No. 721,589. PATENTED FEB. 24, 1903.

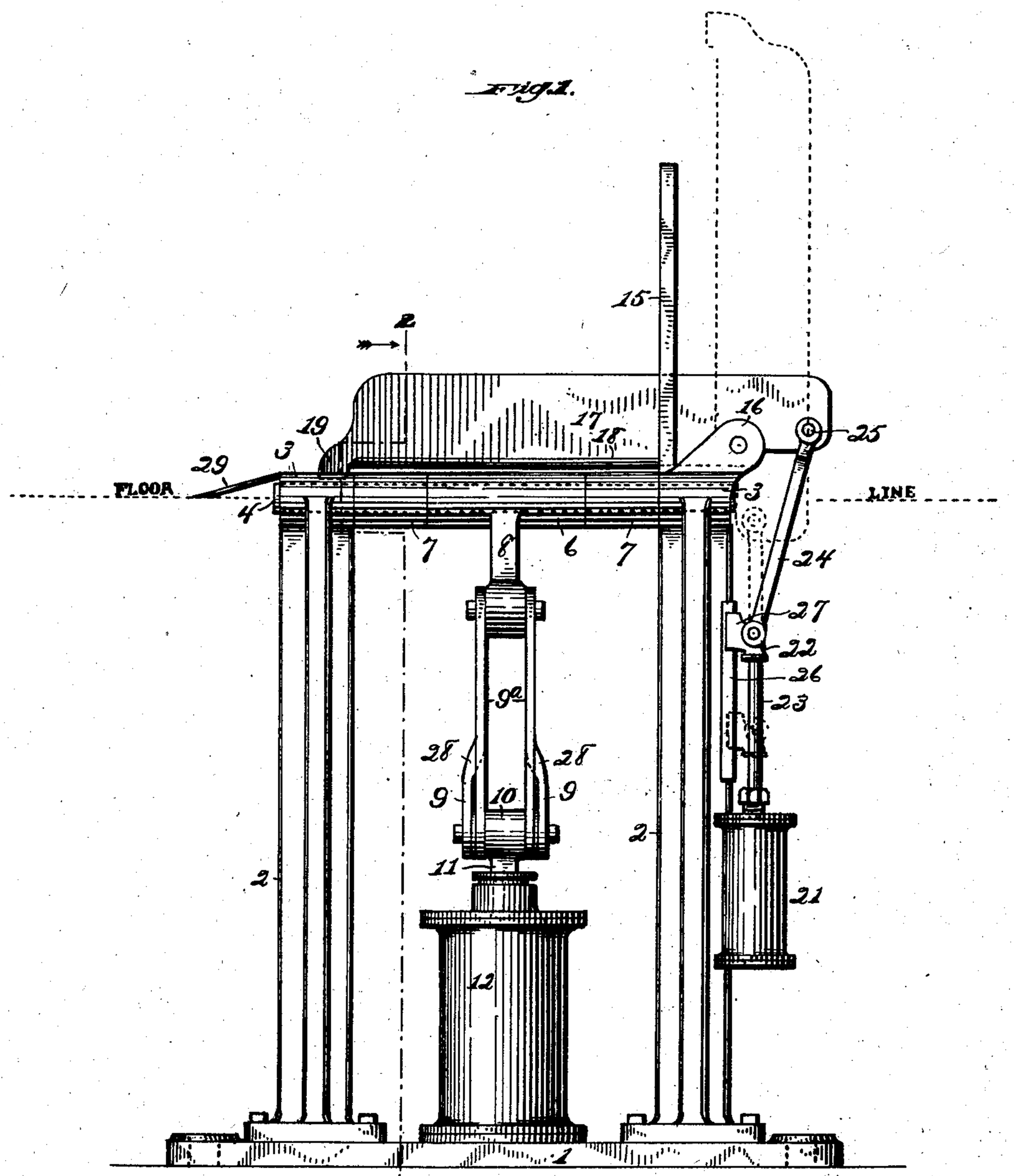
A. J. MASKREY.

FOLDING MACHINE.

APPLICATION FILED NOV. 21, 1902.

NO MODEL. 3 SHEETS—SHEET 1.

Fig. 1.



