No. 864,722. PATENTED AUG. 27, 1907.

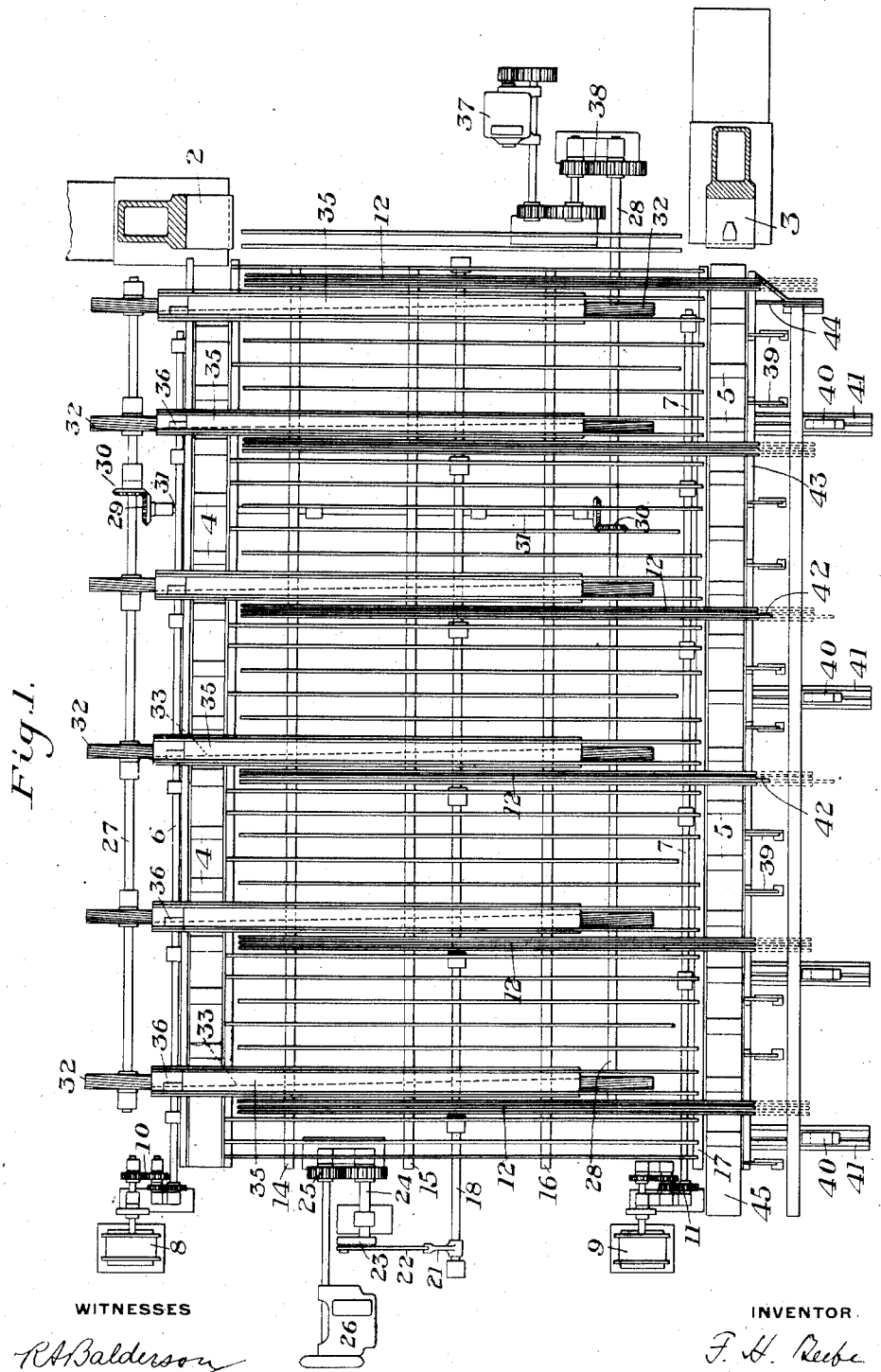
F. H. BEEBE.

