

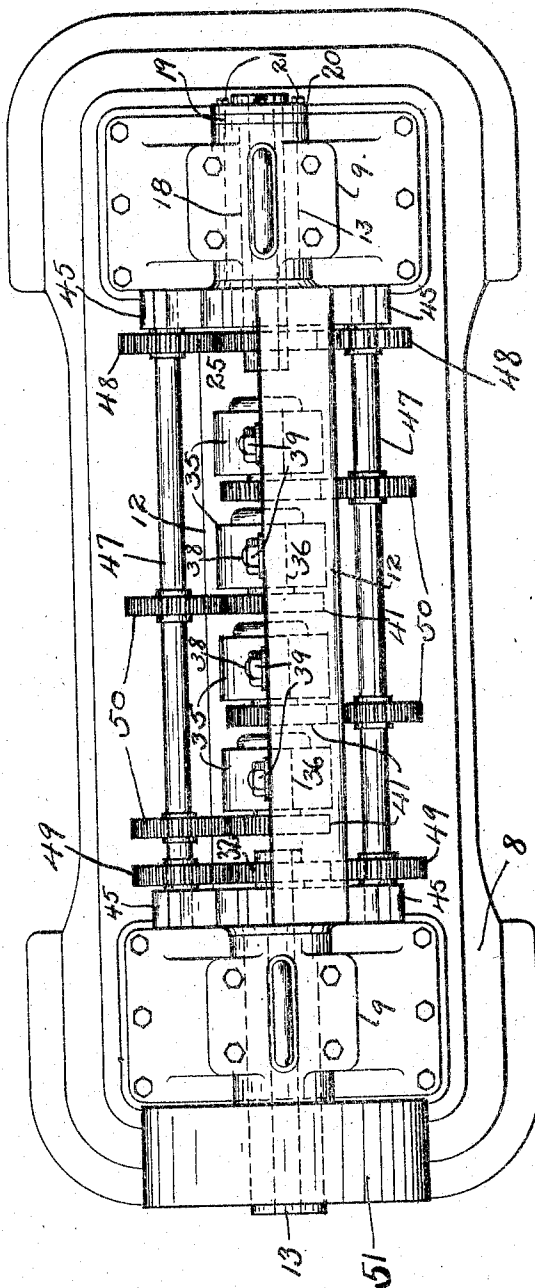
L. H. BRIGHTMAN.
MACHINE FOR STRAIGHTENING METAL BARS.
APPLICATION FILED JAN. 16, 1911.

1,015,473.

Patented Jan. 23, 1912.

4 SHEETS--SHEET 1.

Fig. 1.



Witnesses:
H. J. Gettins.
W. R. McDonnell.

Inventor:
Leitham H. Brightman
by Lynch & Rowe
Attorneys.

