J. H. Kroehl,

Flanging Machine,

No. 12,133. Patented Jan. 2, 1855.

Fig: 1

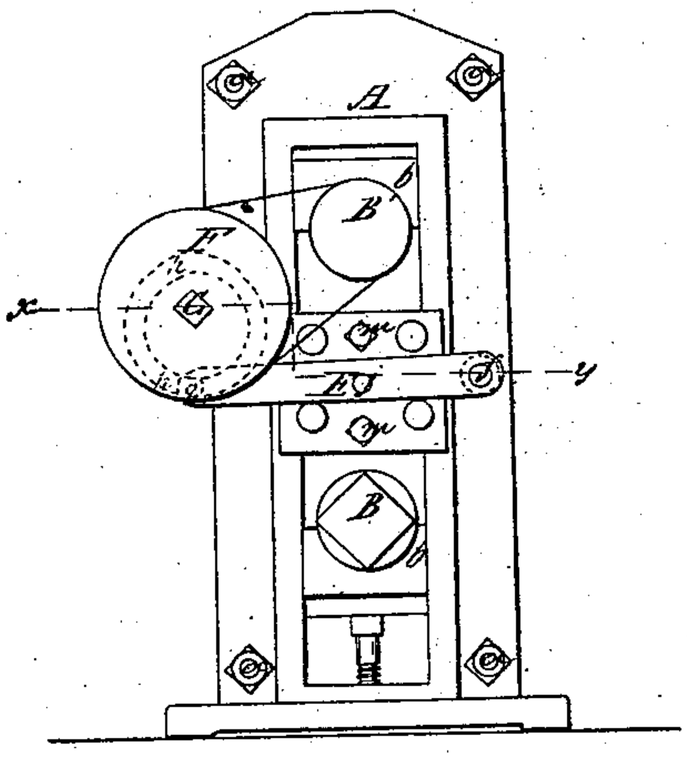


Fig: 2

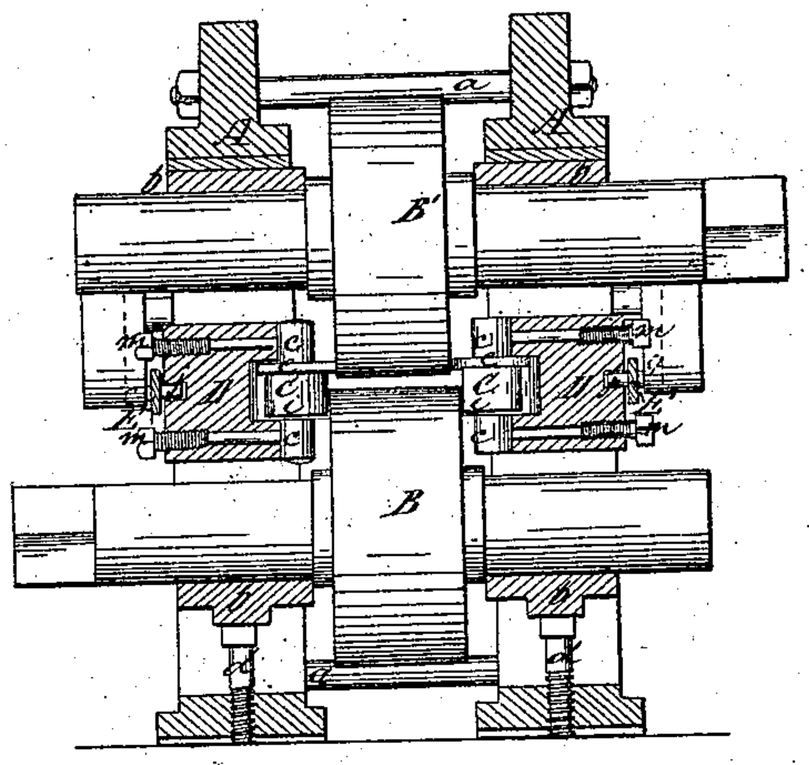


Fig: 3

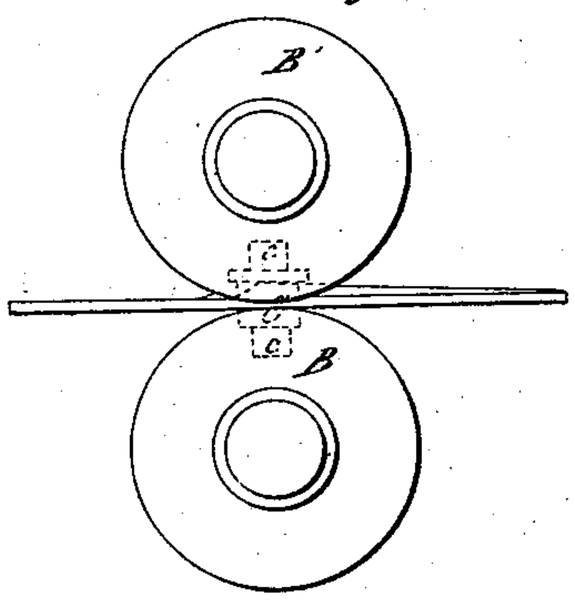


Fig: 4

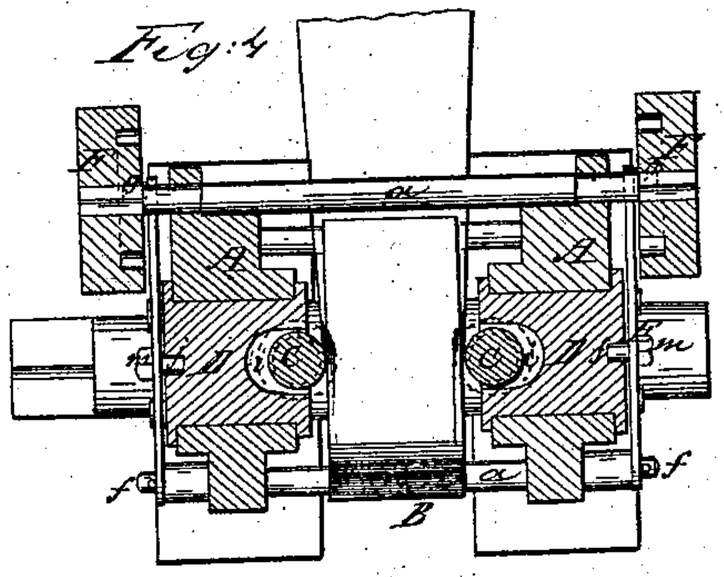


Fig: 5

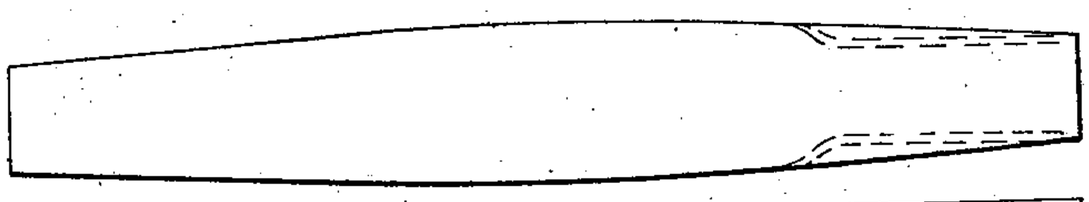


Fig: 6

Fig: 7

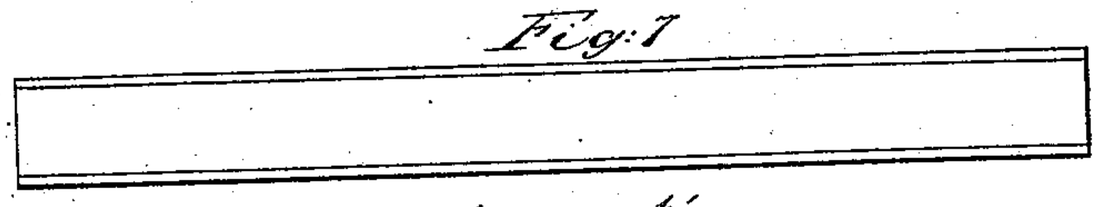
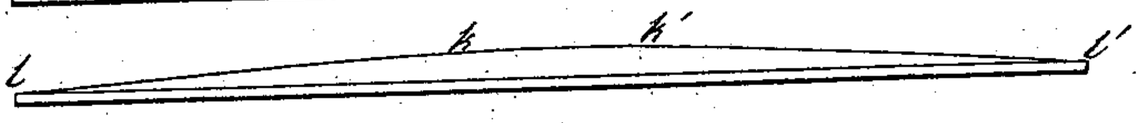


Fig: 8



UNITED STATES PATENT OFFICE.

JULIUS H. KROEHL, OF NEW YORK, N. Y.

MACHINE FOR FORMING FLANGES ON WROUGHT-IRON BEAMS.

Specification of Letters Patent No. 12,133, dated January 2, 1855.

To all whom it may concern:

Be it known that I, JULIUS H. KROEHL, of the city, county, and State of New York, have invented a new and useful Improvement in Machinery for Forming Taper or Elliptic Flanges on Wrought-Iron Beams; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, is a side elevation of a machine constructed according to my invention. Fig. 2, is a vertical section of the same, taken at right angles to Fig. 1, through the center of the machine, but showing the working parts