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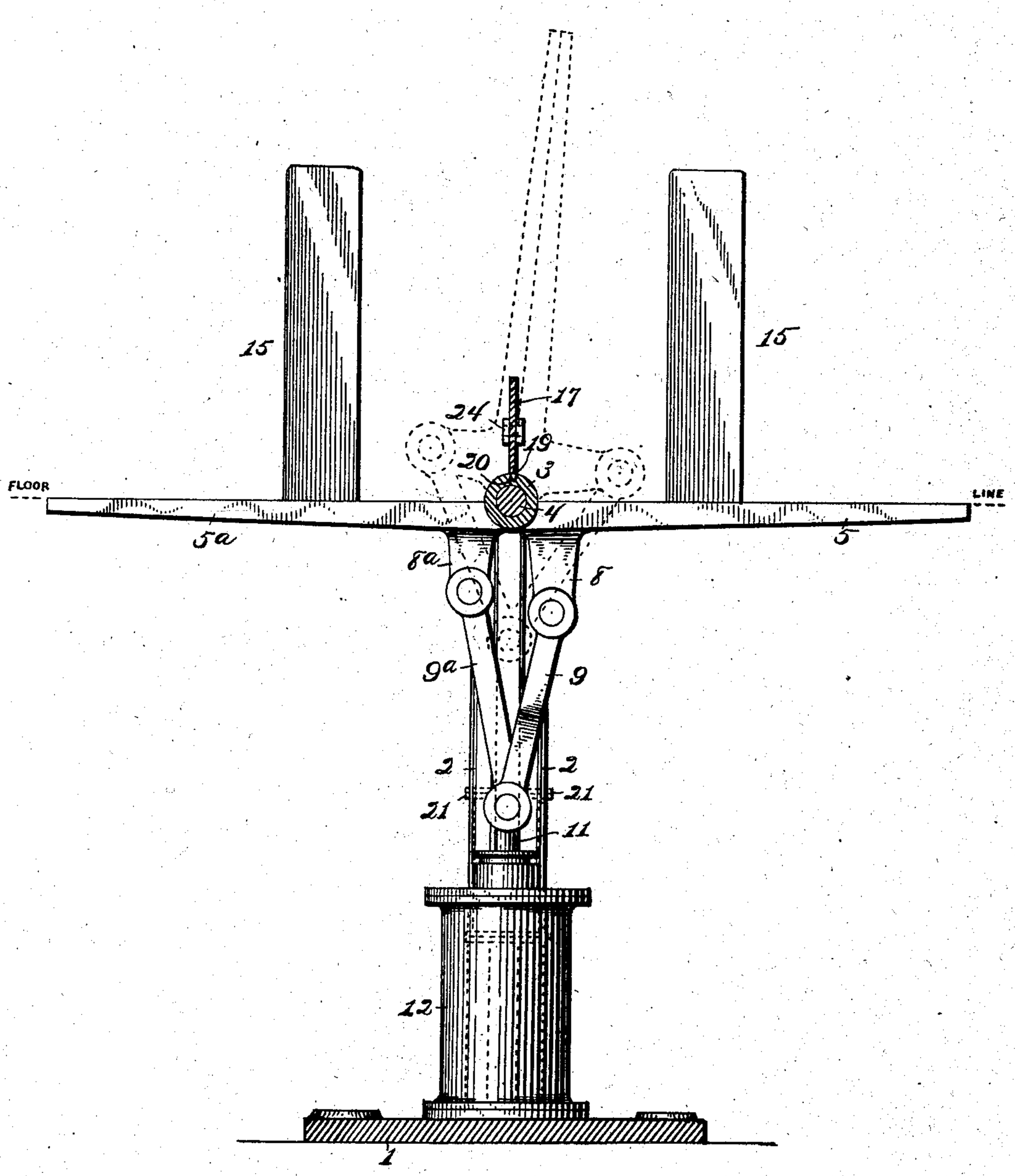
NO MODEL. 3 SHEETS—SHEET 2.

Fig. 2.



