

H. STÜTING.
ROLLING MILL.

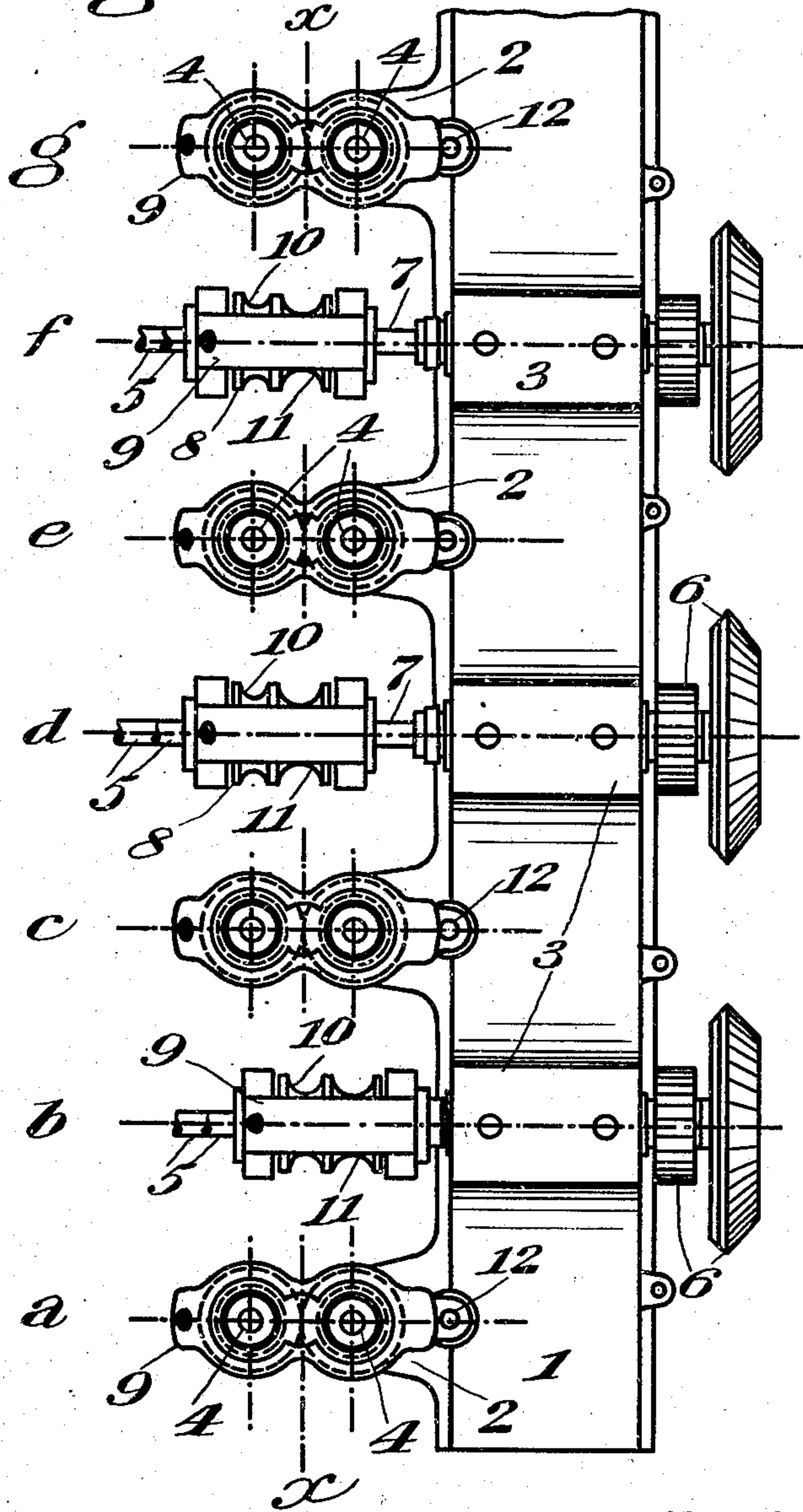
APPLICATION FILED SEPT. 28, 1907.

916,052.

Patented Mar. 23, 1909.

2 SHEETS—SHEET 1.

Fig. 1



Witnesses

W. H. H. H.
W. H. H. H.

Inventor

Heinrich Stüting

By *H. H. H. H.*
Attorney.

