

(No Model.)

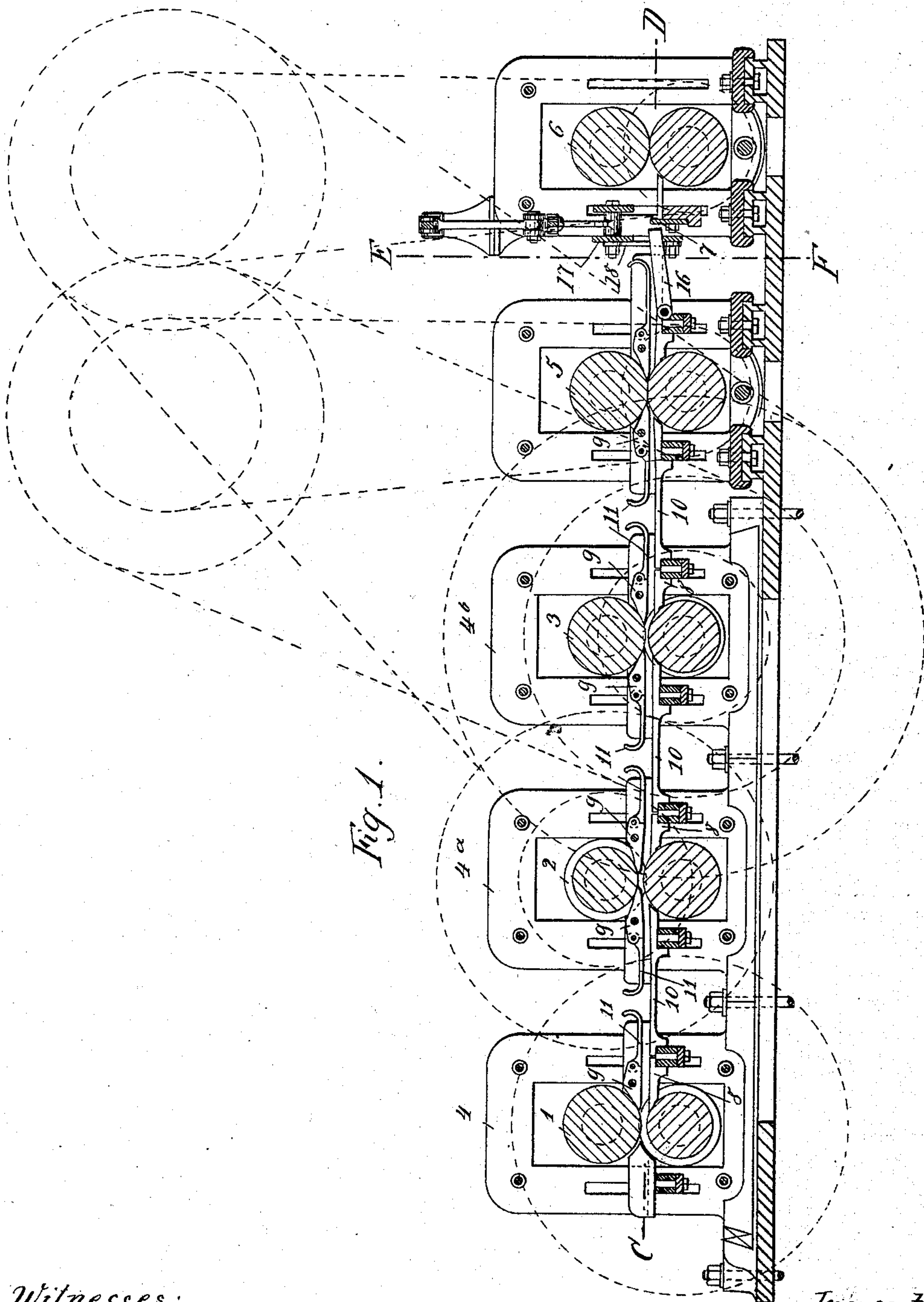
4 Sheets—Sheet 1.

W. BANSEN.

ROLLING TRAIN.

No. 388,389.

Patented Aug. 28, 1888.



Witnesses:
H. Grunow.
M. Hoff.

