July 10, 1951 F. K. SCHEFE 2,560,252

SHEET PILER

Filed June 4, 1947 5 Sheets-Sheet 1

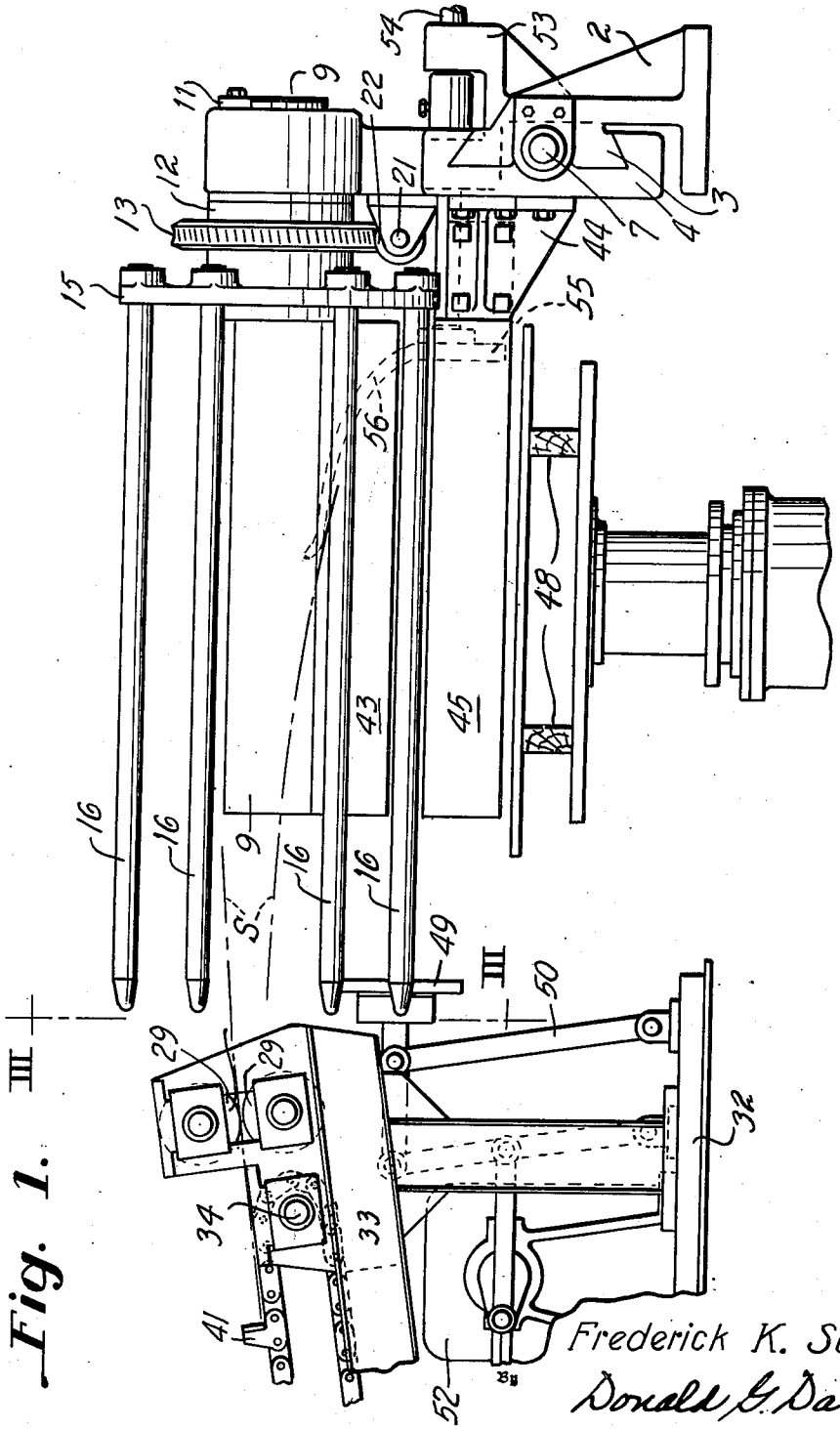


Fig. 1.

