

No. 695,873.

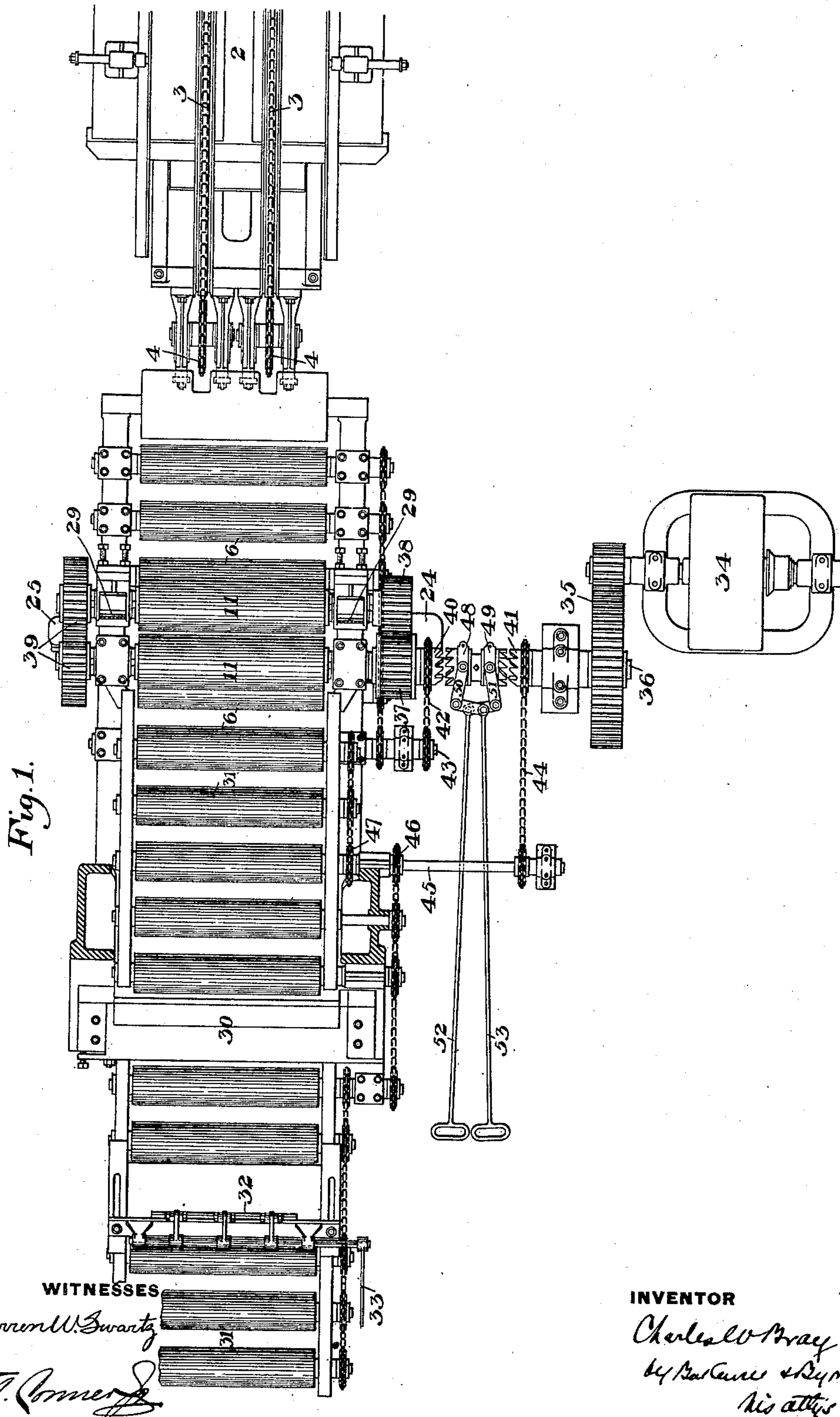
Patented Mar. 18, 1902.

C. W. BRAY.  
DOUBLING AND SHEARING APPARATUS.

(Application filed July 18, 1901.)

(No Model.)

