W. CLEESATTEL.

METAL FORMING MACHINE.

APPLICATION FILED MAR. 9, 1915.

1,166,814.

Patented Jan. 4, 1916.

4 SHEETS—SHEET 1.

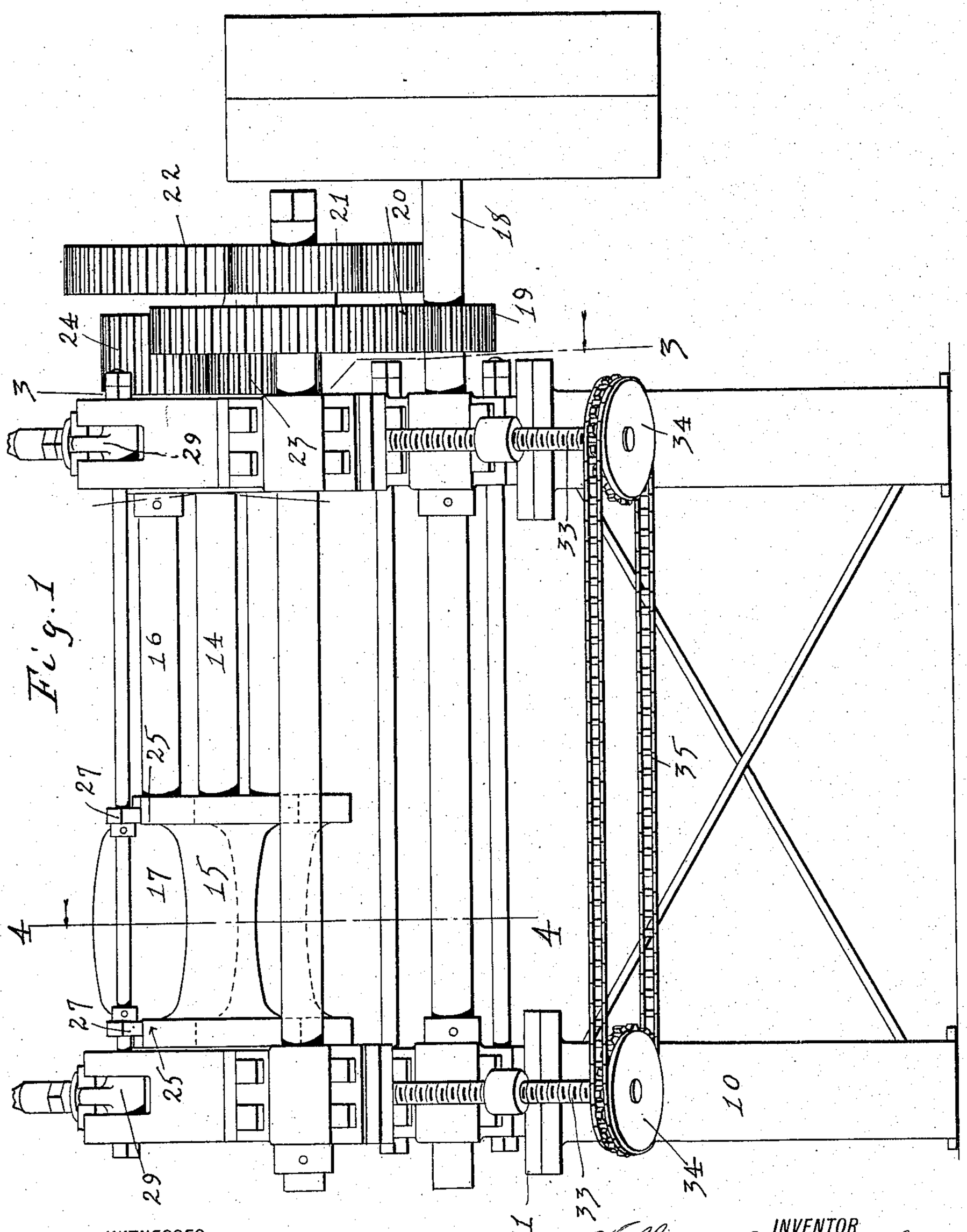

Fig. 1.

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4 SHEETS—SHEET 2.

