

No. 786,246.

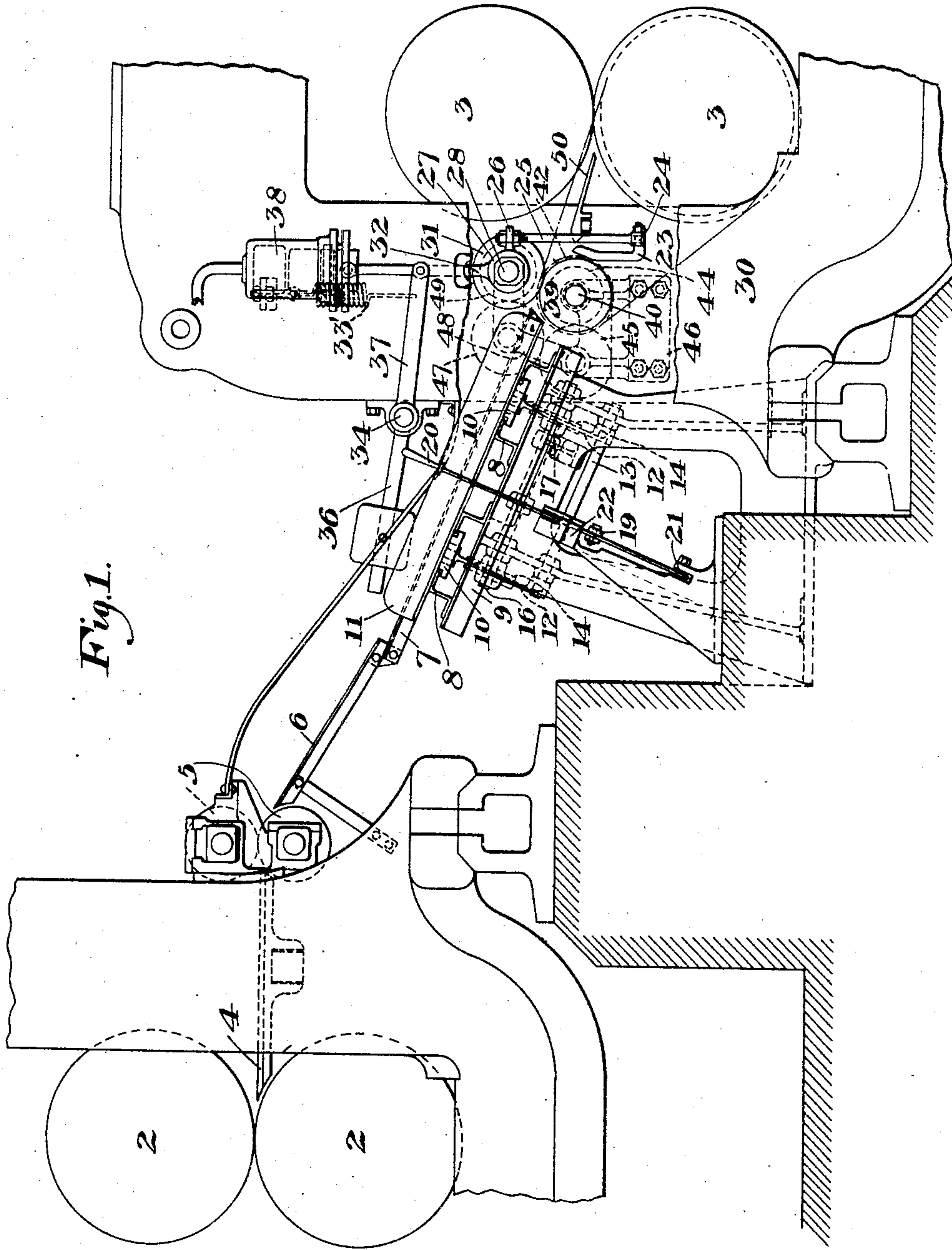
PATENTED MAR. 28, 1905.

C. W. BRAY.

MATCHING DEVICE FOR METAL SHEETS.

APPLICATION FILED JAN. 31, 1903. RENEWED AUG. 15, 1904.

