May 9, 1933. A. RAFTER 1,908,182

MACHINE FOR BENDING SHEET METAL SHAPES

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Fig. 1.

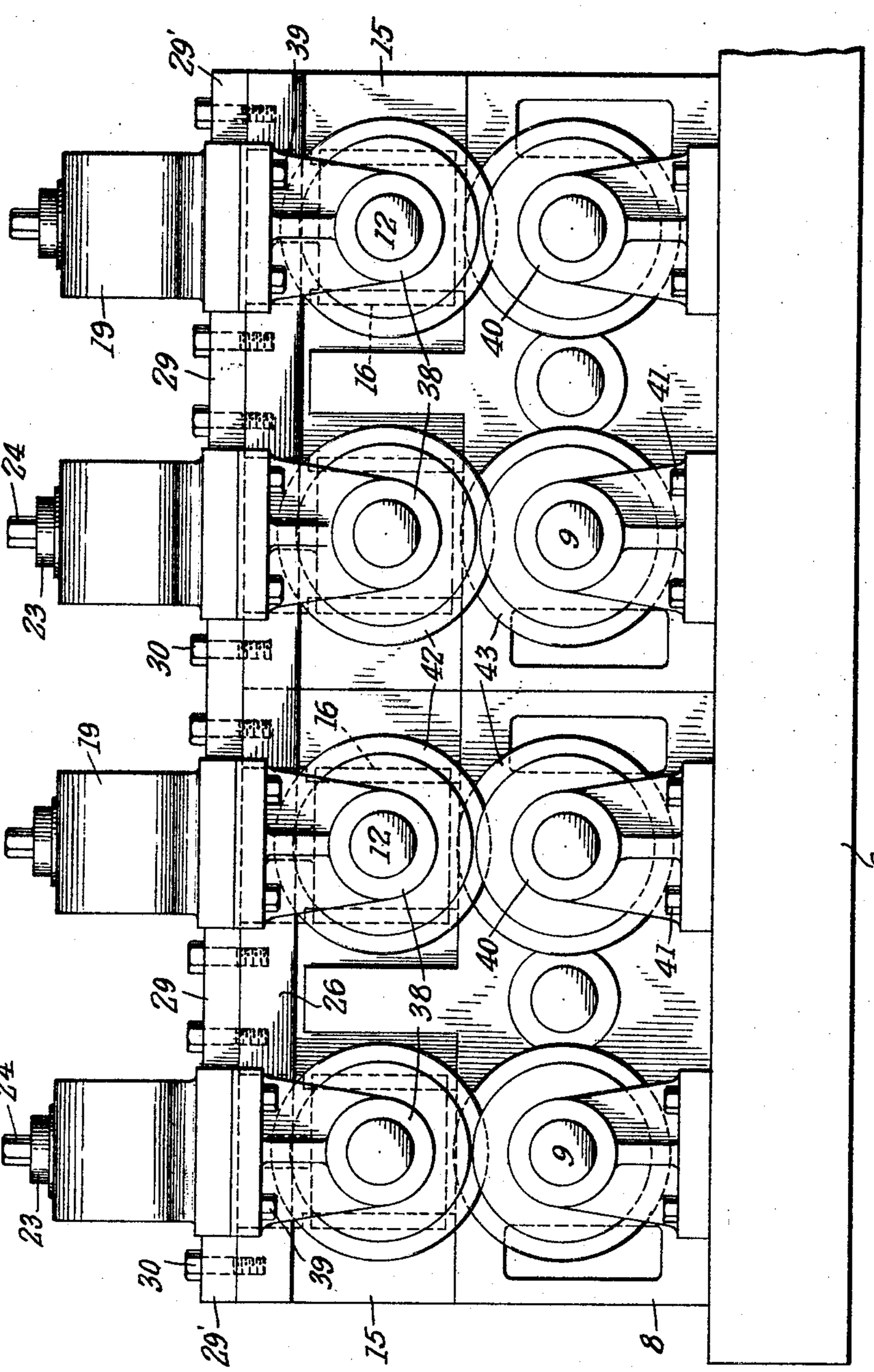

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Fig. 2.