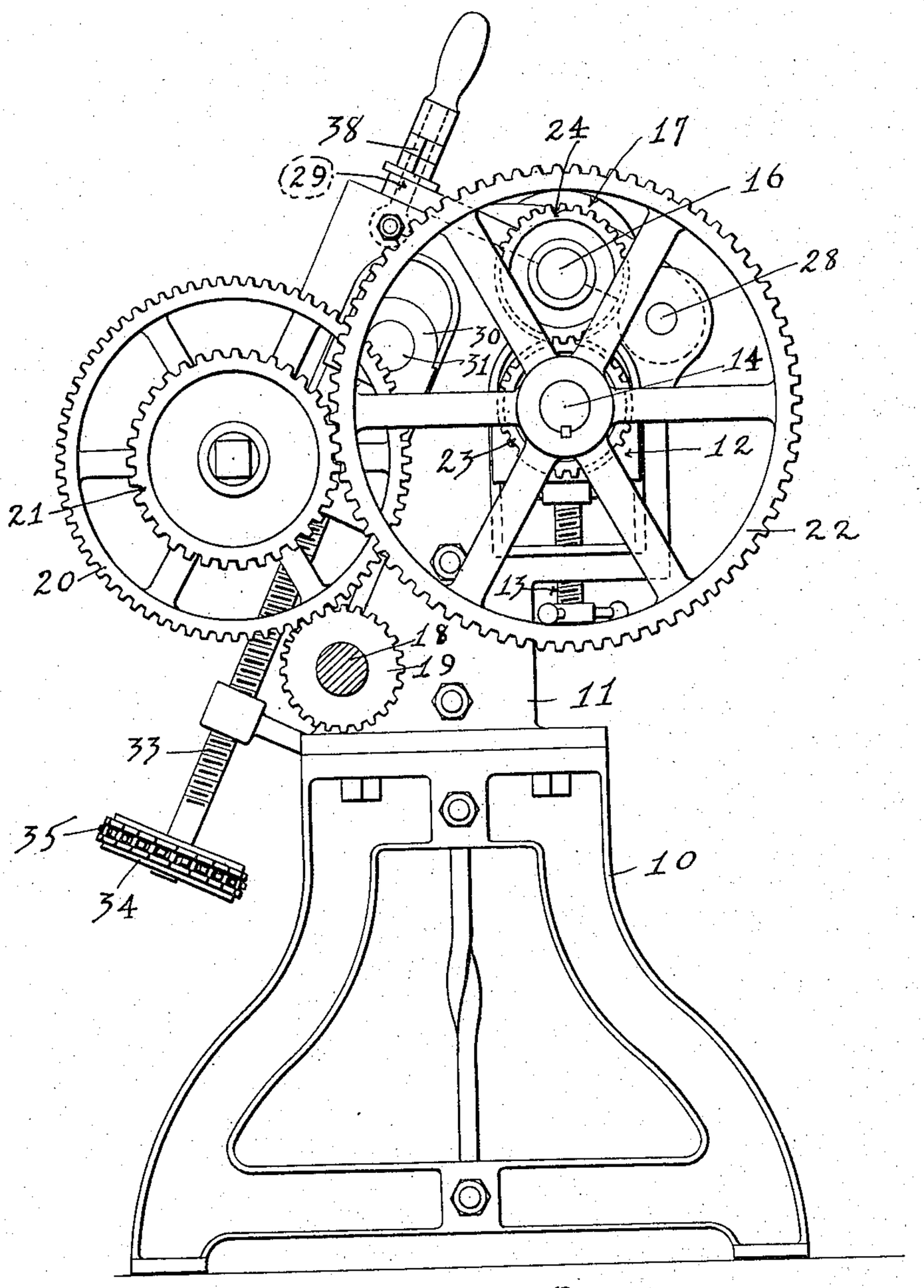

Fig. 2

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4 SHEETS—SHEET 3.