4 Sheets—Sheet 1.



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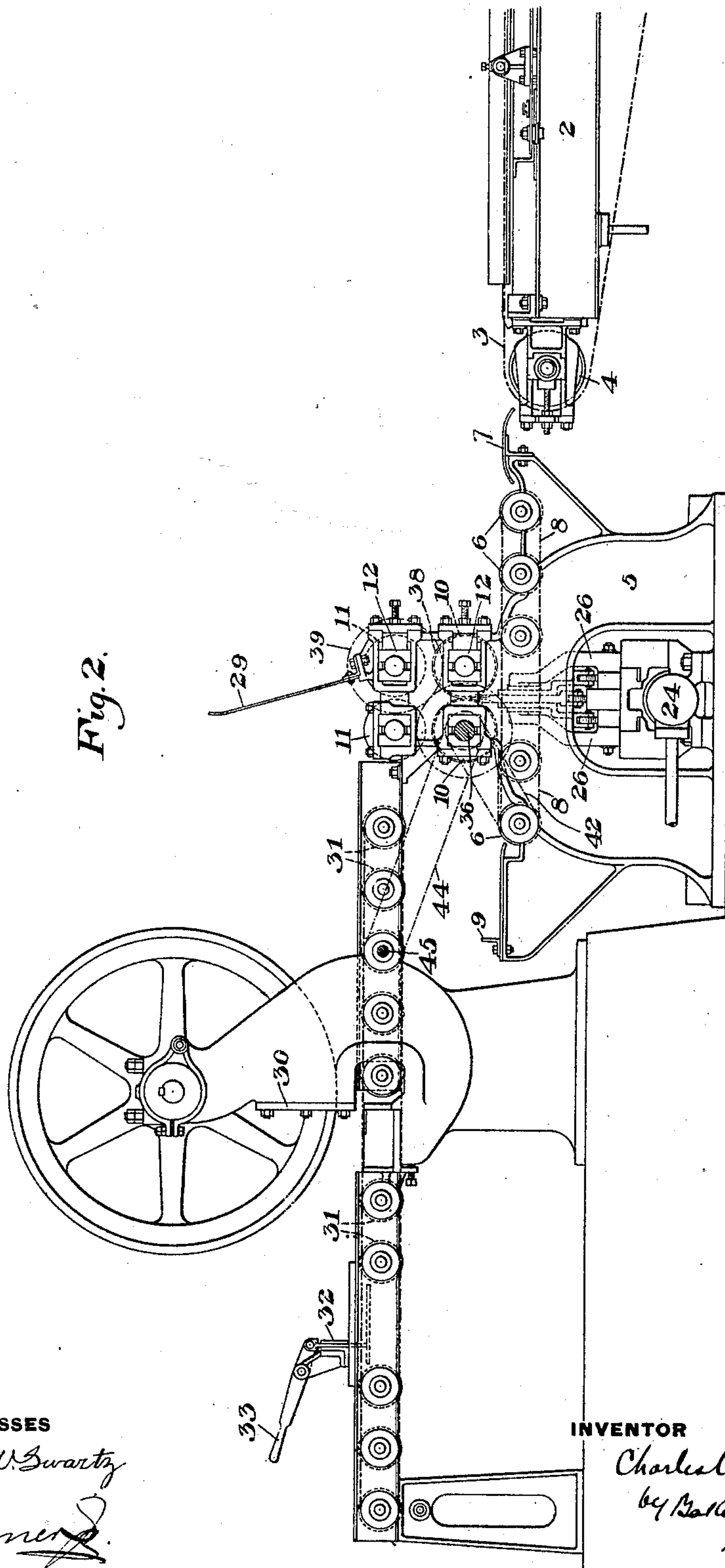
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(Application filed July 13, 1901.)

(No Model.)

4 Sheets—Sheet 2.



WITNESSES

Warren W. Swartz  
L. A. Conner

INVENTOR

Charles W. Bray  
by Barker & Byrnes  
his attys.



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4 Sheets—Sheet 3.

Fig. 5.

