June 7, 1955 S. R. STANBERY 2,710,041

FEEDER AND EJECTOR FOR DOUBLE-RAM PRESSES

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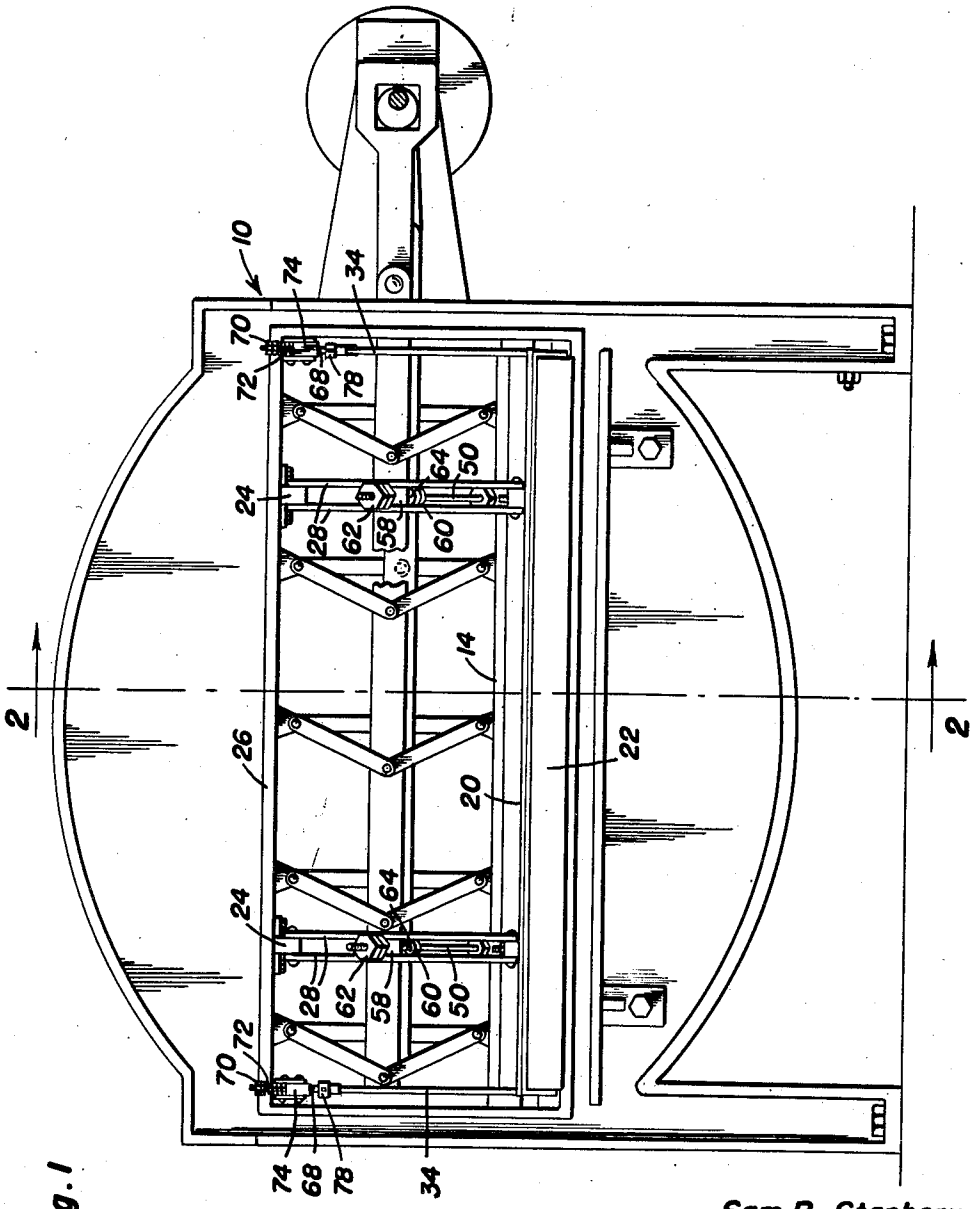

