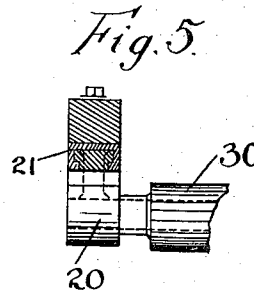
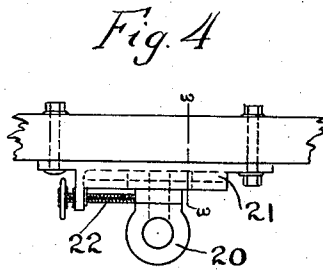
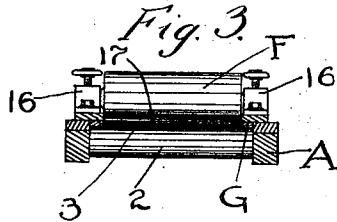
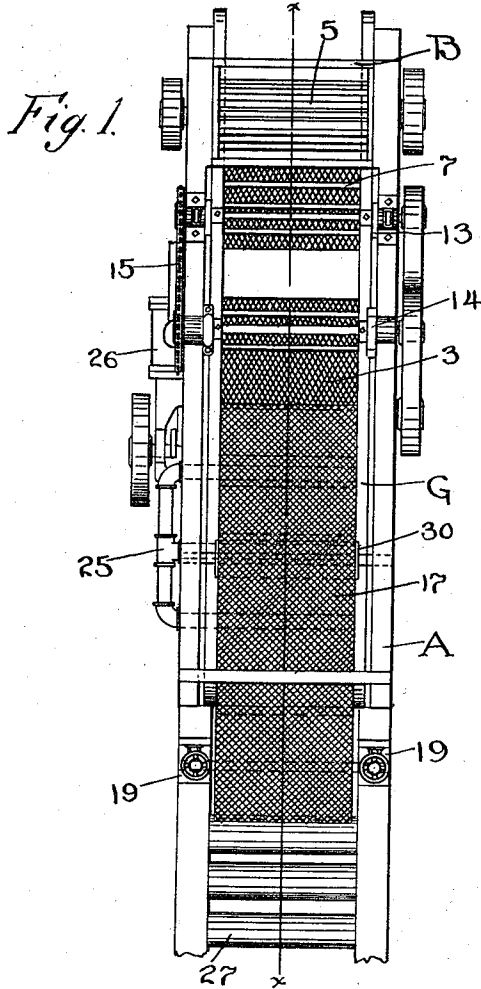


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MACHINE FOR FORMING CEMENTITIOUS INSULATING SHEETS.
APPLICATION FILED MAY 15, 1913.

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Patented May 25, 1915.
2 SHEETS—SHEET 1.



WITNESSES

Walter D. Macdonald
W. Swanson

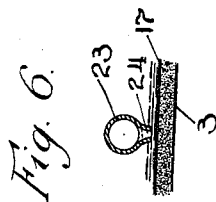
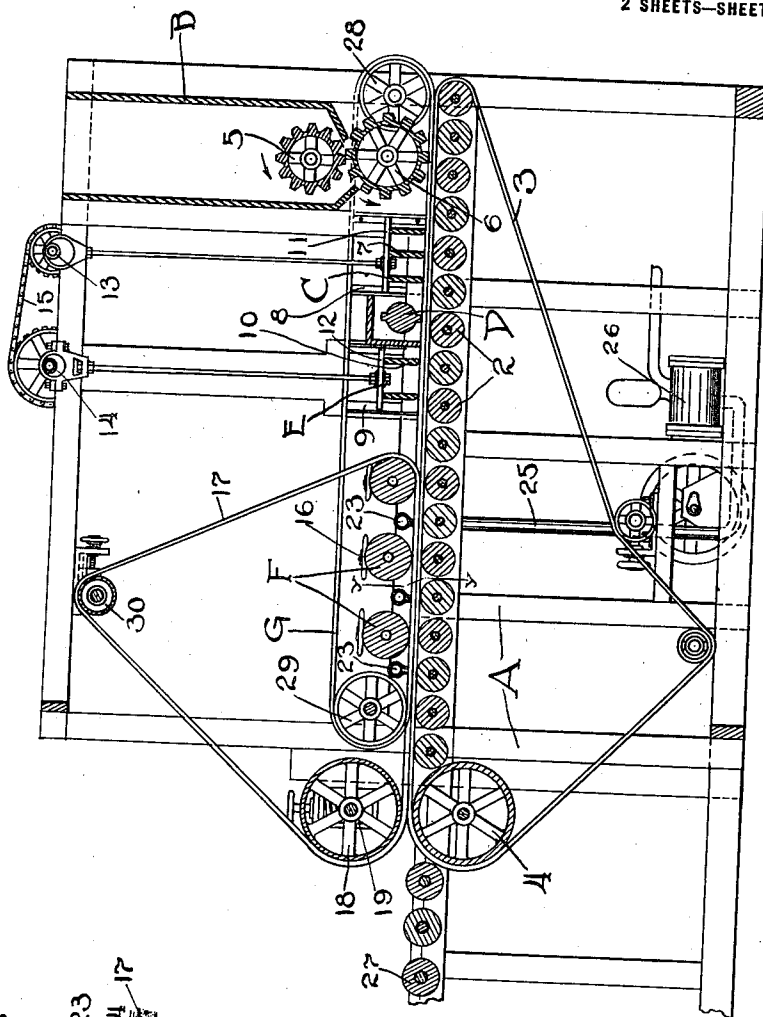
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Fig. 2.