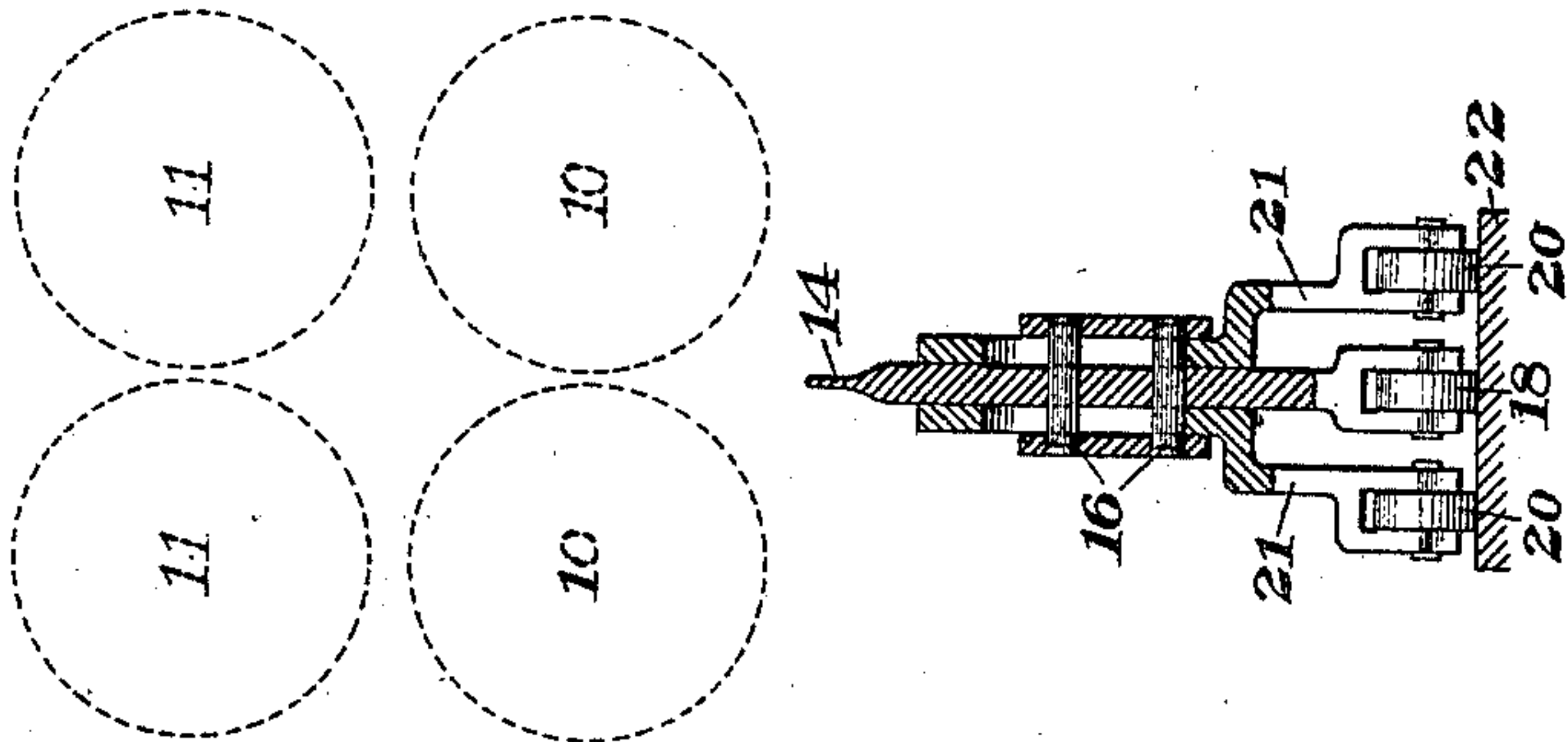