5 SHEETS—SHEET 1.



WITNESSES

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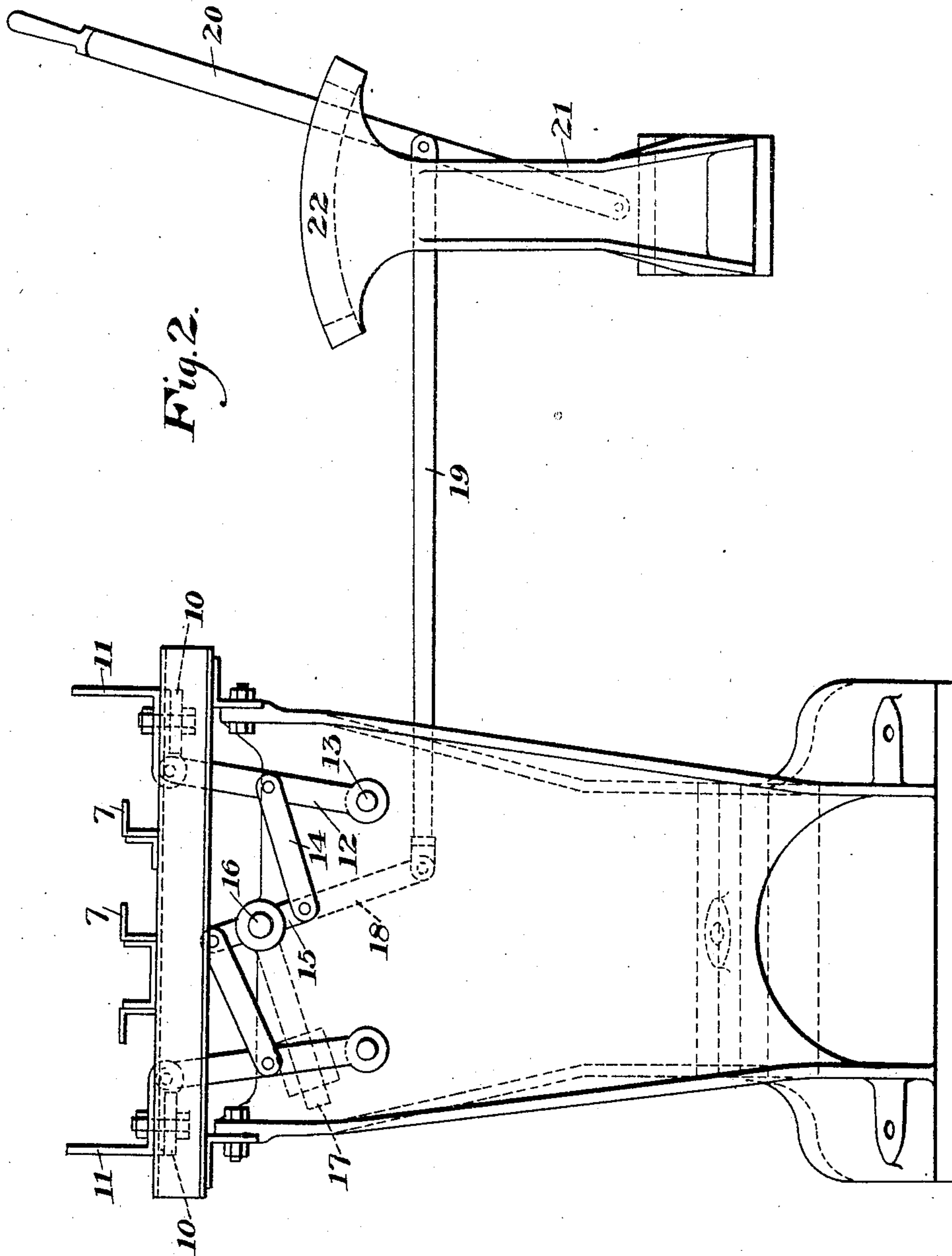
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5 SHEETS—SHEET 2.



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5 SHEETS—SHEET 3.