Inventor:
Wilhelm Bansen,
by
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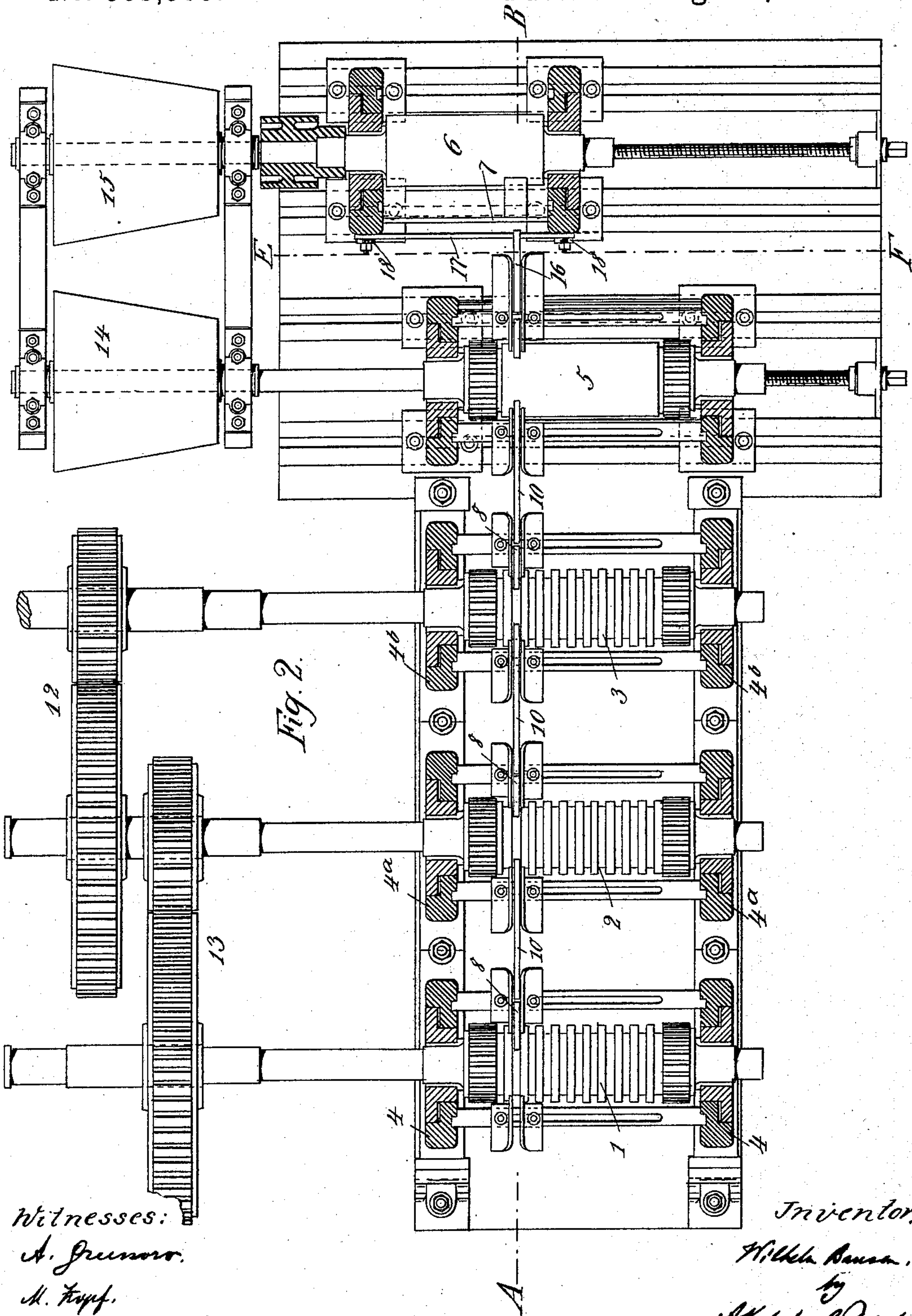
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4 Sheets—Sheet 2.

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(No Model.)