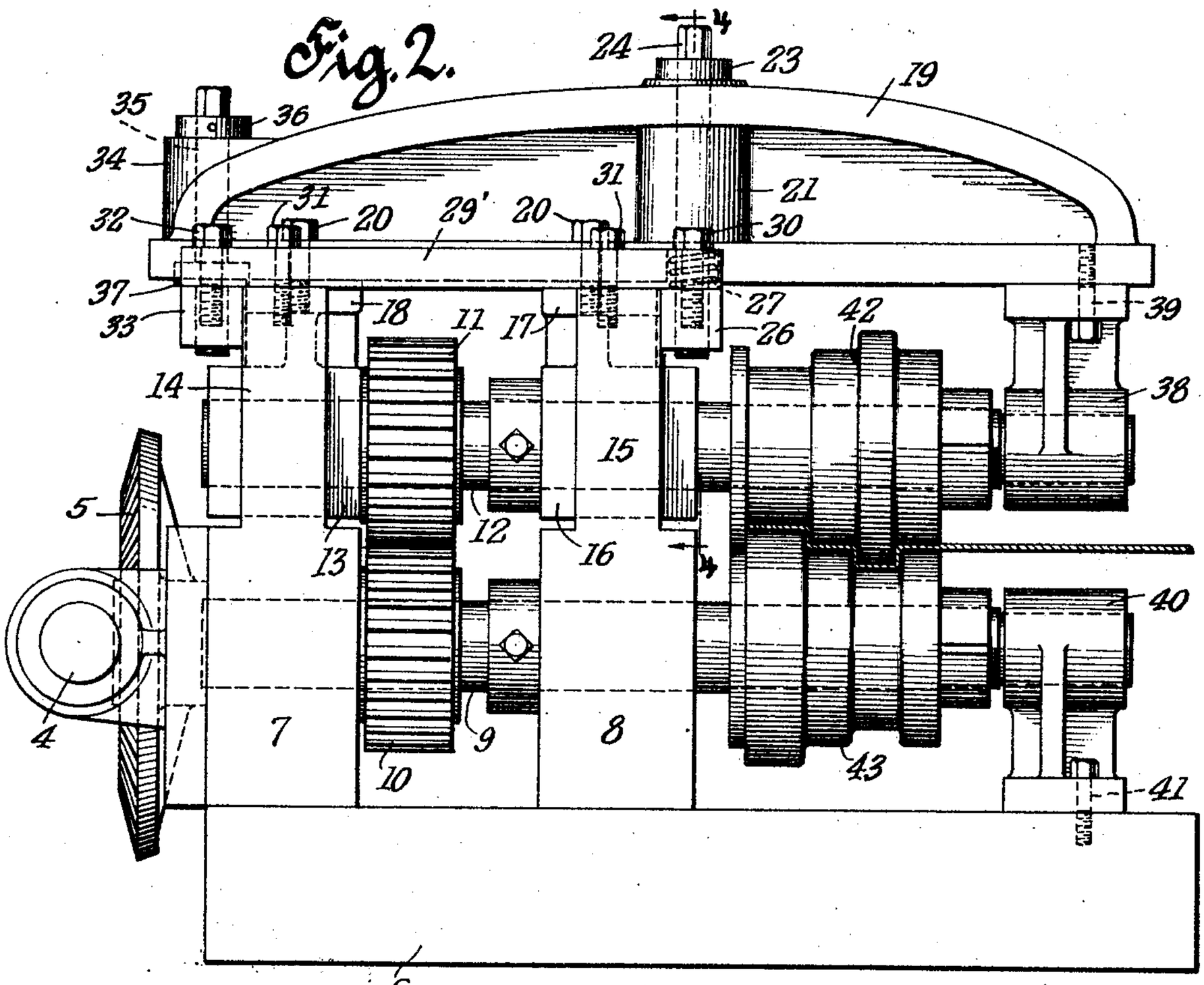


Fig. 3.

