

Feb. 2, 1937.

R. R. SEFT

2,069,424

SHEET STACKING APPARATUS

Filed Feb. 10, 1934

2 Sheets-Sheet 1

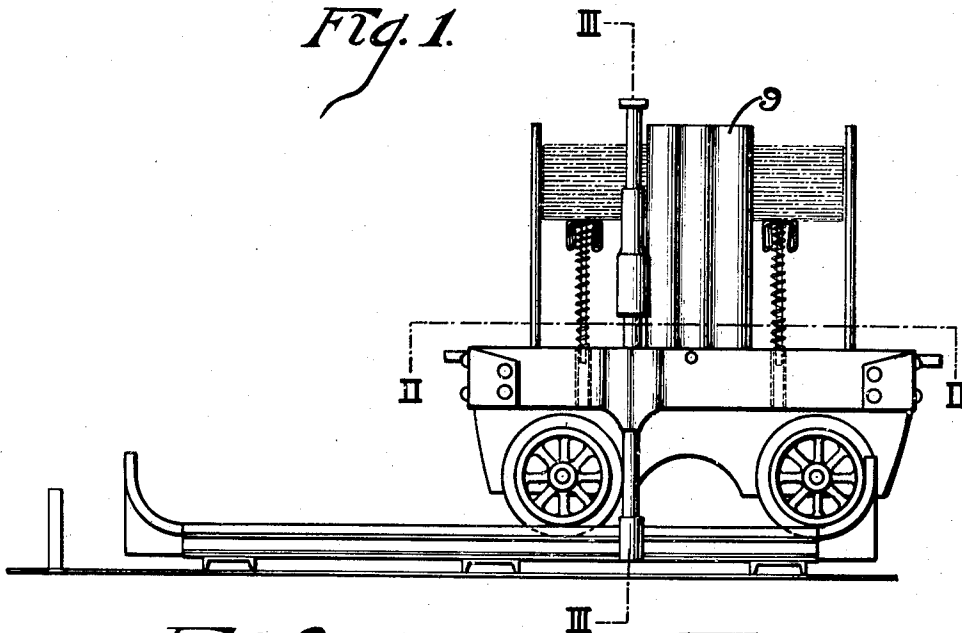
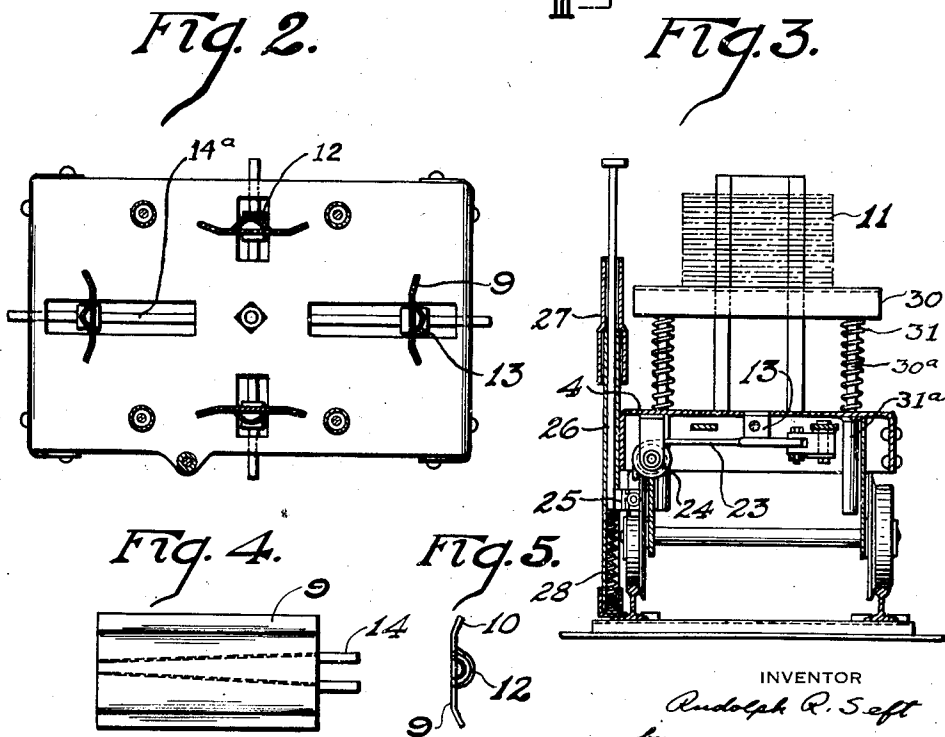


Fig. 4.