4 Sheets—Sheet 3.

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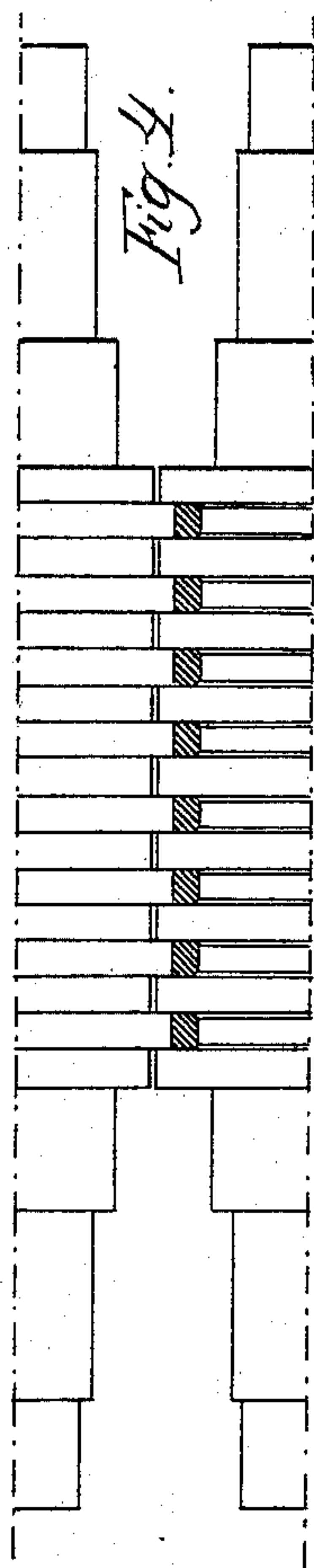


Fig. 4.

Fig. 5.

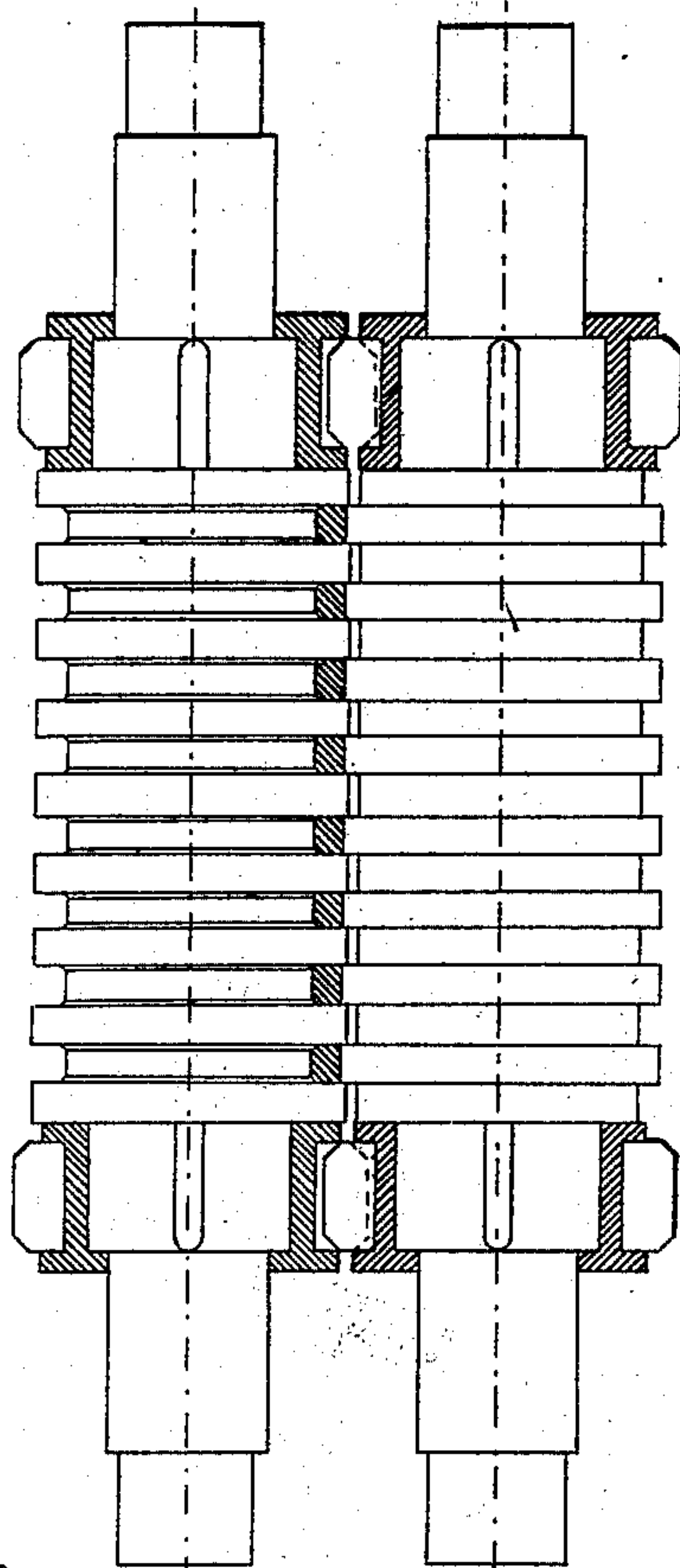


Fig. 6.