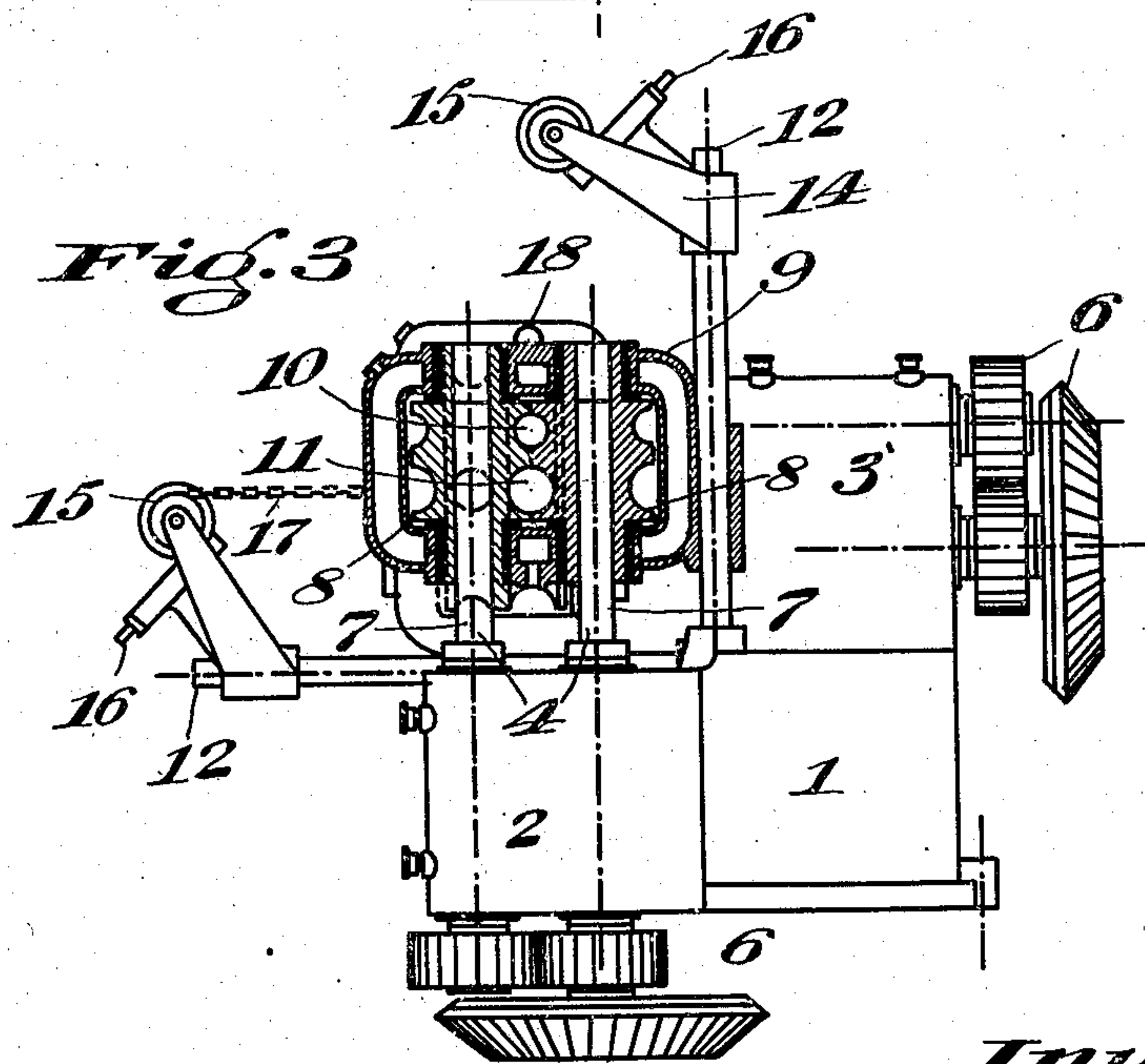
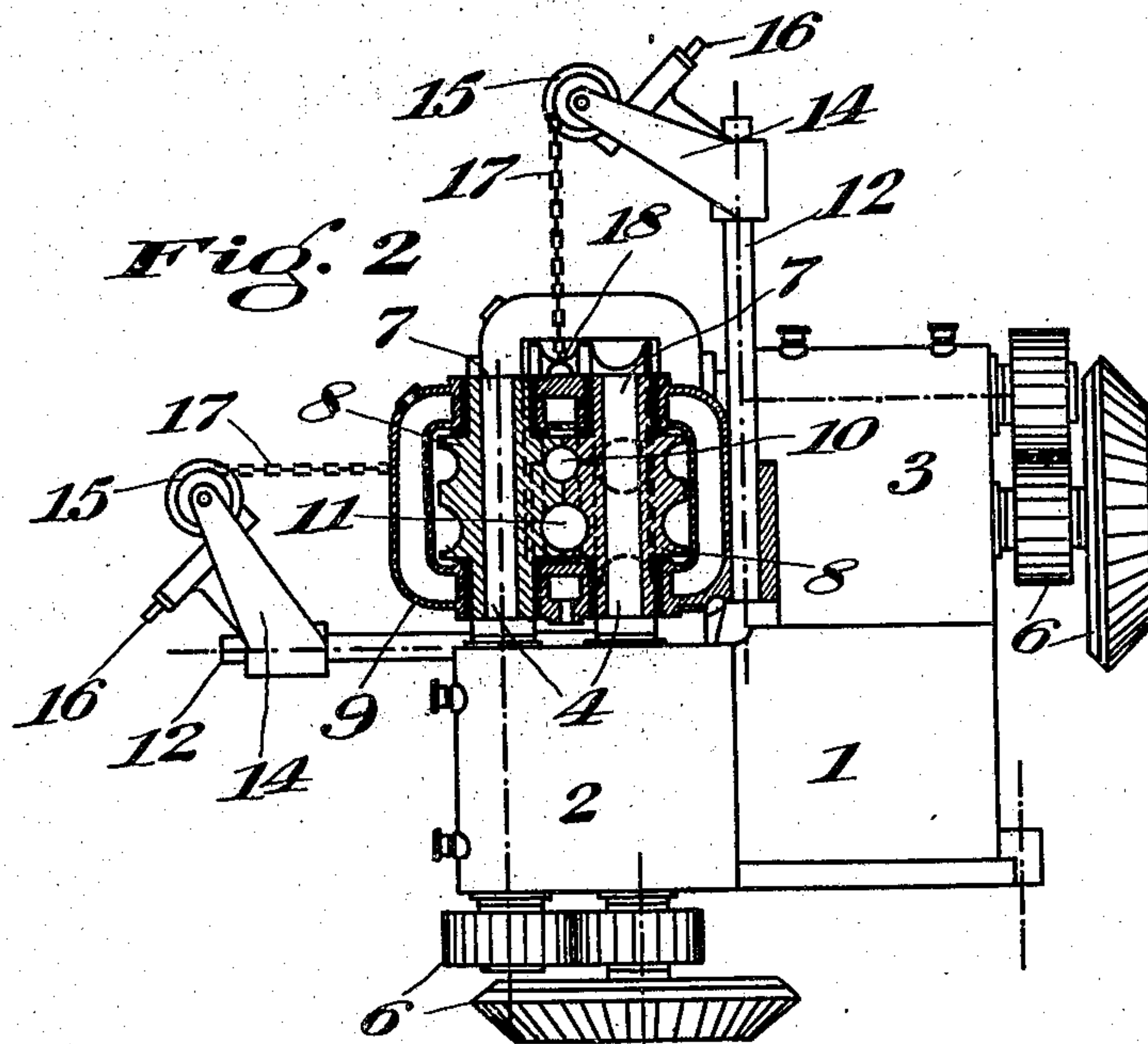
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H. H. H. H.
[Signature]