Fig. 1

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Fig.2

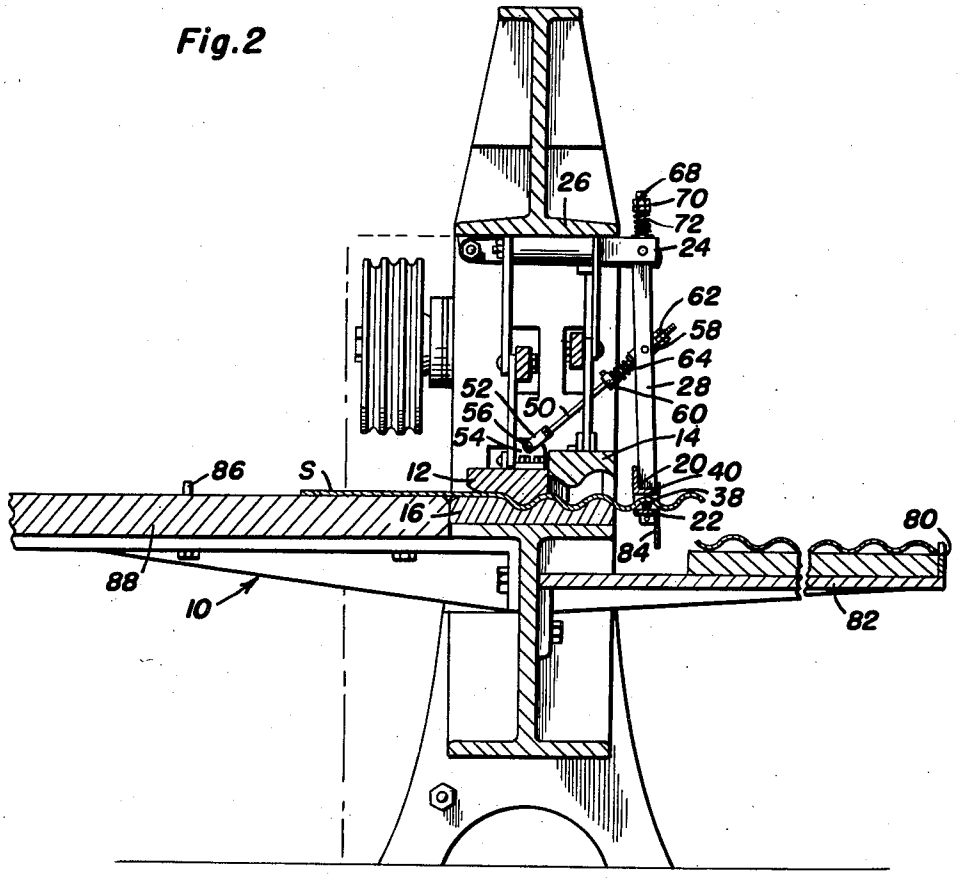


Fig.8

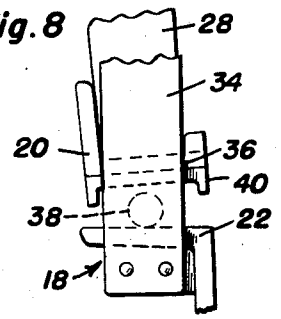
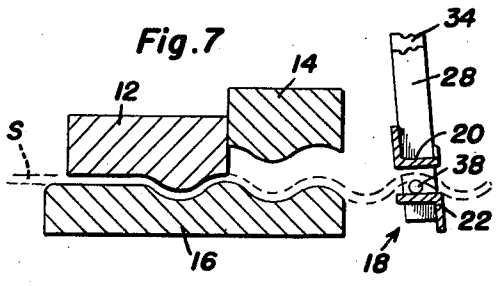


Fig.7



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FEEDER AND EJECTOR FOR DOUBLE-RAM PRESSES

