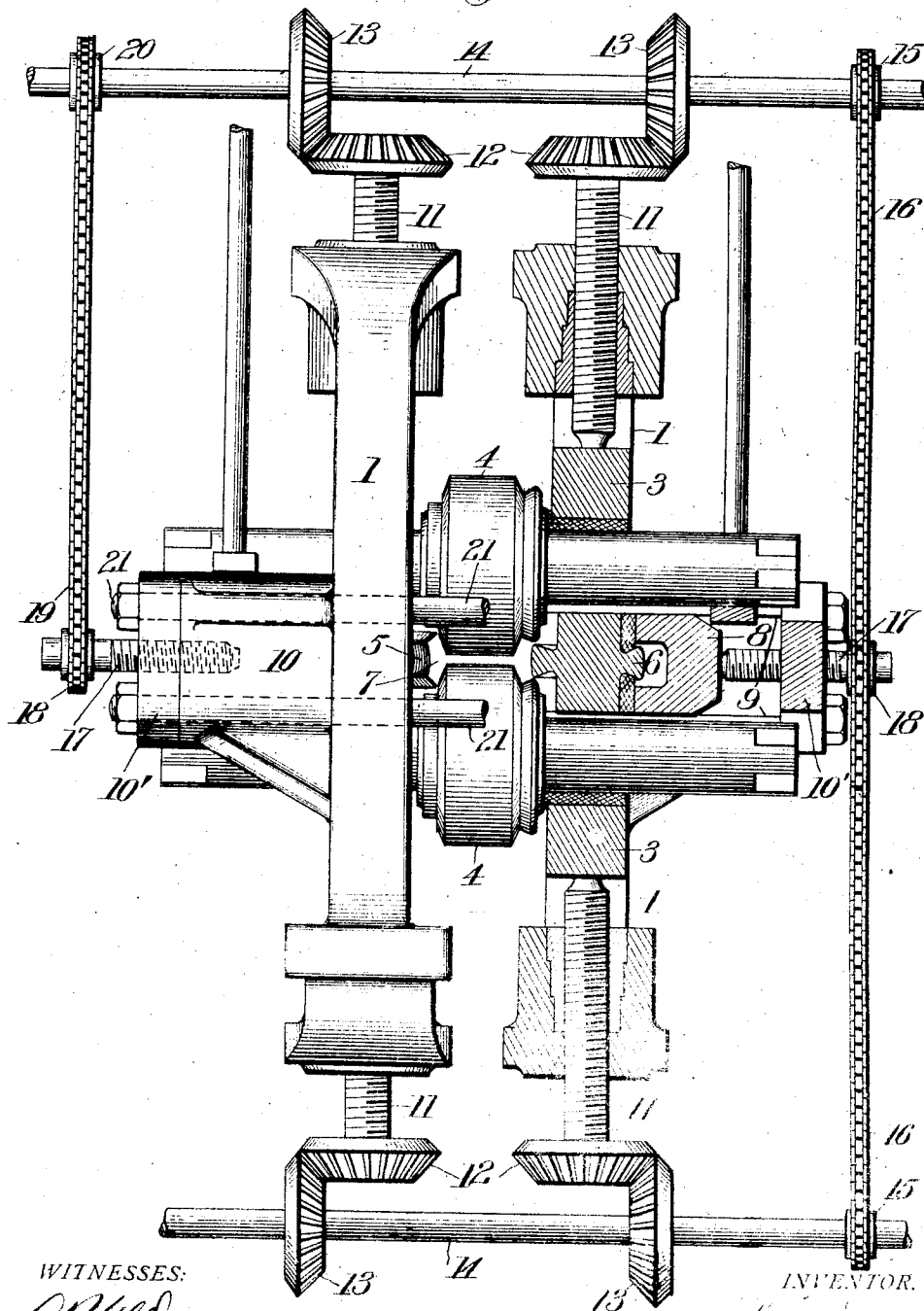


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 UNIVERSAL ROLLING MILL.
 APPLICATION FILED NOV. 30, 1908.

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Patented Nov. 2, 1909.
 2 SHEETS—SHEET 1.

Fig. 1.



WITNESSES:

C. H. Walker
by E. Moore

INVENTOR.