Fig. 3

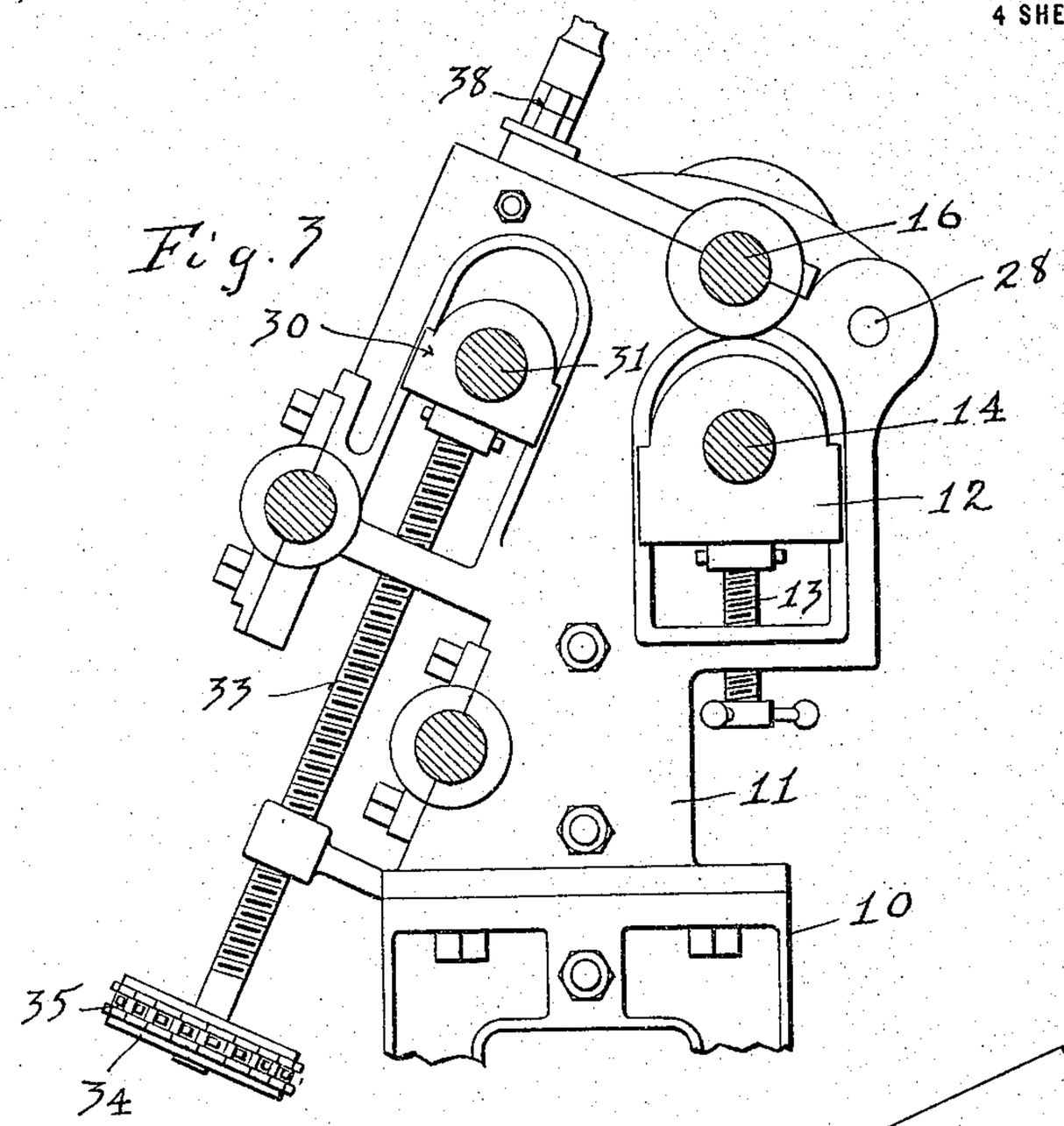


Fig. 7

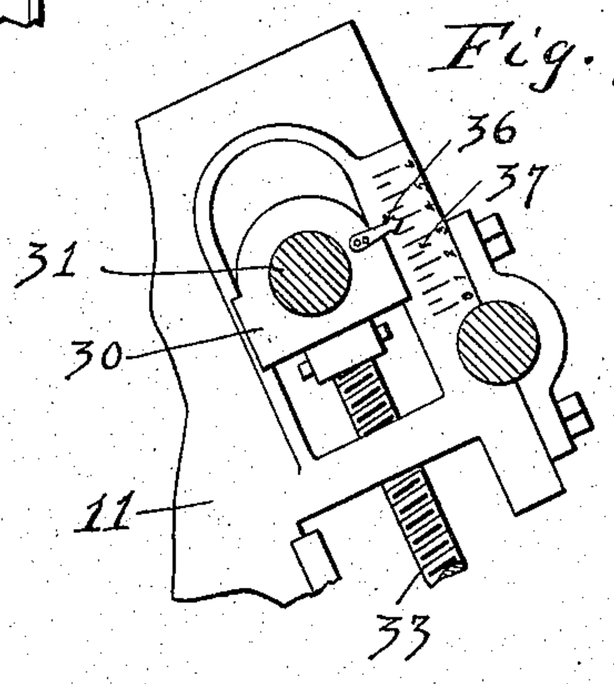


Fig. 6

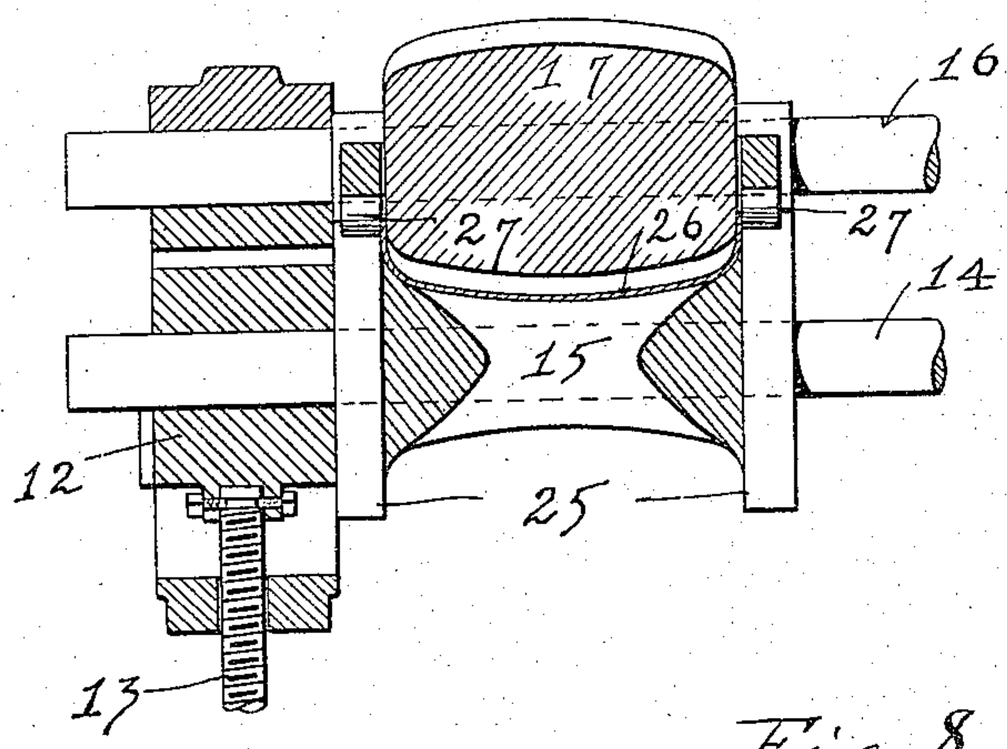
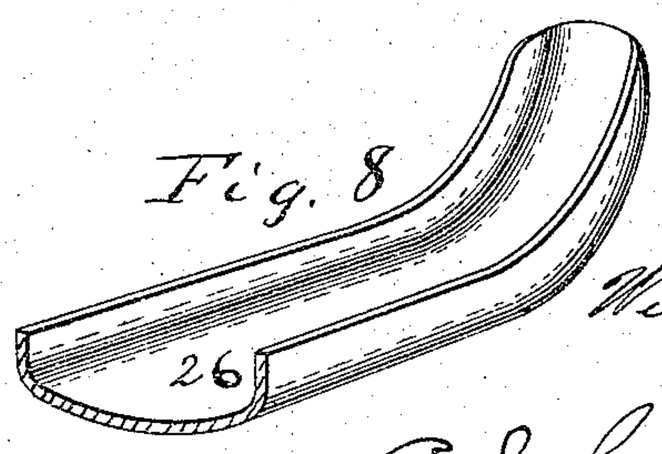


Fig. 8



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4 SHEETS—SHEET 4.