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MACHINE FOR FORMING CEMENTITIOUS INSULATING-SHEETS.

1,140,601.

Specification of Letters Patent.

Patented May 25, 1915.

Application filed May 15, 1913. Serial No. 767,859.

To all whom it may concern:

Be it known that I, JAMES E. LAPPEN, a citizen of the United States, residing at Winona, in the county of Winona and State of Minnesota, have invented certain new and useful Improvements in Machines for Forming Cementitious Insulating-Sheets, of which the following is a specification.

My invention relates to improvements in machines for forming a wet mixture of cement and fiber into a continuous compressed sheet, its object being to provide improved means for carrying the material through the pressure rolls so that it will not adhere to the same, for extracting and removing the water therefrom, and for feeding the material to the traveling apron on which it is formed.

Where as is usually the case the wet material is carried upon a wire cloth or other reticulate apron under press rolls which work in contact with the material, difficulty has been experienced from the tendency of the material to cling to the rolls, and there has been no effective means of drawing off the water which is forced to the top of the mass by the pressure of the rolls, for the material is too thick and heavy to allow this water to drain down through it and through the meshes of the apron below.

The ingredients of the cementitious paste upon which the present machine is particularly designed to act are, preferably, hydraulic cement, mineral wool or asbestos fiber and alum, the latter being employed to set the cement to the mineral wool or asbestos fiber. These ingredients are mixed in a large amount of water, so that the asbestos or mineral wool fibers shall become separated and thoroughly mixed with the cement. This mixture, when reduced to a pasty mass is the stock which is fed to the machine.

With the foregoing object in view my invention consists in the construction, combination, and arrangement of parts herein-after described and claimed.

In the accompanying drawings forming part of this specification, Figure 1 is a top view of the machine; Fig. 2 is a longitudinal section through the middle of the machine on line $w-x$ of Fig. 1; Fig. 3 is a cross section on line $y-y$ of Fig. 2; Fig. 4 is a side view of the adjustable bearing for the screen-centering roller; Fig. 5 is a cross section through the same on line $w-w$ of Fig.

4; and Fig. 6 is a section through one of the suction pipes and the screens below.

In the embodiment of the invention shown in the drawings the invention comprises a relatively long framing A in which is a longitudinal way formed by a series of rollers 2 journaled in the framing, over which travels an endless reticulate apron or screen 3, consisting preferably of wire cloth, through which water can freely run. Near the delivery end of the machine the apron runs over a pulley or roller 4, which may be driven by appropriate mechanism (not shown) from any suitable source of power, and which itself drives the apron. The top reach of the apron passes first under a feed hopper B. Within the hopper just above the discharge opening in the bottom is a toothed wheel 5 which travels from right to left and feeds the material down, while below the hopper is another toothed wheel 6 in the nature of a doffer which runs in close proximity to the wheel 5 above and to the apron below, and receives and picks off the material from the wheel 5 and delivers it to the apron. As the wheel 6 turns in the same direction as the wheel 5, that is from right to left, the lower part of its periphery will run oppositely to the direction of travel of the apron, so that it will lay the material rearwardly upon the apron and draw the fibers backward lengthwise of the sheet. The wheel may be driven from any suitable source of power. The apron next passes under a tamper C which serves to distribute and compact the mass and to expel much of the water from it. The tamper C preferably has its operating face formed by a plurality of transverse ribs or bars 7. The tamper works in vertical guides 8. As the material is carried past the tamper C it is next acted on by a rotary planer or surface D, which is journaled in the frame and driven from right to left, or reversely to the direction of travel of the apron. The planer serves to even up the irregularities in the mass caused by the action of the tamper C, as well as to lay backward lengthwise of the sheet, any projecting fibers so as to strengthen the sheet and give it a smoother surface. After the material has been thus surfaced it is subjected to the action of a second tamper E which works in vertical guides 9. This tamper, like the tamper C, has its operative face formed, preferably, by a plurality of transverse ribs 10. The

