

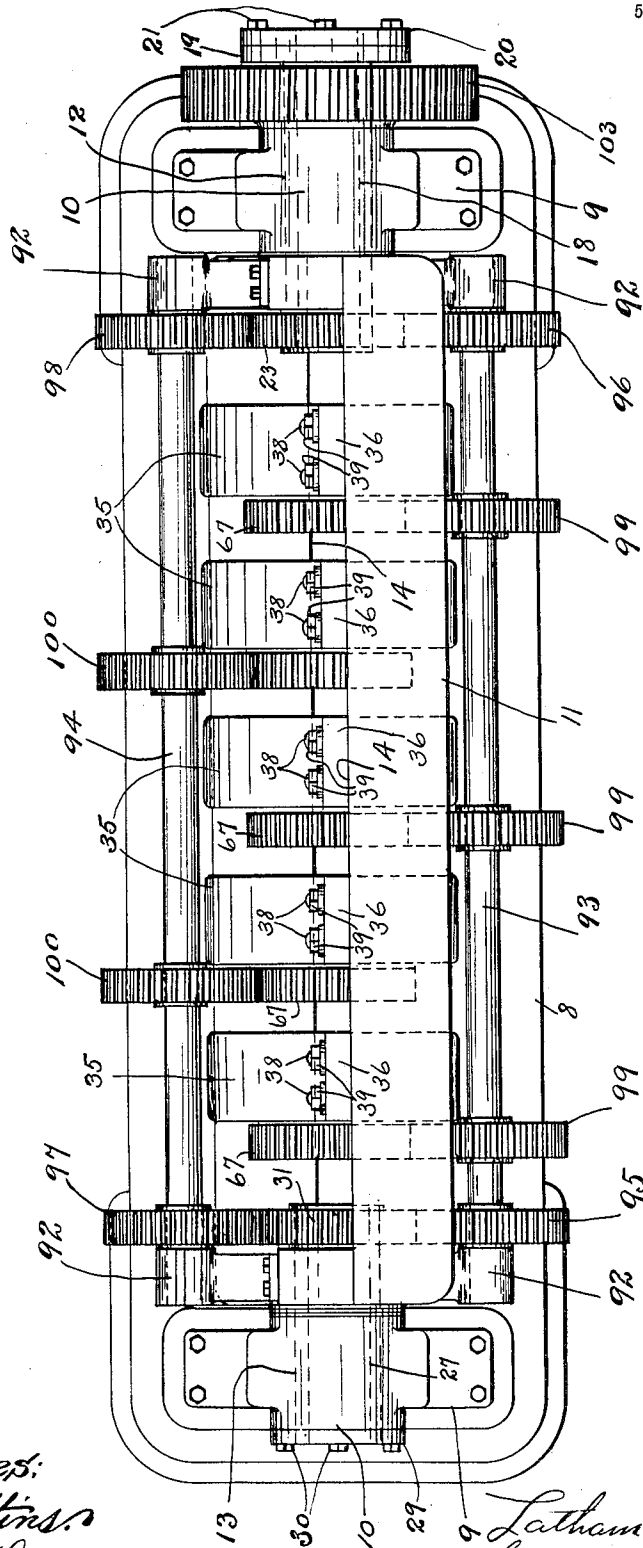
L. H. BRIGHTMAN.
STRAIGHTENING MACHINE.
APPLICATION FILED APR. 14, 1911.

1,017,645.

Patented Feb. 20, 1912.

5 SHEETS—SHEET 1.

Fig. 1.



