

Oct. 25, 1927.

1,646,989

W. M. BLECKER

SHEET SHEARING APPARATUS

Filed Aug. 20, 1926

2 Sheets-Sheet 1

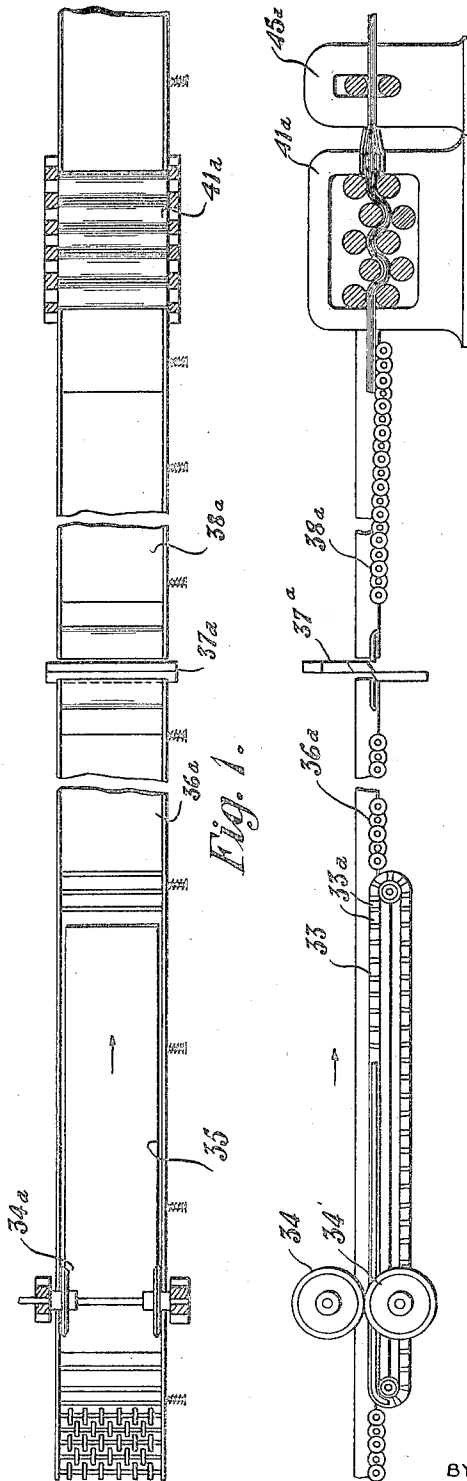


Fig. 2.

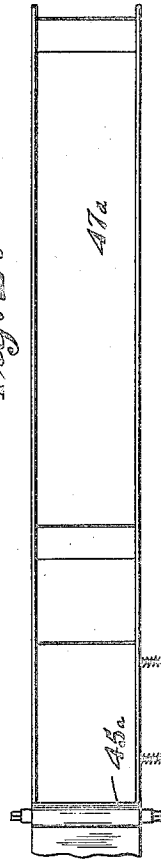


Fig. 3.

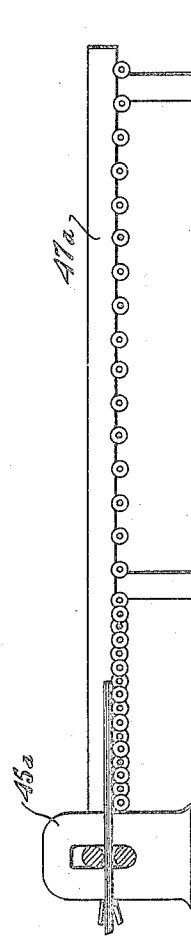


Fig. 4.