tampers C and E may be mounted by means of carriers 11 and 12, respectively, upon eccentrics 13 and 14 carried by shafts having sprocket and chain connection 15 and adapted to be driven by appropriate mechanism from any suitable source of power. The apron then runs under a plurality of pressure rolls F supported in adjustable spring pressed bearings 16 of ordinary construction. These rollers are opposed to the rollers 2 over which the apron 3 travels. To prevent the rolls F from working directly upon and into the pasty material itself I have provided a second endless reticulate screen 17, made preferably of wire cloth, which travels under the rolls F above the apron screen 3 and in the same direction, so that the material will be carried through the rolls between these screens. The screen 17 after passing under the rolls F passes under and around a large driving pulley 18 mounted in spring pressed bearings 19 and opposed to the pulley 4 which drives the apron 3. The pulley 18 may be driven from any suitable source of power. The top reach of the apron passes over an idler pulley 30 having journal support in pivot bearings 20 having horizontally adjustable support in a guide-way 21 secured to the top of the framework and extending lengthwise thereof. The bearings can be adjusted in the guide-way by means of a hand screw 22.

To remove the water which rises above the screen 17 as the material passes between the rolls 2 and F I have arranged the following suction devices: Supported in any suitable manner just above the bottom reach of the screen 17 adjacent to and following each of the rolls F are a plurality of pipes 23 which extend across the machine and are formed in their underside with slotted in-haust openings 24. These pipes are connected with a suction pipe 25 leading to a suction engine 26, which may be operated from any suitable source of power. After the material has been carried by the screens 3 and 17 through the rolls 2 and F and between the pulleys 4 and 18, it is delivered from these pulleys in a continuous sheet upon a table consisting preferably of a series of rolls 27. While the material is being subjected to the action of the tampers, surfacers, and squeeze rollers, it is prevented from escaping at the sides of the apron by means of a pair of spaced endless deckel straps or belts G, which pass over rollers 28 and 29 positioned, respectively, near the feed and delivery ends of the apron. These rollers are arranged in such close proximity to the apron 3, that the lower reaches of the deckels rest upon the top reach of the apron, and are entrained and carried with it.

In use, the heavy cementitious material in

the feed hopper is fed down to the apron by the toothed wheels 5 and 6 upon the top reach of the apron 3, which carries it forward beneath the tampers and planner, whereby it is evenly spread and partially drained. After leaving the tamper E, the material meets the upper screen 17, and is carried forward between the screens 3 and 17 between the rolls F and 2. The pressure of the rolls 2 upon the screen 17 bring to the surface a considerable amount of water, which is drawn off as it forms through the suction pipes 23 and 25, as above described, leaving the compacted sheet sufficiently free of water to be delivered by the pulleys 4 and 6 in a comparatively dry self-sustaining sheet. The screen also prevents the pasty material from clinging to the rolls F, and make a fairly clean line of separation between the cement and the water squeezed up from it, for the cementitious material cannot work up through the screen 17.

I claim as my invention:

1. In a machine for forming cementitious material into compressed sheets, the combination with lower press rolls, of a supporting screen traveling over said rolls, a co-operating screen arranged above said supporting screen and traveling therewith, said screens being adapted to carry cementitious material between them, a succession of press rolls arranged above said upper screen and opposing said lower rolls whereby to press and work the material carried between said screens, and a succession of suction devices arranged between said upper rolls and in proximity to said upper screen, whereby to draw off the water forced up therethrough.

2. In a machine for forming cementitious material into compressed sheets, the combination with pressure instrumentalities, of an endless traveling apron adapted to carry said material into position to be acted upon by said instrumentalities, a feed hopper arranged above said apron, a pair of toothed wheels running in the same direction and oppositely to the direction of travel of the apron, one of said wheels working within the hopper near the mouth thereof, and the other wheel being arranged between said hopper wheel and said apron and working in close proximity to said hopper wheel and to said apron and adapted to pick the material from said hopper wheel and deliver it upon said apron and lay backward the fibers thereof.

In testimony whereof I affix my signature in presence of two witnesses.

JAMES E. LAPPEN.

Witnesses:

J. M. ZOOTH,
F. C. FANDON.