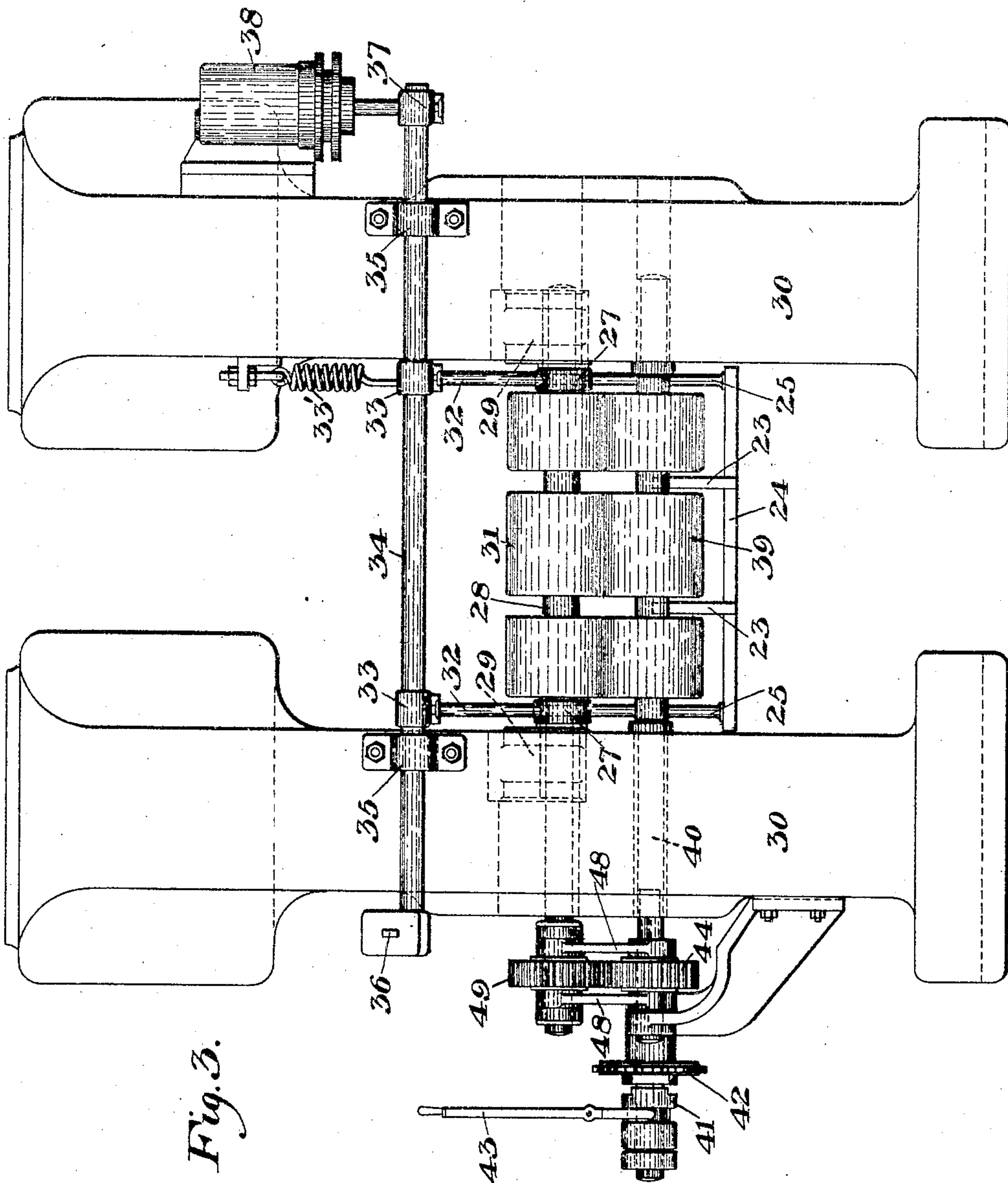


Fig. 3.

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5 SHEETS- SHEET 4.