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His Attorney

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SHEET PILER

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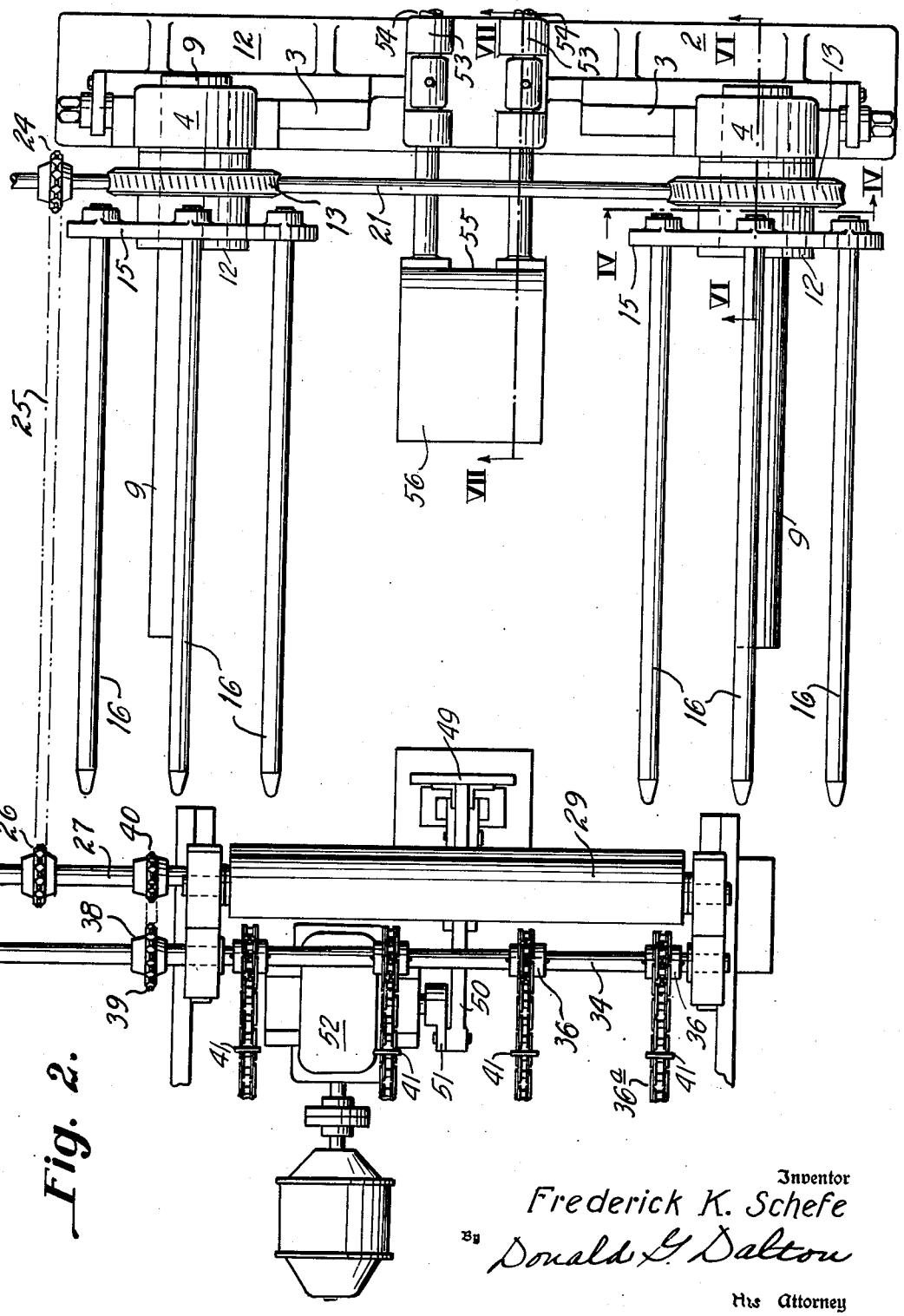


Fig. 2.

