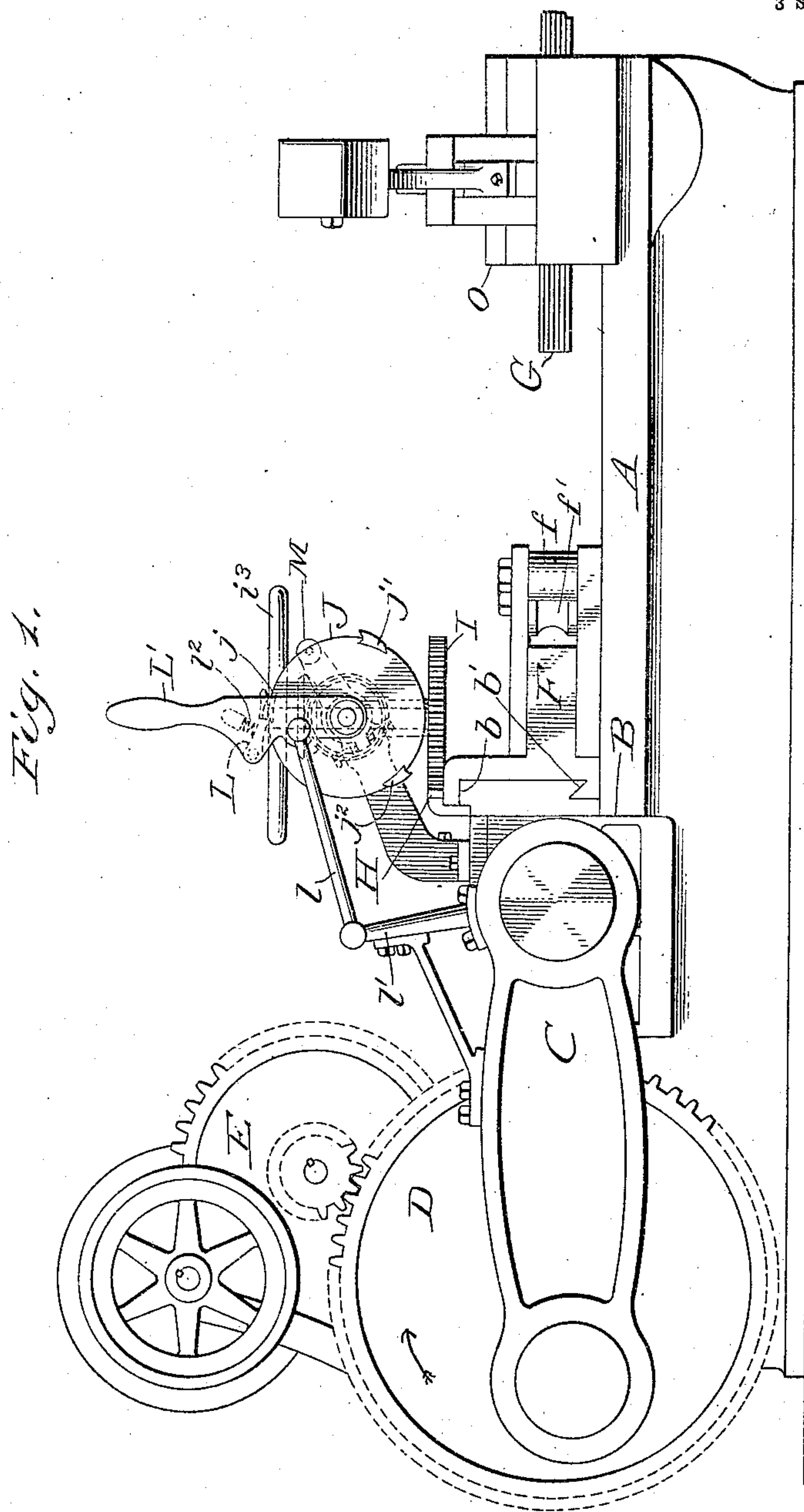


No. 841,950.

PATENTED JAN. 22, 1907.

