

C. W. BRAY.
 PACK OPENING APPARATUS.
 APPLICATION FILED JULY 1, 1904.

991,195.

Patented May 2, 1911.

3 SHEETS—SHEET 1.

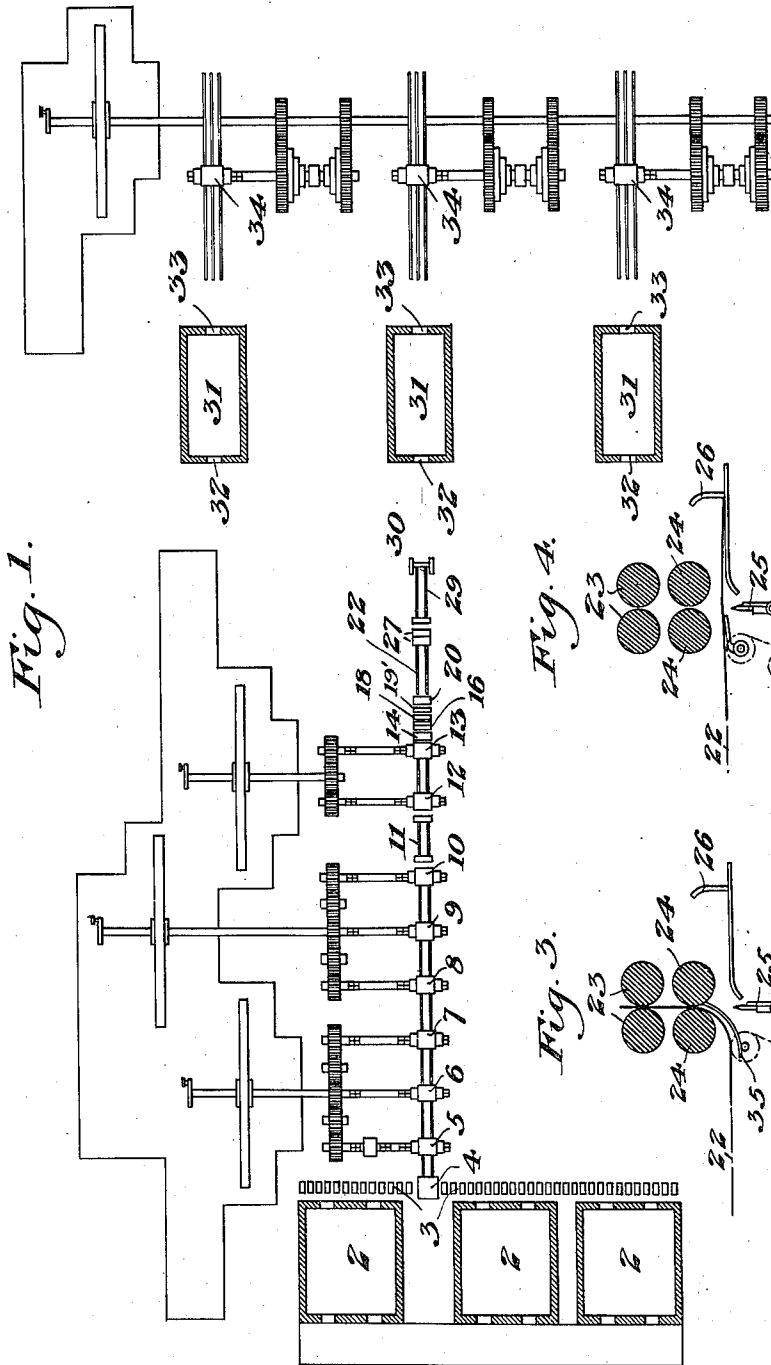


Fig. 1.

Fig. 4.

Fig. 3.

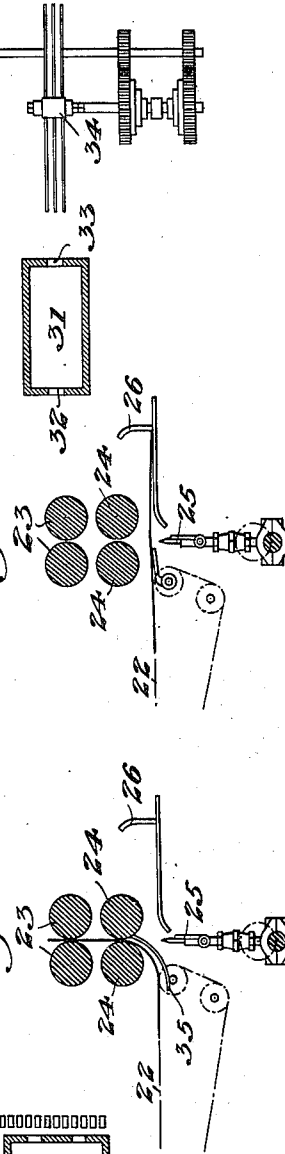


Fig. 2.