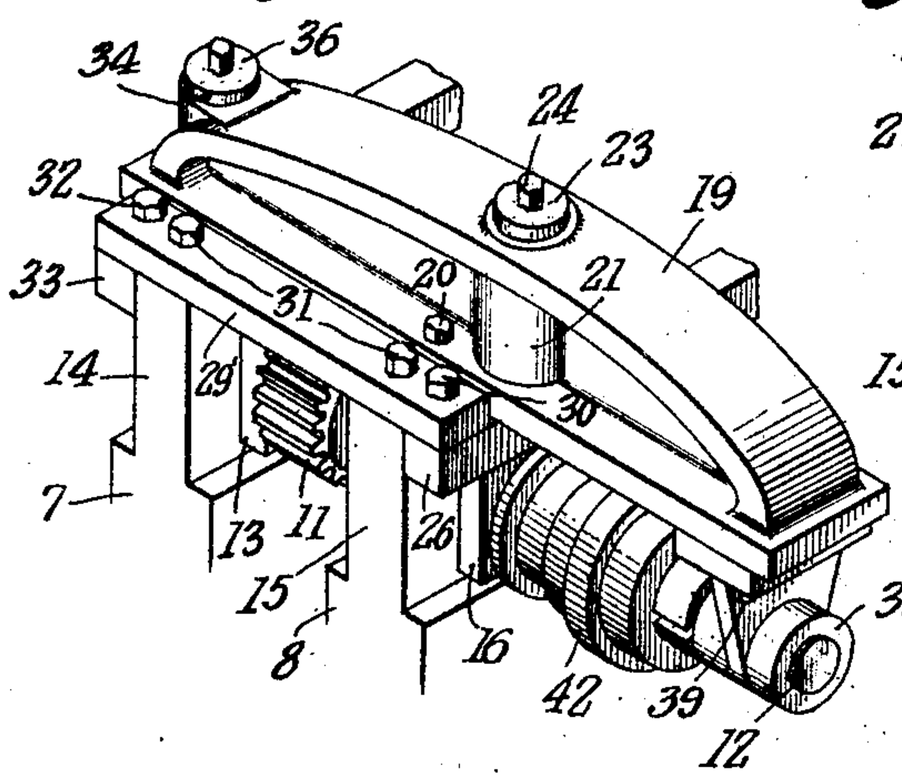
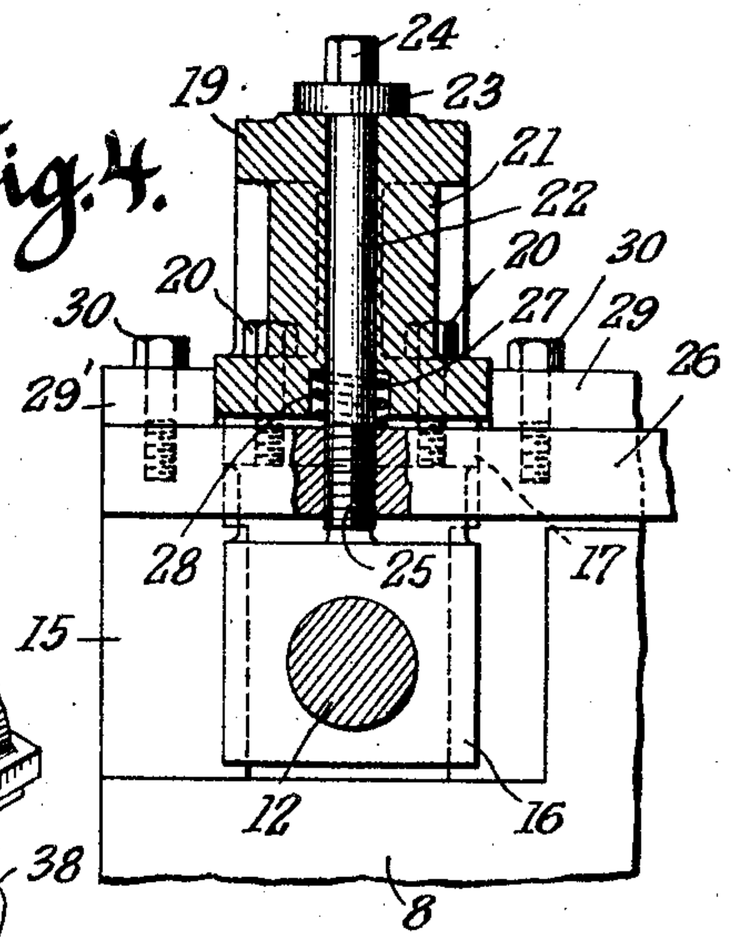


Fig. 4.



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UNITED STATES PATENT OFFICE

ALBERT RAFTER, OF BELLEVILLE, NEW JERSEY, ASSIGNOR TO RAFTER MACHINE COMPANY, OF BELLEVILLE, NEW JERSEY, A PARTNERSHIP OF NEW JERSEY COMPOSED OF ALBERT RAFTER AND JOHN C. RAFTER, JR.

MACHINE FOR BENDING SHEET METAL SHAPES

Application filed August 29, 1930. Serial No. 478,637.

This invention relates to rolling machines for forming sheet metal into miscellaneous shapes, and more particularly to such machines of the "open front" type adapted to accommodate relatively wide sheets of metal.

In my pending application, Serial No. 288,585, filed June 27, 1928, there is described a metal forming machine in which the die rolls are mounted on shafts supported in a manner which necessitates the passing of the metal sheets between the supports. Obviously, such arrangement limits the width of the metal sheet which may be operated upon.

Inasmuch as it is necessary at times to shape the edges of relatively wide sheets, that is, of a width greater than the width of the die rolls, there has been provided an "open face" machine in which the shafts are supported only at their driven ends, thus leaving the free ends of the shafts unsupported and eliminating obstructions to wide sheets of metal.

However, such machines have been found unsatisfactory in that the unsupported ends of the shafts are deflected when pressure is applied thereto, with the result that the metal sheet is formed with round corners instead of the desired sharp corners. Although the shafts used on such machines are comparatively short, and have appreciable diameters, they have been found to deflect as much as one-sixty-fourth of an inch during the forming operation.

It is therefore, an object of this invention to provide means for stably supporting the free ends of the die roll carrying shafts without producing obstructions preventing the accommodation of relatively wide sheets of metal.

