

No. 843,868.

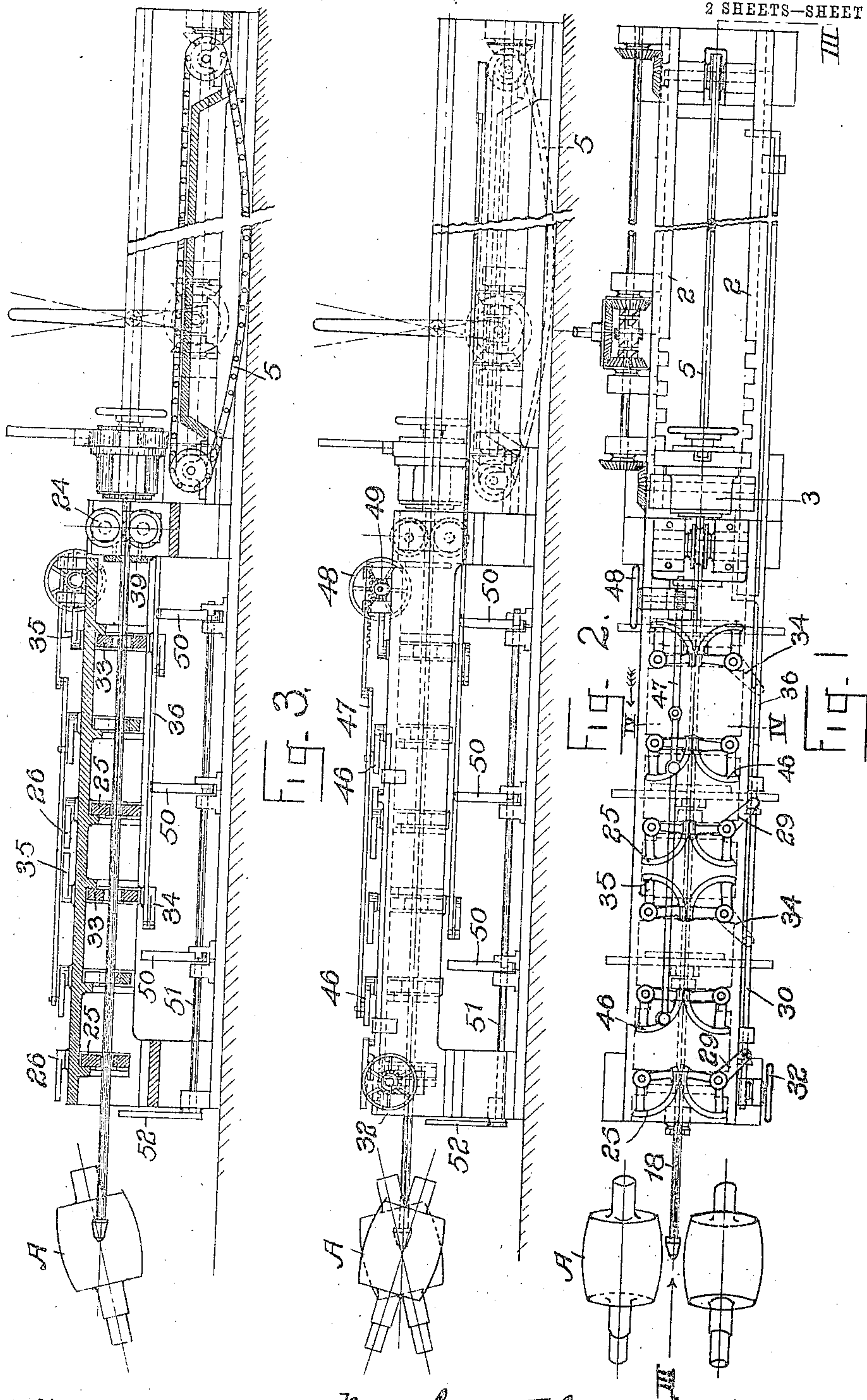
PATENTED FEB. 12, 1907.

M. F. CAPRON.

MECHANISM FOR THE MANUFACTURE OF SEAMLESS TUBES.

APPLICATION FILED MAY 31, 1905. RENEWED JUNE 29, 1906.