WITNESSES

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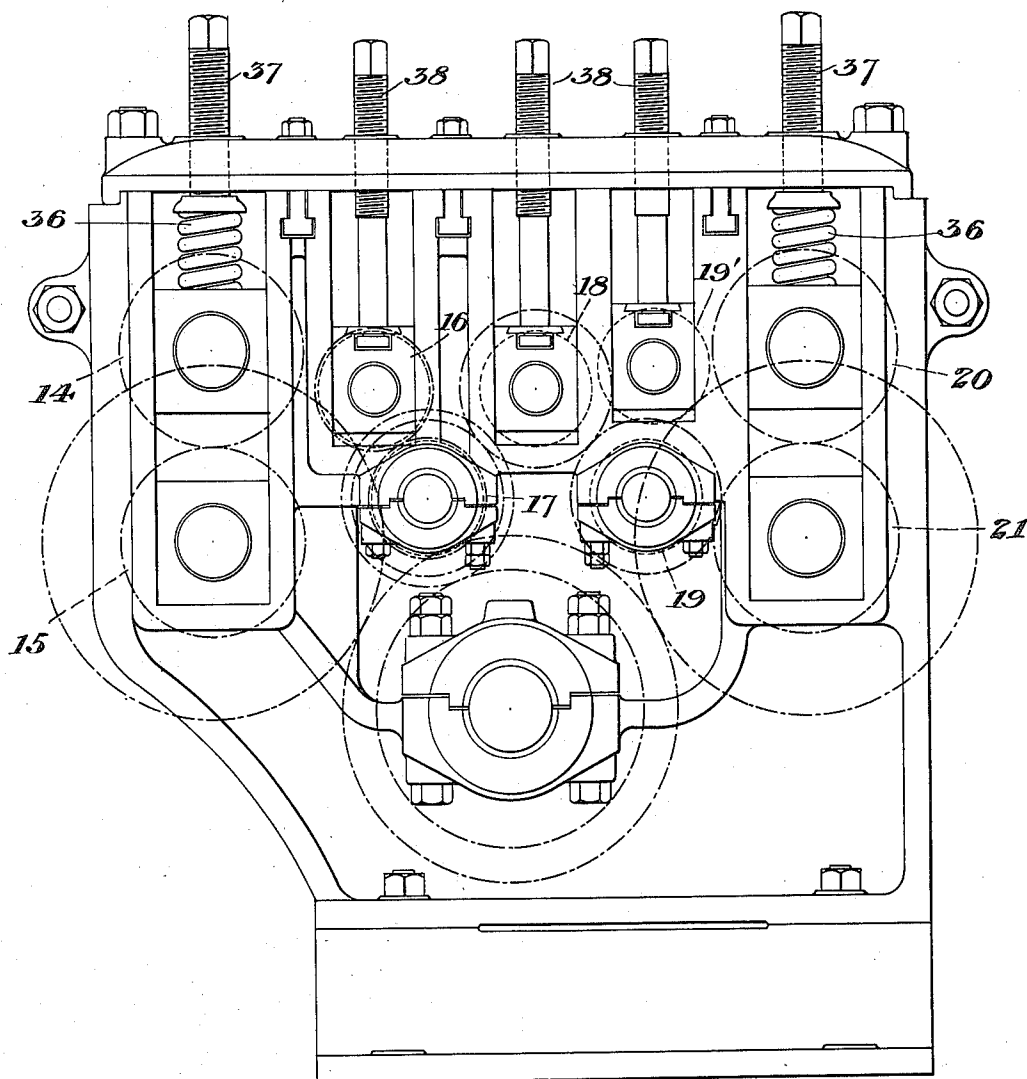
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3 SHEETS—SHEET 2.

Fig. 5.



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3 SHEETS—SHEET 3.

Fig. 6.