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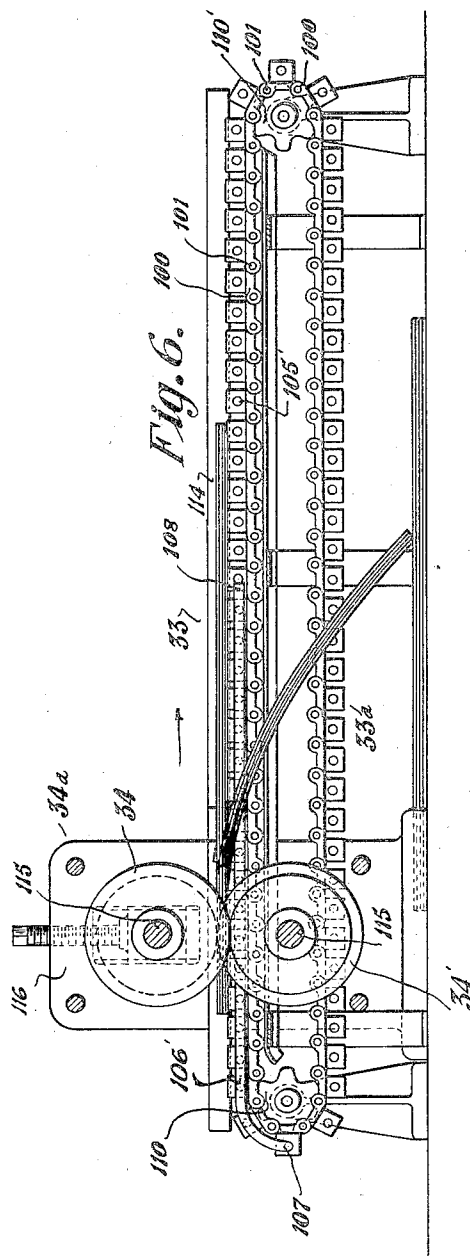
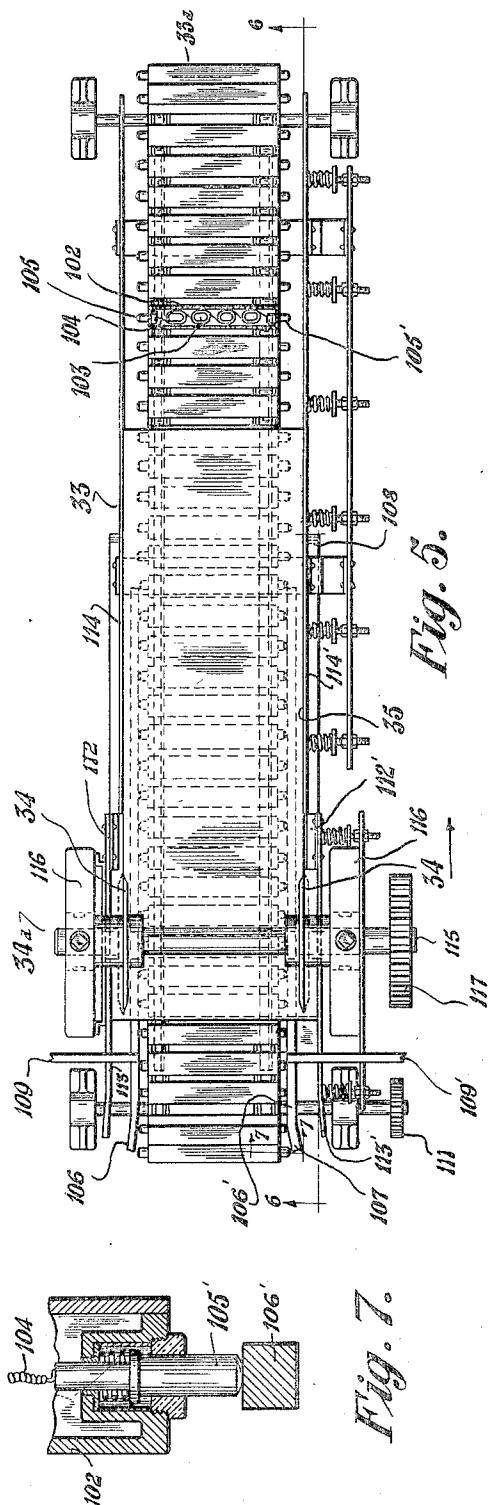
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SHEET SHEARING APPARATUS

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

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SHEET-SHEARING APPARATUS.

Original application filed December 7, 1925, Serial No. 73,597. Divided and this application filed August 20, 1926. Serial No. 130,532.

This invention relates to apparatus for use in the continuous rolling of sheet bars, light plates or slabs into sheets of desired gauge, and the object of the improvement is to provide an automatic and continuous sheet shearing apparatus for use for example in carrying out a continuous sheet rolling method in which sheet bars, light plates or slabs are heated and passed continuously through a series of roughing mills, being matched or piled once, twice or more depending upon the gauge of sheets to be rolled, the pieces being then reheated and automatically doubled, if sheets under 22 gauge are desired, and then continuously passed through finishing rolls through side and end shearing apparatus, then through a continuous annealing furnace and finally through sheet levelling and opening mechanism and onto a cooling table; each succeeding stand of rolls throughout the train being operated at a higher speed than the preceding rolls in order to accommodate the increasing length of the bars or sheets as they are passed through each stand.

An embodiment of the invention is illustrated in the accompanying drawings, in which

Figure 1 is a plan sectional view of the side and end shearing apparatus and pack loosening and opening mechanism, as for lighter than 22 gauge sheets;

Fig. 2, a vertical longitudinal section of the same;

Fig. 3, a plan view of the cooling table located beyond the pack opening mechanism;

Fig. 4, a vertical longitudinal section of the same;

Fig. 5, an enlarged detached plan view of the improved side shearing apparatus similar to the apparatus indicated diagrammatically in Figure 1;

Fig. 6, a vertical longitudinal section of the same as on line 6—6, Fig. 5; and

Fig. 7, a detached fragmentary axial sectional view of one of the magnetic link bars as on line 7—7, Fig. 5 illustrating the construction of the automatic contacts for the magnetic link bars.

Similar numerals refer to similar parts throughout the drawings.