2 SHEETS—SHEET 1.



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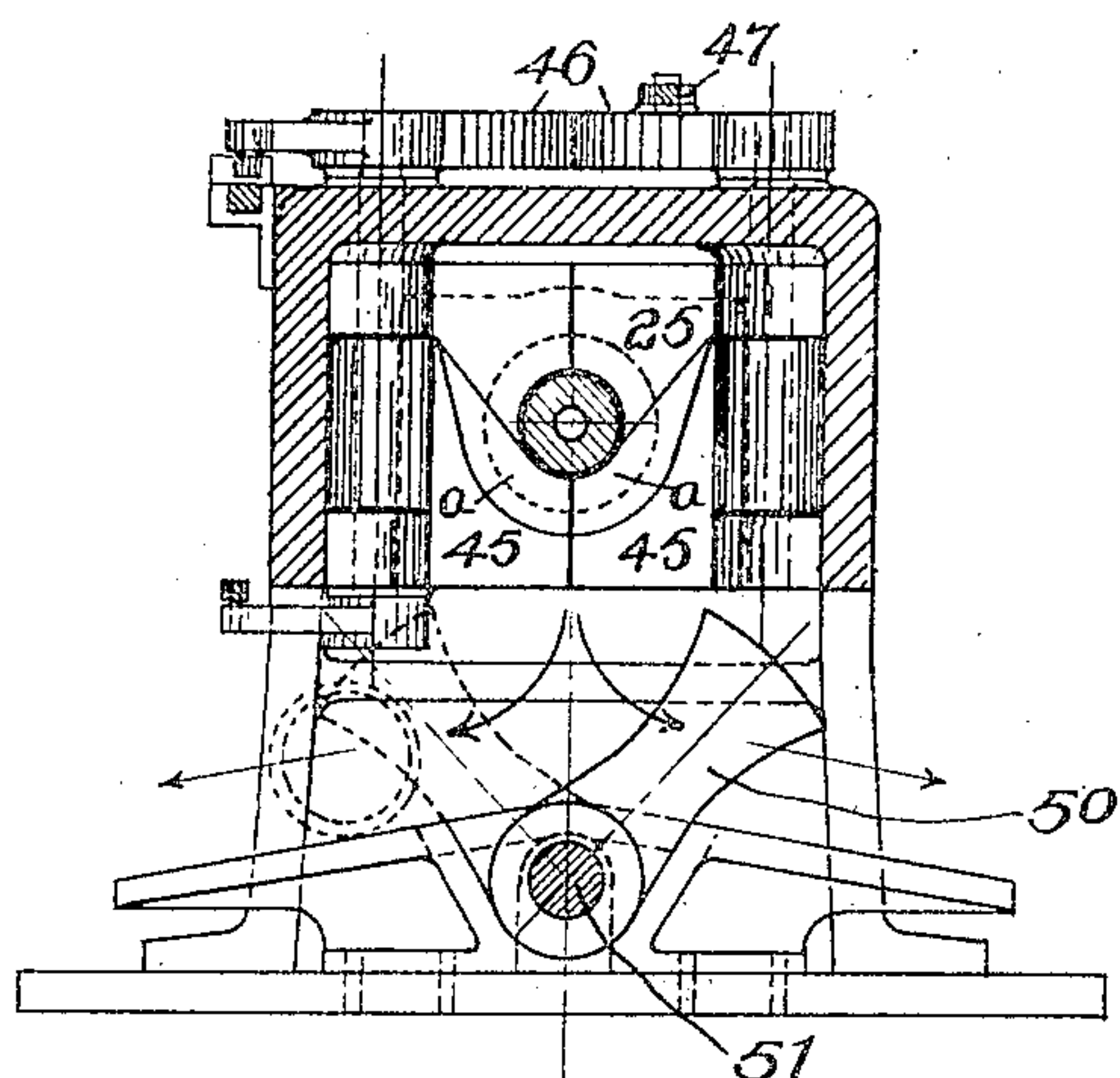


Fig. 4.