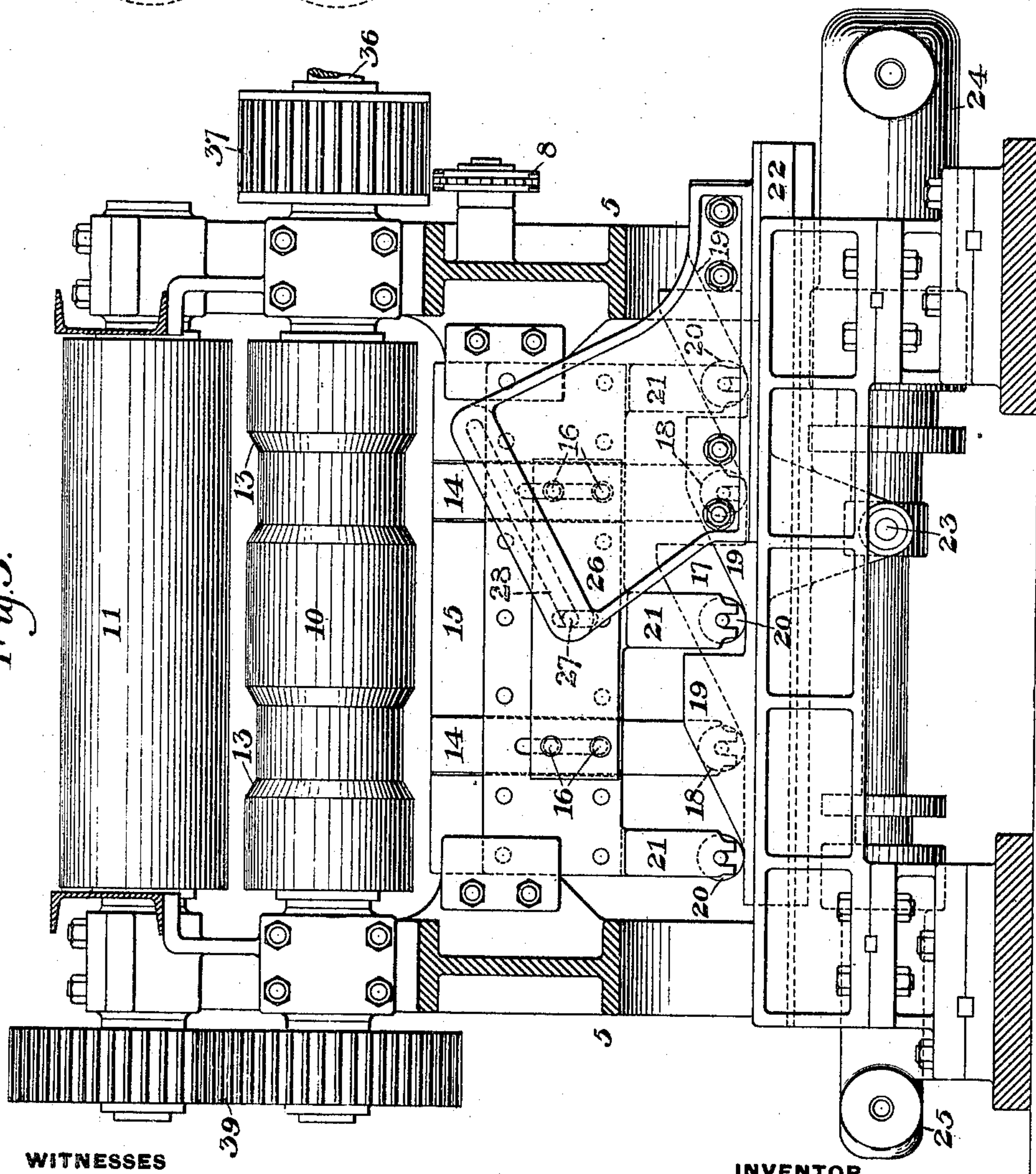