Fig. 4

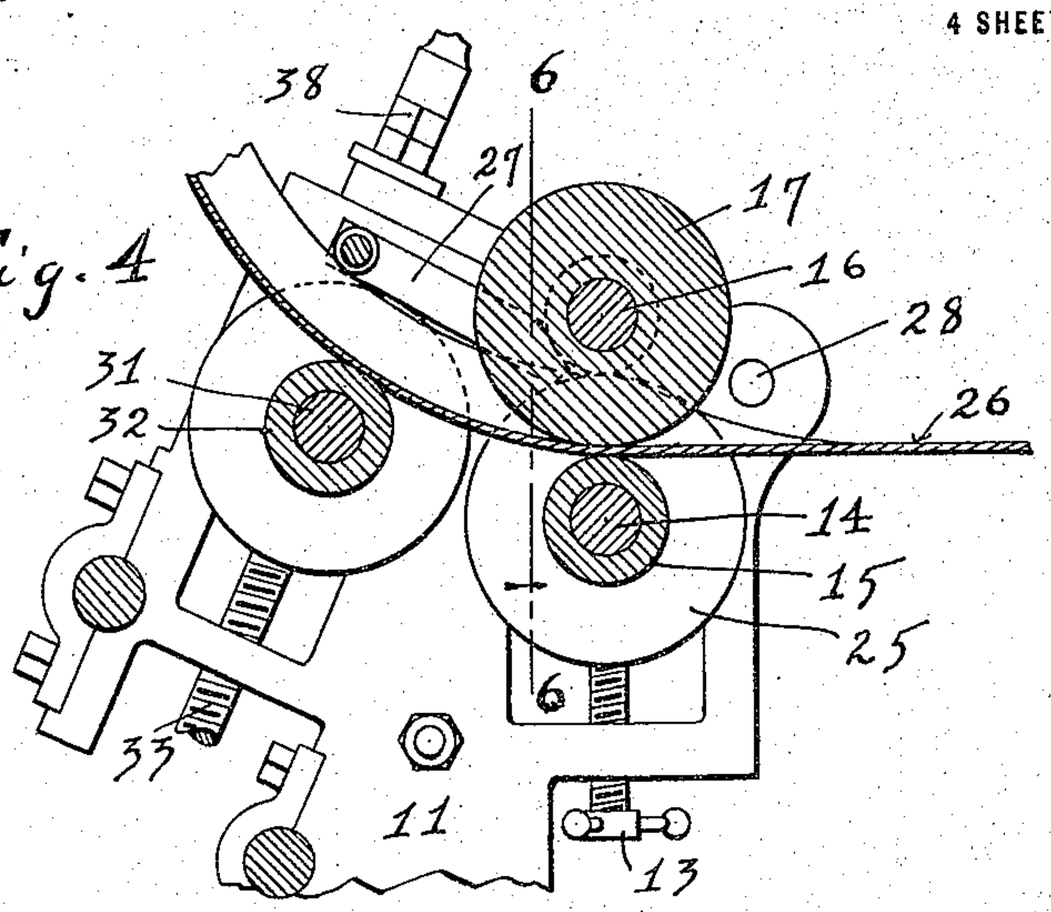
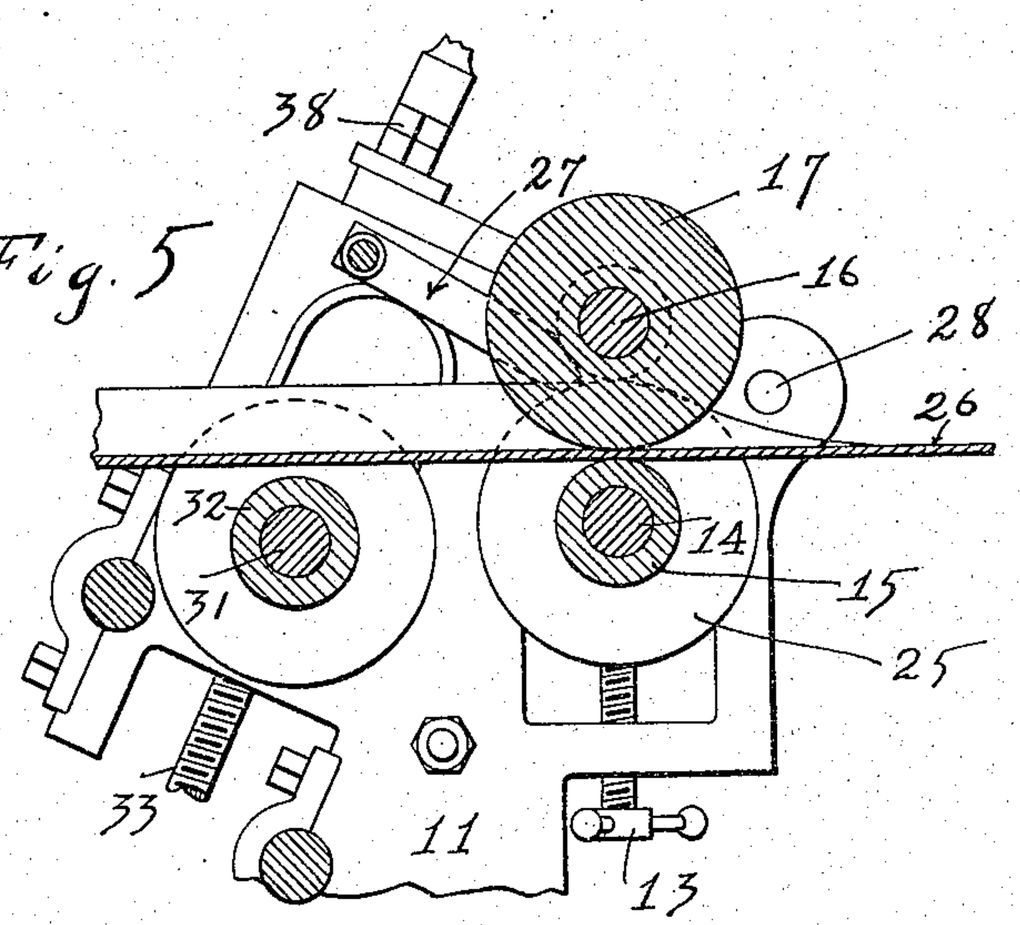