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SHEET PILER

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Fig. 3.

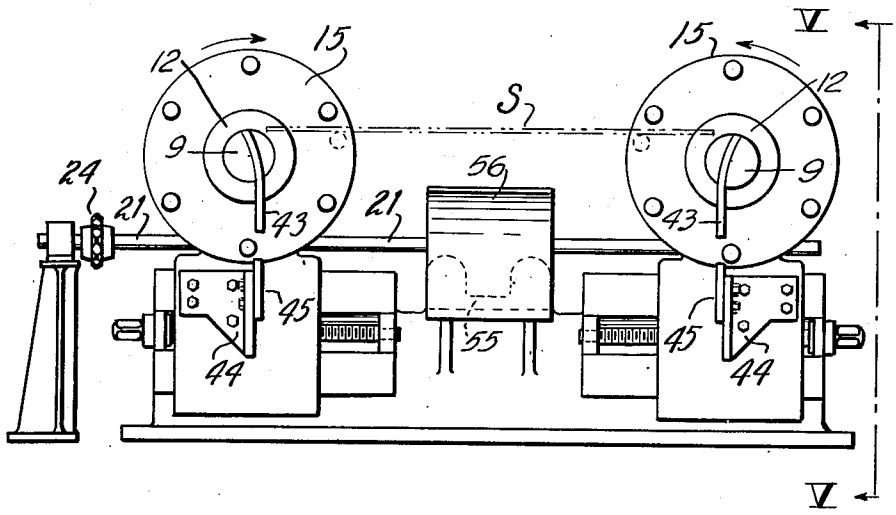
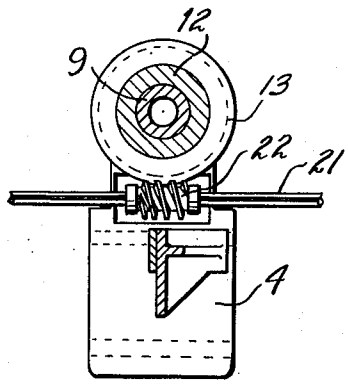


Fig. 4.



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SHEET PILER

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Fig. 6.

