

J. C. STEEN & N. B. CHACE.
SHAPING MACHINE.
APPLICATION FILED MAR. 20, 1906.

949,735.

Patented Feb. 15, 1910.

2 SHEETS—SHEET 1.

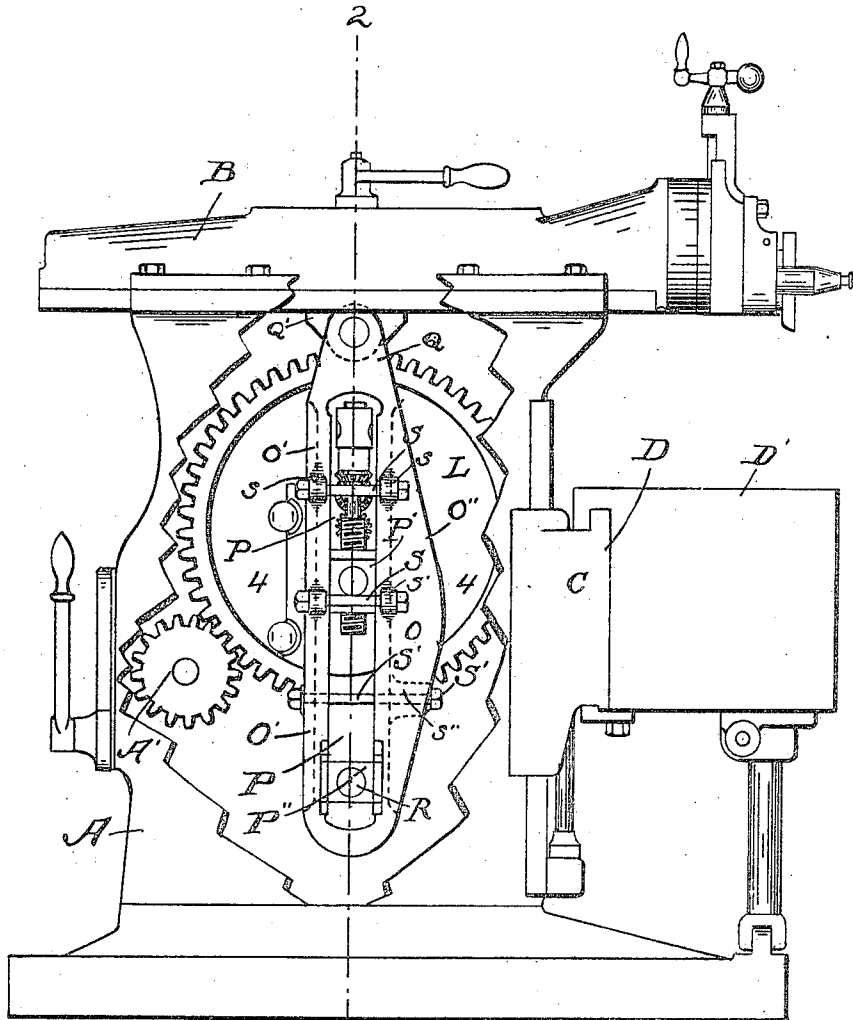


Fig. 1.

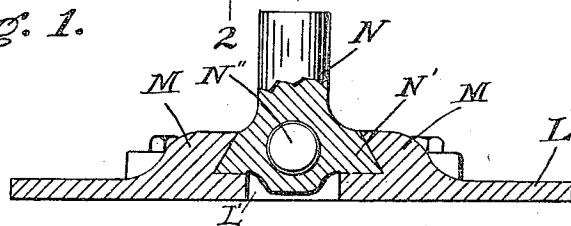


Fig. 5.

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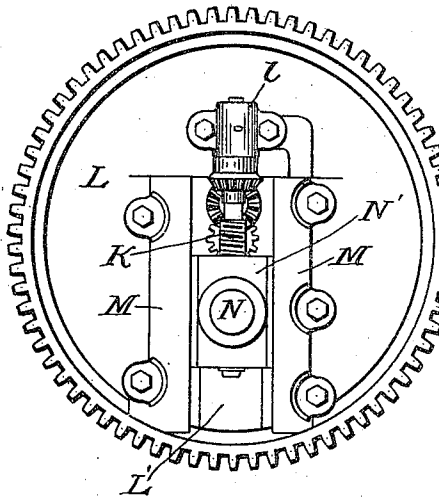


Fig. 3.

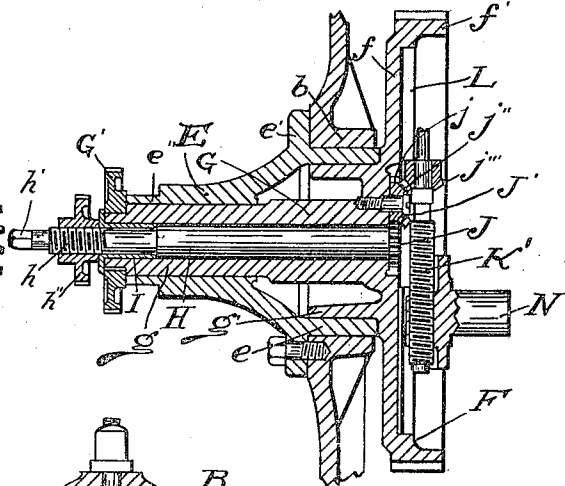


Fig. 4.