Fig. 3.



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4 Sheets—Sheet 4.

Fig. 6.

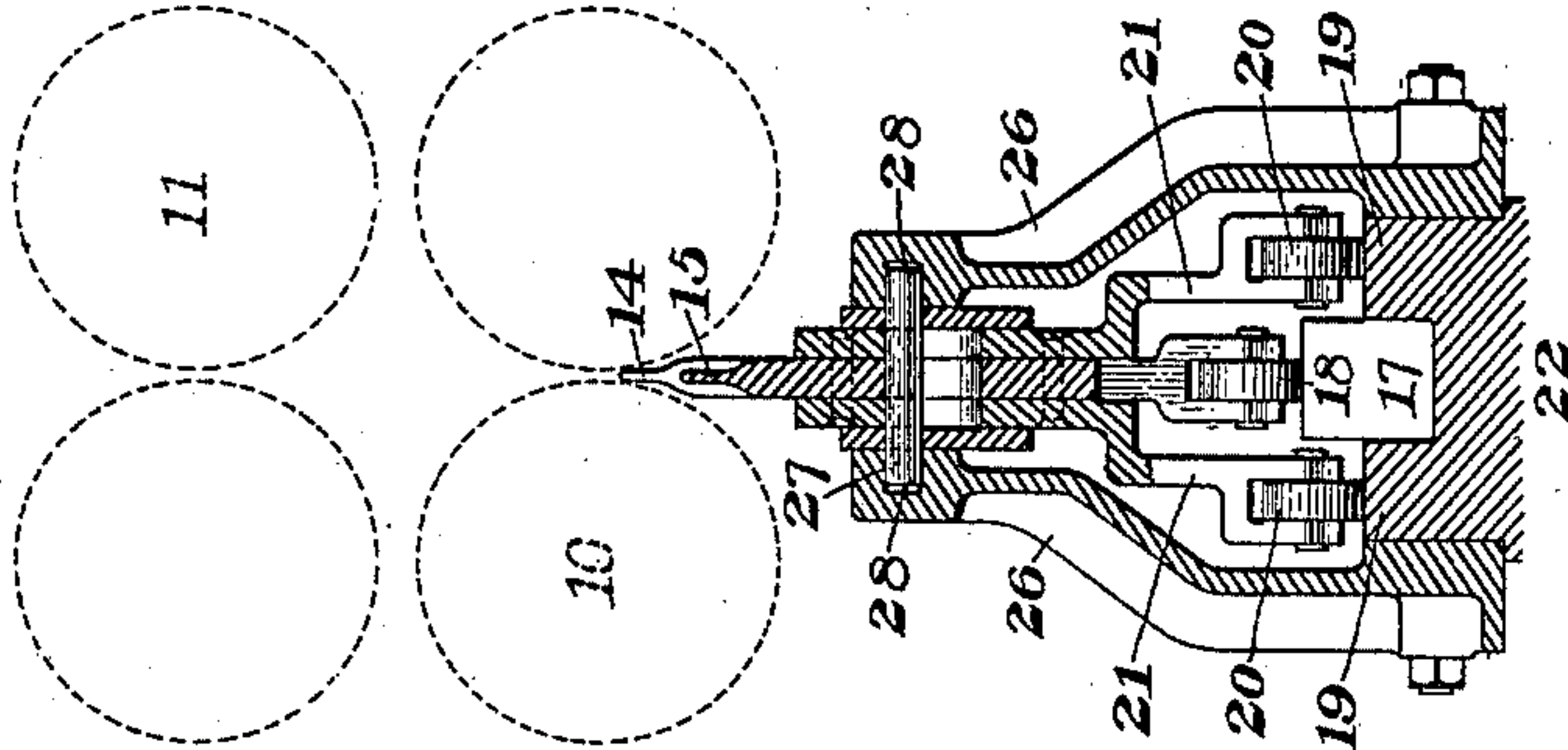
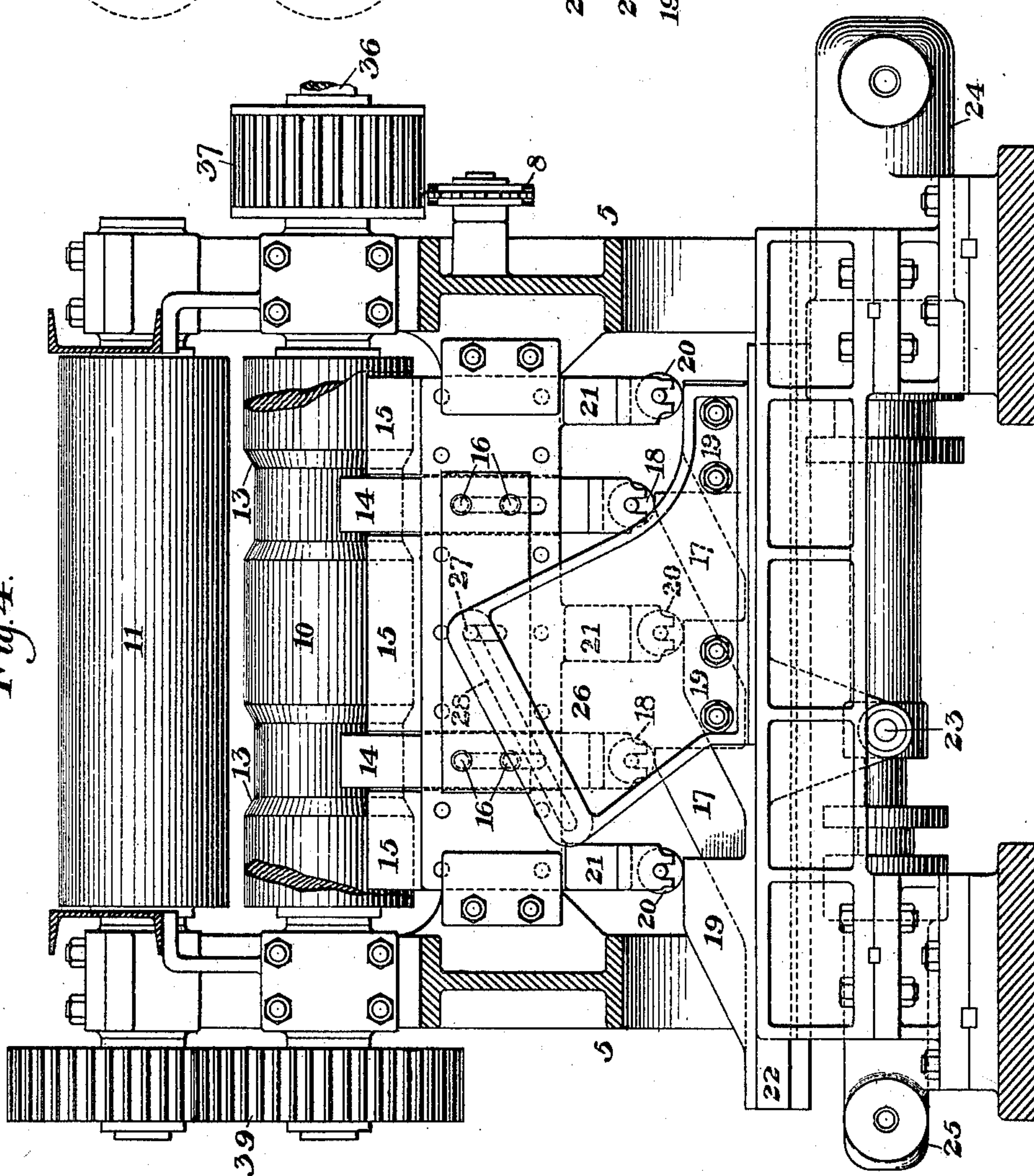