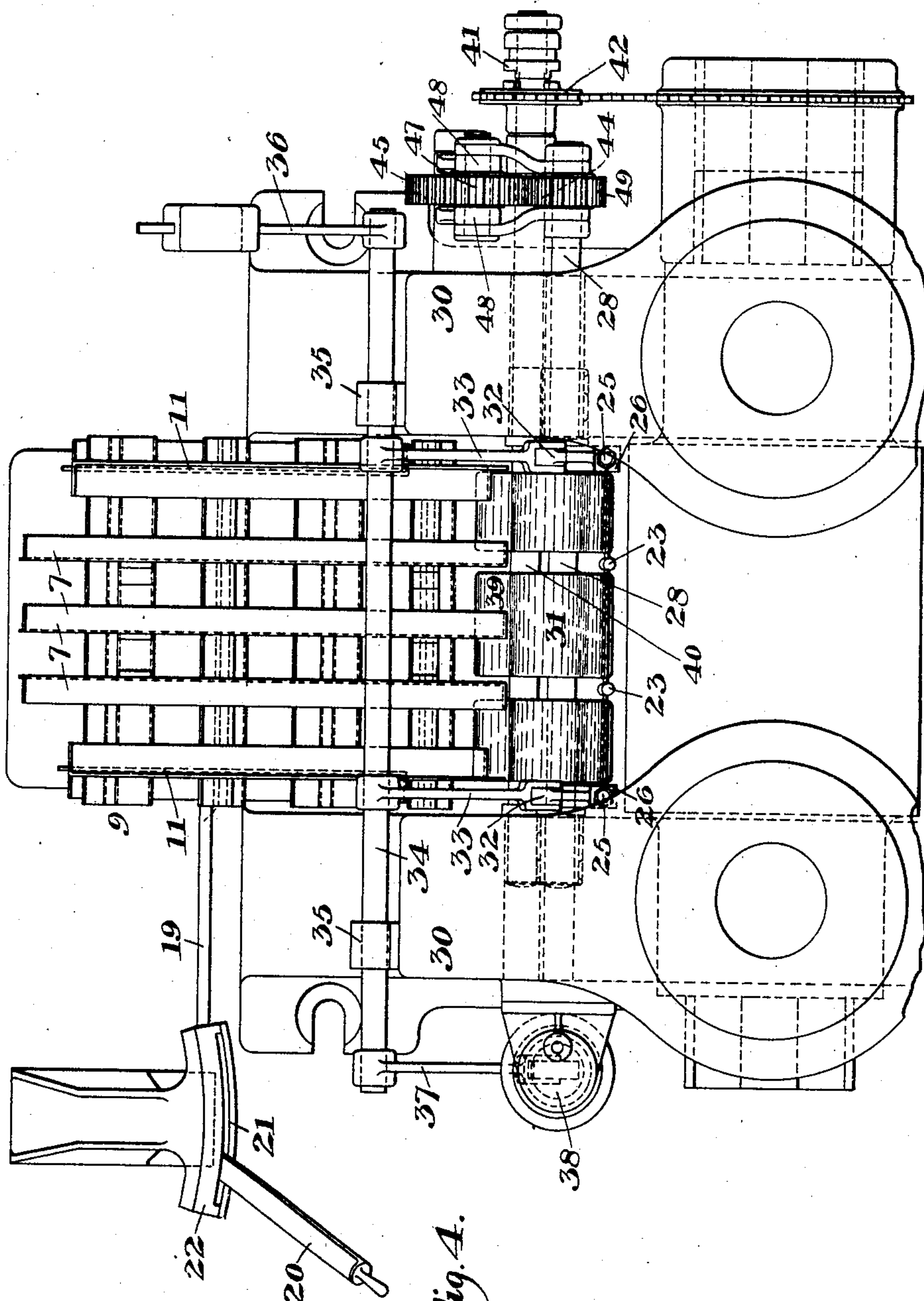


Fig. 4.