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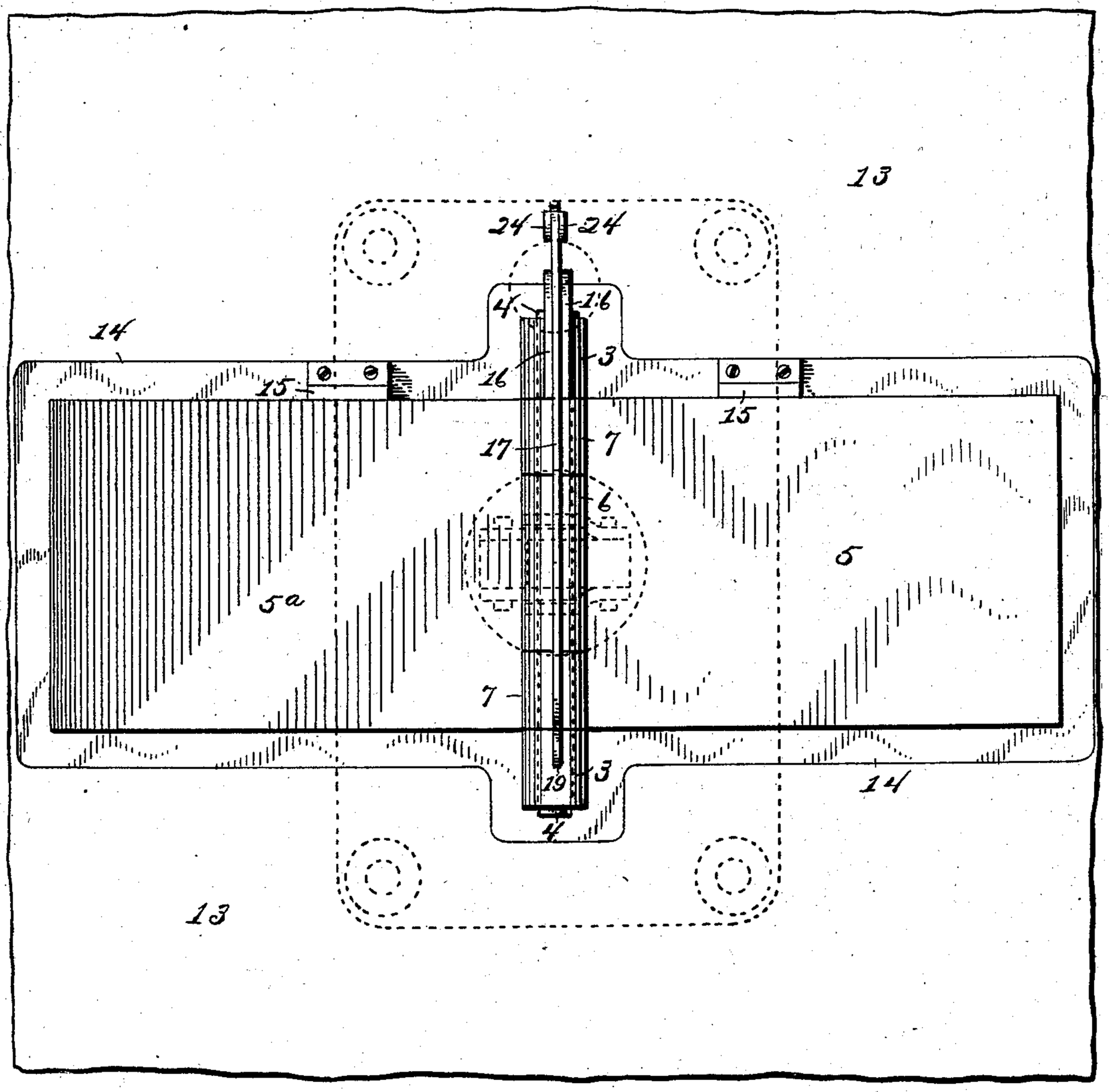
NO MODEL. 3 SHEETS—SHEET 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

ARTHUR JAMES MASKREY, OF MARTINS FERRY, OHIO.

FOLDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 721,589, dated February 24, 1903.

Application filed November 21, 1902. Serial No. 132,246. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR JAMES MASKREY, a subject of the King of Great Britain, and a resident of Martins Ferry, county of Belmont, and State of Ohio, have invented certain new and useful Improvements in Folding-Machines, of which the following is a specification.

My invention relates to new and useful improvements in folding-machines, and more particularly to a machine for folding or doubling sheets or packs of metal which have partially passed through the rolling process and before passing said sheets or packs through the finishing-rolls.

The object of my invention is to provide an extremely simple, convenient, and durable device for performing mechanically a character of work which has heretofore been with but few exceptions performed by muscular force.

A further object of my invention is to provide a machine which will fold or double sheets or packs of metal squarely—that is, which will not permit the ends of the sheets or packs to whip around and become uneven in the pack—and which, furthermore, will fold the sheets or packs so as to leave them flat and perfect—that is, without warp.

With these and other objects in view my invention finally consists in the particular construction, arrangement, and combination of parts, which will hereinafter be fully described, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is an end elevation of my invention, showing the creasing-bar lowered across the table and also indicating in dotted lines the normal position of said creasing-bar. Fig. 2 is a cross-section on the line 2 2, Fig. 1, showing the table open in side elevation and illustrating in dotted lines the position of said table when closed; and Fig. 3 is a top plan view of my invention, showing the table open and the creasing-bar lowered across said table.