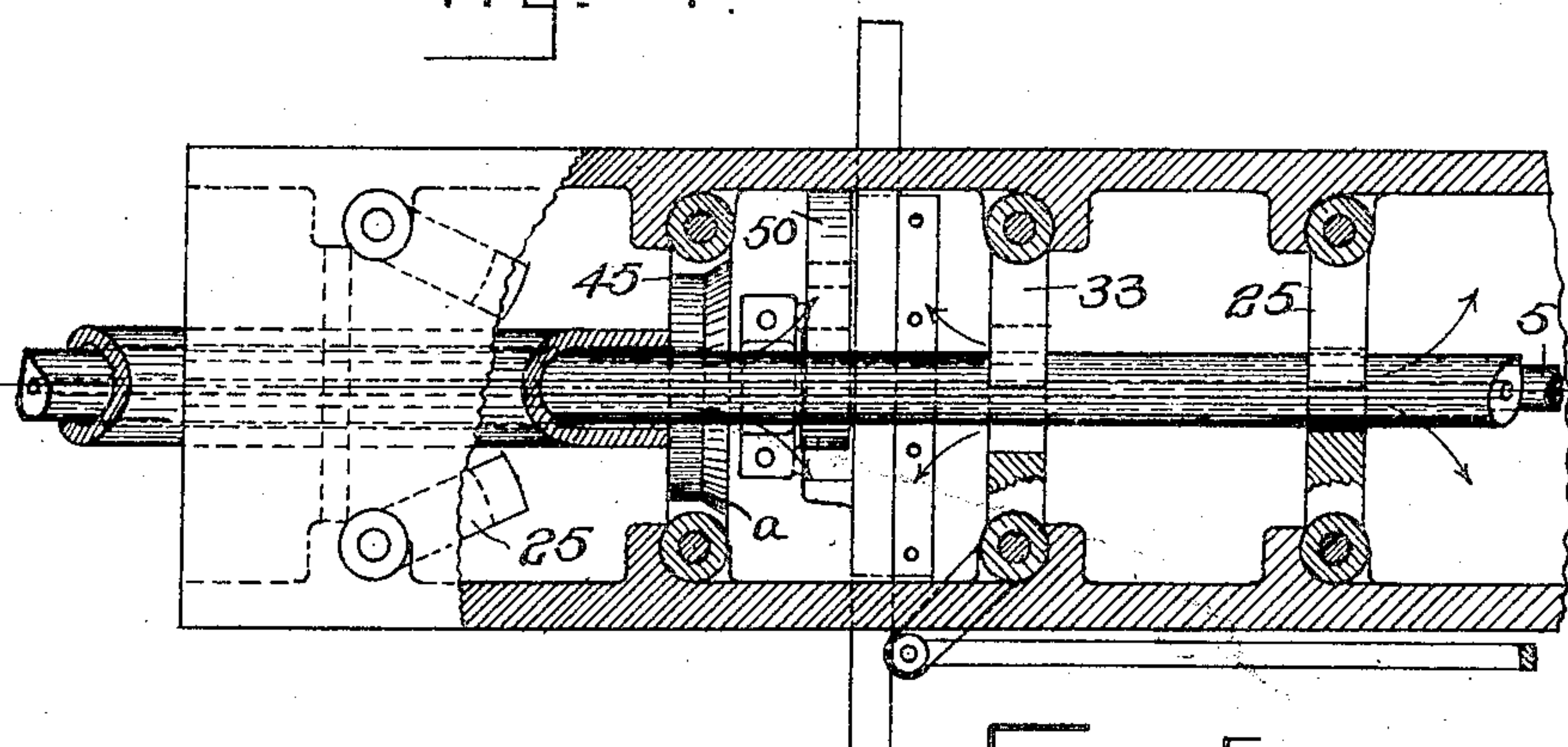


Fig. 5.

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UNITED STATES PATENT OFFICE.

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MECHANISM FOR THE MANUFACTURE OF SEAMLESS TUBES.

No. 843,868.

Specification of Letters Patent.

Patented Feb. 12, 1907.

Application filed May 31, 1905. Renewed June 29, 1906. Serial No. 324,054.

To all whom it may concern:

Be it known that I, MARSHALL F. CAPRON, residing at Elyria, in the county of Lorain and State of Ohio, a citizen of the United States, have invented or discovered certain new and useful Improvements in Mechanism for the Manufacture of Seamless Tubes, of which improvements the following is a specification.

10 In an application filed May 26, 1905, Serial No. 262,468, I have shown and described certain improvements in mechanism for piercing billets, such improvements consisting, generally stated, in suitable mechanism
15 for shifting a mandrel-bar to and from operative position and in the employment of suitable guides or supports for the mandrel-bar and the billet as the latter is being developed along the mandrel-bar. In the machine described in that application provision was
20 made for lifting the billet out of the machine and discharging it on either side.

The present invention has for its object the employment of suitable guides in addition to
25 the billet and mandrel-bar guides shown in said application, whereby the mandrel-bar will be supported and guided as it is being shifted to operative position and additional guides will be afforded to the billet as it is
30 being developed along the mandrel-bar, such additional guides or supports being so constructed as to be capable of being shifted from operative position by the advancing
35 billet, thereby permitting the billet from which the mandrel-bar has been withdrawn to drop on the opening of the billet-supports onto suitable guides, whereby it may be directed out from either side of the machine.

40 The invention is hereinafter more fully described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a top plan view of a billet-piercing mechanism having my improvements applied thereto.
45 Fig. 2 is a side elevation of the same; and Fig. 3 is a sectional elevation on a plane indicated by the line III III, Fig. 1. Fig. 4 is a transverse section on a plane indicated by the line IV IV looking in the direction of
50 the arrow, Fig. 1, said figure being on enlarged scale. Fig. 5 is a view, partly in section and partly in elevation, of a portion of the machine, illustrating the several guides employed.