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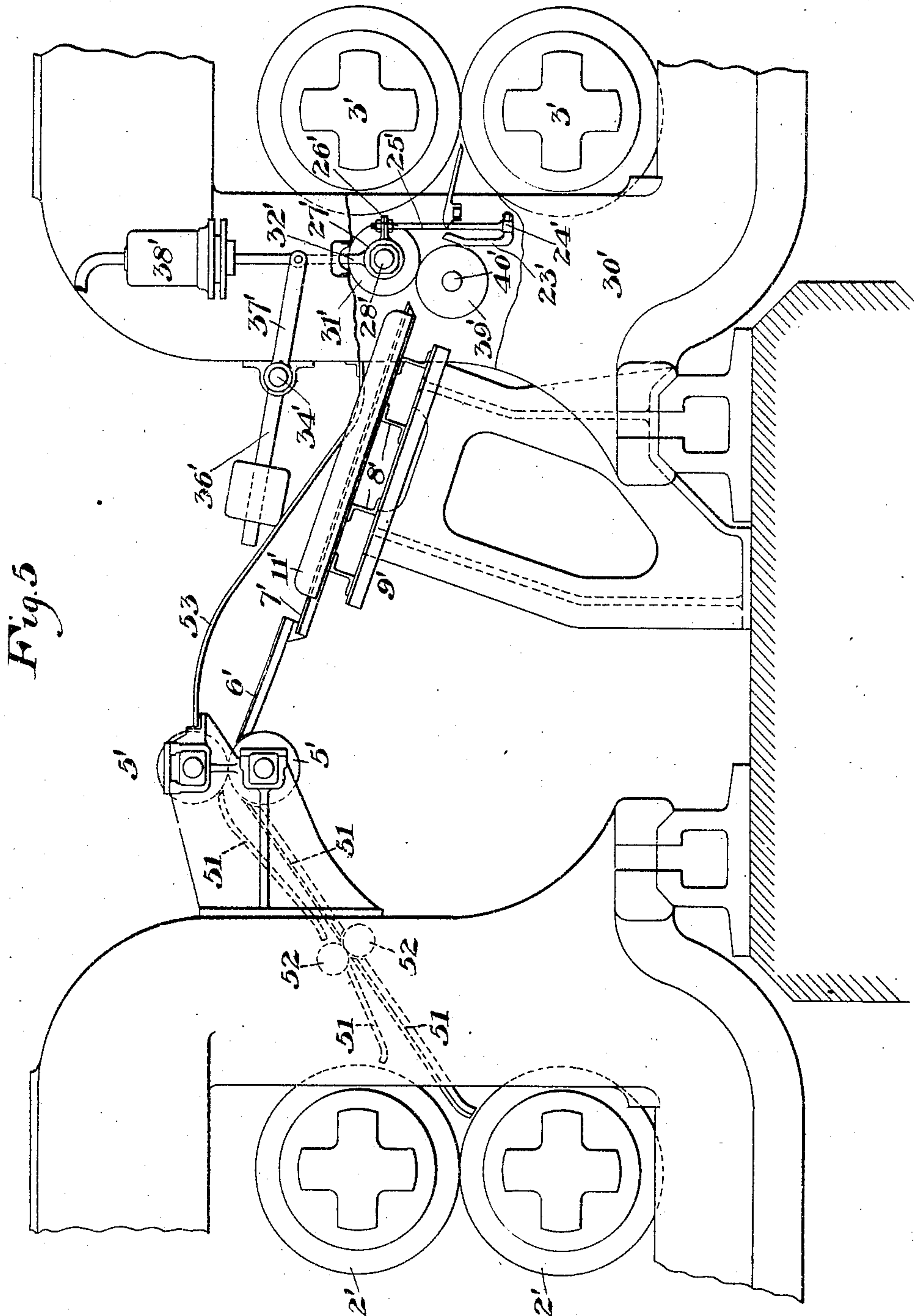
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5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

CHARLES W. BRAY, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO AMERICAN TIN PLATE COMPANY, OF ORANGE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

MATCHING DEVICE FOR METAL SHEETS.

SPECIFICATION forming part of Letters Patent No. 786,246, dated March 28, 1905.

Application filed January 31, 1903. Renewed August 15, 1904. Serial No. 220,710.

To all whom it may concern:

Be it known that I, CHARLES W. BRAY, of Pittsburgh, Allegheny county, Pennsylvania, have invented a new and useful Matching Device for Metal Sheets, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side elevation showing my improved matcher arranged between two sets of rolls of a continuous mill. Fig. 2 is an end detail view showing the device for squaring up the side edges of the sheets. Fig. 3 is an end elevation at the lower end, showing the feed-out rollers and stop mechanism of the matcher. Fig. 4 is a top plan view of the matcher, and Fig. 5 is a side elevation showing a modified form.

My invention relates to devices for matching metal plates or sheets, and more especially to means for feeding the pack forwardly out of the matcher.