METAL PILING APPARATUS.

APPLICATION FILED MAY 31, 1907.

3 SHEETS—SHEET 1.

Fig. 1.



WITNESSES

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3 SHEETS—SHEET 2.

Fig. 2.

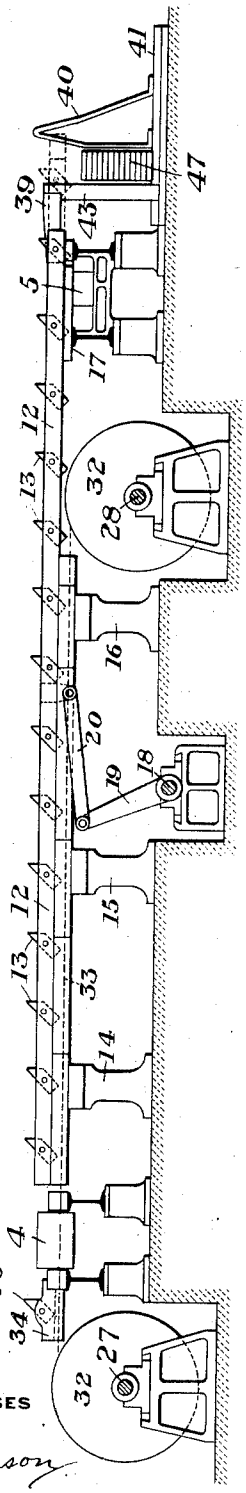
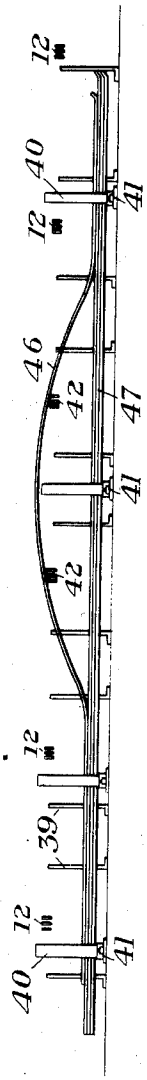


Fig. 3.