Fig. 4.



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# UNITED STATES PATENT OFFICE.

CHARLES W. BRAY, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR TO THE  
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CORPORATION OF NEW JERSEY.

## DOUBLING AND SHEARING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 695,873, dated March 18, 1902.

Application filed July 13, 1901. Serial No. 68,222. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES W. BRAY, of  
Pittsburg, Allegheny county, Pennsylvania,  
have invented a new and useful Doubling and  
5 Shearing Apparatus, of which the following  
is a full, clear, and exact description, refer-  
ence being had to the accompanying draw-  
ings, forming part of this specification, in  
which—

10 Figure 1 is a top plan view showing appa-  
ratus constructed in accordance with my in-  
vention. Fig. 2 is a side elevation of the  
same, partly broken away. Figs. 3 and 4 are  
front elevations of the doubling apparatus,  
15 showing the parts in different positions; and  
Figs. 5 and 6 are vertical cross-sections of  
Figs. 3 and 4, respectively, the rolls being  
shown diagrammatically.

My invention relates to the doubling and  
20 shearing of plates, especially black-plates  
used for tinning; and its object is to provide  
simple and effective apparatus of this char-  
acter which will act upon the sheets as they  
emerge from the feed-table of the finishing-  
25 rolls and in which the steps, while carried  
out automatically, are entirely under the con-  
trol of the operator.

In the drawings, 2 represents a feed-table  
leading from the finishing-rolls of a feed-mill,  
30 this table being shown as provided with  
sprocket-chain carriers 3, movable over end  
sprocket-wheels 4. The doubling apparatus  
5 is arranged in line with this feed-table and  
is provided with a series of feed-rollers 6,  
35 through which the sheets pass over a guide-  
plate 7. These rollers, which are positively  
driven by sprocket-chain 8 engaging the  
sprocket-wheels at the ends of their shafts,  
feed the sheets against the adjustably-fixed  
40 stop 9 at the rear end of the doubler-table.  
Above this feed-table and about centrally  
thereof I place two pairs of doubling-rollers  
10 10 and 11 11, whose bearings are adjust-  
able horizontally within bearing-boxes 12  
45 upon the frame, as shown in Fig. 2. The lower  
rolls 10 10 are provided with registering cir-  
cumferential recesses 13, which are arranged  
to receive pusher-bars 14, adjustably sup-  
ported in a doubling-blade 15. The upper

ends of the bars 14 are reduced or made thin- 50  
ner, as shown in Figs. 5 and 6, and these  
bars are provided with vertical slots, through  
which extend pins 16 on the doubling-blade.  
The doubling-blade and the pusher-bars are  
raised and lowered by means of wedges or 55  
inclined blocks 17, which bear upon the roll-  
ers 18 at the lower end of the pusher-bars,  
and by wedge-blocks 19, which bear upon  
rollers 20, mounted in pairs at the lower ends  
of the legs 21, projecting downwardly from 60  
the doubling-blade. The wedge-blocks are  
mounted upon a horizontal slide 22, which is  
reciprocated horizontally by pivotal connec-  
tion 23 with a ram acted upon by cylinders  
24 and 25, respectively. The bars 14 are 65  
guided within the blade during their move-  
ment, and the blade is guided between the  
side members 26 by means of a pin 27, which  
passes through an inclined slot 28 in the  
bending-blade. 70

The upper doubling-rollers 11 are plain-  
faced, and above them is mounted a deflector  
or shield 29, which is inclined, as shown in  
Fig. 2.

The shear 30 is arranged in tandem with 75  
the upper doubling-rollers and is provided  
with a table having rollers 31 and an adjust-  
able stop 32, controlled by hand-lever 33.

The rollers of both feed-tables, as well as  
the doubling-rolls, are driven from an electric 80  
motor 34. This motor is connected by a slow-  
motion gearing 35 with a constantly-rotating  
shaft 36, carrying pinion 37, intermeshing  
with pinion 38 upon the shafts of one of the  
lower rolls 10. These lower rolls are geared 85  
together, and at the opposite end one of the  
upper rolls 11 is provided with a pinion 39,  
which engages a corresponding pinion on the  
end of one of the lower rolls 10. Upon the  
shaft 36 are loosely mounted two clutch mem- 90  
bers 40 and 41, each carrying a sprocket-  
wheel. The sprocket-wheel upon the clutch  
40 is connected by sprocket-chain 42 with a  
similar wheel upon the shaft 43, which is the  
shaft of the rear feed-roller of the lower table. 95  
The other clutch member 41 is connected by  
chain 44 to the shaft 45, which forms an ex-  
tension of the shaft of one of the feed-rollers



31 of the upper table. This shaft is provided with sprocket-wheels 46 and 47, connected by suitable chains to sprocket-wheels upon the other rollers of this table. The clutch members 40 and 41 coact with sliding clutch members 48 and 49, which are keyed to the shaft 36 and may be actuated by bell-crank levers 50 and 51, having operating-links 52 and 53.