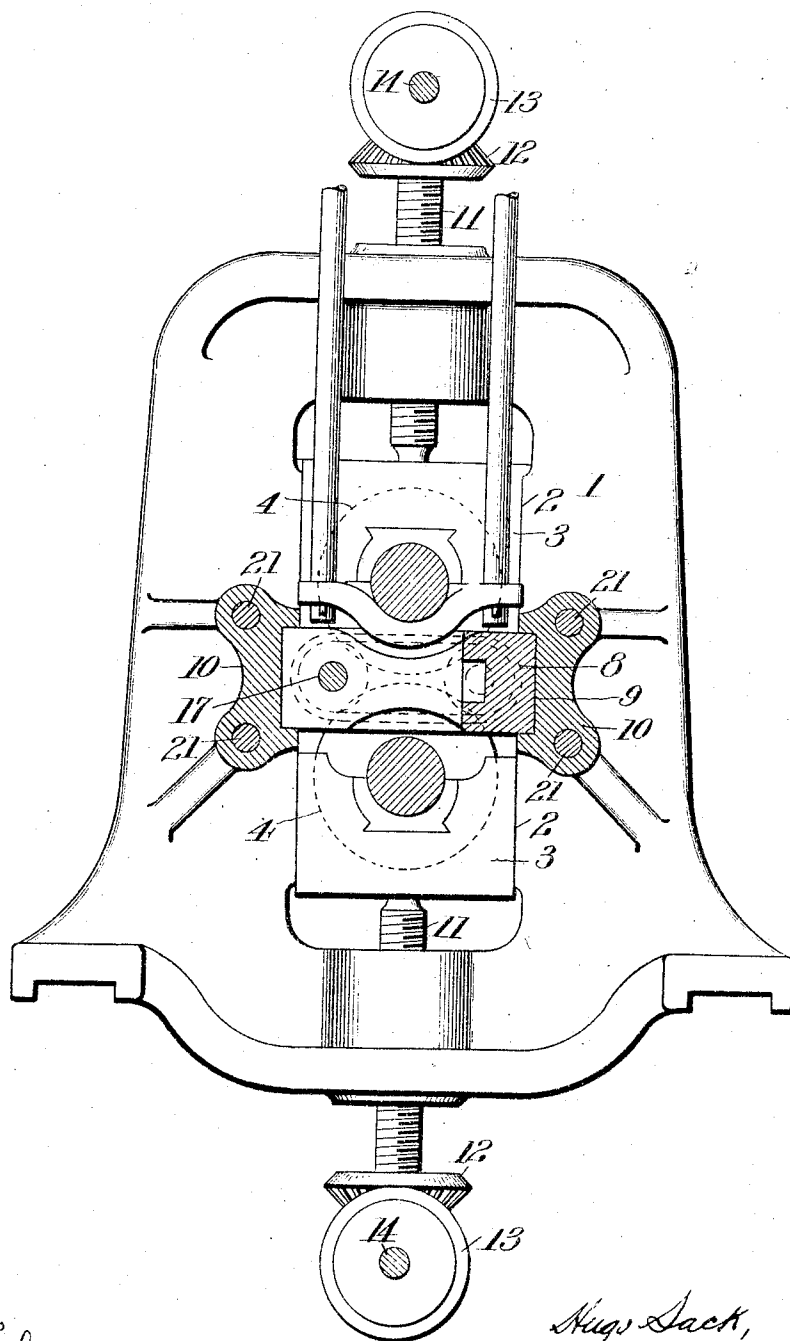
Hugh Sack
 BY
Cyrus Townsend & Co.
 ATTORNEYS.

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Fig. 2.



Witnesses

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UNITED STATES PATENT OFFICE.

HUGO SACK, OF DUSSELDORF, GERMANY; ADELHEID SACK ADMINISTRATRIX OF SAID
HUGO SACK, DECEASED.

UNIVERSAL ROLLING-MILL.

939,173.

Specification of Letters Patent.

Patented Nov. 2, 1909.

Application filed November 30, 1908. Serial No. 465,417.

To all whom it may concern:

Be it known that I, HUGO SACK, a subject of the Emperor of Germany, residing at Dusseldorf, Rhenish Prussia, Germany, have
5 invented certain new and useful Improvements in Universal Rolling-Mills, of which the following is a specification.