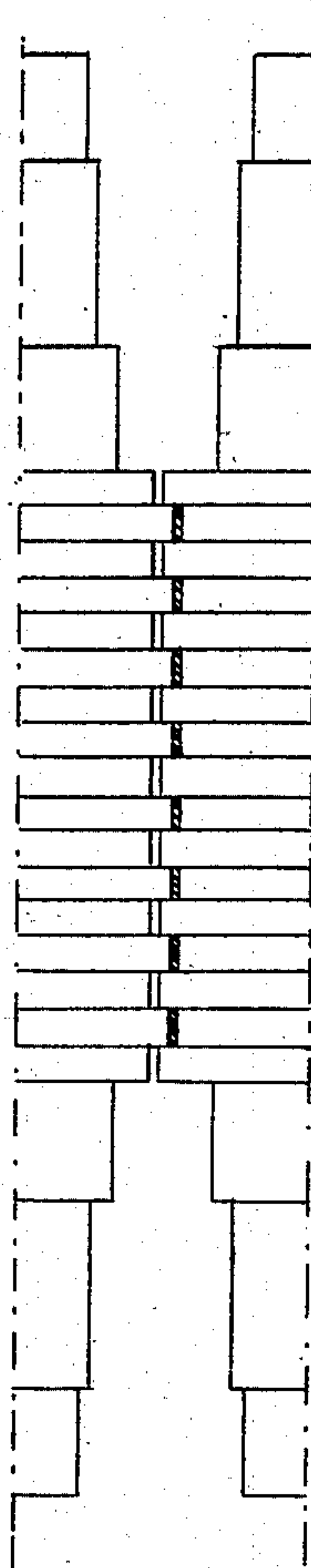
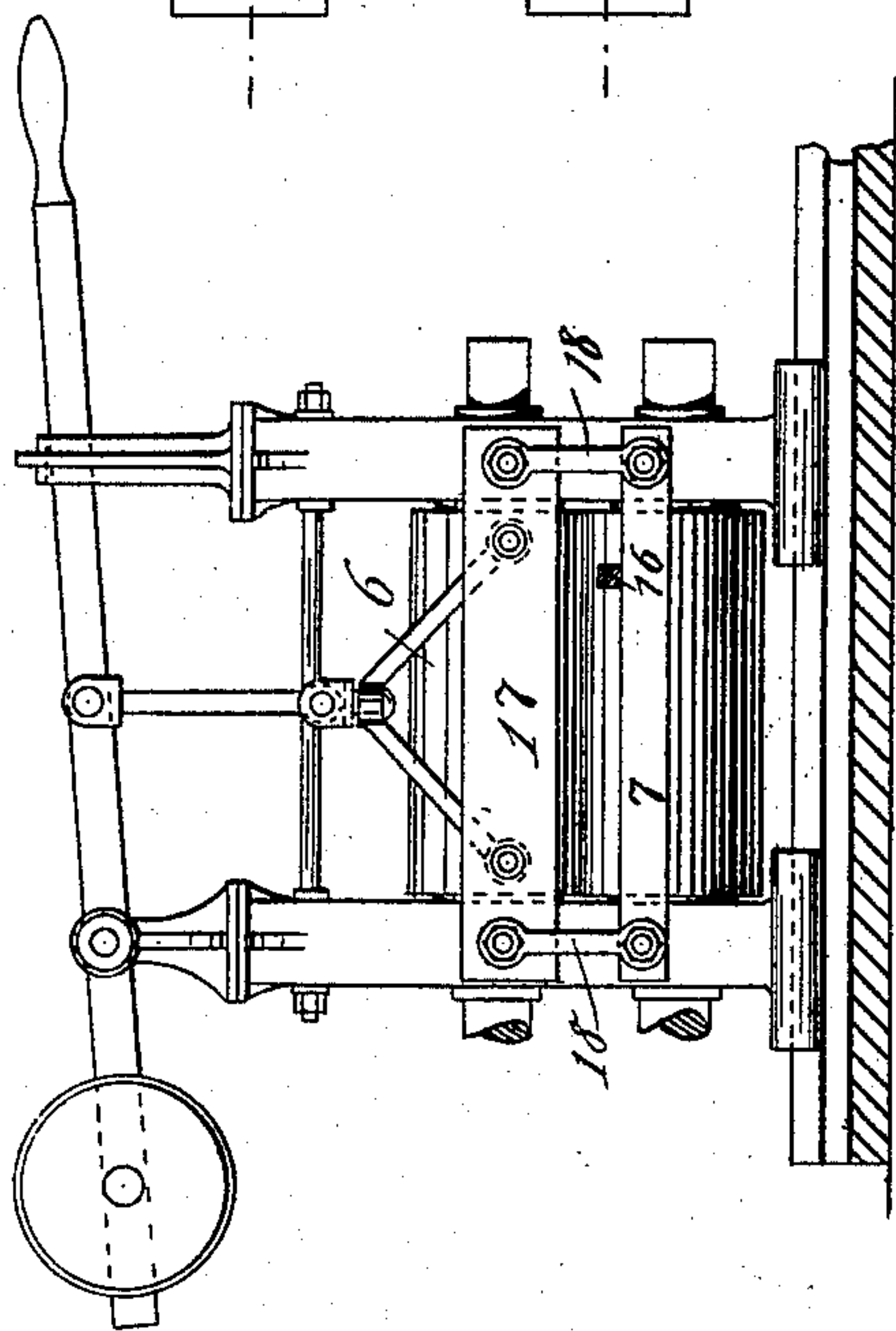