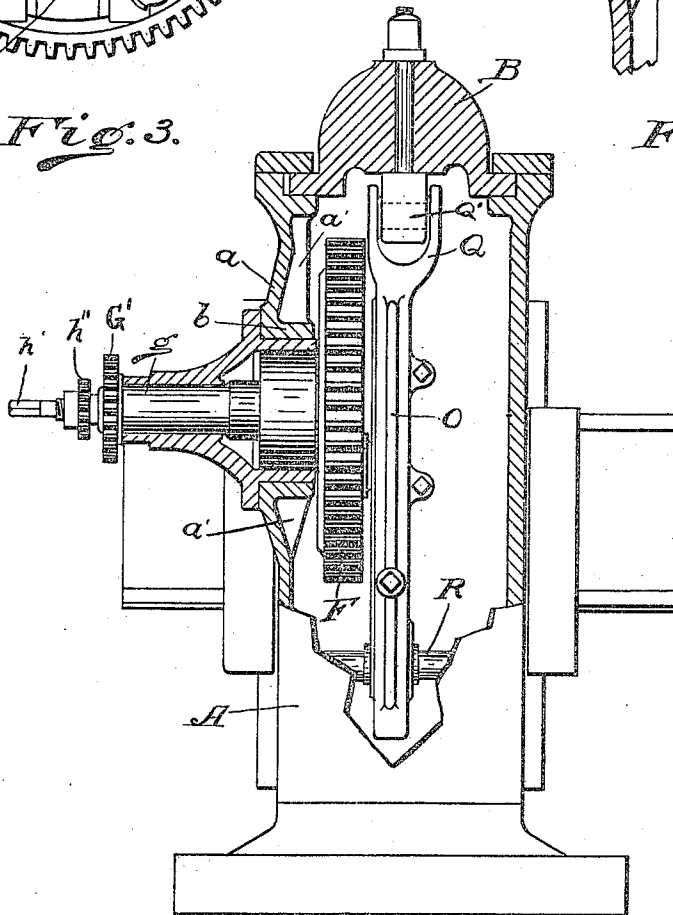


Fig. 2.

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UNITED STATES PATENT OFFICE.

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SHAPING-MACHINE.

949,735.

Specification of Letters Patent.

Patented Feb. 15, 1910.

Application filed March 20, 1906. Serial No. 307,002.

To all whom it may concern:

Be it known that we, JAMES C. STEEN and NORMAN B. CHACE, citizens of the United States, and residents, respectively, of Lynn, in the county of Essex and State of Massachusetts, and College Hill, in the county of Hamilton and State of Ohio, have invented a certain new and useful Improvement in Shaping-Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of our specification.

The invention relates to shaping machines, and more particularly to the construction and arrangement of the mechanism operating the ram and adjusting its throw, and its object is to increase the rigidity and strength of these parts, both in themselves, and in their bearings, without unnecessarily increasing their weight, and also to provide a simple mechanism for adjusting the crank pin from without the machine.

The various advantages of the several improvements will appear more particularly as the specification proceeds.

In the drawings:—Figure 1 is a side elevation of our improved shaping machine with the one face of the column broken away so as to see into the interior; Fig. 2 is a rear elevation of the shaping machine with the column partially broken away at the rear; Fig. 3 is a detail view in elevation of the crank gear showing the method of attachment of the crank pin; Fig. 4 is a vertical section through the same; and Fig. 5 is a horizontal section through the crank pin.

A is a column of the machine, B the ram, C the cross-rail, D the saddle, and D' the table. These are the usual parts of a shaping machine, and are mounted in the ordinary manner.

At one side, the wall of the frame is belled out to form a flat truncated cone, *a*, said cone being reinforced by radial ribs *a'*. The inner circumference of the cone is formed with a cylindrical flange *b* with which the ribs *a'* are made integral, thereby giving support to the said flange and strengthening it.

E is the housing for the crank-gear journal, and approximates a cone in shape. It is provided at the column end with a cylindrical

extension *e* adapted to fit within the flange *b* on the column and with a vertical circular flange *e'* projecting substantially at right angles to the extension *e*, and adapted to butt against and be clamped to the top of the cone *a*. The outer end of the housing E tapers down, as indicated at *e''*. The housing E may be cast integral with the column of the machine if desired.

F is the crank gear which is formed in the shape of a flat disk *f*, with a projecting flange *f'*, in which are cut the gear teeth.

G is the crank gear journal comprising concentric cylinders of different diameters, *g* and *g'*, preferably formed integral with the disk *f*, the one cylinder *g* projecting beyond the other cylinder *g'*. The cylinder *g'* which is the shorter and larger one in diameter, has bearing within the extension *e* of the housing E, while the cylinder *g* has bearing in the outer tapered end of the housing E. A very rigid and long bearing for the gear wheel journal is thus secured. The cylinder *g* projects beyond the housing E where it has keyed to it a gear G' which is in train with the usual mechanism for controlling the feed (not shown in the drawings).