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Inventor:
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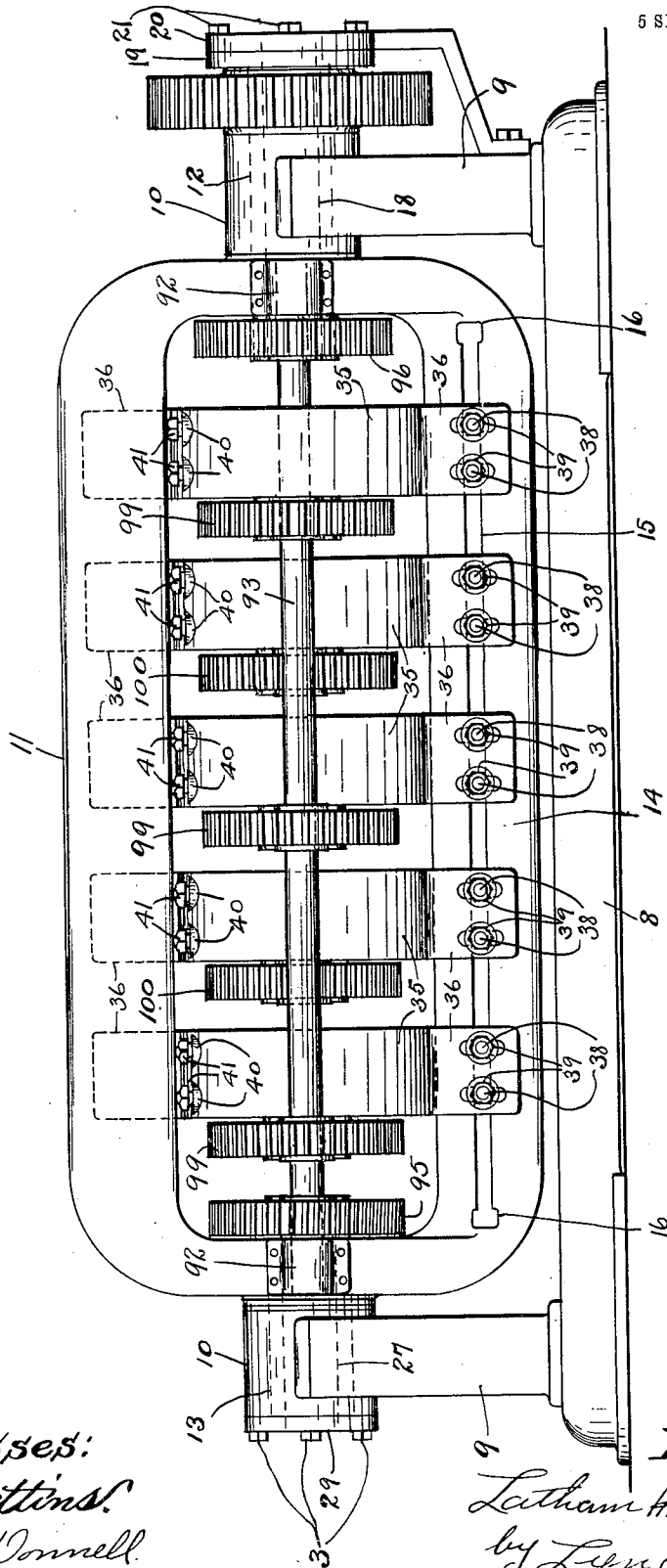
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Fig. 2.