Fig. 3.



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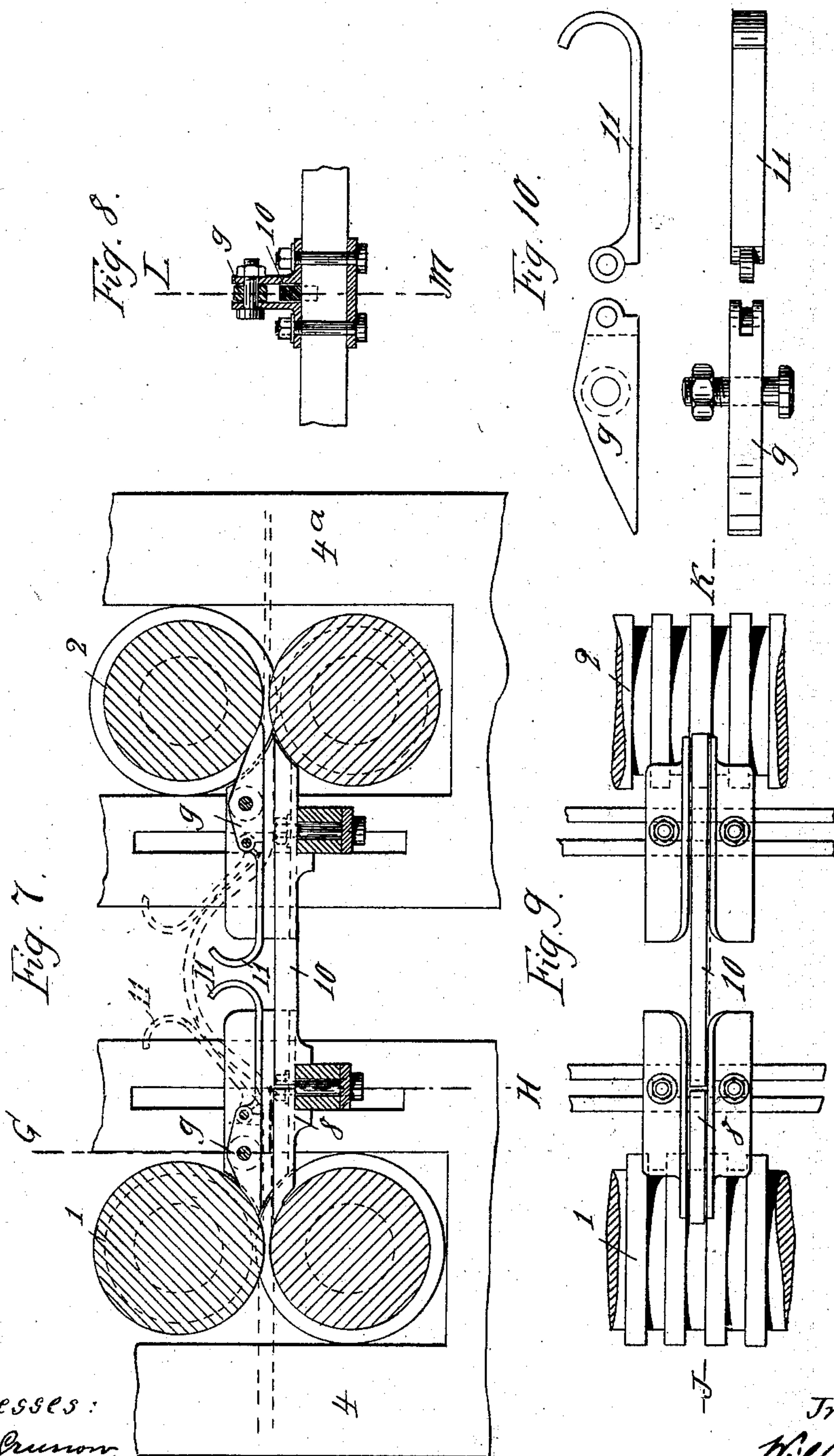
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4 Sheets—Sheet 4.