entire. Fig. 3, is a side view of the rollers. Fig. 4, is a horizontal section of the machine, in the line *x*, *y*, of Fig. 1. Fig. 5, is a face view, representing in black outline, the form of the plate from which the beams are to be formed. Fig. 6, is an edge view of the same. Fig. 7, is a view of the flanged side of a finished beam. Fig. 8, is a longitudinal section of the same.

Similar letters of reference indicate corresponding parts in the several figures.

This invention consists in forming taper or elliptic flanges on wrought-iron beams by means of a pair of vertical and a pair of horizontal rollers all having their axes in the same plane and being constructed and operating in the manner hereinafter described.

To enable those skilled in the art, to make and use my invention, I will proceed to describe particularly its construction and operation.

A, A, are the standards, which, united by transverse stays, *a*, *a*, form the framing of the machine.

B, B′, are the horizontal rollers, whose journals are fitted to boxes, *b*, *b*, sliding vertically within the standards, and having screws, *d*, *d*, applied for the purpose of regulating the distance between the rollers. The lower roller, B, has its face parallel with its axis, and of a width equal to the intended width or depth of the the beam including the flanges. The upper roller, B^1, has its face of a width equal to the intended width or depth of the beam, minus the flanges, and may, or may not, have its edges rounded, and its sides slightly beveled off toward them as represented in Fig. 2. These rollers are similarly arranged to the rollers commonly employed in rolling iron, and may be geared together in a similar manner.

C, C, are the vertical rollers which are supported in boxes, D, D, fitted to slide vertically in guides in the standards, A, A. Each box, D, contains the bearings for the upper and lower journals, *c*, *c*, of its roller, C, and receives the roller in a recess between the said bearings, so as to prevent the roller moving in the direction of its axis. The rollers, C, C, have each a face, *i*, which should be wider than the greatest width ever required for the flange of the beam, and above this face a flange, *e*.