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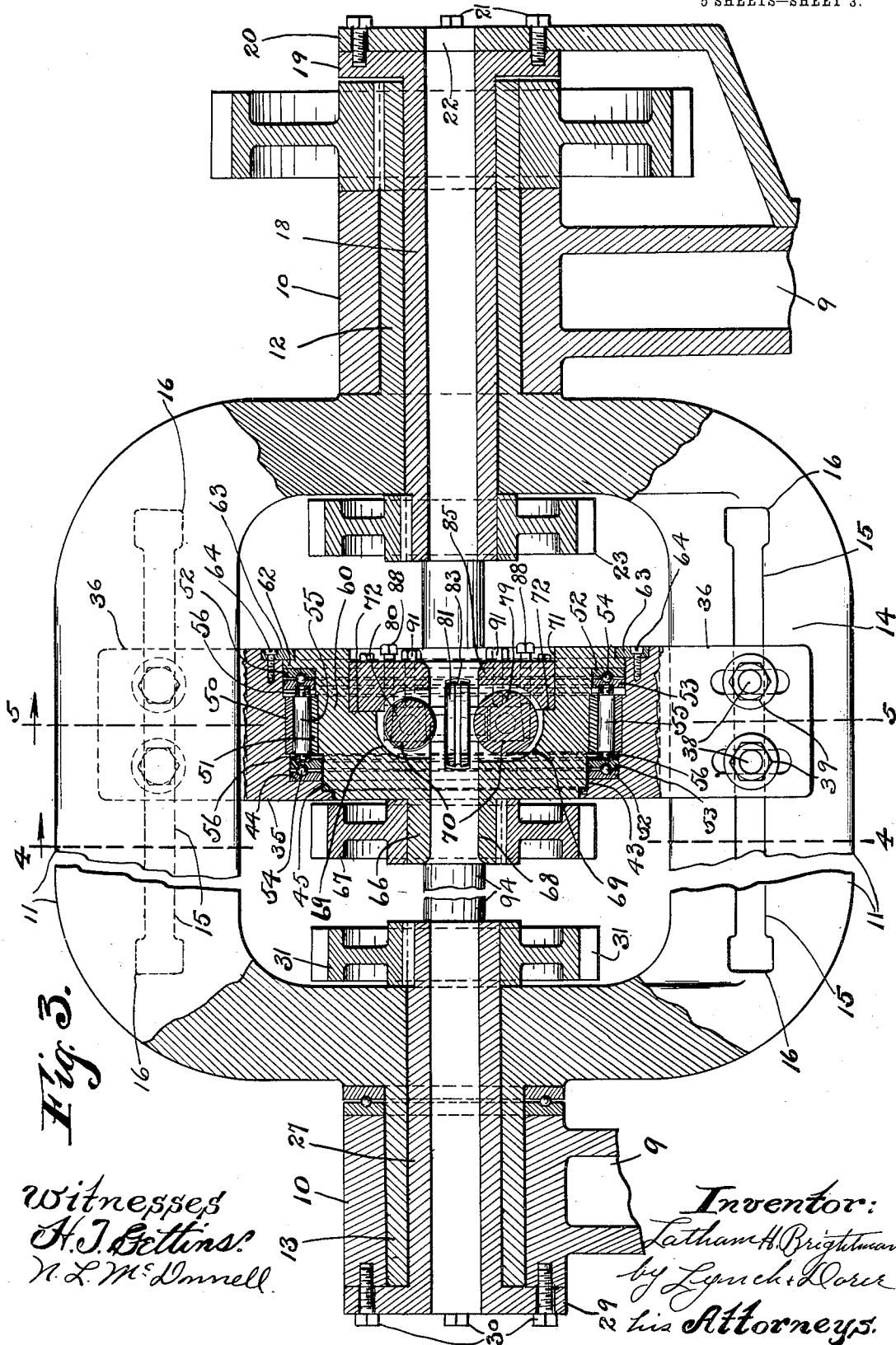


Fig. 3.