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Fig.3

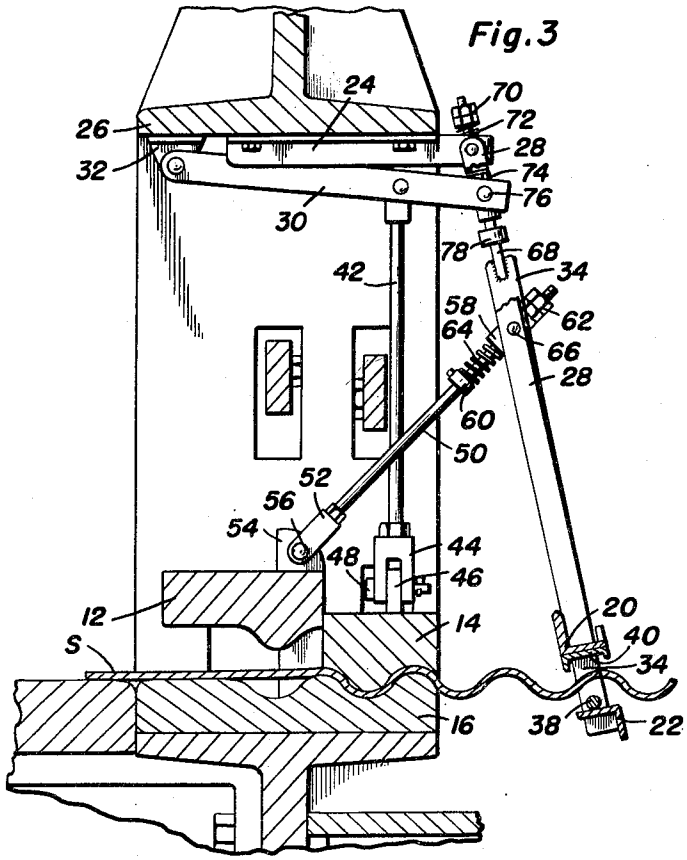


Fig.4

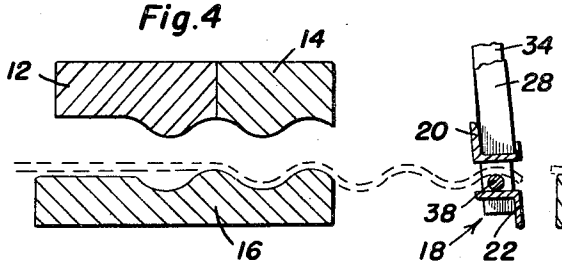


Fig.6

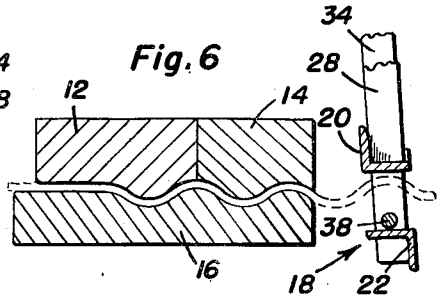
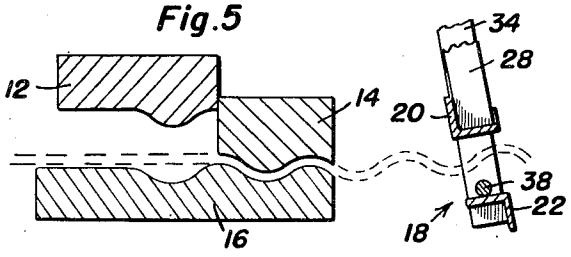


Fig.5



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FEEDER AND EJECTOR FOR DOUBLE-RAM PRESSES

Sam R. Stanbery, New Orleans, La.

Application February 19, 1952, Serial No. 272,374

5 Claims. (Cl. 153—76)

This invention relates to new and useful improvements in double-ram presses and the primary object of the present invention is to provide a device sequentially actuated by the two rams of a double-ram press for feeding sheet metal to and from the rams.

Another important object of the present invention is to provide a simple leverage system for double-ram presses whereby a sheet of material will be gripped during raising of the ram on the ejector side of the press and whereupon the sheet of material will be advanced toward or from the ejector side of the press as the feeder ram is raised.

A further object of the present invention is to provide a device of the aforementioned character that is quickly and readily attached to or removed from a double-ram press without in any way harmfully affecting the normal structure of such a press.