E. EINFELDT.
DIE FEEDING MECHANISM.
APPLICATION FILED NOV. 25, 1905.

3 SHEETS—SHEET 1.



Inventor

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Witnesses

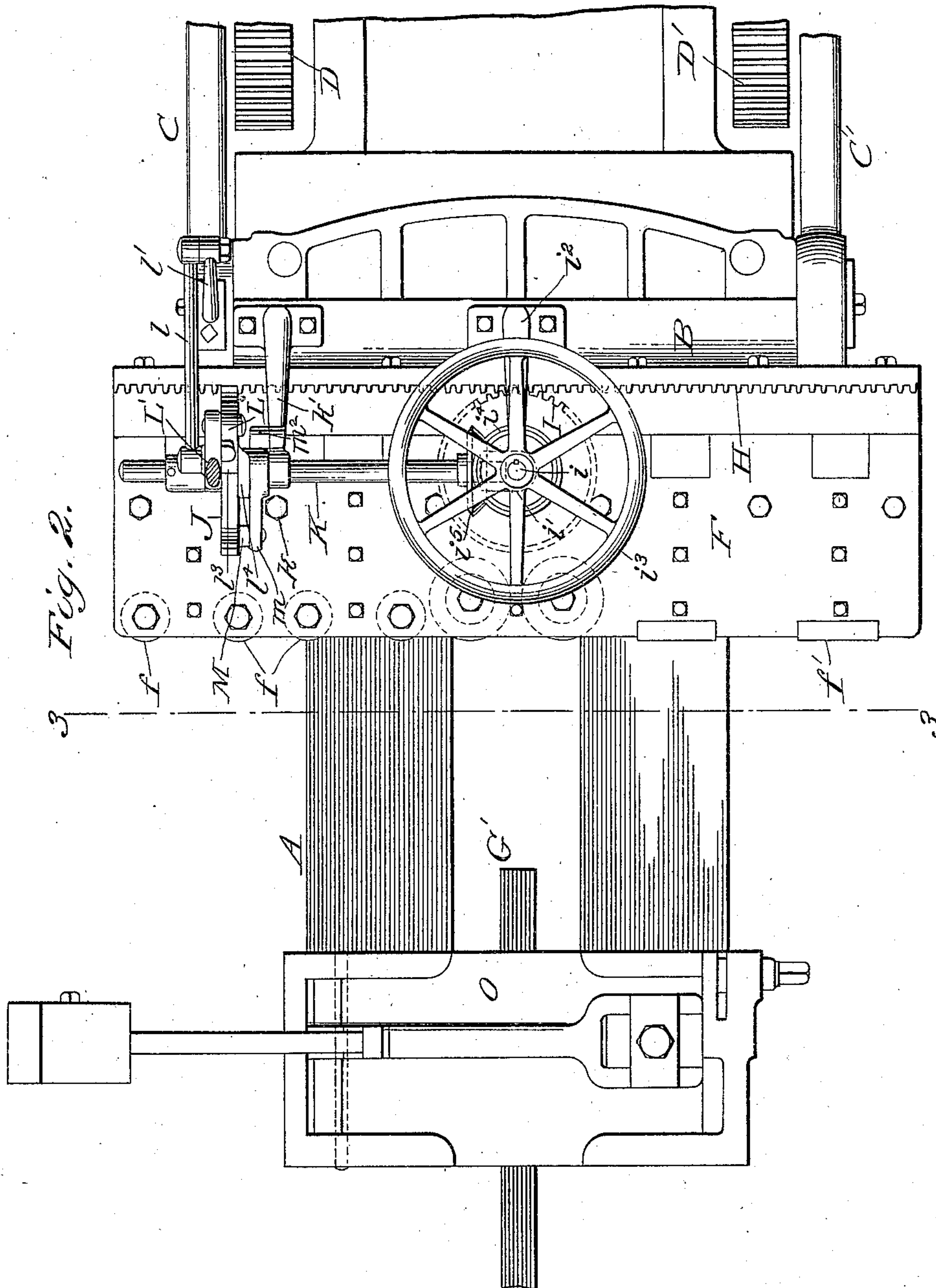
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3 SHEETS—SHEET 2.