It consists in applying pressure to the top or bottom face of the pack after matching to hold the sheets in correct aligned position while the pack is fed forward out of the matching device.

It further consists in applying the pressure by means of pinch-rollers, which also serve to feed the pack forwardly, and, further, in stops beyond the rollers, which stops may be thrown out of position when the pack is fed forwardly.

It also consists in the construction and arrangement of the parts, as hereinafter more fully described and claimed.

In the drawings, 2 2 represent one pair of the rolls of a continuous mill, and 3 3 a succeeding pair at a lower level. The sheets issuing from the rolls 2 pass over a fore plate 4 and between driven feed-rollers 5, whence they drop upon inclined guides 6 and slide down upon the inclined longitudinal supports 7 of the matcher. I have shown these supports as formed of commercial shapes, secured to transverse Z-bars 8 8, arranged in pairs and secured to the supporting-framework 9 of the matcher. Each pair of Z-bars forms a guide for two laterally-movable slides 10,

arranged to move toward and from each other, and the slides on each side are connected by a guide 11, arranged to square up the side edges of the plates. The two guides 11 extend along the sides of the matcher and are simultaneously moved toward and from each other by means of levers 12, which are pivotally connected to the slides and are pivoted at their lower ends to the frame, as shown at 13. The levers 12 are connected by pivotal links 14 to rock-arms 15, projecting in opposite directions from a rock-shaft 16, to which is secured a weighted lever 17, arranged to force the guides apart whenever they are released. The shaft 16 is rocked by lever-arm 18, connected by link 19 to a hand-lever 20, pivoted within a guide 21, having an upper slotted segment 22.

The sheets entering the matcher slide down upon the inclined guides 7 until their lower ends strike movable stops 23 beyond its lower ends, the stops then being in the position shown in dotted lines in Fig. 1. The plates are thus piled upon each other and squared up endwise until the desired number is obtained. The stops 23 are secured to and project upwardly from a cross-bar 24, which is secured to hangers 25, supported on lugs 26, projecting from collars 27, surrounding a transverse shaft 28. This shaft is movable vertically within guides 29, slotted through the side housings 30 of the rolls 3, and carries short roller-sections 31, adapted to engage the top plate of the pack. The collars 27 form the lower ends of links 32, pivoted at their upper ends to levers 33, projecting from the end portions of shaft 34 inside the roll-housings 30. The shaft 34 is carried in bearings 35, secured to the front faces of the housings, and is extended to receive a weighted lever 36 at one end and a lever 37 at the other, which lever is pivotally connected to the plunger of a single-acting cylinder 38, carried upon one housing. A spring 33' is preferably used to aid the weight in lifting the stops into normal position when the fluid is exhausted from the cylinder 38. When motive fluid is admitted to the cylinder, it rocks

the shaft 34, and thereby, through the levers 33, moves the stops into retracted position, and at the same time forces down the roll-sections 31. The roll 31 is thus withdrawn
 5 from a lower roll 39, formed in similar sections and mounted upon a shaft 40 in stationary bearings in the housings. This shaft is extended at one end to receive a clutch 41 and a loose driving sprocket-wheel 42, which
 10 may be clutched to or severed from the shaft by a clutch-lever 43. A driving-pinion 44 is secured to the shaft 40 and intermeshes with an idler 45, mounted in a bracket 46, which is pivoted about the shaft 40. A sec-
 15 ond idler 47 is mounted in pivotal links 48, pivoted to the pivotal bracket 45, and the shaft of the idler 47 is also pivotally linked to the shaft 28. The idler 47 engages a toothed wheel 49 on the shaft 28, this set of connec-
 20 tions being arranged to drive both of the pinch-rollers 31 and 39 in any position of the roller 31.

It will be noted that the pinch-rolls are between the lower end of the matcher and the
 25 stops, a guide-plate 50 being placed beyond the stops to guide the pack into the lower set of rolls.