A still further aim of the present invention is to provide a feeder and ejector attachment for double-ram presses that is extremely simple and practical in construction, strong and reliable in use, small and compact in structure, efficient and durable in operation, inexpensive to manufacture, install and service, and otherwise well adapted for the purposes for which the same is intended.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a rear elevational view of a conventional double-ram press and showing the present invention mounted thereon;

Figure 2 is a vertical sectional view taken substantially on the plane of section line 2—2 of Figure 1;

Figure 3 is an enlarged fragmentary view of Figure 2 but showing the ejector ram lowered and the feeder ram raised;

Figure 4 is a diagrammatic view showing both of the rams lowered and the gripping means disposed away from the rams;

Figure 5 is a diagrammatic view showing the ejector ram lowered and the gripping means disposed away from the rams with the two gripping members spaced apart;

Figure 6 is a diagrammatic view showing both rams lowered with the gripping means disposed close to the rams but with the two gripping members spaced apart;

Figure 7 is a diagrammatic view showing the ejector ram raised and the feeder ram lowered and with the gripping means disposed close to the rams and with the gripping members toward each other to grip a sheet therebetween; and,

Figure 8 is an enlarged fragmentary detail view showing the gripping means of the present invention.

Referring now to the drawings in detail, wherein for the purpose of illustration, there is disclosed a preferred embodiment of the present invention, the numeral 10 represents a well known double-ram press of the type shown, for example, in U. S. Patent 585,923. This press includes

horizontally disposed vertically movable forming and holding dies or rams 12 and 14 located at the feeder side of the press and the ejector side of the press, respectively.

The operating mechanism for the rams 12 and 14 usually includes power driven cams whereby the ram 14 will first be lowered toward the bed 16, then the ram 12 will be lowered toward the bed 16, next the ram 14 will be raised and finally the ram 12 will be raised.

The present invention does not attempt to claim the above well known structure nor is it intended to be limited to a double-ram press having cam means for sequentially raising and lowering the rams 12 and 14. The present invention will permit sheet metal S or the like to be moved over the bed 16 and under the rams 12 and 14 in a step by step manner so that corrugations may be formed in the sheet of metal S.

To accomplish the desired results, there is provided a gripping means 18 composed of upper and lower gripping members or angle iron bars 20 and 22 that are disposed at the ejector side of the press and which members 20 and 22 parallel the rams 12 and 14.

A pair of anchor arms 24 are secured to the head 26 of the press and include rearwardly projecting ends that extend away from the ejector side of the press. The upper ends of pairs of hangers or supports 28 are pivoted to the rearwardly projecting ends of the arms 24 for vertical swinging movement and the lower ends of the hangers 28 are secured to the upper member 20 by horizontal pivots.

Additional hangers or supports are provided for the member 22. These hangers comprise vertically swingable upper hanger sections 30 that are pivoted to ears 32 secured to the head 26 over the ram 12, and lower hanger sections 34 whose upper ends are pivoted to the rearwardly projecting overhanging ends of the sections 30 by horizontal pivots, whereby the sections 30 and 34 may swing vertically. The lower ends of the hanger sections 34 are secured to the ends of the lower member 22 by suitable means.

The ends of the upper member 20 are provided with notches 36 that slidably receive the hanger sections 34 in order to provide a slidable connection between the upper and lower members 20 and 22, whereby the same may move toward and away from each other in a manner presently to be described.

A bar 38 is secured to the upper surface of the member 22 to engage the inner wall of a corrugation formed in the sheet of metal S by the combined action of the corrugated bed 16 and the ram 14, and an inverted channel 40 is secured to the under surface of the member 20 to form a seat for a corrugation formed in the sheet of metal S.

Means is provided for connecting the ejector ram 14 to each of the upper hanger sections 30. This means comprises pitmans or rods 42 whose upper ends are pivoted to the sections 30 and whose lower ends carry bifurcated elements 44 that are pivoted to ears 46 rising from the ram 14 by horizontal pivots 48.