Witnesses

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UNITED STATES PATENT OFFICE.

EMIL EINFELDT, OF DAVENPORT, IOWA, ASSIGNOR TO BETTENDORF
METAL WHEEL COMPANY, A CORPORATION OF IOWA.

DIE-FEEDING MECHANISM.

No. 841,950.

Specification of Letters Patent.

Patented Jan. 22, 1907.

Application filed November 25, 1905. Serial No. 289,006.

To all whom it may concern:

Be it known that I, EMIL EINFELDT, of Davenport, county of Scott, and State of Iowa, have invented a new and useful Improvement in Die-Feeding Mechanism, of which the following is a specification.

This invention relates to mechanism for presenting a number of shaping-dies successively into operative relation to the work being operated on, so that the latter may be subjected to the action of said dies in succession.

The invention is designed with special reference to the formation of an axle from a length of flanged metal bar, the several dies acting on the end of the bar in such manner and with such effect as to round the flanges and form a wheel-spindle; and the invention consists in mechanism of improved form acting to automatically present the several dies in succession in operative relation to the end of the bar, and acting to subject the said bar to the action of said dies. It is manifest, however, that my invention is not limited to this special application, but may be employed in any case where it is desired to present a plurality of forming or shaping dies in succession automatically to the work under treatment.

In the accompanying drawings, Figure 1 is a side elevation of my improved mechanism, partly in section. Fig. 2 is a top plan view of the same. Fig. 3 is a vertical transverse sectional elevation on the line 3 3 of Fig. 2. Fig. 4 is a vertical longitudinal section on the line 4 4 of Fig. 3. Fig. 5 is a similar view with the parts in a different position.

Referring to the drawings, A represents a bed-plate or sustaining-frame, on which is mounted near one end a reciprocating head B, extending transversely across the bed and connected at its opposite ends by means of two fore-and-aft links C C', with two rotary disks or wheels D D', adapted to be operated by driving mechanism E in such manner that the disk-wheels will be rotated continuously in the direction of the arrow in Fig. 1 and will impart to the head a reciprocating horizontal motion longitudinally of the sustaining-bed.

As shown in Fig. 1, the reciprocating head is formed with upper and lower guiding-shoulders b b', on which is mounted to move

transversely a die-carriage F, provided at its front with shaping or forming dies f f', in the present instance five in number, situated side by side and adapted as the carriage is moved transversely on the head to be brought successively in line with the end of the bar G to be shaped, so that as the head is reciprocated by its actuating mechanism the bar will be subjected to the action of the different dies.

The die-carriage is operated automatically in its transverse movements by the reciprocating movements of the head, the mechanism for this purpose comprising a horizontal transverse rack H on the die-carriage engaged by a pinion I, carried by the head, which pinion is operated intermittently by means of a driving-disk J, receiving a step-by-step motion through intermediate driving devices from the rocking action of one of the fore-and-aft links connecting the reciprocating head with the disk-wheels, the mechanism operating in such manner that during the first part of the forward stroke of the reciprocating head the die-carriage will be moved transversely a distance corresponding to that between two adjacent dies, when it will come to a rest, the remainder of the stroke of the reciprocating head forcing the die over the end of the bar, which operations being repeated the several dies are successively and automatically brought into position in line with the bar, and the latter is subjected to the action of the same.

The pinion I is fixed to the lower end of a vertical shaft i, mounted in a bearing i' on the upper end of an arm i², rising from the reciprocating head, the upper end of said shaft being provided with a hand-wheel i³, by which the parts may be manually operated, as will be presently described, to begin the operations anew after the several dies have acted on the bar and completed its formation. Beneath the hand-wheel the shaft has fixed to it a horizontal bevel-pinion i⁴, engaged by a vertical bevel-pinion i⁵ on the inner end of a horizontal transversely-extending shaft K, mounted near its outer end in a bearing k in the upper end of an arm k', extending from the reciprocating head, the inner end of said shaft having a bearing in the side of the bearing i' of the vertical shaft i.

