

D. L. MAINERI.
METAL SHEET PACK SEPARATING DEVICE.
APPLICATION FILED DEC. 16, 1920.

1,378,886.

Patented May 24, 1921.

2 SHEETS—SHEET 1.

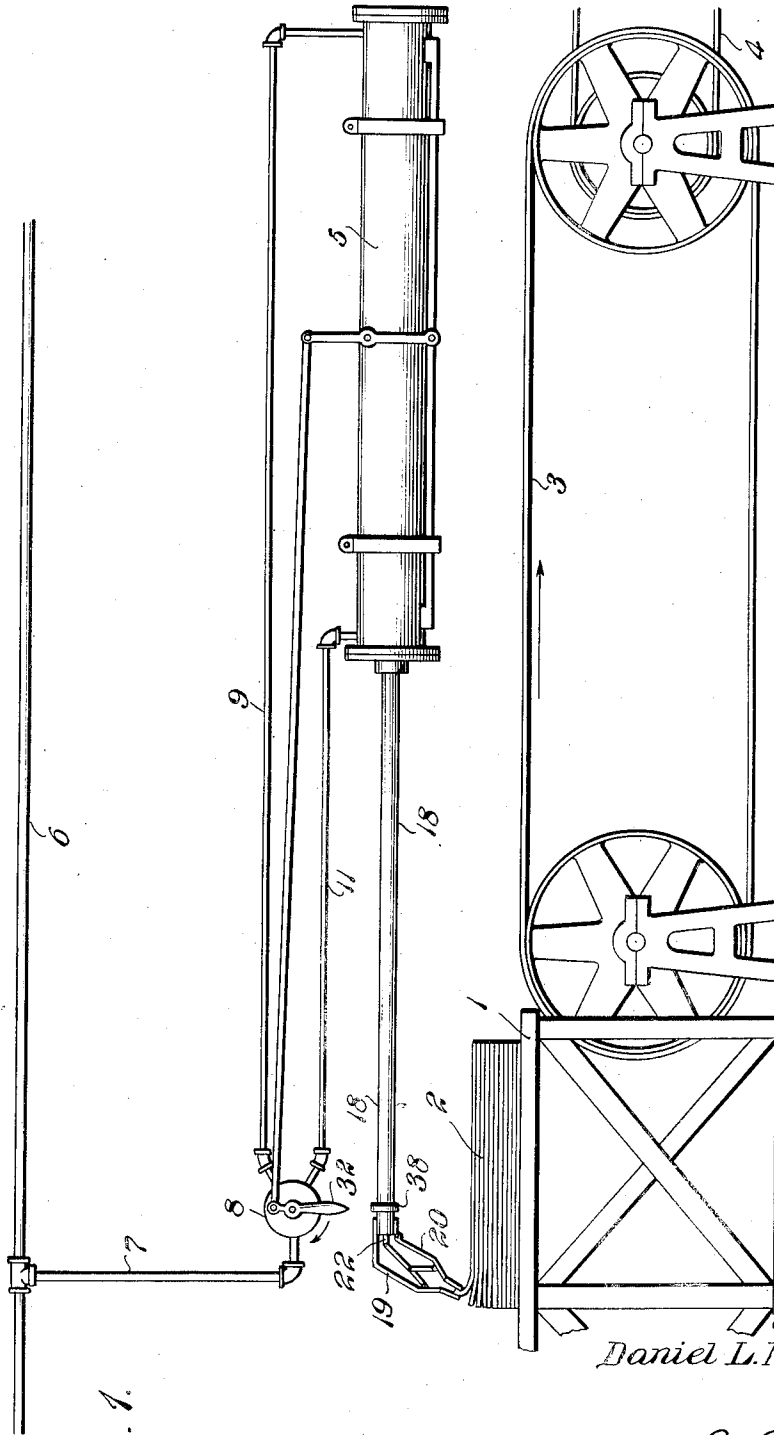


Fig. 1.

Daniel L. Maineri,

INVENTOR.

BY *J. A. Bishop.*
ATTORNEY

D. L. MAINERI.
METAL SHEET PACK SEPARATING DEVICE.
APPLICATION FILED DEC. 16, 1920.

1,378,886.

Patented May 24, 1921.
2 SHEETS—SHEET 2.