In the operation of the apparatus the sheets pass from the feed-table 2 onto the feed-table of the doubling apparatus and are fed along thereby until the sheet engages the adjustable stop 9. At this time the doubling blade and bars are in the position shown in Figs. 3 and 5. The operator then admits fluid to one of the ram-cylinders, and thereby forces the slide carrying the wedge-block endwise, thus forcing the blade and bars upwardly. When the rollers 20 reach the apices of the inclined faces 19, the movement of the blade ceases, while the further movement of the ram forces the bars 14 upwardly to bring the bent sheet into the bite of the lower pair of rolls. The bars are then in the position shown in Figs. 4 and 6 and the sheet being doubled upwardly at its middle portion feeds upwardly as a two-ply sheet between the upper rolls, and being acted upon by the deflector 29 it falls forwardly upon the feed-table of the shear. The feed-rollers of this table then being actuated, the sheet is fed forward until it meets the stop, when the rear end of the doubled sheet is trimmed off. The stop is then lifted and the sheet fed forward to any desired point. The operator throws in or disengages the table-clutches, as desired, as the sheets are fed from the table 2, and the action of the apparatus is rapid and efficient.

The advantages of the invention flow from the peculiar doubling mechanism I employ and also from the arrangement of the doubling mechanism in connection with the shear mechanism.

Many changes may be made in the form and arrangement of the parts without departing from my invention.

I claim—

1. In doubling apparatus, a pair of doubling-rollers arranged horizontally, a table or support for the sheet beneath the said rollers, an opening in the support registering with the rollers, a pusher-blade movable through the opening, and mechanism for moving the pusher-blade vertically to force the intermediate part of the sheet lying on the support upwardly between the doubling-rollers; substantially as described.

2. In doubling apparatus, a pair of grooved rollers, and a pusher having parts arranged to enter the grooves and force the intermediate parts of the sheet between the doubling-rolls; substantially as described.

3. In doubling apparatus, a pair of grooved rolls, a pair of plain-faced rolls in tandem therewith, and a pusher arranged to force the intermediate part of the sheet into the bite of the grooved rolls; substantially as described.

4. In doubling apparatus, a feed-table, a stop, a pair of doubling-rollers mounted over the middle part of the table, and a pusher-blade arranged to force the intermediate part of the sheet upwardly between the rolls; substantially as described.

5. In doubling apparatus, a feed-table, doubling-rollers thereover, mechanism for forcing the intermediate part of the sheet upwardly between the rollers, a feed-table above and to one side of the rollers, and a deflector arranged to cause the rising doubled sheet to drop upon the upper feed-table; substantially as described.

6. In doubling apparatus, a feed-table having a stop, two pairs of doubling-rollers arranged above the intermediate part of the table, the lower pair having grooves while the upper are plain-faced, a vertically-movable pusher-blade arranged to bend and force the intermediate part of the sheets between the lower pair of rolls, and mechanism for driving the rolls; substantially as described.

7. In doubling apparatus, a pair of grooved rolls, a blade movable toward and from the bite of the rolls, and pusher-bars arranged to project beyond the blade and enter the grooved portions of the rolls; substantially as described.

8. In doubling and shearing apparatus, a pair of doubling-rolls, mechanism for bending and feeding the intermediate part of the sheet thereinto, a shear-table arranged to receive the sheet from the bending-rolls, and a shear arranged to trim the ends of the doubled sheets; substantially as described.

9. In doubling and shearing apparatus, a doubling feed-table, doubling-rolls above the same, an upper deflector, a shear feed-table upon which the deflector guides the doubled sheet, a stop on the shear-table, and a shear arranged to trim the edges of the sheet; substantially as described.

10. In doubling apparatus, a pair of grooved rolls a blade movable toward and from the bite of the rolls, pusher-bars movable relatively to the blade, and mechanism for moving said bars relatively to the blade and into the grooved portions of the roll; substantially as described.

In testimony whereof I have hereunto set my hand.

C. W. BRAY.

Witnesses:

H. M. CORWIN,  
GEO. B. BLEMING.