The driving-disk J before alluded to is

keyed to the shaft K alongside its bearing k , and the disk is provided on its periphery with driving-lugs j, j' , and j^2 , in the present instance three in number, spaced an equal distance apart. These driving-lugs are adapted to be engaged by a driving-dog L on a rocking lever L' , loosely encircling the shaft K at the side of the driving-disk and having jointed to it the forward end of the link l , whose opposite end is jointed to the upper end of an arm l' , extending fixedly upward from the forward end of link C, where the latter is pivoted to the reciprocating head.

As a result of the construction described when the rear end of link C passes upward during the rotation of the disk D the arm l' on the opposite end of the link will be tipped or rocked forward, and through the medium of the connecting-link l the lever L' will be rocked forward, causing its driving-dog L to engage one of the driving-lugs on the disk and moving the latter a partial revolution. The movement of the driving-disk is imparted to the pinion I through the medium of shaft K, bevel-pinion i^5 and i^4 , and the pinion I engaging the rack on the die-carriage will shift the latter transversely on the reciprocating head.

The driving-dog L is pivoted to the side of the lever L' and normally rests on the periphery of the disk, being acted on by a spiral spring l^2 , which tends to hold it yielding against the disk. It is formed with an offset shoulder l^3 , adapted to engage the driving-lugs on the disk, and is provided with a lateral extension or nose l^4 , projecting at the side of the disk and adapted to engage a tripping-roller M, arranged in the path of the dog and carried on the upper end of an arm m , whose lower end loosely encircles the shaft-bearing K. Beyond the shaft-bearing the arm is extended and has its extremity mounted between two set-screws m^2, m' , tapped in lugs m^3 on the side of the bearing-arm k' . The purpose of this special construction is to enable the tripping-roller to be adjusted in position so as to vary the point in the movement of the lever L' at which the disengagement of the driving-dog shall take place and in this way vary the lateral feeding movement of the die-carriage according to the conditions encountered in practice.

During the forward movement of the lever L' the driving-dog L will maintain engagement with the driving-lug on the disk until the nose on the driving-dog encounters the tripping-roller, whereupon the dog overriding the roller will be elevated and its shoulder will be disengaged from the lug on the disk, causing the latter to come to a rest. In this position of the parts one of the dies is in line with the end of the bar, and this die will be advanced by the forward movement of the reciprocating head and the bar will be subjected to the action of the same. On the re-

turn movement of the head the die will be withdrawn from the bar, and as the rear end of link C rises as the next forward stroke of the reciprocating head begins the feeding-dog (which had by the return movement of the link C been drawn back ready to engage the next driving-lug) will engage the next driving-lug and moving the disk a partial revolution as before the die-carriage will be again moved transversely to bring the next die in position, which will be arrested at the proper point by the tripping of the dog, and the continued movement of the reciprocating head will carry the die forward over the bar. These operations are repeated until all of the dies have been brought in succession in line with the end of the bar and the latter has been subjected to the action of the same and its formation completed. To begin the operation anew on the next bar, the driving-dog is lifted by hand free of the disk and the hand-wheel is turned to feed the die-carriage back to the starting position, and the completed bar being removed a new one is set in place and the forming operation started, the driving-dog being of course released so that it may perform its functions.

The bar to be acted on is to be held fixedly, as shown in Fig. 2, on the end of the bed-plate, a clamping device O, which may be of any appropriate form, being provided for this purpose and adapted to closely embrace the bar near its end and hold the same fixedly, with the end to be acted on projecting inward and facing the dies.

Having thus described my invention, what I claim is—

1. In a machine of the type described, the combination of means for holding the work, a reciprocating head, means for reciprocating said head, a die-carriage mounted on the head and movable relatively to the same transversely, a plurality of dies on the carriage, a rack on the carriage, a driving-pinion sustained by the head and in constant engagement with the rack-teeth, and intermediate mechanism actuated by the head-actuating means and operating to impart motion to the driving-pinion.