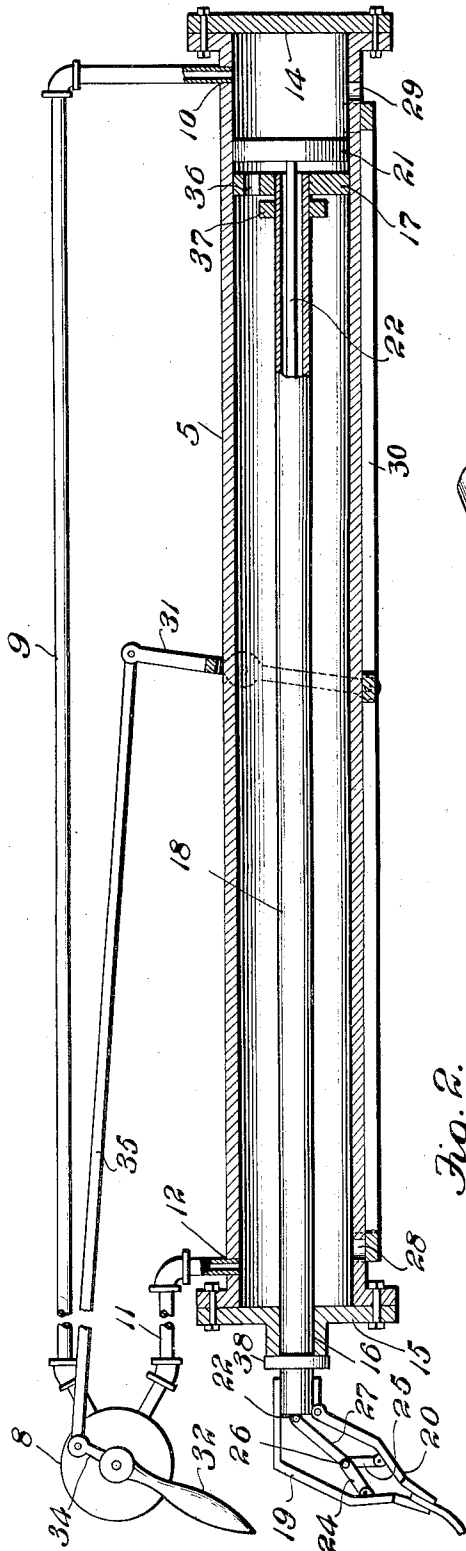


Fig. 2.

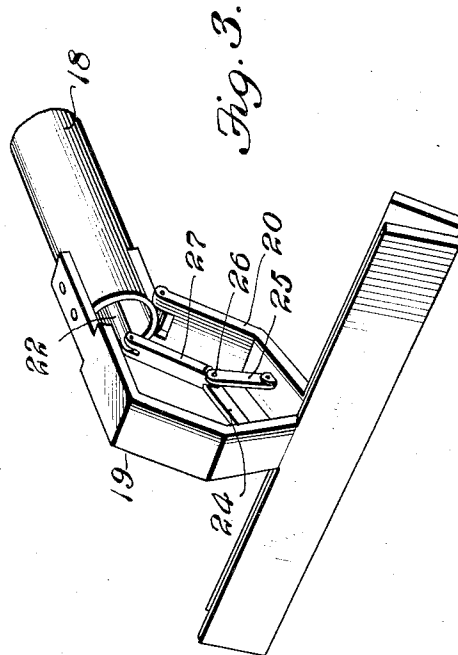


Fig. 3.

Daniel L. Maineri,
INVENTOR.

BY *J. A. Bishop*
ATTORNEY

UNITED STATES PATENT OFFICE.

DANIEL L. MAINERI, OF CANTON, OHIO, ASSIGNOR TO THE BERGER MANUFACTURING COMPANY, OF CANTON, OHIO.

METAL-SHEET-PACK-SEPARATING DEVICE

1,378,886.

Specification of Letters Patent.

Patented May 24, 1921.

Application filed December 16, 1920. Serial No. 431,225.

To all whom it may concern:

Be it known that I, DANIEL L. MAINERI, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented a new and useful Metal-Sheet-Pack-Separating Device, of which the following is a specification.

This invention relates to machines for separating metallic sheets that have been caused to adhere one to the other, in the process of rolling and shearing.