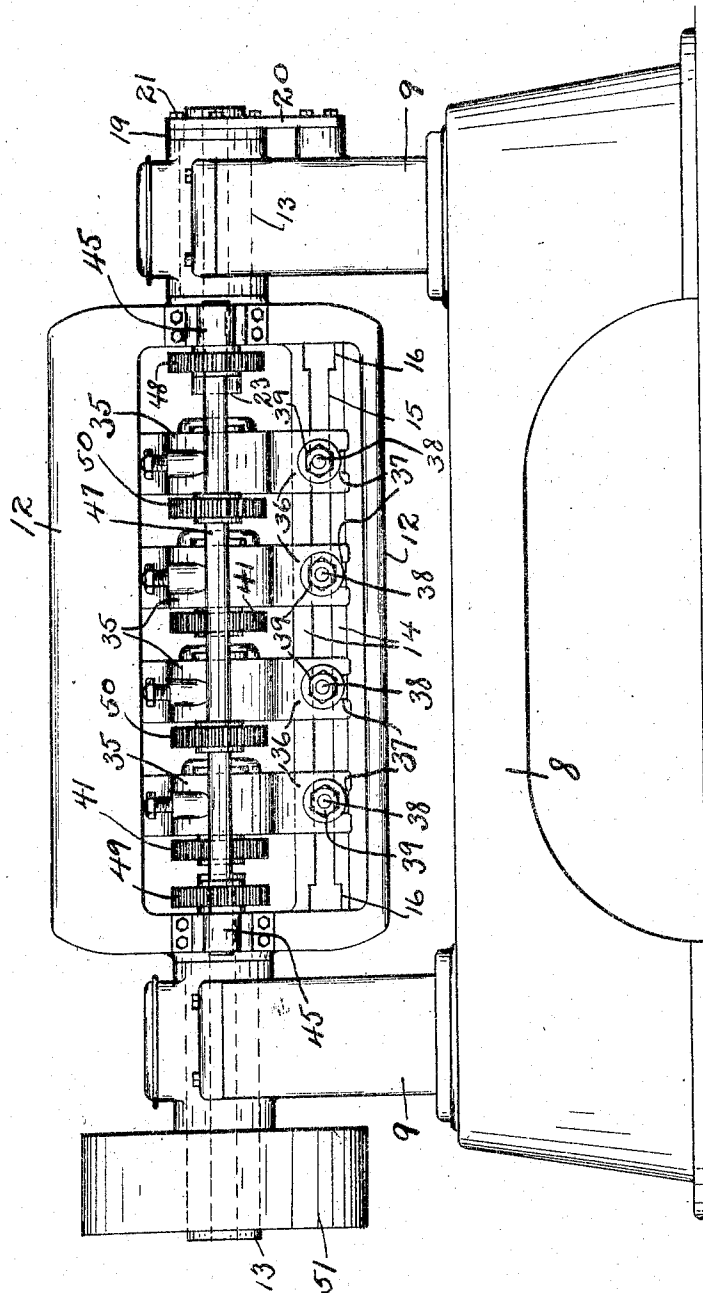
L. H. BRIGHTMAN.
MACHINE FOR STRAIGHTENING METAL BARS.
APPLICATION FILED JAN. 16, 1911.

1,015,473.

Patented Jan. 23, 1912.

4 SHEETS—SHEET 2.

Fig. 2.



witnesses:
H. J. Pettins.
H. L. McConnell

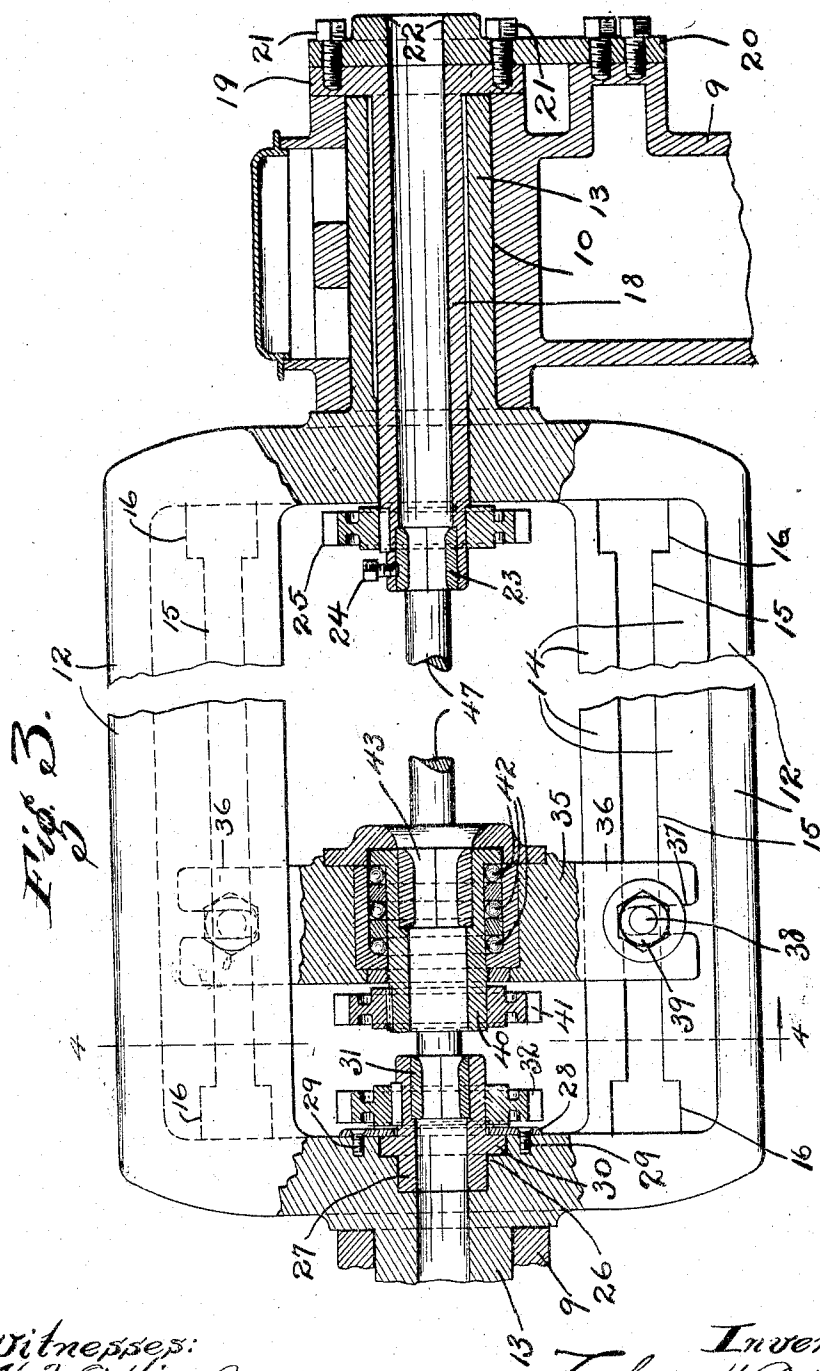
Inventor:
Latham H. Brightman
by Lerich & Dorner
his Attorneys.