WITNESSES

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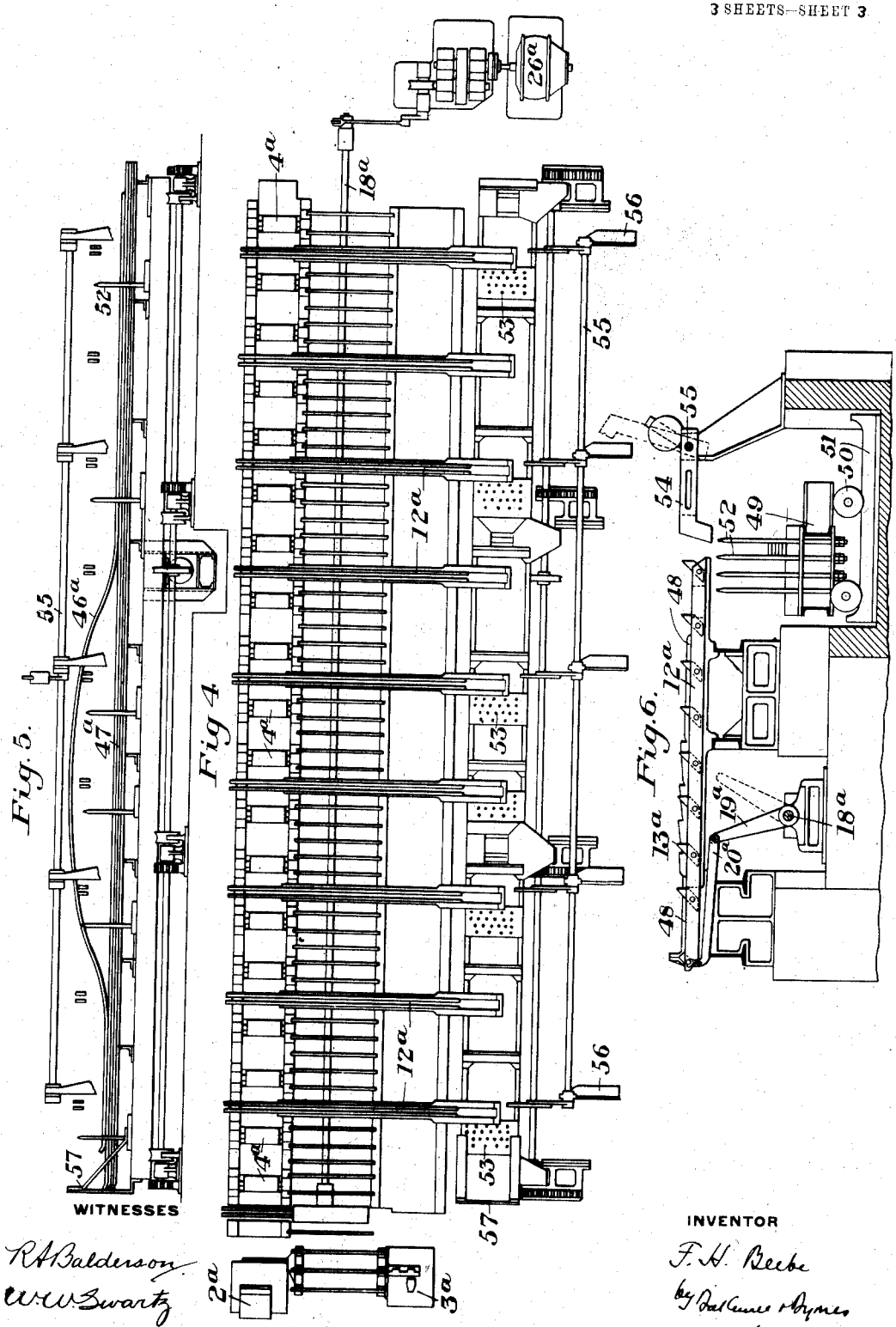
3 SHEETS—SHEET 3.



UNITED STATES PATENT OFFICE.

FREDERICK H. BEEBE, OF ELYRIA, OHIO, ASSIGNOR TO NATIONAL TUBE COMPANY, OF PITTSBURG, PENNSYLVANIA, A CORPORATION OF NEW JERSEY.

METAL-PILING APPARATUS.

No. 864,722. Specification of Letters Patent. Patented Aug. 27, 1907.

Application filed May 31, 1907. Serial No. 376,464.

To all whom it may concern:

Be it known that I, FREDERICK H. BEEBE, of Elyria, Lorain county, Ohio, have invented a new and useful Metal-Piling 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—

Figure 1 is a plan view showing one form of my improved apparatus; Fig. 2 is a sectional end view on a larger scale; Fig. 3 is a side view; and Figs. 4, 5 and 6 are views similar to Figs. 1, 2 and 3, showing another form of the apparatus.

My invention relates to the piling of metal strips or articles such as skelp, and its object is to provide a simple, effective and easily operated device of this character, which will prevent pieces from turning on edge or becoming twisted as they drop into the piling rack, and also to even up the ends of the strips or bars forming the pile.

A further object of the invention is to increase the output of the material and decrease the number of men employed.

In the drawings, referring to the form of Figs. 1, 2 and 3, 2 represents a cutting-off shear arranged to act upon the skelp or metal as it is delivered from the reducing mill. 3 is another shear arranged at the other edge of a cold bed or transfer bed, which extends between the shears. Each shear is provided with a table, consisting of rollers 4 and 5, driven by bevel gear connections with the line shafts 6 and 7, which are actuated from electric motors 8 and 9 respectively through the slow-motion gearing shown at 10 and 11.