In operating the device the plates or sheets issuing from the rolls 2 are fed forward by
 30 the feed-rolls 5 and slide down over guide 6 upon the longitudinally-inclined supports 7. During this period the fluid is exhausted from motive cylinder 38, the stops being in stop-
 35 ping position, and the upper pinch-roll is in raised position to allow the sheets or plates to form a pack between it and the lower roll and against the stops. When a sufficient number of sheets are assembled, the operator squares up their side edges by means of a
 40 handle 20 and then admits motive fluid to the cylinder 38, and thus forces down the stops into the position shown in full lines, and at the same time pinches the lower end of the pack between the roller-sections 31 and 39.
 45 He then throws in the clutch 41, thus driving both of the pinch-rollers, which thereupon feed the pack forwardly over the plate 50 and into the pass of the rolls 3. After the pack is fed out the fluid is exhausted from the mo-
 50 tive cylinder and the upper roll 31 is drawn upwardly while the stops are moved into operative position. The power may then be thrown off from the shaft 40, and the matcher is ready to receive the sheets for a new pack.

55 Instead of arranging the matcher at a downward incline leading from the level of the preceding pass, thus bringing the succeeding reducing-rolls at a lower level, I may direct the sheets or plates upwardly from the preceding
 60 pass, so that the succeeding rolls may be arranged at the same level, or even a higher level, if desired, than the preceding rolls. Thus in Fig. 5 I show guide-plates 51 leading upwardly from the rolls 2' and having intermediate feed-
 65 rollers 52 interposed in the length of the

guides, and which may be positively driven. The plates are thus moved upwardly to the feed-rolls 5', which are at a higher level than the pass, whence they move down over the guides 6' upon the part 7' of the inclined
 70 matcher, as before. The remaining parts are similar to the first form and are marked with similar numerals having the prime-mark applied. In both cases I preferably use upper
 75 holding-down plates or guides 53, which extend longitudinally over the matcher and guide the entering-plates to prevent them from jumping out of place.

The advantages of my invention result from the pinching or compressing of the pack to
 80 hold the sheets or plates after matching and during feeding out, also from the automatic nature of the mechanism, which is easily operated and not liable to get out of order. By
 85 arranging the upwardly-inclined guide leading to the entrance end of the matcher I am enabled to place the succeeding rolls at as high a level as the preceding rolls.

Many variations may be made in the form and arrangement of the pinch and feed-out
 90 mechanism and the other parts of the matcher without departing from my invention.

I claim—

1. A matching device for metal sheets or plates having squaring-up mechanism, mech-
 95 anism for pinching or applying pressure to the face of the squared-up pack, and mechanism for feeding the pack out of the matcher while the plates are pinched or held together; substantially as described. 100

2. A matcher having mechanism for squaring up the pack, mechanism for pinching or applying pressure to the upper face of the pack, and feed-out mechanism for the pack; substantially as described. 105

3. A matcher having pinch-rollers arranged to engage the pack, and means for driving at least one of said rollers; substantially as described.

4. A matcher having end stops, pinch-rolls
 110 in front of the stops, mechanism for driving at least one of the pinch-rolls, and means for retracting the stops; substantially as described.

5. A matcher having pinch-rollers arranged to engage the top and bottom faces of the
 115 pack, mechanism for feeding sheets one upon the other into the matcher and between the rollers, and mechanism for driving at least one of said pinch-rollers to feed out the pack; substantially as described. 120

6. An inclined matching device having squaring-up mechanism for the side edges of the sheets, front stops, pinch-rolls in front of the stops, and mechanism for retracting the stops and driving at least one of the pinch-
 125 rollers; substantially as described.

7. A matcher having upwardly - inclined guides leading to its front end, and having mechanism for piling the upwardly-directed plates, and mechanism for feeding out the pack 130

in a forward direction; substantially as described.

8. A matcher having forwardly and upwardly inclined guides leading thereto, mechanism for moving the plates up over the guides and piling them in the matcher, and mechanism for feeding out the pack; substantially as described.

9. A matcher having a pair of feed-out rolls, stops beyond the rolls, and mechanism for raising and lowering one of the feed-out rolls and the stops; substantially as described.

10. A matcher having feed-out rolls, connections for driving at least one of said rolls, vertically-movable stops beyond the rolls, and mechanism for simultaneously moving the stops and one of the rolls vertically; substantially as described.

In testimony whereof I have hereunto set my hand.

C. W. BRAY.

Witnesses:

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C. P. BYRNES.