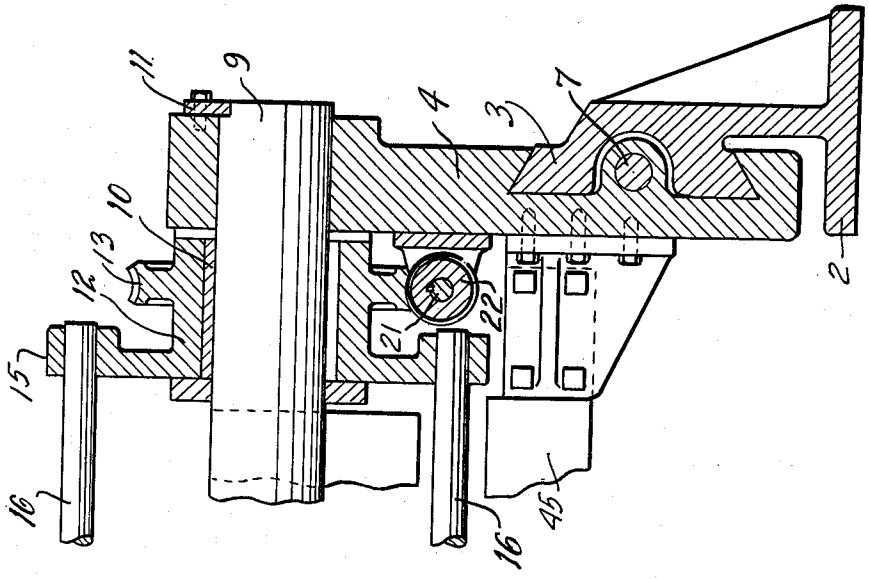
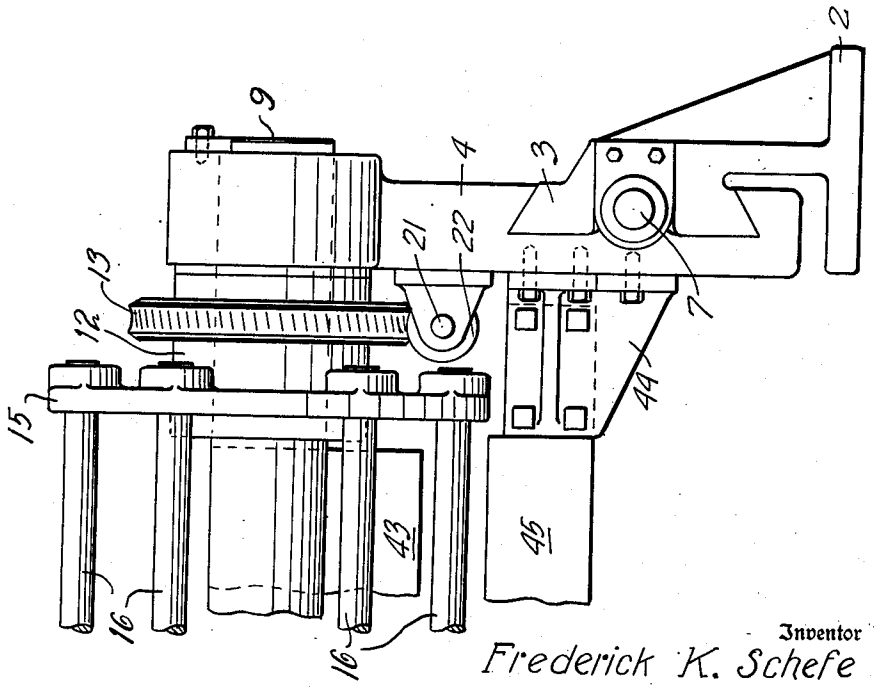


Fig. 5.



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SHEET PILER

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Fig. 7.