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No. 388,389.

Patented Aug. 28, 1888.



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UNITED STATES PATENT OFFICE.

WILHELM BANSEN, OF KATTOWITZ, SILESIA, PRUSSIA, GERMANY.

ROLLING-TRAIN.

SPECIFICATION forming part of Letters Patent No. 388,389, dated August 28, 1888.

Application filed January 24, 1888. Serial No. 261,771. (No model.) Patented in Germany June 18, 1887, No. 43,041; in England July 4, 1887, No. 9,447; in Belgium July 4, 1887, No. 78,058; in France July 4, 1887, No. 184,597, and in Luxemburg January 12, 1888, No. 943.

To all whom it may concern:

Be it known that I, WILHELM BANSEN, a subject of the King of Prussia, German Emperor, residing at Kattowitz, Upper Silesia, Kingdom of Prussia, German Empire, engineer, have invented a new and useful Improvement in Rolling-Trains, (for which I have obtained patents in Germany, No. 43,041, bearing date June 18, 1887; in Great Britain, No. 9,447, bearing date July 4, 1887; in Belgium, No. 78,058, dated July 4, 1887; in France No. 184,597, dated July 4, 1887, and in Luxemburg No. 943, dated January 12, 1888,) of which the following is a specification.

My invention relates to improvements in rolling-trains for the manufacture of hoop-iron in which the sets of rollers are put one behind the other, in order to make hoop-iron of nearly five hundred feet length. The rolling-mill is at the same time provided with a smoothing-roll and a polishing-roll, said rolls being so arranged that the rolled hoop-iron leaving the last grooved roll enters the smoothing or dressing roll and then goes to the polishing-roll.

A further remarkable improvement in this rolling-mill is that the first flat grooved roll has its matrices cut in the under roll, while the second roll has its matrices in the upper roll, and the third again in the under roll. The advantages gained by this arrangement are very essential, as hereinafter described.

Another improvement consists in the construction and combination of certain guides with the rolls, by means of which a tension of the hoop-iron is avoided as soon as the rotation of one of the rolls is changed.

I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of the mill on the line A B, Fig. 2; Fig. 2, a horizontal section of the same on the line C D, Fig. 1. Fig. 3 is a section on the line E F of Figs. 1 and 2, showing the scraper 7 and the polishing-rolls 6. Figs. 4, 5, and 6 are views of the grooved rolls. Fig. 7 is a section of a part of the machine on the line J K, Fig. 9, on an enlarged scale. Fig. 8 is a section on the line G H, Fig. 7. Fig. 9 is a top view of Fig. 7, the up-

per rolls, with the guiding-levers, being removed; and Fig. 10 shows some details of the machine.

Similar letters refer to similar parts throughout the several views.

The rolling-mill illustrated on the annexed drawings is provided with three pairs of grooved rolls, 1 2 3, which rest in bearings of the standards 4 4^a 4^b, and are arranged horizontally and one behind the other, in the usual manner. These rolls are flat grooved rolls with closed grooves, and contain the different grooves for the corresponding sizes, as will be seen in Figs. 4, 5, and 6. The most essential feature in the arrangement of these rolls is that the grooves are so cut in the rolls that the first pair of rolls, 1, has its matrices in the under roll, the second pair, 2, in the upper, and the third pair, 3, again in the under roll, by which construction the turning of the material to be rolled, as also the formation of seams or beards, is completely avoided. Behind these rolls the dressing-rolls 5 and the polishing-rolls 6 are situated. Between the last-mentioned rolls the scraper 7 is inserted, which is constructed and can be operated as the common well-known scrapers.