In universal I-bar mills having four rolls situated in one plane, which develop a
10 blank into a preliminary I-bar with outwardly-diverging flanges, the setting of the rolls must be such that the vertical rolls always remain exactly midway between the two horizontal rolls.

15 In the mills shown in my Patent No. 431,623, of July 8, 1890, and in my copending applications, Ser. No. 341,142, filed Oct. 29, 1906, and Ser. No. 380,854, filed June 26, 1907, either the bottom horizontal roll or the
20 top horizontal roll is fixed, wherefore the vertical rolls must follow the movable horizontal roll half-way upward or downward, in order to remain midway between the two horizontal rolls.

25 In the present mill the vertical rolls have a horizontal movement only, while the two horizontal rolls are provided with adjusting means which cause them to move simultaneously and equally to or from the ver-
30 tical rolls.

Referring to the accompanying drawing:—
Figure 1 is a front elevation of the improved mill, partly in section, showing the rolls in
35 position to receive the blank; and Fig. 2 is an end elevation of the mill, partly in section.

The mill illustrated comprises vertical stands or housings 1 having guideways 2 which receive the vertically-movable bearings 3 at the ends of each horizontal roll 4.
40 These rolls are shown as identical and individually asymmetrical. The vertical rolls 5, 6 are shown as different and individually symmetrical. The pass 7 between the four rolls is of such shape as to roll an I-bar with outwardly-diverging non-parallel flanges, the horizontal rolls having working faces which shape the web and inner sides of the flanges while the vertical rolls have convex
45 working faces which shape the outer sides of the flanges. The edges of one pair of flanges are preferably shaped by collars on one vertical roll, as illustrated, roll 5, while the edges of the other pair of flanges are

shaped by collars on the horizontal rolls. 55
This roll-construction enables any fins formed on the edges of the flanges to be rolled down by reversing the bar, or rotating it through an angle of 180°, between successive passes through the rolls, as fully
60 set forth in my prior application, Ser. No. 353,380, filed June 2, 1908. Each vertical roll is supported and adjusted by a chock 8 which slides horizontally in guideways 9 machined in brackets 10 cast integral with
65 and projecting outward from a housing 1.

Means are provided for simultaneously adjusting the horizontal rolls, and also, preferably, the vertical rolls, so as to accurately maintain the shape of the pass. Various mechanisms may be used to effect this simultaneous adjustment. That shown comprises vertical screws 11 which pass through nuts fixed in the upper and lower closed ends of the housings 1, and bear against
75 the journal-boxes 3. A bevel-gear 12 is keyed on the outer end of each screw, these gears engaging complementary gears 13 keyed on upper and lower horizontal shafts 14. Alined sprockets 15 connected by a
80 chain 16 are also keyed on these shafts, so that they rotate in unison, thereby causing the simultaneous and equal inward movement of the horizontal rolls. Pairs of horizontal screws 17 are threaded through cross
85 plates 10' which are bolted to the outer ends of the brackets 10. These horizontal screws also carry sprockets 18 and are preferably rotated in unison with the vertical screws 11, the sprockets 18 at the right engaging
90 the chain 16 while those at the left engage a chain 19 which is driven by a sprocket 20 on the upper shaft 14. The screws 17 bear against the outer ends of the chocks 8 and thereby force the vertical rolls inward simultaneously with the horizontal rolls, through
95 a distance which is predetermined by the pitch of the screws, so as to maintain the exact shape of the pass 7.

The distance between the housings 1 may
100 be adjusted to suit different rolls by means of the tie-bolts 21 which connect the cross-plates 10.

Suitable guides for the blank may be attached to the bolts 21 and to the housings. 105

I claim:

A universal mill for rolling I-bars with outwardly-diverging flanges, comprising a

pair of housings having guideways, a pair of horizontal rolls journaled in bearings in said guideways, a pair of vertical rolls each having a convex face, a pair of chocks carrying said vertical rolls, horizontal guideways for said chocks, and interconnected means for simultaneously forcing both the horizontal and the vertical rolls toward the

roll-pass, and thereby accurately maintaining the desired form of pass.

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

HUGO SACK.

Witnesses:

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G. E. MOORE.