The object of the invention is to provide a means for speedily removing each sheet separately from the pack, when the said pack has been opened.

Another object is the construction of a machine of this character that will eliminate the necessity for several of the workmen who are now needed in the process of separating sheets.

With these and other objects in view, the invention consists in the novel construction and arrangement of parts, hereinafter described, illustrated in the accompanying drawings, and particularly pointed out in the appended claims, it being understood that various changes in the form, proportions, size and minor details of construction may be made within the scope of the appended claims, without departing from the spirit or sacrificing any of the advantages of the invention.

In the drawings Figure 1 is a side elevation of my machine.

Fig. 2 is an enlarged longitudinal section through the cylinder of the machine, with the control valve and tongs shown in conjunction.

Fig. 3 is a detail perspective view of the tongs.

Similar numerals of reference indicate corresponding parts throughout the several figures of the drawing.

To those familiar with the process of making iron or steel sheets, it will be understood that when a pack of sheets has been rolled, the said sheets adhere firmly one to the other. This adherence of the sheets is frequently so great that considerable difficulty is experienced in removing the separate sheets from the pack. The common practice in steel mills is to pry a corner of the top sheet of the pack up and then work the sheet loose from the pack with a pair of tongs. This labor is performed manually,

and it is obvious therefore that the process is not only slow, but requires a vast amount of man power to handle the output of a modern sheet mill. The present invention is designed to quickly remove the sheets one at a time from the pack after the said pack has been opened.

At 1 I have shown a table upon which the pack of sheets indicated at 2 is placed. Adjacent the table 2 is arranged an endless conveyor 3 which is designed to be driven in the direction indicated by the arrow, by a belt 4 which is connected with any suitable source of power. Supported in any suitable manner in horizontal alinement above the conveyor 3 is an elongated cylinder 5, which cylinder, as shown in Fig. 1, terminates at a point intermediate the extremities of the top section of the conveyor 3.

At 6 is shown the main line of a steam or compressed air supply, from which main line extends a branch line 7, in which is located a two-way valve 8. A pipe 9 connects one port of the valve 8 with the rear end of the cylinder 5, entrance being made to the said cylinder at the point indicated at 10 in Fig. 2, while a pipe 11 connects the other port of the valve 8 to the foremost end of the cylinder 5, at the point 12.

The rear end of the cylinder 5 is tightly closed by the head 14, while the head 15 at the forward end of the cylinder is provided with a central aperture 16. Fitting within the cylinder 5 is a piston 17 to which is attached the inner end of a tubular shaft 18 which shaft extends forwardly and through the aperture 16 in the cylinder head, and has rigidly secured to the upper side of its forward extremity one member 19 of a pair of tongs, while to its under side is hingedly secured the other member 20 of the said tongs.

Fitting within the cylinder 5 and disposed rearwardly of the piston 17, is a second piston 21 to which is attached the rear end of a rod 22, which rod extends forwardly and centrally through the tubular shaft 18, the said rod 22 being slightly greater in length than the shaft 18 and terminating at a point slightly forwardly of the forward extremity of the shaft 18. A pair of links 24 and 25 are hingedly secured to the inner faces of the members 19 and 20 respectively, of the tongs, the free ends of the said links being attached at 26 to a third link 27, the opposite end of the said last named link being at-

tached to the forward extremity of the rod 22.

Formed in the under side of the cylinder 5 at a point adjacent its forward end is a port 28 and a similar port 29 is formed in the under side of the said cylinder adjacent its rear end. A sliding valve 30 controlled by a bifurcated, pivoted yoke 31, is arranged to be moved to open and close the ports 28 and 29 alternately. Extending from the control lever 32 on the valve 8 is a projection 34 to the free end of which is pivotally secured one extremity of a rod 35, the opposite extremity of which is connected to the upper end of the yoke 31. By the foregoing arrangement, when the control lever 32 is swung in the direction indicated by the arrow, steam or compressed air will be admitted through the port alined with the pipe 11 which pipe connects with the forward end of the cylinder 5.

When the control lever 32 is thus moved, the rod 35 will be forced rearwardly, swinging the yoke 31 rearwardly at its upper end and moving its lower portions forwardly. It is thus seen that the valve 30 will be moved to close the port 28 and open the port 29 when steam or compressed air is admitted to the forward end of the cylinder. It will likewise be seen that should the control lever 32 be swung in a direction opposite to that indicated by the arrow, closing the port to the pipe 11 and opening the port to the pipe 9, the valve 30 will likewise be reversed, closing the port 29 and exposing the port 28.