This application is a division of my copending application for improvements in continuous sheet rolling apparatus and

method, Serial No. 73,597, filed December 7, 1925.

After being subject to operations as set forth in my aforesaid copending application, a pack of sheets may be conveyed to and received upon an endless conveyor table 33 of a side shearing apparatus 34^a, the table being provided with magnets 33^a which are automatically energized as the pack passes onto the table, thus holding the pack rigid as it is moved by the table through the rotary shear plates 34 and 34' which trim the side edges of the sheets to the desired width as shown at 35.

The magnets upon the conveyor 33 are automatically deenergized after the trimming of the side edges of the pack is completed, releasing the pack and carrying it on to a roller table 36^a by which the pack is conveyed to end trimming shears 37^a which operate in a manner illustrated in the prior art, to trim the front and rear ends of the pack to the desired length, the trimmed pack being then conveyed by a lower table 38^a to a loosening and opening apparatus 41^a—45^a, and the pack is then passed through the loosening and opening apparatus and thence to a cooling table 47^a of any usual construction, as set forth in my aforementioned application Serial No. 73,597.

The magnets 33^a of the endless conveyor table 33 are preferably in the form of magnetic link bars extending transversely of the longitudinal axis of the machine and being provided with apertured link lugs 100 connected to each other as by pins 101 fitting in the overlapping and registering apertures of the lugs of adjacent link bars.

Each link bar may include a tubular case 102 in which are mounted a plurality of electro-magnets 103 having windings 104 preferably connected in series with each other and with automatic spring pressed contacts 105 and 105' mounted in the ends of the casing as best illustrated in Fig. 7.

The spring pressed contacts 105 and 105' are arranged to automatically contact with longitudinal buss bars 106 and 106' preferably extending from the receiving side 107 of the conveyor, beneath the rotary shear plates 34 and 34', to a position 108 intermediate the ends of the endless conveyor table.

The buss bars are connected as by wires 109 and 109' to a power line, and the mag-

netic link bars of the endless conveyor are mounted for movement on the shaft mounted sprockets 110 and 110', one of which as 110 is provided with a gear 111 at the end of its shaft by suitable connection to a motor for rotating the sprocket to move the conveyor table in the direction indicated by the arrow in Figs. 1, 2, 5 and 6.

Accordingly when the conveyor table is moved as aforesaid the automatic spring pressed contacts 105 and 105' of successive magnetic link bars contact with the buss bars 106 and 106' as the link bars move upward about the sprocket wheels 110, thereby causing a current to flow through the windings until the contacts have been conveyed beyond the ends of the buss bars at 108.

The magnetic link bars are thus automatically energized as a pack passes onto the table, thus holding the pack rigid as it is moved by the table through the rotary shear plates 34 and 34', and the magnetic link bars are automatically deenergized after the trimming of the side edges of the pack have been completed, as the contacts pass beyond the ends of the buss bars at 108.

Deflector guides 112 and 112' may be mounted adjacent the shear plates for deflecting downwards the trimmings cut from the side edges of the sheets by the shear plates.

Likewise suitable edge guides 113 and 113', and 114 and 114' may be provided for the packs before and after trimming.

The rotary shear plates 34 and 34' may be mounted in a well-known manner on rotatable shafts 115 suitably journaled in bearing frames 116 and 116' and the shafts are arranged for connection with a motor as by means of gearing 117 mounted at the ends of the shafts.

I claim:

1. A sheet shearing apparatus including an endless magnetic conveyor arranged to receive sheets to be sheared and a pair of co-

operating rotary shears located adjacent to said conveyor and arranged to shear the sides of sheets as they are carried past the shears upon said conveyor.

2. A sheet shearing apparatus including an endless magnetic conveyor arranged to receive sheets to be sheared, and a plurality of co-operating shears located adjacent to said conveyor and arranged to shear the sides of sheets as they are carried past the shears upon said conveyor.

3. A sheet shearing apparatus including an endless magnetic conveyor arranged to receive sheets to be sheared, and a plurality of co-operating shears located adjacent to said conveyor and arranged to shear the sides of sheets as they are carried past the shears upon said conveyor, and means for automatically energizing the magnetic conveyor as sheets are received thereon.

4. A sheet shearing apparatus including an endless magnetic conveyor arranged to receive sheets to be sheared, and a plurality of co-operating shears located adjacent to said conveyor and arranged to shear the sides of sheets as they are carried past the shears upon said conveyor, and means for automatically deenergizing the magnetic conveyor as sheets are delivered therefrom.

5. A sheet shearing apparatus including an endless magnetic conveyor arranged to receive sheets to be sheared, and a plurality of co-operating shears located adjacent to said conveyor and arranged to shear the sides of sheets as they are carried past the shears upon said conveyor, and means for automatically energizing the magnetic conveyor as sheets are received thereon, and means for automatically deenergizing the magnetic conveyor as sheets are delivered therefrom.

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

WILLIAM M. BLECKER.