2. In a machine of the type described, the combination of a bed-frame, means for holding the work fixedly thereon, a reciprocating head, actuating mechanism for reciprocating the same, a die-carriage provided with a plurality of dies and mounted on said head to move transversely, a rack on the carriage, a pinion engaging the rack-teeth and sustained by the head, a driving-shaft operatively connected with the pinion, a driving-disk on the shaft, and mechanism, controlled by the said head-actuating mechanism, for imparting to said driving-disk a step-by-step movement.

3. In a machine of the type described, the combination of a movable die-carriage, a

plurality of dies thereon spaced apart and adapted by the movement of the carriage to be positioned relatively to the work, a rotary driving-disk operatively connected with the carriage; a driving-dog adapted to engage and rotate the disk, means for operating the dog, and means for tripping the dog when the carriage has moved a distance corresponding to that between the dies.

4. In a machine of the type described, the combination of means for holding the work, a reciprocating head movable to and from the work, a carriage on the head movable horizontally in a transverse direction and provided with a plurality of dies arranged in a horizontal line, a horizontal rack on the carriage, a horizontal pinion mounted on the head and engaging the rack, a horizontal bevel-wheel connected with the pinion, a vertical bevel-wheel engaging the horizontal bevel-wheel, a horizontal transversely-extending shaft mounted in bearings on the head and connected with the vertical bevel-wheel, a driving-disk fixed to said shaft, and means for imparting an intermittent motion to the driving-disk; whereby as the head is reciprocated, the horizontal pinion will impart to the rack on the carriage an intermittent transverse movement.

5. In a machine of the type described, the combination of means for holding the work, a reciprocating head movable to and from the work, a transversely-movable carriage mounted on the head and provided with a plurality of dies, a horizontal transversely-arranged shaft mounted in bearings on the head, a pinion carried by the head and operatively connected with said shaft, a rack on the carriage engaged by said pinion, a driving-disk fixed to the shaft and provided with a number of driving-lugs, a vibratory lever mounted on the shaft, a driving-dog carried by the lever and adapted, when the latter is vibrated, to engage the lugs on the disk, and means for vibrating said lever.

6. In a machine of the type described, the combination of a movable die-carriage, a driving-disk provided with lugs and operatively connected with the carriage, a vibratory lever sustained adjacent said disk, a driving-dog carried by the lever and adapted to engage the lugs on the disk, an adjustable tripping device arranged in the path of the driving-dog; whereby when the latter engages said tripping device, it will be disen-

gaged from the driving-lugs and permit the disk to come to rest, and means for vibrating the lever.

7. In a machine of the type described, the combination of means for holding the work, a reciprocating head movable to and from the work, an operating mechanism for the reciprocating head, a vibrating link C connecting the operating mechanism with the reciprocating head, a die-carriage mounted on the head and movable transversely, a rotary driving-disk carried by the head, an actuating mechanism between said link C and the driving-disk adapted by the vibratory motion of the link to impart to the disk an intermittent motion, and operative connections between the disk and the die-carriage; whereby the intermittent motion of the disk will be imparted to the carriage.

8. In a machine of the type described, the combination of means for holding the work, a reciprocating head movable to and from the work, operating mechanism for the head, a vibratory link connecting said operating mechanism with the head, an arm fixed rigidly to said link, a transversely-movable die-carriage mounted on the head, a rotary driving-disk mounted on the head, operative connections between said disk and die-carriage for moving the latter transversely, a vibratory lever mounted adjacent the driving-disk, a dog on said lever adapted to engage and drive the disk, and a connection between said lever and the arm on the link.

9. In a machine of the type described, the combination of a reciprocating head movable to and from the work, driving mechanism therefor, a transversely-movable die-carriage mounted on the head, a horizontal transverse rack on the die-carriage, a vertical shaft mounted in bearings on the head, a pinion on the shaft engaging the rack, a bevel-pinion also on the shaft, a horizontal shaft mounted in bearings on the head, a bevel-pinion on the horizontal shaft engaging the bevel-pinion first mentioned, and means controlled by the head-driving mechanism for operating the horizontal shaft.

In testimony whereof I hereunto set my hand, this 18th day of October, 1905, in the presence of two attesting witnesses.

EMIL EINFELDT.

Witnesses:

M. LOUISE DODGE,
LEON ZOECKLER.