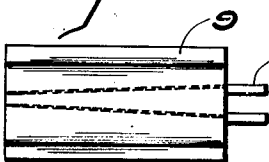
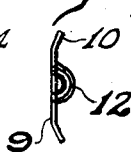


Fig. 5.



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Fig. 6.

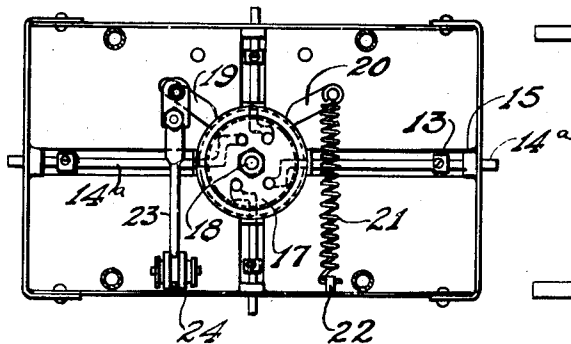


Fig. 7.

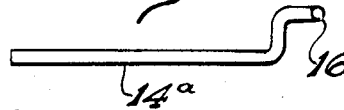


Fig. 8.

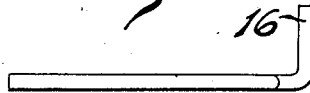


Fig. 10.

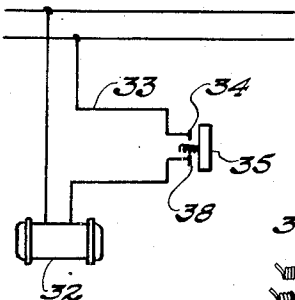
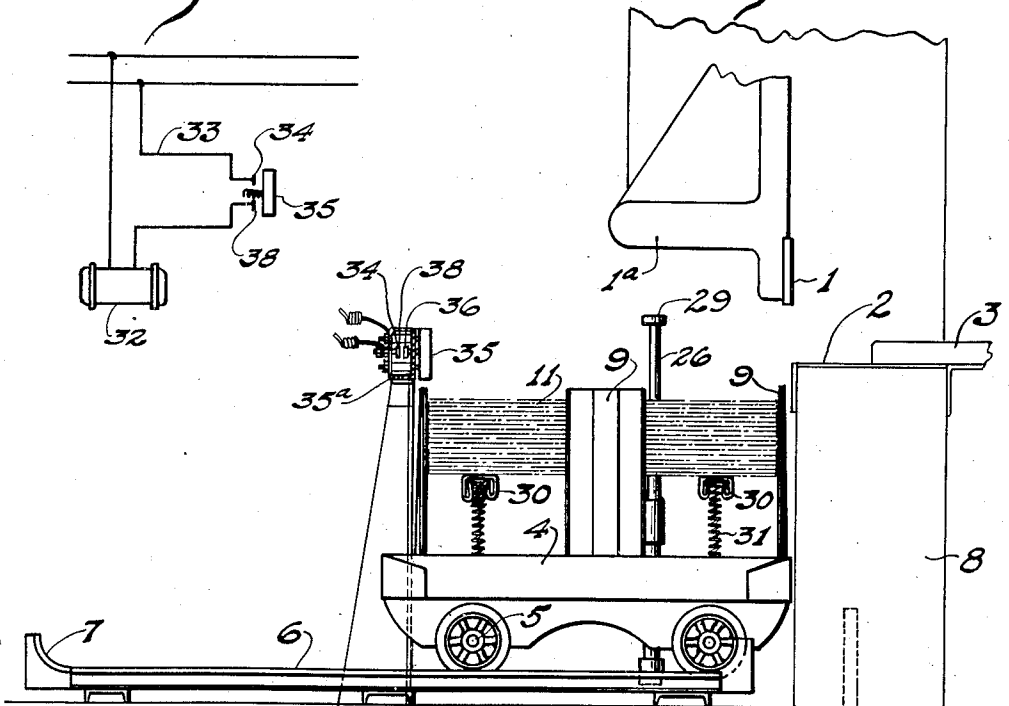


Fig. 9.



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SHEET STACKING APPARATUS

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Application February 10, 1934, Serial No. 710,645

2 Claims. (Cl. 271—89)

This invention relates to sheet stacking apparatus and is especially adapted for use in conjunction with power shears for cutting "strip" or "break-downs" so called.