Fig. 5



WITNESSES

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UNITED STATES PATENT OFFICE.

WILLIAM CLEESATTEL, OF BUFFALO, NEW YORK.

METAL-FORMING MACHINE.

1,166,814. Specification of Letters Patent. Patented Jan. 4, 1916.

Application filed March 9, 1915. Serial No. 13,150.

To all whom it may concern:

Be it known that I, WILLIAM CLEESATTEL, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Metal-Forming Machines, of which the following is a specification.

My invention relates to metal forming machines.

More particularly it relates to improvements in machines for bending and forming sheet metal plates into such irregular and flanged forms as mud-guards for automobiles and the like.

The objects of my invention are to provide a machine for the accurate, perfect and rapid formation of plates variously and irregularly curved, to form perfect flanges thereon and to form such plates with rapidity and uniformity hitherto unattained.

Further objects and the operation of my invention will be understood from the following specification and from the drawings herewith in which,—

Figure 1 is a rear elevation of my machine. Fig. 2 is an end elevation, the driving pulley and idler being omitted for clearness. Fig. 3 is a detail section on the line 3—3, Fig. 1. Fig. 4 is a detail section on the line 4—4, Fig. 1, showing the parts in position to form a plate with a comparatively sharp curvature or curved upon comparatively short radii. Fig. 5 is a similar view, the parts being adjusted to form the plate with the desired flange substantially in plane. Fig. 6 is a detail section upon the line 6—6, looking toward the right in Fig. 4, showing the forming or die rolls. Fig. 7 is a detail of one of my adjustable bearings, hereafter described. Fig. 8 is a detail perspective of a part of a mud-guard formed on my machine.