Means is provided for connecting the forming ram 12 to the hangers 28 for the upper gripping member 20 and this means comprises pitmans or rods 50 whose lower ends carry bifurcated elements 52 that are pivoted to ears 54 on the ram 12 by horizontal pivots 56. The rods 50 slidably support upper and lower collars 58 and 60 and the collars 60 carry removable wedge pins that will enter transverse apertures in the rods 50 to hold the collars 60 against sliding on the rods 50.

The outer threaded ends of the rods 50 receivably engage nuts 62 against which the collars 58 are urged by springs 64 embracing the rods 50 and biased between the collars 58 and 60. Collars 58 are positioned between the hangers 28 of each pair of hangers 28 and carry

coaxial trunnions 66 that extend through apertures on the hangers 28.

It should be noted that the hanger sections 30 are connected to the hanger sections 34 by an adjustable joint in the form of rods 68 that are fixed to the upper ends of sections 34 and which extend upwardly through accommodating slots in the rear ends of the sections 30. The upper threaded ends of the rods 68 receivably engage nuts 70 forming abutments for coil springs 72 that embrace the upper ends of rods 68 and which act against upper collars 74 slidable on the rods 68 below the springs 72.

Trunnions 76 carried by the collars 74 extend through apertures in the sections 30 and stop collars 78 held on the rods 68 by wedge pins or the like that are removably carried by the collars 78 and enter transverse apertures in rods 68, limit downward sliding movement of the collars 74.

In practical use of the present invention the machine is arrested with the rams 12 and 14 raised and then the sheet of metal S manually placed on the bed and beneath the rams 12 and 14. Then the machine is started through the usual clutch to permit lowering of the ram 14 and the formation of a corrugation in the sheet S. Ram 12 then descends striking the next corrugation. Ram 14 rises then followed by ram 12.

The sheet is manually pushed forward and just short of members 20 and 22 with the rams 12 and 14 both raised as shown in Figure 4. On the next cycle the members 20 and 22 swing toward the press and grab the sheet.

The ram 14 is again lowered to enter the corrugation in the sheet of metal S formed by ram 12, as shown in Figure 5, with the members 20 and 22 spaced apart. Then, ram 12 is lowered to strike a new corrugation, as shown in Figure 6, and since the members 20 and 22 are connected together and the hangers 28 are connected to ram 12 by pitmans 50, the members 20 and 22 will be swung rearwardly away from the rams and the sheet of material S gripped between members 20 and 22 will be pulled rearwardly so that ram 14 overlies the corrugation just formed by ram 12.

This procedure is repeated until the desired number of corrugations have been formed in the sheet of metal after which the leading edge of the sheet will engage a stop 80 on the stacking table 82 of the machine 10 and the trailing edge of the sheet of material will slide downwardly on a guide flange 84 depending from member 22, where the sheet of material will rest on the table 82.

A guide bar 86 is mounted on the front table 88 of the machine 10 and forms a guide for the positioning of a new sheet to be fed to the rams 12 and 14 over the bed 16.

The adjustable joints between the sections 30 and 34, and between the pitmans 50 and bars 28 will permit the invention to be employed with metal sheets of predetermined thickness and rams 12 and 14 having corrugation forming ribs of predetermined width. However, obviously other joints functioning in this capacity could also be incorporated in the feeding and ejecting mechanism. Furthermore, it is likewise possible to employ the pusher mechanism 50, 52, 54, 56, 58, 60, 62, 64, and 66 as a connection between the hanger sections 34 and ram 12 since the swinging action imparted the members 20 and 22 could be through hangers 34 as well as hangers 28. However, under this construction slots in the hangers 34 would be required to accommodate the pivots 66.

The number of hangers and connections between the hangers and rams could obviously be increased if desired.

The continuing automatic operation of the apparatus is the essence of the invention and such operation is permitted since a second sheet is introduced into the press when two or three corrugations have been struck in the first sheet. The third sheet is introduced into the press when five or six corrugations have been struck in the first sheet. The fourth sheet is introduced into the press when eight or nine corrugations have been struck in the first sheet. The first sheet is, at the time the fourth sheet is introduced, completely corrugated, or nearly so, depending on the type and/or number of corrugations to be made.