L. H. BRIGHTMAN.
MACHINE FOR STRAIGHTENING METAL BARS.
APPLICATION FILED JAN. 16, 1911.

1,015,473.

Patented Jan. 23, 1912.

4 SHEETS—SHEET 3.



Witnesses:
H. J. Giddins.
W. L. McDonnell.

Inventor:
Latham H. Brightman
by Lynch & Co.
his Attorneys.

L. H. BRIGHTMAN.
MACHINE FOR STRAIGHTENING METAL BARS.
APPLICATION FILED JAN. 16, 1911.

1,015,473.

Patented Jan. 23, 1912.

4 SHEETS—SHEET 4.

Fig. 5.

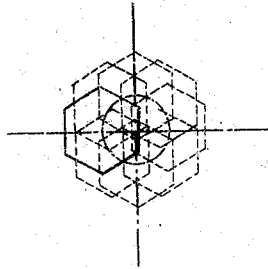
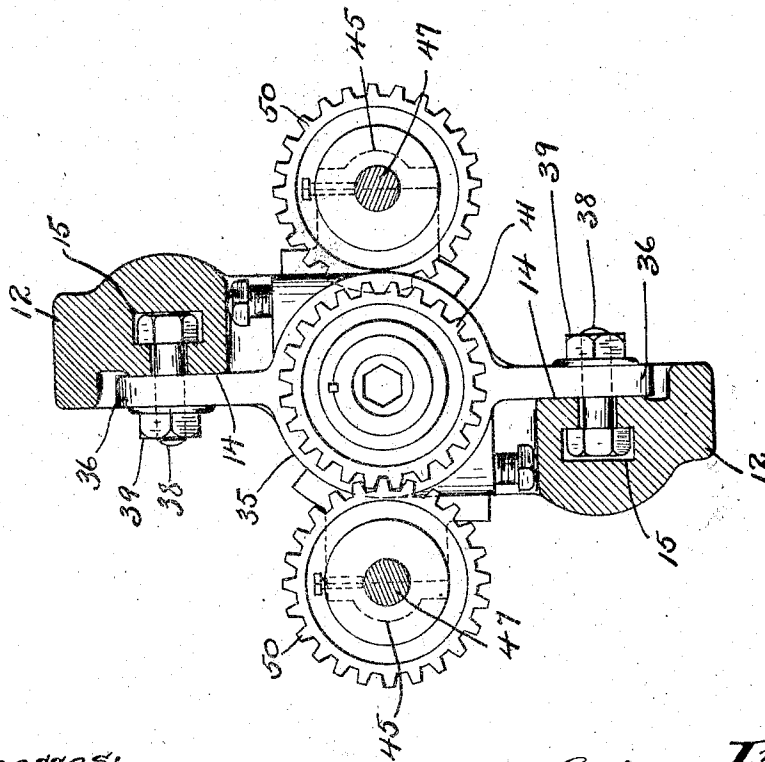


Fig. 4.