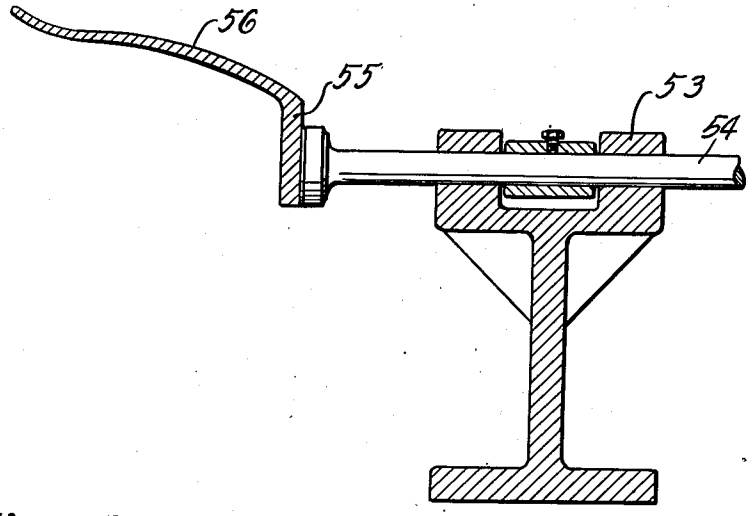
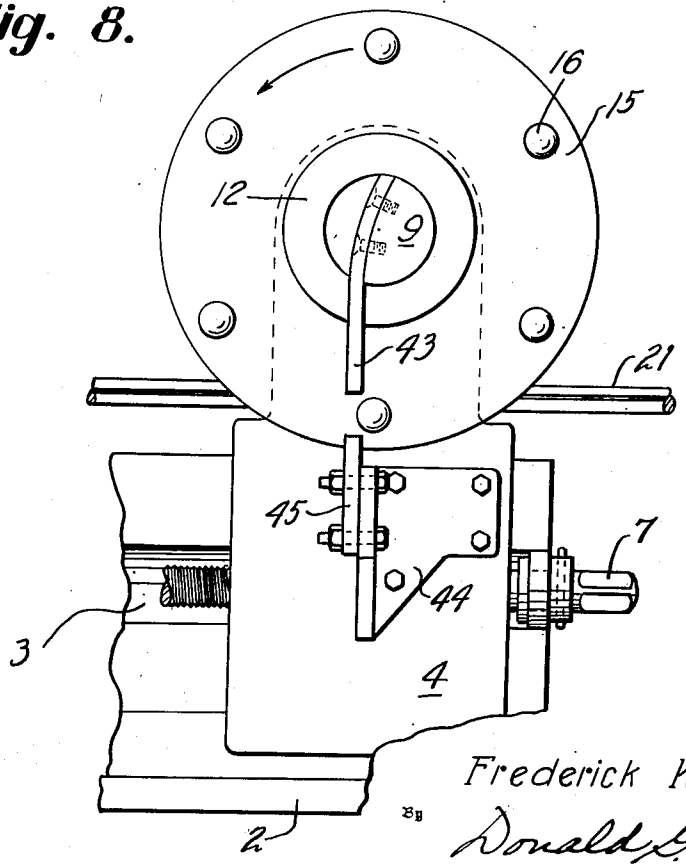


Fig. 8.



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UNITED STATES PATENT OFFICE

2,560,252

SHEET PILER

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Application June 4, 1947, Serial No. 752,334

3 Claims. (Cl. 214—6)

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This invention relates to sheet pilers, and more particularly to those which are adapted to handle elongate metallic sheets as they are discharged at a high rate of speed from a processing unit, such as a flying shear, etc.

In the manufacture of elongate metallic sheets it is necessary to catch them as they are fed from the processing unit (i. e. flying shear, etc.), convey them to a suitable position for piling, and pile the said sheets in an orderly fashion and without damage thereto.

Numerous devices have been proposed for attaining the foregoing objectives but, so far as I am aware, they are all subject to various disadvantages. One prime disadvantage of conventional sheet pilers of the class with which the present invention is concerned is that they are costly to manufacture, install and maintain. Another disadvantage, and one which is particularly applicable to the least expensive installations, is that during the stacking or piling operation the sheets are permitted to slide upon one another.

It is among the objects of the present invention to provide a sheet piler of the class described which is highly efficient in operation, accomplishing the stacking or piling operation without damage to the individual sheets; and one which is at the same time relatively inexpensive to manufacture, install and maintain.

Another object is to provide an apparatus of the class described which is entirely automatic in operation and one which is also adjustable to accommodate sheets of varying sizes.

Numerous other objects of the invention will be apparent as it is better understood from the following description, which, taken in connection with the accompanying drawings, discloses a preferred embodiment thereof.

Referring to the drawings:

Figure 1 is a side elevation of the apparatus of the invention;

Figure 2 is a plan of the showing of Figure 1;

Figure 3 is a view taken on the line III—III of Figure 1.

Figure 4 is a view on the line IV—IV of Figure 2;

Figure 5 is an enlarged view on the line V—V of Figure 3;

Figure 6 is an enlarged view on the line VI—VI of Figure 2;

Figure 7 is an enlarged view on the line VII—VII of Figure 2; and

Figure 8 is a fragmentary enlarged end view of the right-hand portion of the apparatus of Figure 3.

Referring more particularly to the drawings, the numeral 2 designates a rail base which is disposed adjacent a point of delivery of successively fed sheets and in front of which there may be disposed the skids on which the sheets are to be piled.