55 In the practice of my invention the mandrel-bar is connected, as described in the ap-

plication referred to, to a carriage 3, mounted on ways 2 at one end of the machine—i. e., at the right-hand end, as shown in Figs. 1, 2, and 3—and is adapted to be shifted back and forth by suitable mechanism operating through the sprocket-chain 5. In front of the portion of the machine on which the carriage operates and between it and the guides hereinafter to be described I preferably locate a pair of supporting-rollers 24 for the
65 mandrel-bar, such supporting-rollers being especially useful for the purpose stated when the mandrel has been drawn back or away from the rolls A. As stated in the application above referred to, it is preferred to put the stripper-plate 39, whereby the billet is held stationary while the mandrel is drawn out or away from the rolls A, on the housings or bearings of the rollers 24.
75

A series of two or more doors or wings 25, which are mounted on vertical axes and caused to move in unison by means of geared sectors 26, are arranged along at suitable intervals on the frame of the machine. These
80 wings or doors are adapted to be shifted to closed position by means of a bar 30, connected to the sectors or wings by arms 29. This bar is shifted back and forth by means of a hand-wheel 32, operating a pinion engaging teeth upon the bar 30. These wings or
85 doors are provided in their meeting faces with suitable grooves of a diameter slightly greater than the external diameter of the mandrel-bar 18 and serve as supports for
90 such bar while the billet is being developed along the same. These doors or wings are adapted to be forced open by the advancing end of the billet as it is developed along the mandrel-bar, and the mechanism employed
95 for operating the wings or doors is constructed to permit this opening movement by the advancing billet. Wings or doors 33, provided in their meeting faces with grooves or notches of such a size that the opening
100 formed by them will be a little larger than the external diameter of the billet formed, are arranged alternately with the wings or doors 25. These wings or doors 33 are caused to move in unison by means of geared sectors
105 35, as described in the application referred to, and one of each pair of such sectors or one of each pair of the doors are connected by an arm 34 to a sliding bar 36, which extends backward to and along the part of the bed on
110 which the carriage 3 moves and is provided with tappets 37 and 38, whereby said doors

may be closed when the carriage is in its forward position and opened when the carriage reaches the limit of its rearward movement.

Additional supports for the mandrel-bar, which will also serve as guides as it is shifted forward to operative position by the carriage, are arranged intermediate of the doors of the two series of doors. These supports and guides are made in the forms of wings or doors 45, arranged on vertical axes and have their meeting edges inclined away from each other from a point below the line of movement of a mandrel-bar as it is shifted to position, thus forming V-shaped supports, as clearly shown in Fig. 4. The inclined edges of these supports and guides are beveled outwardly, as at *a*, so as to form a bell-mouth extending rearwardly, so that as the mandrel-bar is moved forward its end, due to the sagging of the bar, will strike against these beveled faces and be guided up to the proper vertical and lateral alinement. These doors or wings 45 are arranged on vertical shafts and are caused to move in unison by toothed segments 46. The doors are arranged to open in the direction of movement of the billet and by the billet as it is being developed along the mandrel-bar. To close the doors 45, any suitable mechanism may be employed—such, for example, as that shown, consisting of a bar 47, connected to the doors or to the toothed segments and adapted to be shifted back and forth by means of a hand-wheel 48, operating a pinion 49, engaging the teeth on the bar or an extension thereof.

As the billet is being developed along the mandrel-bar the doors 25 and 45 will be opened by the billet, so that after the latter is completed it and the mandrel-bar inside of the same will be supported by the doors 33. The mandrel-bar is withdrawn from the billet by a backward movement of the carriage. The front end of the billet, striking against the stripper-plate 39, is held from movement with the mandrel. As soon as the mandrel-bar has been removed, at which time or very soon

thereafter the carriage will strike against the rear tappet on the bar 36, thereby opening the doors 33, permitting the completed billet to drop onto arms 50. As shown, these arms are mounted on a shaft 51, by which they may be shifted from one side to the other, dependent upon which side of the machine the completed billet is to be delivered, as clearly shown in Fig. 4. This shaft is operated by any suitable means—as, for example, a lever 52, as shown in Figs. 2 and 3.

I claim herein as my invention—

1. A combination of rolls of a billet-piercing mill, a mandrel-bar, doors or wings movable horizontally to and from operative position for supporting the billet and movable arms below the doors or wings for the discharge of the billet to one side of the machine.

2. A combination of rolls of a billet-piercing mill, a mandrel-bar, wings or doors for supporting the billet, a carriage for shifting the mandrel-bar, means for shifting the doors or wings operative by the carriage and movable arms below the doors or wings for the discharge of the billet.

3. A combination of rolls of a billet-piercing mill, a mandrel-bar, wings or doors for guiding the mandrel-bar to operative position, wings or doors for holding the mandrel-bar in operative position, the guiding and holding doors adapted to be shifted to open position by the billet, wings or doors for supporting the billet, a carriage for shifting the mandrel-bar, means for shifting the billet-supporting doors by the carriage and movable arms below the billet-supporting doors for directing the completed billet to the side of the machine.

In testimony whereof I have hereunto set my hand.

MARSHALL F. CAPRON.

Witnesses:

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