5 It is among the objects of the invention to provide a sheet stacking and handling device which shall be adapted to receive the sheet as it is cut from the shear directly on a transfer table in such manner that successive sheets will be built up in a substantially square pile to facilitate the handling of the stack for further operations.

10 Another object of the invention is the provision of mechanism which is responsive to the movement of the shear for actuating a plurality of sheet engaging members that align the sheets on the transfer table.

15 Another object of the invention is the provision of means whereby when the sheet is advanced to the proper position in alignment with the transfer table, it will automatically energize the motor circuit or other prime mover of the power shear to initiate the cutting operation, the circuit being automatically deenergized when the sheet has been severed.

20 These and other objects will become more apparent from a consideration of the accompanying drawings constituting a part hereof in which like reference characters designate like parts and in which:

25 Figure 1 is a side elevational view of a combined stacking and transfer mechanism embodying the principles of the invention;

Figure 2 a top plan view thereof;

30 Figure 3 a front elevational view partially in section.

Figures 4 and 5, side and end elevational views respectively of the sheet engaging member;

Figure 6 a bottom plan view of the stacking mechanism;

40 Figures 7 and 8, bottom and side elevational views respectively of the actuating arms;

Figure 9 a view diagrammatically illustrating the cooperating position of the stacker with the power shears; and,

45 Figure 10 a wiring diagram of the motor circuit.

50 With reference to Figure 9 of the drawings, the reference numeral 1 designates the cutting shears which are vertically movable to sever the sheets that are placed on the cutting table 2, 3 being guide members to maintain the sheets in proper alignment. A combined transfer mechanism and stacker generally designated by the reference numeral 4 is mounted upon wheeled 55 axles 5, movable on a track 6 that is in align-

ment with the cutting shears, the end of the stack being provided with curved bumpers 7 that determine the limits of travel of the sheet transfer device. In the position of the transfer table as shown in Figure 9, it is adjacent the base 8 5 of the cutting shears and directly below the shear blade 1 so that the sheet material as it is advanced below the shear will project over the transfer device, and when cut off will drop between the spacing and aligning fingers designated 10 by the numeral 9.

The arrangement of the aligning members 9 is more clearly shown in connection with Figures 1 to 5 inclusive of the drawings, the members 9 being shown with flared edges 10 to prevent binding 15 of the gripping members with the stack sheets which in the drawings are generally designated by the numeral 11.

The engaging members 9 are provided with reinforcing ribs 12 and are secured to adjustable 20 blocks 13 by prongs 14, Figure 4, to render the fingers removable. Obviously, other means of fastening the grippers 9 to the movable blocks 13 may be employed.

25 The blocks 13 are shown in Figure 6 of the drawings to be fastened to a series of rods 14a having their ends formed in the manner shown in Figures 7 and 8, the straight ends of the rod projecting through slide brackets 15 and what may be termed cranks 16 on the opposite ends 30 of the rod are pivotally mounted on a disc 17 that is rotatably journaled by a bolt 18 in the center of the base 4. The disc 17, when subjected to angular movement will simultaneously subject all of the rods 14 to axial movement thereby moving 35 the blocks 13 that carry the gripping fingers 9 to expand and contract these fingers to allow the cut-off sheet 11 to drop between the fingers and be brought into proper alignment when the fingers contract. Blocks 13 are adjustable 40 on rods 14a to accommodate different sizes of break-downs or strip.

Suitable mechanism for actuating the disc 17 in proper synchronism with the cutting movement of the shear 1 consists of ears or lugs 19 45 and 20 which are integrally formed with the disc 17, the lug 20 being provided with a coil spring 21 that is fastened at 22 to the base 4, and the lug 19 being connected to a cable 23 that operates over a pulley or roller 24 journaled underneath the 50 base 4.