Witnesses:
H. J. Bettins.
N. L. McDonnell.

Inventor:
Latham H. Brightman
by Lynch & Orr
his Attorneys.

UNITED STATES PATENT OFFICE.

LATHAM H. BRIGHTMAN, OF LAKEWOOD, OHIO.

MACHINE FOR STRAIGHTENING METAL BARS.

1,015,473.

Specification of Letters Patent.

Patented Jan. 23, 1912.

Application filed January 16, 1911. Serial No. 602,773.

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 Machines for Straightening Metal Bars; 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 metal bars of angular cross-section which will remove both the longitudinal curvature and also any twist that there may be in the bar.

The invention, therefore, consists particularly in providing in a machine of this character a plurality of straightening dies freely supported in a flier frame adapted to be revolved around said dies and means carried by said flier frame for holding said dies against rotation on their own axes while the said flier frame is being revolved.

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 showing the flier frame and the bearing and standard at one end thereof. Fig. 4 is a section on line 4-4, Fig. 3. Fig. 5 is a diagram illustrating the positions assumed by the portion of the bar passing through the eccentrically arranged straightening dies.

In general a machine embodying the invention comprises a flier frame of the usual rectangular shape which is revolubly supported on suitable standards by means of hollow trunnions. The flier frame is provided with a feed tube which is mounted in the hollow trunnion at the receiving end of the frame and is held against rotation by a rigid connection with the supporting frame and with a discharge tube which is rotatably

mounted in a seat formed in the hollow trunnion at the discharge end of the flier frame. The flier frame is provided with a plurality of dies, which for convenience we may term the guide dies and the straightening dies. One guide die is rigidly secured in the inner end of the feed tube and the other guide die is rigidly secured in the inner end of the discharge tube. The straightening dies are rotatably mounted in brackets which are arranged on the flier frame and are capable of adjustment both longitudinally and transversely thereof. By the longitudinal adjustment of the brackets it is possible to space the straightening dies along the flier frame as desired and by the transverse adjustment of the brackets it is possible to move the straightening dies so that their axes are slightly out of line with the axis of the flier frame. It is necessary in order to remove any twist which may be in the bar which is being straightened and also in order to prevent any torsional strain on the bar which might impart a twist thereto to hold the dies against rotation on their own axes and this is accomplished as follows:—On the inner end of the feed tube and on the inner end of the discharge tube is rigidly secured a gear wheel and to each of the straightening dies is rigidly secured a gear wheel. At each side of the flier frame, near each end thereof, is mounted a shaft support, and in the said shaft supports are rotatably mounted the ends of a pair of shafts which extend longitudinally of the flier frame at each side thereof. On the ends of the said shafts at the receiving end of the machine are rigidly mounted gear wheels which are arranged to mesh with the gear wheel on the feed tube, and on the ends of said shafts at the discharge end of the machine are arranged gear wheels which mesh with the gear wheel on the discharge tube, and on said shafts intermediate of these gears are secured other gears, the gears on one shaft being arranged to mesh with the gears on the alternate straightening dies. As will appear hereinafter more clearly, during the operation of the machine the gears on the said shafts will be positively driven by the rotation of the said shafts and will also be revolved by the flier frame, and therefore the gears on the straightening dies will be positively held against movement and the straightening dies themselves will remain stationary.

Referring now particularly to the construction illustrated in the drawings 8 represents the bed of the machine and at each end thereof is mounted an upright or standard 9 having a bearing 10. The flier frame, indicated at 12, is of the usual rectangular shape and is provided at each end with a hollow trunnion 13 by means of which the flier 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 being enlarged, as shown at 16, to permit the insertion of the head of a bolt, as will be more fully explained later. In the hollow trunnion at the receiving end of the machine is arranged a guide tube 18 which projects beyond the trunnion at both ends. The outer end of said guide tube 18 has a flange 19 and a plate 20 is rigidly secured to said flange 19 and to the standard 9, by means of bolts 21, the said plate having an opening 22 corresponding to the bore of the guide tube and preferably slightly flaring at its outer end. Within the inner end of said guide tube 18 is rigidly secured a guide die 23 by means of a set screw 24, the said guide die having an opening corresponding in cross section to the cross section of the rod which is to be straightened. On the inner end of the guide tube 18 is rigidly secured a gear wheel 25. In the opposite end of the flier frame at the inner end of the bore in the trunnion is formed a seat 26 in which is rotatably arranged a discharge tube 27. The said tube 27 is held on the seat 26 by means of a collar 28 which engages an annular flange 30 formed on said discharge tube and the said collar is rigidly secured to the flier frame by screws 29. In the inner end of the discharge tube is rigidly mounted a guide die 31, in all respects similar to the guide die 23. On the inner end of the discharge tube is rigidly secured a gear wheel 32.