Witnesses
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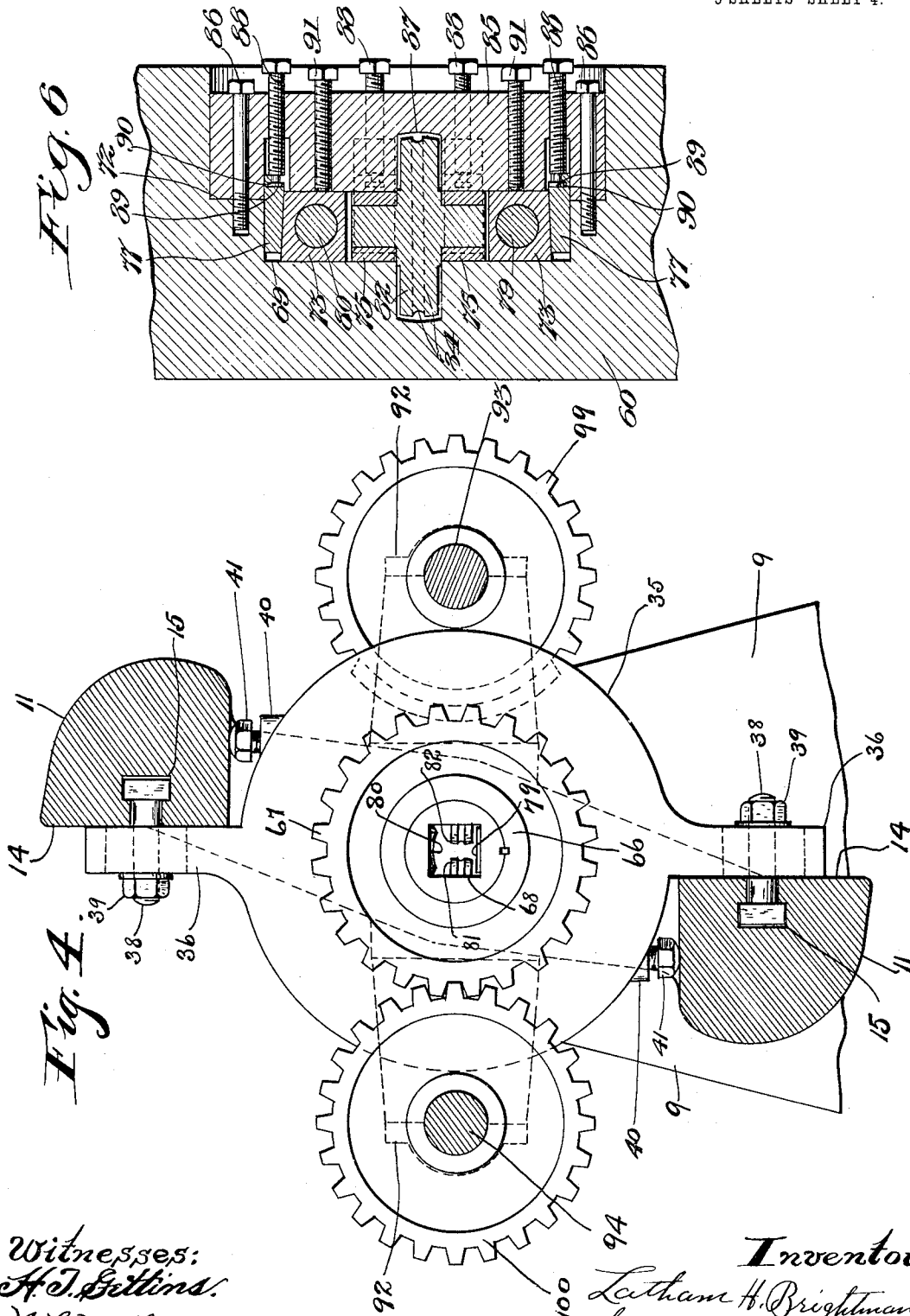
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5 SHEETS—SHEET 4.



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5 SHEETS—SHEET 5.