Another object of this inventon is to provide a powerful, efficient drive in which power is distributed to each individual pair of rolls, thus requiring less power to operate than would be necessary in other types of forming and rolling machines; and further:

To provide a machine of this character that eliminates springing of the shafts and die rolls, and provides means to keep said members in perfect alinement, and is so constructed that the rolls can be easily removed and replaced in a relatively short space of time, a desideratum of importance in modern systems of production.

This and other advantageous objects which will later appear, are accomplished by the simple and practical construction and arrangement of parts hereinafter described and exhibited in the accompanying drawings, forming part hereof, and in which:

Figure 1 represents a front elevational view of a machine embodying the invention.

Figure 2 represents an end view of the machine.

Figure 3 represents a perspective view of a section of the machine.

Figure 4 represents a sectional view taken on the line 4—4 of Figure 2.

Referring to the drawings, the rolling machine is shown to include a base 6 upon which are mounted a plurality of rear heads 7 and a plurality of front heads 8 in which are journalled lower shafts 9 having fixed thereto the gears 10. Inasmuch as the structure of the several sections is identical, the description will be confined to one section such as is shown in Figure 2.

Integral with heads 7 and 8, are respectively sides uprights 14 and 15 between which are slidably mounted the housings 13 and 16 having journalled therein the upper shaft 12 to which is fixed a gear 11 in mesh with the gear 10.

The structure above described is identical with that disclosed in my application Serial No. 288,585, filed June 27, 1928, in which it is shown that the shafts 9 and 12 are driven by means of bevelled gear 5 in mesh with a bevelled gear on the driving shaft 4.

The housings 13 and 16 respectively are provided with raised flat portions 18 and 17 respectively, which support a yoke 19, the latter being rigidly secured to the flat portions 18 and 17 by means of bolts 20.

The yoke 19 has an enlarged portion 21 provided with an aperture through which passes a bolt 22 having an integral collar 23 which engages the upper side of yoke 19, and a hexagonal head 24 by means of which the bolt may be rotated.

The lower end of the bolt has a threaded

portion 25 in threaded engagement with a bar 26, upon which rests a compression spring 27, the latter encircling the bolt and being housed in a recess 28 in the yoke 19.

The bar 26 is secured by bolts 30 to transverse end bars 29′ and intermediate plates 29, the bar 29′ and plates 29 being secured to the uprights 14 and 15 by bolts 31. Also secured to bar 29′ and plates 29 by means of bolts 32, is a rear bar 33 in threaded engagement with a bolt 35 passing through an aperture in the enlarged portion 34 at the rear of yoke 19. Downward movement of the bolt 35 is limited by a collar 36 fixed thereto by a pin; and upward movement of bolt 35 is limited by an integral collar 37 positioned in a recess on the under side of yoke 19.

Secured to the forward end of yoke 19 by means of bolts 39, is a bearing 38 which supports the free end of shaft 12. The free end of shaft 9 is supported in a bearing 40 which is fixed to the base 6 by means of bolts 41. As clearly shown in Figure 2, the bearings 38 and 40 are sufficiently spaced so that no obstruction would be in the path of the wide metal sheet which may be in the process of being formed by the roll dies 42 and 43 fixed respectively to shafts 12 and 9.

In operation, a metal sheet to be shaped is introduced into the machine at the end thereof and passes between the bearings 38 and 40 as shown in Figure 2. It will be seen that the yoke 19 is rigidly connected to the housings 13 and 16 and consequently any adjustment of the yoke will be transmitted to the housing.

When adjustment of the housing is desired, the bolt 22 is rotated to cause the yoke to be moved towards or away from the bar 26. When the bolt is loosened, or withdrawn from the bar 26, the coil spring 27 assists in raising the yoke 19. Simultaneously with the adjustment of bolt 22 it is necessary also to adjust bolt 35.

From the above description, it will be seen that I have provided a simple expedient for rigidly supporting shafts on a rolling machine without in any way obstructing the movement of relatively wide sheets of metal which may be in the process of being shaped by the machine.

The foregoing disclosure is to be regarded as descriptive and illustrative only, and not as restrictive or limitative of the invention, of which obviously an embodiment may be constructed including many modifications without departing from the general scope herein indicated and denoted in the appended claim.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

In a rolling machine, a base, a plurality of sections mounted on the base, each section including a front head and a rear head, lower bearings mounted on the heads, a lower shaft journalled in the lower bearings, upper housings slidably mounted in the heads, a yoke fixed to said upper housings, an upper shaft journalled in the housings, plates rigidly attached to the heads, said plates acting as guides for the yokes and preventing lateral movement of the yokes and spacing the sections, a bar extending the length of the machine, said bar being supported by the plates, and means associated with the bar and yokes to adjust the yokes vertically.

This specification signed this 9th day of June, 1931.

ALBERT RAFTER.