Inventor

Heinrich Stütting.
By *[Signature]*
Attorney.

UNITED STATES PATENT OFFICE.

HEINRICH STÜTING, OF WITTEN, GERMANY.

ROLLING-MILL.

No. 916,052.

Specification of Letters Patent.

Patented March 23, 1909.

Application filed September 28, 1907. Serial No. 394,942.

To all whom it may concern:

Be it known that I, HEINRICH STÜTING, a subject of the German Emperor, and residing at Witten-on-the-Ruhr, Germany, have invented certain new and useful Improvements in Rolling-Mills, of which the following is a specification.

This invention relates to certain improvements in rolling mills such as are particularly designed and adapted for employment in rolling or reducing metal rods, pipes and the like, and the object of the invention is to provide a device of this general character having means of a novel and improved nature for supporting the rod or pipe being rolled adjacent to each pair of rolls of the train whereby, when either pair of such rolls is shifted to throw its reducing pass out of operative position for accommodating the mill to different cross sectional forms of the rod or pipe to be rolled, the corresponding supporting means may be readily and conveniently adjusted in position for supporting engagement with such rod or pipe to prevent damage due to sagging or bending of the same.

The invention consists in certain novel features of the construction, and combinations and arrangements of the several parts of the improved rolling mill whereby certain important advantages are attained, and the device is rendered simpler, less expensive and otherwise better adapted and more convenient for use, all as will be hereinafter fully set forth.

One embodiment of my improvements is shown in the accompanying drawings, wherein—

Figure 1 is a plan view showing a rolling mill constructed according to my invention; Fig. 2 is a sectional view taken vertically and transversely through the rolling mill constructed as shown in Fig. 1 and showing one adjustment of the passes thereof, and Fig. 3 is a view similar to Fig. 2, but illustrating another adjustment of the passes.

As shown in these views the improved rolling mill is constructed with a base or frame 1 from which two series of bearing portions or projections 2 and 3 are extended, the bearing portions 2 of one series alternating between those of the other series, and being extended from the base or frame 1 in directions at

right angles to such other series of bearing portions as clearly shown in Figs. 2 and 3 of the drawings.

Each of the bearing portions 2, 2 is extended laterally or horizontally from the base or frame 1 and carries a pair of spaced shafts 4, 4 mounted to turn and vertically extended parallel with each other, and at the under side of each such bearing portion 2, the corresponding shafts 4, 4 are provided with gearing as shown at 6 for driving them in unison with each other from any suitable source of power, while the opposite upper ends of said shafts 4, 4 are arranged to project above the upper side of such bearing portion 2, as shown at 7, 7 in position to receive a pair of rolls 8, 8 having grooves adapted for registry to produce two passes 10 and 11, one above the other, the said rolls 8, 8 being carried in a yoke 9 which is capable of vertical movement in such a manner as to cause said rolls to slide vertically along the projecting upper end portions 7, 7 of the respective shafts without interference with the driving connection between said shafts and rolls.

Each of the bearing portions 3, 3 is extended vertically upward from the base or frame 1 and carries a pair of parallel spaced shafts 5, 5 mounted to turn and extended horizontally, and at the side of the base opposite to the bearing portions 2, 2 the said shafts 5, 5 have gearing as shown at 6 for driving them in unison with each other from any suitable source of power, while the opposite ends of said shaft 5, 5 are arranged to project beyond the opposite side of the base 1 as shown at 7, 7 the said projecting ends 7, 7 of said shafts being directed at right angles to the corresponding portions 7, 7 of the shafts 4, 4 and being arranged to receive a pair of rolls 8, 8 having grooves adapted for registry to produce two passes 10 and 11, the said rolls 8, 8 being also carried in a yoke 9 which is capable of horizontal movement in such a manner as to cause the said rolls to slide horizontally upon the projecting end portions 7, 7 of the corresponding shafts 5, without interfering with the driving connection between said rolls and shafts.

For moving the respective yokes 9, 9 to cause the rolls carried thereby to slide vertically and horizontally upon the projecting

end portions of the corresponding shafts 4, 4 and 5, 5, rods 12, 12 are extended from the base adjacent to each bearing portion 2 and 3 parallel with the shafts at such bearings, and said rods have their extremities provided with arms 14, 14 carrying sheaves or drums 15 whereon chains 17 are adapted to be wound, said chains having detachable connections with the yokes 9 as indicated at 18. The sheaves or drums 15 as herein shown are adapted to be turned by means of one gearing as indicated at 16 on the drawings in such a manner as to cause the chains 17 to be wound upon said sheaves or drums, whereby the yokes 9, 9 connected with the chains are moved and the rolls carried thereby are adjusted lengthwise along the corresponding shafts 4 and 5.