The face, *i*, is in contact, or nearly in contact with the sides or ends of the lower horizontal roller, B, and the flange, *e*, is in contact, or nearly in contact with the corresponding parts of the upper horizontal roller, B′. The boxes, D, D, are connected at *j*, see Fig. 1, with two strong levers of the second order, E, E, which work on fulcrum pins, *f*, *f*, secured in the outside of the standards. These levers are furnished at the opposite end to the fulcrum with studs, *g*, *g*, which enter into eccentric grooves in the faces of the two cams, F, F, upon the shaft, G, which works in suitable bearings on the standards, parallel with the shafts of the rollers, B, B′, and receives motion through a belt or gearing from the shaft of B′. One of these grooves is shown in dotted lines at *h*, *h*, in Fig. 1. The revolution of the cams has the effect of elevating and depressing the boxes, D, D, and the rollers, C, C. The grooves are of such form, and the cams are driven at such speed relatively to the speed of the rollers, that the rollers, C, C, will have such a motion as is necessary for their flanges to give the desired form to the edges of the flanges of the beam.

The operation of the machine is as follows. I will suppose that the form of the beam is desired to be similar to that shown in Figs. 7, and 8, consisting of a flat plate with two flanges. The flanges are required to be straight for a certain length, *k*, *k′*, at the middle, and tapered off from the points, *k*, *k*, to nothing at the ends. The plate or bar from which the beam is to be made, is previously wrought by any suitable means, to about the form represented in Figs. 3, and 6, care being taken to have the proper quantity of metal, and to have the ends of the width required for the extreme width

of the beam. It is conducted in a heated state between the rollers, and as it is drawn along by the revolution of the rollers, B, and B′, which have power applied to them for the purpose, it gives motion to the rollers, C, C, by its contact with them, and, by the last named rollers, has its flanges bent upward, over the sides of the roller, B′. When the end, *l*, of iron, is first introduced to the rollers, the flanges, *e*, *e*, of the rollers, C, C, are in contact, or nearly so, with the roller, B, but the movements given by the cams, F, F, to the levers, E, E, are such as to cause the rollers, C, C, to ascend at a regular speed proportionate to the motion of the iron between the rollers, until the point, *k*, arrives opposite the axes, when they commence to descend and continue descending at a regular speed until the beam leaves the rollers entirely. By the regular ascent of the rollers, C, C, a regular incline, *l*, *k*, is produced on the flange. While they remain stationary, the straight part, *k*, *k′*, is produced, and while they descend, another incline, *k′*, *l′*, is produced.

By varying the form of the grooves in the cams, F, F, and properly regulating the velocity of their revolution, an almost indefinite variety of forms may be given to the flanges of the beams. The rollers, B, B, are adjusted for beams of different thicknesses in the same way as the rollers of an ordinary rolling machine. The rollers, C, C, should also be adjustable laterally to the machine to regulate the thickness of the flanges. As a rude means of adjustment, I have represented screws, *m*, *m*, bearing upon the journals of the latter rollers, but a better arrangement would be to make the bearings for the journals in small boxes adjustable by screws within the main boxes, D, D.

The principal advantage which this machine possesses over machines in common use for rolling iron beams, is, that beams of any length, with flanges of tapering elliptic, or other irregular form, can be rolled without making the diameter of any of the rollers larger than those commonly employed. If two rollers only are used, a beam such as I have represented, must be produced by one single revolution; and if the beam were of great length, the rollers would require to be immense. But in this machine, the rollers, B, B′, need not be larger than the rollers most commonly employed. The rollers, C, C, will be much smaller.

I do not claim the employment for forming or reducing metal bars of two pairs of rollers arranged as described when the side rollers, C, C, have no flanges or no movement in the line of their axes, or any of the rollers are otherwise constructed than as herein described. But

What I claim as my invention and desire to secure by Letters Patent, is—

The combination of the wide and narrow rollers, B, B′, and the flanged rollers, C, C, which have a movement in the line of their axes corresponding with the desired form of the edges of the flanges on the beam for the purpose of finishing or smoothing the said edges substantially as herein set forth.

JULIUS H. KROEHL.

Witnesses:
O. D. Munn,
Jno. W. Hamilton.