The cold bed is provided with a series of supporting bars forming a skeleton rest, along which the bars are moved by reciprocating transfer bars 12, of which I have shown six sets. Each bar or set of bars is provided with pivotally mounted dogs 13 which will tilt down as the bar is moved rearwardly and will rise back of the metal and push it forwardly as the bar is moved forwardly. The transfer bars are preferably mounted in guide-ways on the supports 14, 15, 16 and 17.

The transfer bars are reciprocated by a rock shaft 18 having lever arms 19 connected to the transfer bars by pivotal links 20. The rock shaft 18 is oscillated through a predetermined arc by the rock arm 21 connected by link 22 with a crank 23 on shaft 24 which receives motion through slow motion gearing 25 from electric motor 26.

The upper edges of the transfer bars are preferably in substantially the same plane with the rollers 4; and to transfer the metal from the rollers to the bars I preferably employ an auxiliary rope transfer device. In the form shown, this consists of line shafts 27 and 28, which are connected by bevel gears 29 and 30 on the shaft 31 as shown in Fig. 1. The rope sheaves 32 are mounted on the shafts 27 and 28, and are connected by wire ropes 33, to which are attached the carriages 34 traveling in troughs 35, which are shown as mounted alongside the transfer bars. Each carriage 34 carries a pivotal dog 36 which is the same as those on the transfer bars. The line shafts receive their motion from the reversing electric motor 37, which is connected with shaft 28 through slow motion gearing shown at 38.

At the delivery end of the bed I provide adjustable frames 39, beyond the rollers 5, and the top surfaces of which are slightly inclined upwardly from the level of the transfer bed.

40 represent a series of holding frames adjustably mounted on shoes 41, so that they may be shifted to suit different widths of skelp. These frames preferably extend higher than the frames 39.

The transfer bars at the center of the bed are preferably provided with removable extensions 42 adapted to support the intermediate portion of each skelp after the end portions have entered the rack, formed between the frames 40 and the supports 43 for the frames 39.

44 is a stop located at the end of the rack near the clipping shear 3; and 45 is a stop secured to the end of the roller table for the clipping shear.

I show one or more pieces of skelp in the intermediate stages of piling at 46; and I show as 47 a number of pieces that have been piled in the rack.

In the operation of the apparatus, after the skelp has been cut to the desired length by the shear 2, it is transferred from the rollers of the shear table onto the cold bed by the carriages 34. These carriages deliver within the range of the transfer bars, and as succeeding pieces of skelp are cut to the desired length, and delivered to the bed they are advanced successively toward the clipping shear by repeated movement of the transfer bars, whose pivotal dogs act on the forward stroke but not on the rearward stroke. As the pieces reach the shear 2, their ends are clipped off at the corners and bent up in boat shape; and are moved back against the stop 45 by means of the clipping shear roller table. From this position they are advanced by the transfer bars until their ends drop onto the rack. This dropping of the end is accomplished by a partial backward stroke of the transfer bars. After this partial stroke the central portion of each skelp is held by extensions 42 on the bars until the ends have dropped to the bottom of the rack. On the succeeding portion of the back-stroke of the bars, this central portion is then released. The result of this peculiar piling method is that the pieces are prevented from turning over, turning on edge, or becoming twisted, as they drop into the rack. By holding up an intermediate portion of each skelp, which portion

is nearer to the clipping shear than toward the other end; as this intermediate portion is released the end of the bar will be advanced to and against stop 44, after which the bar will straighten to its final position. A pile is thus produced with the clipped ends even and without manual labor. The extensions 42 on the bars are preferably made removable, and adjustable, so that their position may be varied to suit different lengths of skelp.