As shown in Fig. 1, the improved rolling mill has a train comprising seven pairs or sets of rolls, marked, respectively, *a, b, c, d, e, f* and *g* upon the drawing, each pair of rolls or sets being provided, as above described, with two passes 10 and 11, and in the use of the mill, one or the other of said passes 10 and 11 at each pair or set of rolls is adapted to be alined with other passes at the other several pairs or sets of rolls comprised in the train, in such a manner as to receive and effectively support the rod or other article being rolled at such close intervals as may be necessary to prevent undue sagging or strain thereon between the successive passes of the train, the structure and arrangement of the rolls 8, their yokes, and the means for adjusting the same, being such as to facilitate the adjustment of either pass 10 or 11 at each pair or set of rolls in or out of the path of the rod or other article being rolled or reduced as may be desired.

One pass, as 10, at each pair or set of rolls comprised in the train, is a reducing pass, and the reducing passes 10, 10, at the several pairs of rolls *a, b, c, d, e, f* and *g* comprised in the train, are made in gradually lessening diameters from one end of the mill to the other, so that the several reducing passes may operate in a well known way to successively reduce the rod or other article to be rolled until the desired final cross sectional form is imparted thereto, and the construction and arrangement of the parts is such that when one or more of the pairs or sets of rolls adjacent to the delivery end of the train are adjusted to throw their reducing passes 10 out of alinement with the path of the rod or other article passing through the initial passes of the train, the rolls so adjusted are caused to stand in such position that the rod coming from the preceding reducing passes can pass without interference the rolls which have been so adjusted from their reducing position. In Fig. 1 I have shown the rolls at *d, e, f* and *g* so adjusted as to throw their reducing passes out of alinement with the corresponding passes of the rolls at *a, b*

and *c*, so that the final diameter of the rod or other article to be rolled will be determined by the diameter of the last reducing pass (that at *c*) through which such rod or other article is drawn. The other passes 11, 11 at the several pairs or sets of rolls *a, b, c, d, e, f* and *g* comprised in the train, are of equal diameter, being at least equal to the diameter of the initial reducing pass 10 of the rolls at *a*, and the arrangement of the parts is such that when either pair or set of the rolls is adjusted in the manner above set forth, to throw its reducing pass 10 out of alinement with the path of the rod or other article to be rolled through the mill, the pass 11 of that pair or set of rolls is automatically adjusted in the path of such rod or other article in such a manner as to afford an effective support for such rod or other article to be rolled, so as to prevent sagging or bending thereof upon the emergence of such rod from the last reducing pass of the train. In the position of the parts shown in Fig. 1, wherein the rolls at *d, e, f* and *g* are adjusted to throw their reducing passes 10 out of alinement with the path of the rod to be rolled, it will be seen that the larger supporting passes 11, 11 of the rolls are automatically moved in alinement with the path of the rod so as to effectively support the same and prevent bending or sagging beyond the last reducing pass at *c*.

The improved rolling mill constructed according to my invention is of a simple and inexpensive nature and is particularly well adapted for use by reason of the fact that it permits of effectively supporting the article to be rolled at points where the reducing passes are thrown out of operation in an extremely simple and convenient manner without requiring the removal and replacement of the rolls at such points.

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

1. A rolling mill having a train comprising rolls arranged in a plurality of pairs, each having a reducing pass and a supporting pass, each pair of rolls being adjustable to aline one or the other of said passes with the path of an article to be rolled, the reducing passes being of gradually lessening diameters from one end of the train to the other, and the supporting passes being each at least equal in diameter to the initial reducing pass of the train.

2. In a rolling mill, a train having rolls arranged in a plurality of sets, each set of rolls having a reducing pass and non-reducing supporting means, and being adjustable to aline either said reducing pass or said supporting means with the path of an article to be rolled.

3. In a rolling mill, a train having rolls arranged in a plurality of sets, each set of rolls having a reducing pass adjustable in and out of alinement with the path of an article to be

rolled, the reducing passes being of gradually lessening diameters from one end of the train to the other, and non-reducing supporting means at each set of rolls and normally
5 out of the path of the article to be rolled and adapted, when such rolls are adjusted to throw their reducing passes out of the path of the article to be rolled, to be positioned in

the path of said article for supporting engagement therewith.

In testimony whereof, I affix my signature in the presence of two witnesses.

HEINRICH STÜTING. [L. s.]

Witnesses:

WM. WASHINGTON BRUNSWICK,
R. SCHMIDT.