The brackets for supporting the straightening dies are all similar in construction and each comprises a circular body portion 35, at diametrically opposite sides of which are arranged arms 36 which are provided at their outer ends with longitudinal slots 37. The said arms are secured to the flier frame by means of bolts 38, the heads of which are adapted to slide 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 the said brackets can be adjusted longitudinally of the said frame or transversely of the frame as desired. In the body portion of each of the brackets is rotatably mounted a sleeve 40, one end of which projects beyond the body portion of

the bracket, and thereon is rigidly secured a gear wheel 41. In order to eliminate all friction between the sleeve and its mounting in the said bracket a suitable ball bearing is employed, indicated at 42. In the sleeve 40 is rigidly secured a die 43, similar in cross section to the guide dies.

At each end of the flier frame, at each side thereof are mounted shaft supports 45, and in said shaft supports are rotatably mounted the ends of shafts 47 which extend longitudinally from end to end of the said frame and parallel with each other. Near each end of each shaft are rigidly secured gear wheels 48 and 49 respectively which are adapted to mesh with the respective gear wheels on the guide tube 18 and on the discharge tube 27, and on said shafts 47 intermediate the end gear wheels are mounted gear wheels 50, the gear wheels on the shafts alternately engaging with the gear wheels 41 on the sleeves 40 carrying the straightening dies 43.

Any suitable means for revolving the flier frame is provided, such as a pulley 51 rigidly secured on the trunnion at the left hand side of the flier frame as viewed in Fig. 2.

As before stated this machine is intended for straightening metal bars, angular in cross section. In practice the bar to be straightened is fed through the machine by any suitable means, the bar passing first through the guide tube at the receiving end, then through the straightening dies in the bracket and out through the guide 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 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 said dies producing a kneading action on the bar which renders the same absolutely straight. While the bar is being thus kneaded by the action of the eccentric dies it is necessary to prevent any rotation of the said dies which would of course result in a torsional strain on the bar, tending to twist the same, and this is secured by the intermeshing gears carried by the shafts 47 which intermesh with the gears carried by the die supports. It will be seen that as the flier frame is revolved the gears 48 at the right hand end of the shafts 47 as viewed in Fig. 1 will be revolved owing to their meshing with the gear 25 which is rigidly mounted on the stationary feed tube 18 and therefore the said shafts 47 are revolved

and all the gears carried by said shafts will be revolved. The said gear wheels will not only be revolved with their respective shafts 47 but will also be carried around the gear wheels 41 on the die supports by the revolving of the flier frame and therefore the gear wheels on the die supports will be held absolutely stationary preventing any movement of the dies on their own axes.

10 What I claim is,—

1. In a machine of the character described, the combination of a bed, a flier frame revolvably mounted on said bed, dies rotatably supported in said flier frame and means for 15 holding the dies against rotation on their own axes while the said flier frame is being revolved.

2. In a machine of the character described, the combination of a bed, a flier frame revolvably mounted on said bed, means for revolving said flier frame, brackets supported on said flier frame, dies journaled in said 20 brackets with their axes parallel with the axis of the flier frame and means carried by said flier frame for preventing the rotation of the dies on their own axes while the said flier frame is being revolved.

3. In a machine of the character described, the combination of a bed, a flier frame revolvably mounted on said bed, guide dies arranged at each end of said flier frame, a series of brackets mounted on said flier frame, straightening dies journaled in said 30 brackets with their axes parallel with the axis of the flier frame and means carried by said flier frame and adapted to engage with said straightening dies to prevent the rotation of said dies on their own axes while the flier frame is being revolved.

