eccentric to axis of said gear, a stud on side of said gear which operates in an oblong recess in said plate, and causes said plate to revolve with said gear in a path eccentric to path of same, and a collar to retain said plate in position, all as and for the purpose set forth.

2. The combination in a shaping machine, of a gear having a bearing on the outside of a bushing attached to the frame of shaping machine, a bearing in said bushing eccentric to its axis in which the hub of a plate has a bearing, a stud on said gear operating in a recess in said plate, a slide block operating in ways in said plate, a rack secured to inside of said slide block, a shaft having a bearing in hub of plate which is provided with a pinion and washer on one of its ends, its other end provided with a check-nut and means for revolving said shaft, said pinion meshing into said rack, a metal filling strip attached to the inside of slide block opposite to rack, upon both of which said washer on end of shaft have a bearing, and a stud projecting from the top of slide block which has a bearing in a link block running in a slot in a pitman, all as and for the purpose specified.

3. The combination in a shaping machine, of a gear having a bearing outside of a bushing attached to the frame of said shaping machine, a bearing in said bushing eccentric to its axis in which the hub of a plate has a bearing, a stud on said gear operating in a recess in said plate, a slide-block operating in ways in said plate, a stud projecting from the top of said slide-block which has a bearing in a link-block, a pitman having a longitudinal slot in which said link-block runs, lugs cast upon the parallel sides of said pitman, and a filling strip inserted between said lugs, and bolts inserted in said lugs, substantially as and for the purpose set forth.

4. In a shaping machine, an indicator used to determine the length of stroke of ram, consisting of a spiral groove in the adjusting shaft o , a collar surrounding grooved portion of said adjusting shaft and not movable with

same, a longitudinal slot in said collar, the
edges of said slot provided with graduations,
a sliding block longitudinally movable in
said slot by means of the spiral groove in ad-
5 justing shaft o, said sliding block being pro-
vided with a finger or pointer extending over
graduations on collar, substantially as and
for the purpose set forth.

In testimony whereof we have signed our

names to this specification, in the presence of 10
two subscribing witnesses, this 8th day of
May, A. D. 1894.

MARK FLATHER.

ERNEST J. FLATHER.

Witnesses:

R. P. ELLIOTT,

H. H. JEWELL.