In order to avoid any damageable tension of the iron between one pair of rolls and the next one when passing through said rolls, I use the hereinafter-described guides. The grooved rolls receive the guides 8 and 9, one arranged above the other, between which the rolled iron is passing. Behind the under guide, 8, a firmly-fastened bridge, 10, is arranged, which leads to the next pair of rolls. Between the upper guides, 9, the hinge-like fastened guide-levers 11 are fastened, which open upward, as shown in Figs. 7 to 10, in enlarged scale. The speeds of the grooved rolls are to each other as the decrease of the sections of the grooves, and remain constant for the rolls 1 2 3 at all sections to be rolled; but the speed of the dressing-rolls 5 and the polishing-rolls 6 change at every section. The grooved rolls 1, 2, and 3 can therefore be brought in motion by means of cog-wheels 12 13, Fig. 2; but the impulsion for the dressing-rolls 5 and the polishing-rolls 6 must be changeable, and is executed by conical pulley-drums 14 and 15, as shown.

The success gained by the above-described arrangement is as follows: If at any time tensions should occur in the rolled bar during the process of rolling which arise therefrom, that one roll rotates faster than the other. These tensions can easily be removed in lowering the upper roll of the pair of grooved rolls 1, thus diminishing the section of the groove, and in changing the position of the strap on the conical pulley-drums of the rolls 6, so as to lessen the speed of rolls 5. As soon as this is done the iron will bend upward between the grooved rolls 1 and 2, as shown by dotted lines in Fig. 7, and with it the guide bars or levers 11 will open, whereby it is evident that the iron bar between the said rolls has no tension at all.

The above-described guiding goes to the polishing-rolls 6, and the iron to be polished is conducted to the polishing-roll by means of a bar, 16, which is provided with a hinge and rests on a frame, 17, and goes up and down with the scraper 7. For this reason scraper 7 and frame 17 are connected by the connecting-bars 18. The grooved rolls 1, 2, and 3 rest in bearings which are fixed to the base-plate by means of screws, or in any suitable manner; but the dressing-rolls 5 and the polishing-rolls 6 rest in bearings which can be moved in the longitudinal direction of the axes of the rolls, so that the entire surface of the same can be used for every flat groove.

Behind the polishing-rolls any winding mechanism can be provided in order to wind up the hoop-iron after it leaves the apparatus. I also employ the above-described mill for the manufacture of flat iron. In such case I place the polishing-roll at a distance of twenty meters behind the dressing-roll. This position of the polishing-roll allows that flat iron, as also hoop iron, can be manufactured on one and the same rolling-mill. In the latter case

the hoop-iron is only conducted by any suitable means to the polishing-roll, and after being polished to any winding-up mechanism.

I am aware that prior to my invention rolling-mills have been constructed in which the grooved rolls are put one behind the other. I therefore do not claim such a construction, broadly; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. In a rolling-mill, the combination of grooved rolls 1, 2, and 3, with a dressing-roll, 5, and a polishing-roll, 6, all arranged one behind the other, the last-mentioned rolls 5 and 6 being movable in the direction of their axles, substantially as described and shown.

2. In a rolling-mill, the combination of the grooved rolls 1 2 3 and the dressing-roll 5 and the polishing-roll 6, with the guides 8 and 9, the lower, 8, being provided with a fixed bridge, 10, leading to the next roll, and the upper, 9, with hinge-like fastened guide levers or bars 11, opening upward, for the purpose as described.

3. In a rolling-mill, the combination of grooved rolls 1 2 3, dressing-rolls 5, polishing-rolls 6, guides 8 9, with cog-wheels 12 and 13 and conical-shaped pulley-drums 14 15, all substantially as described.

4. In a rolling-mill, the combination of grooved rolls 1 2 3, cog-wheels 12 13, guides 8 9, dressing-rolls 5, polishing-rolls 6, and conical-shaped pulley-drums 14 15, with a scraper, 7, substantially as described and shown.

In witness whereof I have hereunto set my hand in presence of two witnesses.

WILHELM BANSSEN.

Witnesses:

M. GOLDSTEIN,
HANS BANSSEN.