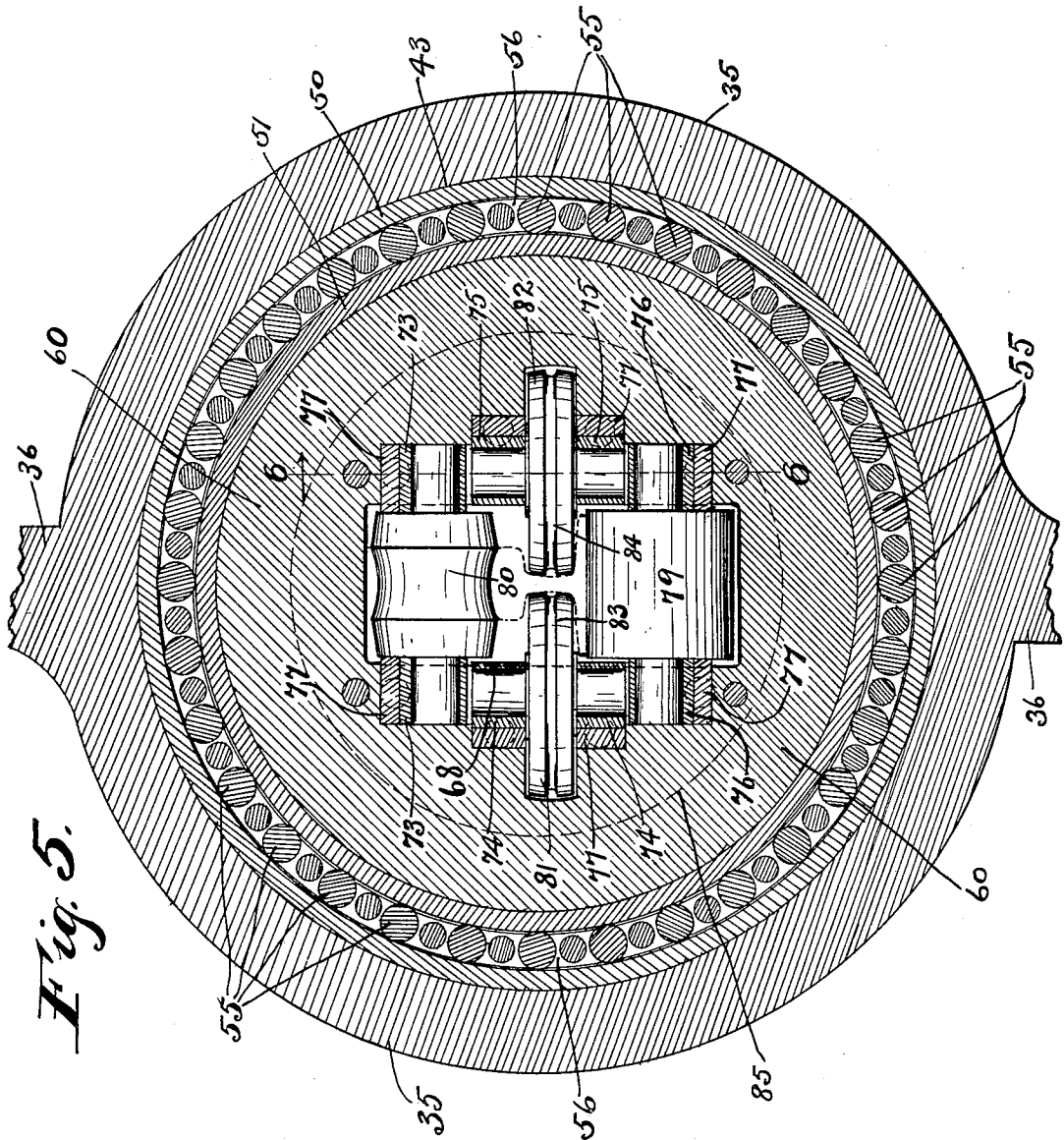


Fig. 5.

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UNITED STATES PATENT OFFICE.

LATHAM H. BRIGHTMAN, OF LAKEWOOD, OHIO.

STRAIGHTENING-MACHINE.

1,017,645.

Specification of Letters Patent.

Patented Feb. 20, 1912.

Application filed April 14, 1911. Serial No. 620,966.

To all whom it may concern:

Be it known that I, LATHAM H. BRIGHTMAN, a citizen of the United States of America, residing at Lakewood, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Straightening-Machines; and I hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

This invention relates to new and useful improvements in machines for straightening metal bars.

The object of this invention is to provide a machine especially adapted for straightening rails, angle bars, channel bars, structural iron and the like which will straighten the main body of the bar together with the flanges or other portions in a single operation.