The rail base 2 is provided with a pair of sliding-ways 3 each of which is adapted to receive the depending leg of a housing 4. As shown most clearly in Figures 3 and 8, the housing 4 may be adjusted longitudinally of the rail base 2 by means of rotatable screws 7.

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Facing in the direction in which the sheets are to be successively fed, each of the housings 4 is provided with a horizontally extending stationary shaft 9, the same being received in a bearing 10 and located in position by means of a conventional clamp 11. Each of the horizontally extending shafts 9 carries a rotatable hub 12 with which there is integrally formed a face plate 15. Each of the face plates 15 is provided with a series of horizontally extending individual fingers 16; the same being adapted to receive between them, and to stack or pile, the successively fed sheets, the manner of which will be described hereinafter.

Each of the hubs 12 is provided with an integrally formed worm gear 13, a shaft 21 extends between the worm gears 13 and carries in slidably keyed fashion a pair of worms 22 one of which is adapted to cooperate with each of the worm gears 13.

Referring to the upper right-hand part of Figure 2, the shaft 21 is provided with an extended end which carries a sprocket 24, the same being driven by a chain 25 which connects with a sprocket 26 on a shaft 27. This shaft 27 is connected to the lower of a pair of pinch rolls 29 which are disposed at the delivery end of a processing unit, the same in the present instance being represented by a typical sheet conveyor 32. This sheet conveyor 32 comprises a pair of parallel angularly inclined rails 33. Adjacent the upper ends of the rails 33 and the hereinbefore described pinch rolls 29, there is provided a shaft 34 which carries a series of sprockets 36 around each of which there is strung a chain 36a the opposite end of which is not shown. As shown most clearly in the upper left-hand end of Figure 2, the shaft 34 is extended, and carries on its extended end a sprocket 38 to which there is connected a chain 39, the latter being also connected to a sprocket 40 on the shaft 27 (the latter being connected to the lower of the pinch rolls 29, as previously described).

The shaft 34 may be driven in any suitable manner; for example, by an adjustably disposed electric motor (not shown).

Referring particularly to Figures 1 and 2, each of the chains 36a is provided with a series of spaced lugs 41, the said lugs being abreast of one another on the adjacent chains, whereby they serve to successively feed the sheets from the sheet conveyor 32 and into the pinch rolls 29. The bottom pinch roll (which is driven from the shaft 34) rotates at a higher rate of speed than the chains 36a, thereby eliminating buckling of the sheets as they enter the pinch rolls.

In order to guide and align the sheets as they

are fed from the pinch rolls 29 there is attached to each of the stationary horizontal shafts 9 a longitudinally extending stationary guide 43 (see Figure 3). In addition, each of the housings 4 is provided with a bracket 44 which carries a stationary guide 45, the latter being in effect continuations (downwardly) of the stationary guides 43. From the foregoing it will be perceived that the combination of guides 43 and 45 provides a simple and readily adjustable means for receiving and aligning the sheets as they are delivered from the pinch rolls 29.

Referring to Figure 1, there is disposed beneath the space between the corresponding stationary guides (43—43 and 45—45) piling skids 48 upon which the sheets are to be stacked or piled. In order to even the ends of the successively fed sheets after they are deposited on the piling skids 48, there is provided a contacting platen 49 which is connected to a series of oscillating members 50 which are connected to and motivated by a crank 51 which is connected to a motor driven speed reducer 52.

In operation:

Sheets S are successively fed from the pinch rolls 29 and moved in between the revolving assemblies of fingers 16. The speed of rotation of the fingers 16 (which are mounted on the face plates 15) is coordinated with the speed of the pinch rolls 29 in such manner as to cause the extending fingers to successively register and thereby provide supporting means for the sheets, as shown in dotted lines in Figure 3.