The cable 23 is connected at its other end to a block 25, Figure 11, that is fastened to a rod 26 slidable in a sleeve 27 that is secured to the table 4 as shown in Figure 3; the telescoping rod 26 55

is biased by a coil spring 28 provided in the bottom of sleeve 27 to normally hold the rod in its raised position which is the position in which coil spring 21 of disc 17, Figure 6, has pulled the disc in its extreme clockwise position. When the rod 26 is depressed, the cable 23 is drawn downwardly pulling the disc 17 in a counterclockwise direction against the tension of spring 21 and this counterclockwise movement of the disc will cause the rod 14 to move radially outwardly from the disc which will move the blocks 13 and their sheet gripping elements 9 in the same direction causing a spreading of the members 9 to provide ample room for the sheet 11 to drop on the pile without interference. When the pressure on rod 26 is subsequently removed, springs 21 and 28 will act to return the disc 17 to its clockwise position which will cause gripping members 9 to contract until they engage the sheet 11 and bring it in alignment with the remaining sheets of the stack. It is to be noted that by reason of spring 21, the gripping members 9 have yielding contact with the sheets, thus assuring that all of the sheets of the stack will be built up square.

The rod 26 is operated by the cutting shear in the following manner.

As shown in Figure 9, the shear blade 1 is attached to a shear block 1a which extends over the stacker in alignment with the rod 26, and in the downward or cutting movement of the shear, the shear block 1a will engage a head 29 of the rod 26 pushing it downward to cause the spreading of the grippers 9 in the manner explained. When the shear block moves or is retracted, springs 21 and 28 will again raise the rod 26 to the position of Figure 3, in which position the grippers 9 are contracted and engage the sheet metal on the stack.

With reference to Figure 9, it will be seen that the sheets 11 are piled on a pair of channels 30 that are supported on springs 31 so that as the sheets accumulate on the stack, the supports 30 will be depressed to allow the sheets to stack up between the gripper members 9 as shown in Figure 9, and added weight of the stack causing the support 30 to gradually lower until a stack of desired size has accumulated at which time the transfer table 4 is moved to the extended abutment 7 of the rail 6, and the stack is removed by a crane or other suitable conveying means. The supporting channels 30 are provided with guide rods 30a, Figure 3, that are disposed in guide sockets 31a secured to table 4.

With reference to Figures 9 and 10 of the drawings, provision is made to automatically control the shear operating motor by the movement of the sheet strip over the cutting support 2, and by the subsequent cutting off of the strip therefrom, this being accomplished in the following manner; the motor 32 is wired in circuit 33 including a switch 34 that consists of a movable abutment 35 having a contact 36 that is normally held in open position by spring (not shown). The movable abutment 35 is in alignment with the surface 2 of the shear supports so that any sheets passing between the guides 3 and on surface 2 will

abut the member 35 and its support such as the L-shape bar 35a. The member 35 will then be depressed to make contact at 36 with the terminals to close the motor circuit and the motor will operate the shear to bring the cutter 1 in contact with the sheet. As the sheet is severed it will drop on the stack in the manner heretofore explained thereby releasing the pressure from the movable contact 35 which is displaced by the spring to break the motor circuit which will again become energized when the strip is advanced in contact with the movable abutment 35 of the switch.

It will be seen from the foregoing description of this invention that it provides mechanical means for the handling of the cut-off sheets to pile them in stacks for subsequent handling and that this type of device is especially suited for the handling of silicon steel which is fabricated in long strips and which must have straight edges free from any edge distortions.

Also, it will be apparent that the shear operating control provided herein is a convenient means of rendering the shears operative in conjunction with the conveyance and cutting of the strip material.

Although one embodiment of the invention has been herein illustrated and described, it will be obvious to those skilled in the art that various modifications may be made in the details of construction without departing from the principles herein set forth.

I claim:

1. A sheet stacker comprising a support having a flat horizontal sheet supporting surface with transverse slots, sheet aligning members secured to brackets movably mounted in the slots of said support, links connecting said brackets, a common actuator for said links, means biasing said actuator to normally contract said aligning members a lever for subjecting said actuator to angular movement, and a plunger on the side of said sheet support operatively joined to said lever to actuate the same, said plunger being spring biased to extend vertically upward and being adapted when depressed to move said aligning members to their extended position.

2. In a sheet stacking mechanism for receiving and stacking sheets severed by a cutting mechanism, a movable support adapted for alignment beneath the point of severance of the cutting mechanism, sheet aligning members mounted on said support having link connections with a common coupling member below the sheet supporting surface, a vertically movable plunger secured to said movable support and normally biased by a spring to its upper position, said plunger having connection with the coupling member to subject all of the aligning members to movement simultaneously, and said plunger being adapted for alignment with the cutting mechanism to be actuated by the cutter bar, thereby to render the aligning members movable in response to movement of the cut-off device.

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