The invention, therefore, consists particularly in providing in a machine of this character a plurality of new and improved straightening dies, the members of which will engage all portions of the bar and remove therefrom during the straightening operation any twist or other irregularity in the contour of the bar.

The invention also consists in the features of construction and combination of parts described in the specification, pointed out in the claims and illustrated in the accompanying drawings.

In the accompanying drawings Figure 1 is a top plan of a straightening machine embodying my invention. Fig. 2 is a side elevation of the same. Fig. 3 is an enlarged detail view, mostly in central section, of the machine, part being broken away. Fig. 4 is a section on line 4—4, Fig. 3. Fig. 5 is a section on line 5—5, Fig. 3. Fig. 6 is a section on line 6—6, Fig. 5.

Referring now particularly to the construction illustrated in the drawings 8 represents the bed or frame of the machine and at each end thereof is mounted an upright or standard 9 having a bearing 10. The flier frame, indicated at 11, is of the

usual rectangular shape and is provided at its ends with hollow trunnions 12 and 13 by means of which the frame is revolvably mounted in the bearings 10 in the said standards 9. The side members of the flier frame have flat faces, shown at 14, which face in opposite directions and are parallel to each other. In each face is formed a longitudinally extending T-slot 15, the ends of the slot 15 being enlarged, as shown at 16, to permit the insertion of the head of a bolt, as will be fully explained later. In the hollow trunnion 12 at the receiving end of the machine is arranged a guide tube 18 which projects beyond the trunnion at both ends. At the outer end of said tube 18 is formed a flange 19, and a plate 20 is rigidly secured to said flange 19 and to the adjacent standard 9 by means of bolts 21, the said plate having an opening 22 corresponding to the bore of the guide tube. On the inner end of said guide tube 18 is rigidly secured a gear wheel 23. In the trunnion in the opposite end of the flier frame is arranged a discharge tube 27, which in a similar way extends beyond the trunnion at each end and at the outer end thereof is formed with a flange 29 which is secured to the adjacent standard 9 by means of screws 30. On the inner end of said tube is rigidly secured a gear wheel 31.

The brackets for supporting the straightening dies are all similar in construction and each comprises a circular body portion having arms 36 arranged at diametrically opposite sides. The said arms 36 are provided at their outer ends with longitudinal slots through which bolts 38 are passed, the heads of the said bolts having been first inserted in the T-slots 15 formed in the flier frame, and the said bolts 38 are provided with nuts 39 which clamp against the said arms 36. It will, therefore, be seen that by loosening the nuts 39 the said brackets can be adjusted longitudinally or transversely of the flier frame as desired. On the body portion 35 of each bracket are formed small bosses which are tapped to receive thumb screws 41, and the heads of said screws can be caused to abut against portions of the flier

frame after the bracket has been adjusted and thereby provide additional means for holding the bracket in position on the frame. In the circular body portion 35 of each bracket is formed a circular opening or bore 43 which extends from side to side thereof, but annular shoulders 44 and 45 are left at one side of said opening. Within said opening 43, around the wall thereof and abutting against the shoulder 44, is arranged an anti-friction bearing comprising a cage consisting of an outer annular track 50 and an inner annular track 51, and a pair of rings 52 and 53 arranged at each side of the tracks. Between the rings 52 and 53 are arranged ball bearings 54 and between the tracks 50 and 51 are arranged rollers 55 which have their ends journaled in narrow rings 56, the said rings 56 being partly seated in the rings 53.