The frame 10 of the machine carries upon it two heavy bearing-castings 11. Mounted in the castings 11 are two bearings 12 which are adjustable in vertical plane by means of screws 13. These bearings support the shaft 14 upon which is rigidly mounted the female roll-die 15. Mounted in vertical plane in bearings hereafter described is the shaft 16 which has rigidly mounted upon it the male roll-die 17. These two shafts and their roll-dies are positively driven at equal speed by the following gearing: A driving shaft 18 upon which are mounted the ordinary belt-pulleys carries the gear 19, which meshes with the gear 20, which is in rotation upon a common shaft with a gear 21, which is in mesh with a gear 22, which is rigid upon the shaft 14, which shaft also carries the gear 23 which is in mesh with a gear 24 of equal diameter and rigid upon the shaft 16. It will be seen that by this train of gearing powerful action is given to the shafts 14 and 16 and to the die-rolls 15 and 17.

The roll-die 15 has end flanges 25 for turning up the edges of the metal plate to be formed which overlap the ends of the roll-die 17 leaving intervening spaces corresponding to the thickness of the metal treated. To assist further in the perfect flanging of the plate I pivot to the bearing castings 11 the flange bars 27, which are spaced apart equally with the end flanges 25 and ride upon them. These flange bars 27 hold the flanges formed by the dies while the plate is being curved as presently described.

To facilitate removal and replacement of the die-roll 17 or the insertion of another similar roll of different size to adapt the machine to metal of different thickness the upper halves of the bearings of the shaft 16 are pivoted to the bearing castings, as shown at 28 in Fig. 3, and the free ends of these bearings are held by swivel-bolts 29 which are pivoted to the bearing castings and which take through slots in the ends of the pivoted bearing members and are held by hand-nuts 38 which screw down upon the said bearing members.

In order to form the plate and side flanges as above described and also to give any longitudinal curvature desired I mount sliding bearings 30 in the bearing castings to the rear of the bearings of the die-rolls and preferably on lines slightly out of vertical, as shown. These bearings carry the shaft 31 of the idler roll 32, and these bearings are adjustable simultaneously and substantially equally by means of the screws 33, sprockets 34 and sprocket chain 35. This roll 32 is thus adjustable in and out of the path of travel of the sheet metal through the die-rolls, and may be lowered entirely out of said path as shown in Fig. 5, or may be brought into the path of travel as shown in Fig. 4. When in the path as shown in said last-mentioned figure, it will deflect and curve the metal upon a constant radius if the adjustment of the bearings of said idler roll remains constant; but if the said bearings are adjusted during the process by means of said screws, sprockets and sprocket-

chains, the curvature will be varied according to the change of adjustment made. By so changing the position of the idler roll during the process of formation of the plate any desired degree or change of curvature may be secured. It is now to be observed that, as the plate 26 is thus being curved by the idler roller, the flange bars 27 hold the side flanges in proper position and prevent buckling or other irregularity while the plate is being curved. And it is also to be noted that, as the shafts 14 and 16 are much longer than the roll-dies 15 and 17 and as the bearings of the shaft 14 are adjustable, by the use of dies of various lengths, contour, or diameter, plates may be formed of different widths and forms.

In Fig. 7 I have shown one of the bearings 30 provided with a pointer 36 and a scale 37 stamped into the bearing casting. By means of this pointer and scale the projection of the idler roll into the path of the plate may be definitely determined and the curvature of the plate also accurately predetermined.

Having thus described my invention, I claim:

1. In a machine of the type described, in combination with positively and equally driven male and female roll-dies, end-flanges upon said female die overlapping the ends of the male die with sufficient intervening space only for the side flanges of the metal plate and flange bars pivotally secured to a fixed portion of the machine having their free ends riding upon the flange ends of said female roll-die and spaced equidistantly with said end flanges, to insure the perfect formation of the side flanges of the plate.

2. In a machine of the type described, the combination of positively and equally-driven male and female roll-dies, said female die having end flanges overlapping the ends of the male die with sufficient intervening space only for the side flanges of the metal plate and flange bars pivotally secured to a fixed portion of the machine, said parts coacting to produce the transverse shaping, with means for curving the plate longitudinally immediately following the transverse shaping comprising an idler-roll mounted in adjustable bearings to project said idler roll to a greater or less degree into the path of travel of the plate through said dies and means for adjusting said idler-roll.

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