The apparatus may be used either for forming in a single pile, or for multiple piles; and in Figs. 4, 5 and 6 I show a modified form for multiple piling. This multiple piling is employed for narrow widths of skelp where the weight of any single pile would be small, and consequently several piles should be handled at once in order to give a large output. In these figures parts similar to those of Figs. 1, 2 and 3 are indicated by similar numerals with the letter "a" applied. The cutting-off shear 2^a and the clipping shear 3^a may be the same as in the first form. The cold bed or transfer bed may be of the same type, except that in this case I have omitted the auxiliary rope transfer, and clipping shear roller table. I show the stationary bars 48 as notched on their upper edges or sides in such a manner as to effect the piling of all pieces which lie between any pair of the pivotally mounted dogs. I thus deliver the skelp to the clipping shear in piles, of two or three pieces, which can be clipped at one stroke of the shear. Aside from this notching of the stationary bars and the moving of the transfer bars between the rollers 4^a so as to carry the skelp forwardly therefrom, the bed may be the same as before. At the delivery end of the bed I show a frame 49 mounted upon wheels 50 supported upon rails 51. The office of this traveling frame is to carry the vertical pins or guides 52 forming the racks, in which the skelp is piled. These pins or guides may be spaced apart at different distances to suit the widths of skelp, by making use of the various groups of holes shown at 53. 54 is an adjustable stop, which is secured to the line shaft 55 mounted in bearings 56, and 57 is the stop at the end of the frame. In this form of the apparatus, the shear 2 cuts the pieces to the desired length, either as singles or in groups. The transfer bars then move the skelp laterally across the bed, piling the pieces as they pass over the notches in the stationary bars, and finally delivering them to the clipping shear. After being clipped the pieces are thrown back out of the way by hand, and are then transferred automatically to the piling rack. When one rack is full the car is moved to bring another rack into position. In this case, the same as in the previous one, an intermediate portion of the skelp is held up until the ends have dropped down, this portion being preferably nearer the clipped end. As before, the skelp can be prevented from turning over, turning on edge, or twisted. In either case, the elevation of a part of the skelp may be at one end, that is, one end may be held up until the other end portion is dropped and the second portion then dropped. I prefer, however, to elevate the central portion as shown.

The advantages of my invention result from the automatic registering of the clipped ends of the skelp, and also from the increased output and reduced number of men employed due to the facility of handling finished skelp. The holding up of a portion of the skelp while another portion is dropped into the rack, I consider broadly new, and it gives the advantages above named.

Many changes may be made in the form and arrangement of the bed, shears, transfer mechanism, racks, &c., without departing from my invention.

I claim:—

1. In piling apparatus, a piling rack, mechanism for dropping the bars or metal strips therein, and mechanism for delaying the dropping of a portion of each piece; substantially as described.

2. In metal piling apparatus, a rack, mechanism for dropping the metal strips thereinto, and holders arranged to uphold a portion of each strip until after another portion has dropped; substantially as described.

3. In piling apparatus, a rack, feeding devices arranged to drop strips thereinto, and mechanism moved in a predetermined relation with the feeding devices and arranged to delay the dropping of an intermediate part of each strip; substantially as described.

4. In piling apparatus, a rack, feeding devices arranged to drop strips thereinto, and mechanism moved in a predetermined relation with the feeding devices and arranged to delay the dropping of an intermediate part of each strip, said intermediate part being nearer one end of the strip than the other end; substantially as described.

5. In piling apparatus, a shear, a rack having an end stop, and mechanism for dropping the cut strips into the rack with their cut ends against the stop; substantially as described.

6. In metal piling apparatus, a transfer bed, a rack at one side thereof, transfer mechanism for carrying the metal strip or bars across the bed and dropping them in the rack, and hold-up devices connected with the transfer mechanism and arranged to delay the dropping of a portion of each metal piece; substantially as described.

7. In a metal piling apparatus, a transfer bed, a clipping shear, and a rack having an end stop, and mechanism for dropping the clipped metal pieces in the rack with their ends against the stop; substantially as described.

8. In metal piling apparatus, a transfer bed having mechanism for piling the bars as they are moved across the bed, and a multiple rack device arranged to receive several piles of the bars; substantially as described.

9. In metal piling apparatus, a transfer bed, a shear, and a multiple rack to which the transfer devices deliver the sheared metal blanks; substantially as described.

In testimony whereof, I have hereunto set my hand.

FREDERICK H. BEEBE.

Witnesses:
O. WINTER,
F. D. TRUSS.