Formed in the piston 17 is a port 36 for a purpose to be hereinafter set forth and fixed to the tubular shaft 8 at a point slightly forwardly of the piston 17, is a collar 37 which collar together with a similar collar 38 adjacent the forward extremity of the shaft 18, form stops to limit the forward and rearward travel of the said shaft.

In operation, when the pack of sheets indicated at 2 has been placed in a position upon the table 1 and the forward edge of the top sheet of the pack has been loosened from the next sheet, the control lever 32 will be operated to admit the steam or compressed air through the pipe 9 to the rear end of the cylinder. The piston 21 will move slightly forward until it contacts with the rearmost face of the piston 17, carrying the said piston 17 ahead of it until the stop 37 engages the inner face of the cylinder head 15. The control lever 32 will then be brought into neutral position closing both of the ports in the valve 8 and opening both the ports 28 and 29.

The tongs carried by the forward end of the tubular shaft 18 are now positioned above the pack of sheets with the forward extremity of the said tongs adjacent the forward edge of the said pack. The loosened front edge of the top sheet is now curled

backwardly a trifle and interposed between the open jaws of the tongs. The control lever 32 is now operated to admit pressure through the pipe 11, closing the port 28 and allowing the port 29 to remain open. The steam or compressed air entering the cylinder at its forward end will quickly fill the small space between the front side of the piston 17 and the cylinder 15 and passing through the port 26 in the piston 17, will force the piston 21 rearwardly within the cylinder. It is obvious that the rearward movement of the piston 21 will exert a pull through the rod 22 upon the link 27 which pull will be transmitted through the link 25, to the jaw 20 of the tongs, bringing the said jaw upwardly until the edge of the sheet interposed between the jaw 20 and the jaw 19, will be firmly gripped by the said tongs. It will be obvious that when the jaws of the tongs have closed upon the sheet, further rearward movement of the piston 21 will cause the piston 17, to likewise move rearwardly. The sheet gripped between the jaws of the tongs is thus stripped backwardly over the pack, the tongs continuing to move rearwardly until the stop 38 contacts with the outer side of the cylinder head 15. The control lever 32 is now once more moved into neutral position, opening the ports 28 and 29 and closing the ports in the valve 8. The pressure being removed, the jaws of the tongs will release the sheet, allowing it to fall upon the conveyer 3.

Having now described my invention what I claim and desire to secure by Letters Patent is:

1. In a sheet separating device, a cylinder, a reciprocating rod within said cylinder and projecting therefrom, a pair of tongs carried by said reciprocating rod, means whereby the said reciprocating rod can be projected from the said cylinder or withdraw therein and means for causing the said tongs carried by the said rod to open as the said rod is projected and to close as the said rod is withdrawn.

2. In a sheet separating device, a cylinder, a piston within said cylinder, a shaft connected to said piston and extending from said cylinder, a pair of tongs carried by said shaft, control means for admitting pressure alternately to opposite ends of said cylinder whereby said piston and shaft will be reciprocated, and means operated by said pressure for opening said tongs on the forward stroke of said piston and rod and closing said tongs on the rearward stroke.

3. In a sheet separating device, a cylinder, a reciprocating piston within said cylinder, a tubular shaft connected to said piston and extending from said cylinder, a pair of tongs carried by said tubular shaft, a second piston within said cylinder, a rod connecting to said second piston and extending centrally

through said tubular shaft, actuating means
connected to said tongs for opening and clos-
ing said tongs, said actuating means being
connected to said rod, a valve arranged with-
5 in a steam or compressed air line, means for
controlling said valve to admit pressure to
opposite ends of said cylinder alternately, the
said pistons being arranged to move for-
wardly within said cylinder, and to project
10 the said tubular shaft and rod therein from

said cylinder on said forward stroke and to
open the said tongs, and to move rearwardly
within said cylinder when pressure is ad-
mitted at the forward end thereof, withdraw-
ing said tubular shaft and rod and closing 15
said tongs tightly on the said rearward
stroke.

In testimony that I claim the above, I have
hereunto subscribed my name.

DANIEL L. MAINERI.