The crank pin, with its attachment to the crank-gear and its method of adjustment for various lengths of throw, is now to be described.

Within the cylinder *g* is located a shaft H. At the inner end of said shaft is secured a spur gear J which is in mesh with the spur part of a double gear J' trunnioned in the face of the disk *f* of the crank gear wheel, said disk being suitably cut away to make room for the location of these gears. The double gear J' comprises a spur gear portion *j*, engaging the gear J and a miter gear *j''*. The latter is in mesh with another miter gear *j'''* which is keyed to a vertical shaft K located adjacent the inner face of the disk F.

An annular plate L is bolted to the inner face of the crank gear F. Said plate is provided with an ear *l*, which supports the shaft K and in which it has bearing, and also with vertical projections M, M, which are cut out to form a vertical wedge shaped run-way L' in which the base N' of the crank pin N is located. The base or block

N', on which the crank pin N is formed, is provided with a vertical threaded bore N'' and the shaft K is threaded to fit said bore.

The shaft H projects beyond the cylinder
 5 g of the journal G and is there provided with a screw threaded portion h, and a nut-head h'. A nut with a knurled flange h'' is made to fit the threaded portion h and is adapted upon being screwed up to engage a
 10 flanged sleeve I mounted on the shaft H, which is turned down at this point for the purpose, and bring the flange into engagement with the end of the journal G, thereby causing the shaft H to turn with the journal
 15 of the crank gear.

It is apparent that by rotating the shaft H which may be done by means of a crank fitted on the square nut-head h' located at its end, the gears J, J', and j'', will rotate,
 20 which will communicate rotation to the shaft K and thereby cause the threaded portion thereof to move the crank pin to or from the center of the gear wheel. As the distance of the crank pin from the center of
 25 the crank gear wheel controls the throw of the ram, it is apparent that the said throw may be varied by simply loosening the knurled nut h'' and rotating the shaft H.

We will now pass to a description of the
 30 rocker arm and its method of attachment and operation.

O is the rocker arm, and it consists of a flat beam-like structure much broader than it is thick. The faces of the arm are pro-
 35 longed at each side into rib-like extensions O', O'', O''', in order to strengthen them, those on one side, the side of greater strain, viz., O'', being farther extended than those on the other. This arm is provided with a
 40 slot P in which the blocks P' and P'' run. The arm is provided with a fork Q at its upper end which is pivoted to a plate or lug Q' secured to the under side of the ram. The crank pin N is journaled in the block
 45 P'. R is a fulcrum pin which is secured in any convenient manner at the side of the column near the bottom of the same. On this fulcrum pin is journaled the lower block P''. The rocker arm is braced by means of
 50 bolts S S, S', the first two connecting together lugs s, s, on opposite sides of the slot P, and extending from the face of the rocker arm, and the lower one S', passing through the rocker arm itself; lugs s'' being formed
 55 at this point to connect the bracing ribs and to give bearing for the nut and head of the bolt. We find that this construction of rocker arm produces a very rigid and strong device.

60 The operation of the rocker arm is apparent from the description. As the crank pin rotates it causes the upper end of the rocker arm to swing backward and forward, thus

operating the ram, the arm itself bodily moving up and down the while on the 65 block P''.

The crank gear is driven in the usual manner by means of a driving gear A', which itself is driven from the outside of the column of the machine. The method of
 70 driving this gear is not illustrated, it forming no part of our invention.

The advantages of the arrangement and construction described above are apparent. By the construction of conical swell a in the
 75 side of the column, the wall of the column is enormously strengthened at the point where the strain of the crank-gear falls upon it, and this is done without materially add-
 80 ing to the weight of the metal in the wall, the construction of crank-gear-journal and its housing producing not only a very long bearing, but one of increased diameter next to the crank-gear. A very firm and rigid
 85 bearing for the crank gear is thus secured. By the arrangement of the crank pin and of its method of adjustment, the crank pin is shortened, and the rocker-arm brought close
 90 up to the face of the crank gear, so that distortion in the crank-pin is greatly diminished: and at the same time, the means for its adjustment being operable from the out-
 side, is of great advantage in the use of the machine.

Having thus described our invention, what
 95 we desire to claim as new and to cover by Letters Patent, is:—

1. In a shaping machine, a crank gear, a journal formed on said crank gear comprising cylindrical bearing surfaces, one of large
 100 diameter adjacent the gear and the other of reduced diameter projected beyond the first, a housing having similar bearing surfaces, and the column of the machine, the support-
 105 ing wall thereof having a flat conical formation adjacent the housing and a flanged opening within which said housing is secured, and strengthening ribs connecting said flange with said wall.

2. In a shaping machine, in combination
 110 with the column, the ram, the crank gear, and an adjustable crank-pin, and the rocker arm fulcrum pin, a rocker arm pivoted to said ram, a slot in said rocker arm and blocks sliding in said slot in one of which is
 115 journaled the crank-pin, and in the other of which is journaled the rocker arm fulcrum pin.

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