In the aforementioned anti-friction bearing is mounted a circular member or head 60 which has a shoulder at one side which abuts against the shoulder 45 in the body portion 35, and at its opposite side said head 60 is provided with an annular flange 62 which abuts against the outer side of the anti-friction bearing. The head 60 is held in the body portion 35 by means of a ring 63 which is secured to the body portion 35 by screws 64 and overlaps the flange 62 on the head 60. The head 60 is provided with a hub portion 66 which extends beyond the body portion 35 and on said hub portion is secured a gear wheel 67. An opening 68, of sufficient size to accommodate the passage of the bar which is to be straightened, is formed in the head 60 and toward the center of the head 60 the opening 68 increases in size, as indicated at 69, and has an approximately rectangular shape, and in this rectangular shaped cavity are formed four flat seats 70, one seat being arranged in each corner, and the wall of the cavity is concaved between the said seats to accommodate the straightening rolls, which will be described presently. The opening 68 is again enlarged toward the face of the head 60 forming a circular cavity 71 in which is an annular seat 72. On the flat seats 70 are mounted four pairs of bearing blocks, shown at 73, 74, 75 and 76, Fig. 5. Between each bearing block and the adjacent wall of the cavity 69 is arranged an adjusting wedge 77, the means for actuating which will be described later. In each pair of bearing blocks is mounted a straightening roll and the rolls as shown are designed for straightening a railroad rail. The roll, indicated by 79, is cylindrical in shape and is designed to engage the under surface of the base of the rail. The roll indicated at 80 is slightly concaved and is designed to engage the head of the rail and the rolls, indicated at 81 and 82, are slightly convexed and are designed

to engage the web of the rail. In each of the rolls 81 and 82 are formed annular grooves 83 and 84, the object of which is to allow for any lettering which may be on the rail so that the lettering will not prevent the rolls from coming in direct contact with the faces of the web. An end plate 85 is arranged on the seat 72 and is secured thereon by screws 86. In the said plate 85 is a central opening 87 in line with the opening 68 in the head 60.

In the plate 85, in line with each of the adjusting wedges 77 is mounted a screw 88 which has a small head 89 on its inner end which fits into a socket 90 in the wedge, forming a swivel connection between the screw and the wedge so that by screwing the screws up or down the wedge will be drawn out or will be forced down between the adjacent bearing blocks and the wall of the cavity 69. By this arrangement it is possible to secure an adjustment of the bearing blocks which will bring the rolls carried thereby into the proper relation with the rail which is being straightened. Screws 91 are mounted in the plate 85 and are arranged to bear against the bearing block 73 so as to hold them in position after they have been adjusted.

The aforesaid head 60, with the rolls therein, is commonly termed the straightening die, and in order to hold each die against rotation on its axis when the flier frame is revolved the following described means is provided which is the same as shown in my pending application, Serial No. 602,773. At each end of the flier frame, at each side thereof is arranged a shaft support 92, the shaft supports on the same side of the frame being in line with each other, and in the said shaft supports are rotatably mounted the ends of the shafts 93 and 94, one shaft of course being on each side of the frame and the said shafts extending parallel with each other. At each end of the shaft 93 is secured a gear wheel, indicated by 95 and 96, and at each end of the shaft 94 is secured a gear wheel, indicated at 97 and 98. The gear wheels 95 and 97 are arranged to mesh with the gear wheel 31 on the discharge tube 27, and the gear wheels 96 and 98 are arranged to mesh with the gear wheel 23 on the guide tube 18. On the shaft 93, intermediate of the ends thereof, are secured gear wheels 99, and on the shaft 94, intermediate the ends thereof, are secured gear wheels 100, the said gear wheels on the respective shafts being arranged to engage alternately with the gear wheels 67 on the hub portions 66 of the straightening dies. Any suitable means for revolving the flier frame may be provided, such as a gear wheel 103, which is rigidly secured on the trunnion 12.

As before stated this machine is particu-

larly intended for the straightening of metal bars, such as rails and channel and angle iron. In practice the bar to be straightened is fed to the machine by any suitable means, the bars passing first through the guide tube at the receiving end and then through the straightening dies in the bracket and out through the discharge tube at the discharge end. The brackets carrying the straightening dies are adjusted as desired longitudinally of the frame and one or more thereof are adjusted transversely of the frame so that the axes of the dies therein will be slightly out of line with the axial line of the flier frame. These dies therefore will be slightly eccentric with regard to the axis of the flier frame, and when the frame is revolved the portion of the bar carried by the eccentric dies will be bent up and down and back and forth in all directions owing to the eccentric movement of the eccentric dies. While the bar is passing through the dies the rolls thereof will engage the various portions of the bar, and if a rail is being straightened one roll will travel along the head of the rail, one roll beneath the base of the rail and one roll at each side of the flange of the rail and the rolls can be adjusted as before described so as to bear properly on the rail.