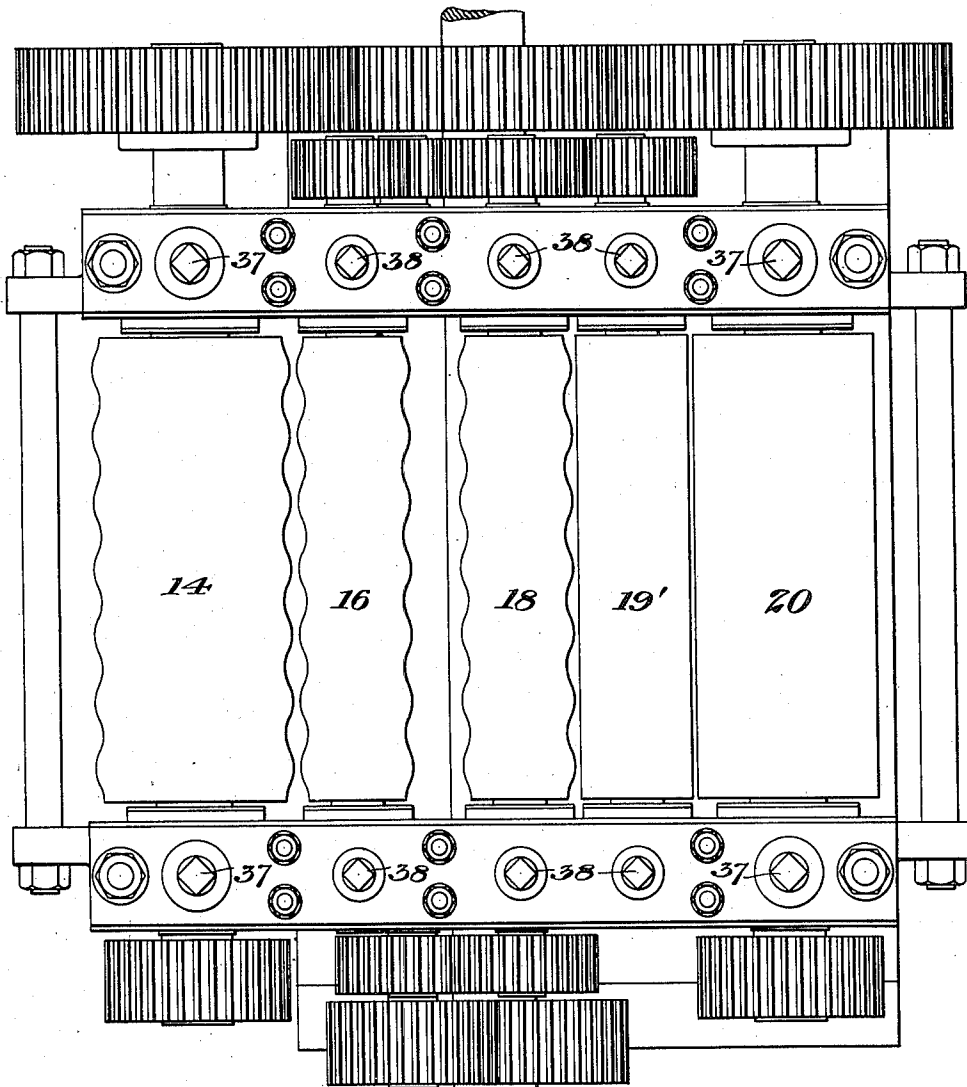
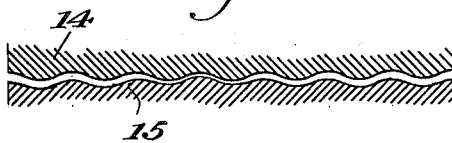


Fig. 7.



WITNESSES

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UNITED STATES PATENT OFFICE.

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

PACK-OPENING APPARATUS.

991,195.

Specification of Letters Patent.

Patented May 2, 1911.

Application filed July 1, 1904. Serial No. 214,984.

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 Pack-Opening Apparatus, 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—

10 Figure 1 is a diagrammatic plan view of a plant constructed in accordance with my invention; Fig. 2 is a diagrammatic side elevation of the same; Figs. 3 and 4 are cross sections of the doubling apparatus; 15 Fig. 5 is a side elevation on a larger scale of the opening apparatus; Fig. 6 is a top plan view of the same; and Fig. 7 is a detail view of the pass for the corrugating rolls.

20 My invention relates to the rolling of sheets and is designed to provide a new and improved apparatus whereby packs of sheets may be rapidly and cheaply produced with a small amount of hand labor.

25 In the drawings, referring to the form of Figs. 1 and 2, 2 are continuous heating furnaces from which the bars are fed and from which they drop upon roller tables 3 and pass to the table 4, whence they enter a continuous or tandem mill. I have shown 30 six sets of rolls, 5, 6, 7, 8, 9, and 10 arranged in tandem in this mill, the metal feeding forward in the same line through the successive steps and then entering a matcher 11.