At all times, after the start of operation, the press is working on many sheets in various states of completion; three corrugations in one, six in another, ten in another, etc. The press is never stopped for the introduction of new sheets. Sheets are manually introduced into the press while it is running and the advancement and completion of the sheets are automatic.

Another outstanding feature of the invention is the function of spring 64. As ram 12 begins to rise, the rod 50 begins to push forward. However, bars 20 and 22, which have the sheet grabbed, cannot move inasmuch as the sheet has not been freed completely by the rising of ram 12. At this time, spring 64 compresses until ram 12 has raised sufficiently to free the sheets. Spring 64 then expands and the sheets are advanced. There is a sort of pinching action between ram 12, the bed 16, and the advancing sheets. This pinching action forces a sheet (that has just been introduced into the press and is not yet advanced to the point that bars 20 and 22 have grabbed it) against the next lower sheet which has been engaged by bars 20 and 22. As the lower sheet is advanced, the upper (which has just been introduced) is forced forward and grabbed by bars 20 and 22.

It will thus be seen, that a single operator standing on the feed side of the press may introduce sheets to the press.

In view of the foregoing description taken in conjunction with the accompanying drawings it is believed that a clear understanding of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention the same is suceptible to certain changes fully comprehended by the spirit of the invention as herein described and the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. In a double ram press including a frame and a bed, a first ram and a second ram movable from a raised position to a lowered position relative to the bed in timed relation to one another wherein the first ram is first lowered, then the second ram is lowered, next the first ram is raised and finally the second ram is raised; mechanism mounted on the frame and actuated by the rams to move work beneath the rams, said mechanism comprising a swingable gripping means carried by said frame including two slidably connected portions each carrying a gripping jaw, means connecting one of said portions to said first ram for moving said gripping jaws toward one another to grip the work as said first ram is raised and away from one another to release the work as said first ram is lowered, means connecting the other of said portions to said second ram for swinging said gripping means away from said rams to advance the work as said second ram is raised and toward said rams as said second ram is lowered, said last named means including a lost motion connection allowing initial raising movement of said second ram before swinging said gripping means away from said rams.

2. The combination of claim 1 wherein said first named means comprises an elongated rigid member pivoted at longitudinally spaced points therealong to said frame and to said one of said portions, a link pivotally connected to said rigid member and said first ram.

3. The combination of claim 1 wherein said second named means includes a link mechanism pivotally connected to said second ram and said other of said portions, said lost motion connection connecting said link mech-

anism and said other of said portions, resilient means reacting against said other of said portions and said link mechanism normally urging said other of said portions away from said second ram.

4. The combination of claim 1 wherein said first named means comprises an elongated rigid member pivoted at longitudinally spaced points therealong to said frame and to said one of said portions, a link pivotally connected to said rigid member and said first ram, said second named means including a link mechanism pivotally connected to said second ram and said other of said portions, said lost motion connection connecting said link mechanism and said other of said portions, resilient means reacting against said other of said portions and said link mechanism normally urging said other of said portions away from said second ram.

5. In a double ram press including a head and a bed and having holding and forming rams arranged to move upwardly and downwardly relative to the bed in timed relation, the timed relation being such that from a raised position of both rams the holding ram is first lowered, then the forming ram is lowered, then the holding ram is raised, and then the forming ram is raised, a mechanism

actuated by the movement of the rams for moving sheets of metal beneath the rams including a swingable gripping means carried by the head for moving work beneath the rams, said swingable gripping means including two slidably connected portions each carrying a gripping jaw, means carried by said press above said rams pivotally supporting one portion, a link mechanism pivotally connected to said forming ram and connecting to said one portion by means of a lost motion connection for swinging said two portions in response to raising and lowering of said forming ram, a rigid member pivotally connected to said head and to the other portion of said gripping means, a member pivotally connected to said first named rigid member and said holding ram for moving said other portion relative to said first named portion to clamp and unclamp the work in response to movement of said holding ram.

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