Referring to the drawings, in which like reference-numerals designate like parts throughout the several views, 1 indicates a bed-plate, on which are mounted supports 2. Journaled in the upper ends 3 of said supports 2 are the opposite ends of a shaft or pintle 4. Loosely mounted on said shaft 4, as the leaves of a hinge about its pintle, are the leaves 5 and 5^a of a table, the shaft-encircling portions 6 being integral with the leaf 5 and the shaft-encircling portions 7 being integral with the leaf 5^a. On the under side of the leaf 5 and at a substantially right angle to the plane thereof is an arm 8, and on the under side of the leaf 5^a is a similar arm 8^a. To the end of the arm 8 are pivoted the upper ends of toggle-arms 9, and to the end of the arm 8^a are pivoted the ends of toggle-arms 9^a. The lower ends of each of said toggle-arms are pivoted to the head 10 of the piston-rod 11 of a steam-cylinder 12, which is also mounted on the bed-plate 1. The surface of the table when open, as illustrated in Fig. 2, is preferably flush with the floor 13 of the mill, and encircling the opening in the floor 13, in which the table is supported, is preferably provided a substantially rectangular border-plate 14. Upright guides 15 are mounted on the plate 14 at the rear side of the table, against which the sheets or packs are squared up when placed on said table preparatory to folding.

Pivoted in lugs 16, provided on the upper face of the journal 3 at the rear side of the table and directly in the center thereof, is a creasing-bar 17, with a beveled edge 18 for lowering across the center of the sheet or pack resting upon the table at right angles to the length thereof to hold said sheet or pack firmly in position while the leaves 5 and 5^a thereof are being raised, thus providing means whereby a crease for folding is formed in said sheet or pack at direct right angles to the length thereof and in its center. Said creasing-bar is provided with a vertical point 19 for engaging a recess 20, provided in the upper face of the journal 3 at the front side of the table, means being thus provided whereby lateral movement is prevented in said creasing-bar. As a means for operating said creasing-bar 17 I provide a small vertical steam-cylinder 21, to the head 22 of the piston-rod 23 of which I pivot the lower end of a toggle 24. The upper end of said toggle 24 is pivoted to the rear end of said creasing-bar at 25.

26 indicates a guide on the support 2, on which the yoke or saddle 27 of the head 22 slides.

The creasing-bar 17 normally stands in the position indicated in dotted lines in Fig. 1.

The toggles 9 are each provided with an outward bend 28 at their lower ends, so as to straddle the lower ends of the toggles 9^a when the table lies open, as illustrated in Fig. 2. The arm 8^a on the under side of the leaf 5^a is preferably made relatively shorter in length than the arm 8, so that the arc described by said arm in traveling to the position indicated in dotted lines in Fig. 2—that is, when closing the table—will be somewhat shorter than that of the opposite arm 8, thus making the table stand when closed at an angle to the vertical. The object of this construction or arrangement is to cause the folded sheet or pack to follow the leaf 5 when the table is reopened, falling on that leaf of the table, which leaf is preferably on the side next the feed-rolls. However, as is obvious, the parts may be so constructed as to cause the table to stand in a vertical position when closed, from whence the sheets may fall to either side.

At the front side of the table an inclined guide 29 may be placed on the floor, which guide will lead up to the level of the hinge. The sheets or packs may then be shoved up on the table without hindrance from the said hinge.

The operation of my invention is substantially as follows: The sheet or pack of metal to be folded is placed on the table and is squared up against the upright guides 15 at the rear side of said table and is centrally divided thereon—that is, an equal portion of the sheet or pack is placed over each leaf of the table. The steam is then thrown into the cylinder 21, forcing the piston-rod 23 upward and through the intermediate toggle 24, lowering the creasing-bar 25 across the center of the sheet or pack. The steam is then thrown into the cylinder 12, forcing the piston-rod 11 upward and through the intermediate toggles 9 and 9^a, forcing the leaves 5 and 5^a of the table upward, carrying the ends of the sheets or packs and folding said sheets or packs over the creasing-bar 17. However, directly before the closing of the sheet or pack against the sides of the creasing-bar the steam is released from the cylinder 21, and the said creasing-bar is thereby whipped back to its normal vertical position, thus permitting the ends of said sheet or pack to be folded closely together by the leaves of the table. When the steam is released from the cylinder 12, the leaves of the table assume their normal horizontal positions and in so returning, because of the inclined position of the table when closed, the folded pack will follow the leaf 5 thereof.