35 The successive sheets are fed into this matcher one above the other and are thus matched and fed forwardly into the successive sets of rolls 12 and 13. The pack passing forwardly through these rolls 12 and 13 then enters an opening device. This opening device consists of a 40 pair of corrugating rolls, 14 and 15, following which are bending rolls 16, 17, 18 and 19 which are arranged to bend the corrugated pack first in one direction and then in the opposite. From these bending 45 rolls, the pack passes under the guide roll 19' and enters flattening rolls 20 and 21 which straighten and flatten the sheets of the pack. From the rolls 20 and 21 the pack passes forwardly over feed mechanism 22 to the doubler in line therewith. The doubler is provided with upper rolls 23, lower rolls 24, and a vertically reciprocating 55 blade 25 which acts upon the central part of the pack to carry it forwardly into the doubling rolls. The blade being in lowered position, the pack feeds forwardly against suitable stops 26 and the blade then pushes the intermediate portion upwardly into the 60 doubling rolls. From the upper rolls the doubled pack passes through guide rolls 27 and 28 and thence over the feed table 29 to a shear indicated at 30. At this point the scrap end of the pack is sheared off. 65 From the shear the pack passes to any one of a set of continuous heating furnaces 31 through which the packs are fed continuously from the entrance opening 32 to the outlet opening 33 at the other end. From 70 these reheating furnaces the packs are taken to any one of the ordinary single finishing mills 34 of which I show three, one for each furnace. In case sheets of heavier gages are to be rolled I do not double the 75 pack; and to prevent doubling I preferably introduce a curved guide or stop 35 below the rolls 24 of the doubler. This curved guide causes the pack to feed upwardly through the doubler rolls without doubling, 80 the pack thence passing on to the shears where the crop ends may be sheared off. The upper rolls 14 and 20 of the opening apparatus are preferably yieldingly backed by springs 36 having adjusting screws 37 85 by which the pressure may be regulated. The bearings of the rollers, 16, 18, and 19' are adjustable by means of screws 38. The rolls 14, 15, 16, 17, 18 and 19 are all corrugated as indicated in Fig. 6. In order to 90 prevent stretching of the metal during the corrugating of it, I preferably shape the rolls 14, 15, so that their surfaces are closer together at the centers of the rolls and the pass is slightly widened toward each end 95 as indicated on an exaggerated scale in Fig. 7. This allows the drawing of the metal from the side portions toward the center during the corrugating operation and prevents stretching or pulling of the sheet. 100

The advantages of my invention result from the mechanical opening of the packs as they are fed forward. Also from the peculiar apparatus for opening in which the pack is corrugated, bent and then flattened; and 105 further from the continuous heating of the packs as they are taken from the shears on their way to the single finishing mill. The amount of hand labor is small, as the metal feeds forwardly preferably in the same line 110

up to the shears. The apparatus is adapted for either thin sheets or sheets of heavier gage.

5 The opening apparatus may be placed on the opposite side of the doubler to that shown, or in any other convenient location, though I prefer the location described; and such other variations as fall within the scope of the claims may be made in the form and arrangement of the opening apparatus
10 and other parts of the system.

I claim:—

1. In pack opening apparatus, a pair of corrugating rolls, having their surfaces
15 nearer each other at the center of the rolls than at their end portions to thereby cause the metal to draw from the side portions toward the center, means for feeding the pack therethrough, bending rolls arranged to bend
20 the corrugated pack on lines at an angle to the length of the corrugations, and means for flattening and straightening the sheets of the pack after they leave the bending rolls; substantially as described.

25 2. The herein described method of opening packs, which consists in loosening the sheets of a pack by bending the same portion of the pack in two directions transversely to one another, and then subsequently
30 pressing the sheets flat and separating them.

3. The herein described method of opening

packs, which consists in bending the same portion of the pack in two directions at angles to each other to loosen the sheets, and subsequently flattening and straightening
35 the bent pack and separating the sheets.

4. The herein described method of opening packs, which consists in first subjecting the pack to a corrugating action, then bending the corrugated portion of the pack first in
40 one direction and then in the opposite direction, and finally flattening and straightening the sheets of the pack.

5. The herein described method of opening packs, which consists in subjecting the same
45 portion of a pack to two series of bendings, the direction of one series of bendings differing from that of the other, substantially as described.

6. The herein described method of opening
50 packs, which consists in subjecting the same portion of the pack to two series of bendings, the direction and degree of bending of one series differing from the direction and degree
55 of bending of the other series, substantially as described.

In testimony whereof, I have hereunto set my hand.

CHARLES W. BRAY.

Witnesses:

JOHN MILLER,

H. M. CORWIN.