What I claim is,—

1. In a machine of the character described, the combination of a flier frame, means for revolubly supporting said flier frame, a straightening die rotatably mounted in said flier frame, said die being provided with an opening for the passage of the bar which is to be straightened, and rolls mounted in the opening in said die and adapted to engage with the bar as it passes through said die.

2. In a machine of the character described, the combination of a flier frame, means for revolubly supporting said flier frame, a straightening die rotatably mounted in said flier frame, said die being provided with an opening for the passage of the bar which is to be straightened, rolls mounted in the opening in said die and adapted to engage with the bar as it passes through said die and means for adjusting said rolls in said opening.

3. In a machine of the character described, the combination of a flier frame, means for revolubly supporting said flier frame, a straightening die rotatably mounted in said flier frame, said die being provided with an opening for the passage of the bar which is to be straightened, bearing blocks mounted in the wall of said opening in said die, rolls journaled in said bearing blocks and means for adjusting said bearing blocks so as to increase or decrease the space between said rolls.

4. In a machine of the character de-

scribed, the combination of a flier frame, means for revolubly supporting said flier frame, a straightening die rotatably mounted in said flier frame, said die being provided with an opening for the passage of the bar which is to be straightened, bearing blocks mounted in the said opening in said die, rolls journaled in said bearing blocks, wedges arranged between the walls of said opening in said die and said bearing blocks and means for moving said wedges in or out between the walls of said opening and said bearing blocks, for the purpose set forth.

5. In a machine of the character described, the combination of a flier frame, means for revolubly supporting said flier frame, a bracket mounted on said flier frame, said bracket having a body portion provided with an opening extending there-through and having a shoulder arranged at one end of said opening, an anti-friction bearing arranged in said bearing and having its inner end abutting against the shoulder in said opening, a die mounted in said anti-friction bearing and having a flange arranged to abut against the outer end of said anti-friction bearing, means for securing said die in said bearing, rolls mounted in said die and adapted to engage with the bar which is to be straightened as it passes through said die and means for adjusting said rolls.

6. In a machine of the character described, the combination of a flier frame, means for revolubly supporting said flier frame, a bracket mounted on said flier frame, a straightening die rotatably mounted in said bracket, said die being provided with a hub which projects beyond said bracket, a gear wheel rigidly secured on said hub, rolls mounted in the opening in said die and adapted to engage with the bar which is to be straightened as it passes through said die, a shaft rotatably supported on each side of said flier frame, a gear wheel secured on each shaft and arranged to mesh with the gear wheel on the hub of the die and means for operatively connecting said shafts with the flier frame so that said shafts will be rotated when the flier frame is revolved.

7. In a machine of the character indicated, the combination of a flier frame, means for revolubly supporting said flier frame, tubes mounted in each end of said flier frame, said tubes being rigidly connected with the means for supporting the flier frame, gears rigidly mounted on the inner ends of said tubes, a bracket mounted in said flier frame, a die rotatably mounted in said bracket and having a hub projecting beyond said bracket, a gear wheel rigidly secured on said hub, rolls mounted in said die and adapted to come in contact with

the bar which is to be straightened, means
for adjusting said rolls, a shaft rotatably
mounted on each side of said flier frame
and gear wheels mounted on said shafts and
5 adapted to mesh with the gears on the said
tubes and on the hub of the die.

In testimony whereof, I sign the forego-

ing specification, in the presence of two wit-
nesses.

LATHAM H. BRIGHTMAN.

Witnesses:

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