I have described my invention in what I consider to be its simplest form; but it is apparent that many mere mechanical changes may be made in the construction without departing from the spirit or scope thereof. Hence I do not wish to limit myself to the precise construction shown.

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

1. In a folding-machine, a steam-cylinder, a folding table over said cylinder, the leaves of said table pivoted to a common shaft, and toggle-arms connecting each of the leaves of said table with the piston-rod of said cylinder, whereby when said piston-rod is forced upward the leaves of said table close or fold together, substantially as described.

2. In a machine for doubling metal plates or packs, a table composed of two hinged sections, means for folding said sections together at a slight angle from the vertical, guides at the rear side of said table, a creasing-bar for holding a plate or pack on said table until the same has been creased along its center, and means for operating said creasing-bar, substantially as described.

3. In a machine for folding metal plates, suitable supports located beneath the floor-line, a shaft mounted at its ends in said supports, a table composed of two leaves hinged upon said shaft, the surface of said table flushing with the floor, an arm on the under side of each leaf of the table, toggles attached at one end to each of said arms, a steam-cylinder, all of said toggles having their lower ends attached to the piston-rod of said steam-cylinder, whereby the leaves of said table are forced together, and means for holding sheets of metal in place on said table, substantially as described.

4. In a machine for doubling metal plates or packs, a table composed of two hinged sections, means for folding said sections together, guides at the rear side of said table, a creasing-bar pivoted at the rear side of said table for holding the center of the sheet or pack while the sections of the table are being folded together, and means for operating said creasing-bar, substantially as described.

5. In a machine for folding metal plates, suitable supports located beneath the floor-line; a shaft mounted at its ends in said supports; a table, composed of two leaves, hinged at its center upon said shaft; an arm on the under side of each leaf of the table, toggles attached at one end to each of said arms, a steam-cylinder, all of said toggles attached at their lower ends to the piston-rod of said steam-cylinder, said steam-cylinder and toggles forming means whereby the leaves of said table are folded together, and means for holding sheets or packs of metal across their centers on said table, substantially as described.

6. In a folding-machine, the combination with a steam-cylinder and its piston-rod, of a folding table having the two leaves thereof hinged together at a central point, arms on the undersides of said leaves, toggle-arms connecting the said arms with said piston-rod, guides

at the rear side of said table, a creasing-bar mounted at the rear side of said table, means for lowering said creasing-bar across the table, substantially as described.

7. In a folding-machine, supports, a shaft journaled in said supports, leaves of a table hinged to said shaft, an arm on the under side of each leaf, a steam-cylinder, toggles connecting the arms with the piston-rod of the cylinder, a creasing-bar mounted on said table over the hinge, and means for lowering said creasing-bar across said table on the center line thereof and for raising it therefrom, substantially as described.

8. In a machine for folding metal plates, suitable supports, a shaft mounted in said supports, a table composed of two sections, the sections of said table hinged on said shaft, an arm on the under side of each section, toggles attached at their upper ends to said arms, guides at the rear side of said table, a normally upright creasing-bar pivoted at the rear side of said table over said shaft, means for lowering said creasing-bar across the center of said table and for returning the same to its normal position, and a steam-cylinder, located beneath said table, to the piston-rod of which is attached the lower ends of said toggles, for closing or folding together and reopening the sections of said table, substantially as described.

9. In a machine for folding metal plates or packs, a table composed of two sections hinged together at a central point, an arm on the under side of each section, the arm on one section being longer than that on the other section, a steam-cylinder, toggle-arms connecting the piston-rod of said cylinder with each of the arms on the table-sections, a creasing-bar pivoted at the rear side of said table and normally standing in a vertical position, a toggle attached to the rear end of said creasing-bar at a point behind its pivot, a steam-cylinder beneath its rear end, the lower end of said toggle-arm attached to the piston-rod of the last-mentioned cylinder, and guides at the rear of said table, substantially as described, and for the purposes set forth.

10. In a machine of the character described, the combination with a hinged table, of a creasing-bar pivoted at the side of said table, a toggle pivoted to the rear end of said creasing-bar, a steam-cylinder below said creasing-bar, the lower end of said toggle attached to the piston-rod of said cylinder, said cylinder and toggle-forming means whereby said creasing-bar is operated to fall across said table along the center line of the hinge, and for returning the same to its normal position, substantially as described.

Signed by me at Martins Ferry, Ohio, this 20th day of November, 1902.

ARTHUR JAMES MASKREY.

Witnesses:

H. E. DUNLAP,

MINNIE MASKREY.