4. In a machine of the character described, the combination of a bed, standards mounted on said bed, a flier frame provided with hollow trunnions journaled in said standards, guide dies arranged at each end of 45 said flier frame, a series of brackets mounted on the flier frame and adjustable longitudinally and transversely thereof, straightening dies rotatably mounted in said brackets and means carried by the flier frame and 50 operatively connected with said straightening dies for holding said straightening dies against rotation on their own axes while the flier frame is being revolved.

5. In a machine of the character described, the combination of a stationary frame, a flier frame having hollow trunnions journaled on said stationary frame, a series of 55 brackets mounted in said flier frame, straightening dies rotatably mounted in said brackets, a gear wheel operatively connected with each die, a shaft rotatably supported on said flier frame, a series of gear wheels secured on said shaft, the gear wheels on said shaft being arranged to mesh with 60 alternate gear wheels connected with the

straightening dies and means for revolving said shaft as the flier frame is revolved.

6. In a machine of the character described, the combination of a stationary frame, a flier frame having hollow trunnions journaled on said stationary frame, a series of 70 brackets mounted on said flier frame, straightening dies rotatably mounted in said brackets, a gear operatively connected with each die, a shaft rotatably mounted on each side of said flier frame, gear wheels secured on each of said shafts, the arrangement being such that each gear wheel on each shaft will mesh with a gear wheel connected to a straightening die and means for 80 rotating said shafts when the flier frame is revolved.

7. In a machine of the character described, the combination of a stationary frame, a flier frame having hollow trunnions journaled on 85 said stationary frame, a series of brackets mounted on said flier frame, straightening dies rotatably mounted in said brackets and adjustable transversely of the flier frame, a gear operatively connected with each die, a 90 shaft rotatably mounted on each side of said flier frame, gear wheels secured on each of said shafts, the arrangement being such that each gear wheel on each shaft will mesh with a gear wheel connected to a 95 straightening die and means for rotating said shafts when the flier frame is revolved.

8. In a machine of the character described, the combination of a stationary frame, a flier frame journaled on said stationary 100 frame, a gear wheel rigidly supported in proximity to said flier frame, a series of brackets mounted on said flier frame, straightening dies rotatably mounted in said brackets, a gear operatively connected with 105 each die, a shaft rotatably mounted on each side of said flier frame, gear wheels secured on each of said shafts, the arrangement being such that one gear wheel on each shaft will mesh with the said rigid gear wheel 110 and each of the other gear wheels on said shafts will mesh with a gear wheel connected to a straightening die and means for revolving said flier frame.

9. In a machine of the character described, 115 the combination of a stationary frame, a flier frame having hollow trunnions journaled in said stationary frame, a series of brackets mounted in said flier frame, straightening dies rotatably mounted in said 120 brackets, a tube extending through one of the said trunnions, said tube being rigidly secured at its outer end to the frame of the machine, a gear wheel rigidly secured on the inner end of said sleeve, a gear opera- 125 tively connected with each straightening die, a shaft rotatably mounted on each side of the flier frame, gear wheels secured on each of said shafts, the arrangement being such that one gear wheel on each shaft will 130

mesh with the gear wheel on said tube and each of the other gear wheels on said shafts will mesh with a gear wheel connected to a straightening die and means for revolving said flier frame.

10. In a machine of the character described, the combination of a stationary frame, a flier frame having hollow trunnions journaled on said stationary frame, a feed tube arranged in the hollow trunnion at one end of said frame, a discharge tube arranged in the hollow trunnion at the other end of said frame, means rigidly connecting the feed tube with the stationary frame, guide dies arranged in said tubes, gear wheels secured on the inner end of said tubes, a series of brackets mounted on said flier frame, a sleeve rotatably mounted in each bracket, a straightening die arranged in each sleeve, a

gear wheel rigidly secured on each sleeve, a shaft rotatably mounted on each side of said flier frame, gear wheels secured on each of said shafts, the arrangement being such that the gear wheels at the ends of each shaft will mesh with the gear wheels on the feed tube and the discharge tube, and each of the intermediate gear wheels on each shaft will mesh with a gear wheel on the sleeves in said brackets and means for revolving said flier frame.

In testimony whereof, I sign the foregoing specification, in the presence of two witnesses.

LATHAM H. BRIGHTMAN.

Witnesses:

VICTOR C. LYNCH,
N. L. McDONNELL.