It is, of course, essential that (as viewed in Figure 3) the left-hand assembly of the fingers 16 be rotated clockwise while the opposite (right-hand) assembly of the fingers is rotated in a counter-clockwise direction. In this manner, then, there is assured a rapid and smooth lowering of the successively fed sheets into position on the piling skids 48, the fingers 16 when in their lowermost positions being automatically withdrawn due to their rotative motion.

In order to prevent the excessive forward movement of the successively fed sheets S there is provided a pair of brackets 53 in which there is adjustably supported a pair of parallel horizontally extending rods 54. These rods 54 extend between the assemblies of fingers 16 and carry a stop member 55 having a curved upper face 56 which serves to decelerate the forward movement of each of the successively fed sheets immediately before contacting the stop 55, thereby preventing damage. As shown by the broken lines in Figure 1, when the sheet S enters the piling device it is partially supported by both the fingers 16 and rolls 29. As forward movement continues the sheet simultaneously assumes a downward motion corresponding to the moving fingers 16. By proper adjustment of the stop 55 with respect to the length and speed of the sheets being fed, the advancing ends of the latter may be assured contact with the upper curved face 56 of the stop 55.

Since many changes, variations, and modifications in the specific form, construction and arrangement of the elements shown and described may be had without departing from the spirit of my invention, I wish it to be understood as being limited solely by the scope of the appended claims, rather than by any details of the illustrative showing and foregoing description.

What I claim is:

1. Apparatus for piling sheets comprising a pair of parallel rotatable heads, a series of forwardly extending parallel fingers carried by each of said heads, and means for rotating said heads in opposite directions so that the fingers carried thereby travel downwardly in the convergent direction, said fingers being adapted for disposition beneath the opposite edges of a sheet disposed between said heads and for withdrawal from contact with said edges at the lower extremity of the rotative movement thereof.

2. Apparatus for piling sheets comprising a pair of parallel base supported housings, a rotatable head mounted on a fixed shaft in each housing, said shafts protruding forwardly from said heads, a series of forwardly extending parallel fingers carried by each of said heads, means for rotating said heads in opposite directions so that the fingers carried thereby travel downwardly in the convergent direction, said fingers being adapted for disposition beneath the opposite edges of a sheet disposed between said heads and for withdrawal from contact with said edges at the lower extremity of the rotative movement thereof, and side guide means for assuring the even disposition of a sheet relative to said heads, said guide means including a horizontally extending sheet member carried by and projecting below each of said fixed shafts, and a horizontally extending sheet member mounted on each housing below each head and projecting forwardly therefrom, said last named sheet member being spaced vertically from said first named sheet member.

3. Apparatus for piling sheets comprising a pair of parallel base supported housings, a rotatable head mounted on a fixed shaft in each housing, said shafts protruding forwardly from said heads, a series of forwardly extending parallel fingers carried by each of said heads, means for synchronously rotating said heads in opposite directions so that the fingers carried thereby travel downwardly in the convergent direction, said fingers being adapted for disposition beneath the opposite edges of a sheet disposed between said heads and for withdrawal from contact with said edges at the lower extremity of the rotative movement thereof, side guide means for assuring the even disposition of a sheet relative to said heads, said guide means including a horizontally extending sheet member carried by and projecting below each of said fixed shafts, a bracket member mounted on each of said housings below each head, and a horizontally extending sheet member mounted on and projecting forwardly from said bracket, said last named sheet member being spaced vertically from said first named sheet member, and an end stop mounted on the base supporting said housings and disposed between said heads for preventing the excessive forward movement sheets fed into the apparatus.

FREDERICK K. SCHEFE.

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Certificate of Correction

Patent No. 2,560,252 July 10, 1951

FREDERICK K. SCHEFE

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows:

Column 4, line 59, after "movement" insert *of*;

and that the said Letters Patent should be read as corrected above, so that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 2nd day of October, A. D. 1951.

[SEAL]

THOMAS F. MURPHY,
Assistant Commissioner of Patents.