

No. 885,131.

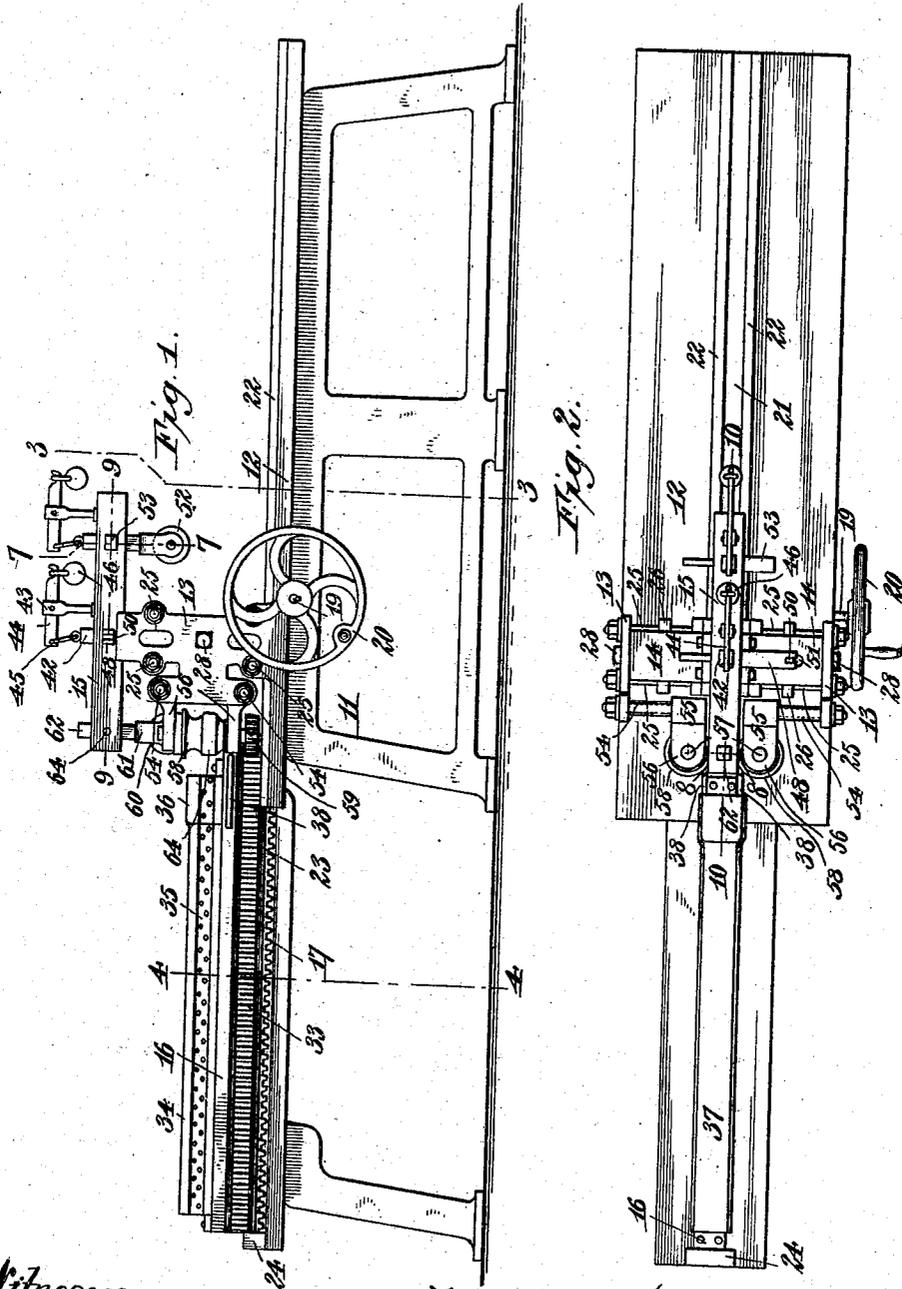
PATENTED APR. 21, 1908.

W. H. BAKER.

MACHINE FOR FORMING FIBER ARTICLES.

APPLICATION FILED OCT. 18, 1906.

3 SHEETS—SHEET 1.



Witnesses:  
Christ Feinle.  
Harry Rapp

William H. Baker, Inventor.  
By Emil Neuhart,  
Attorney.

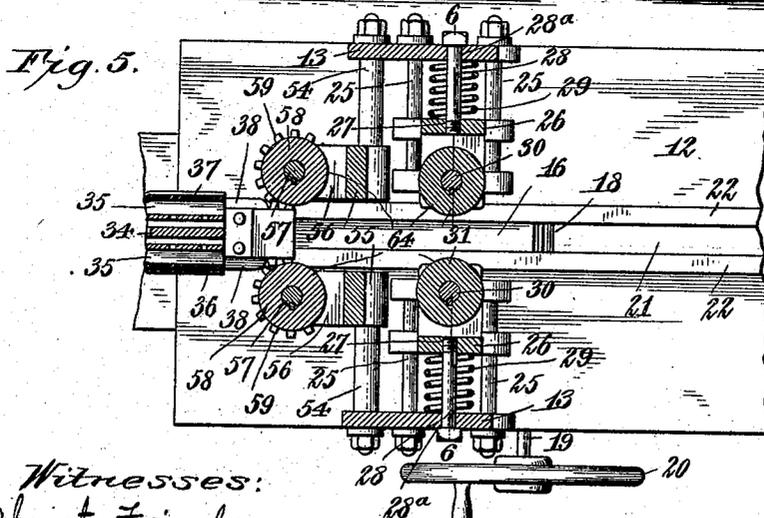
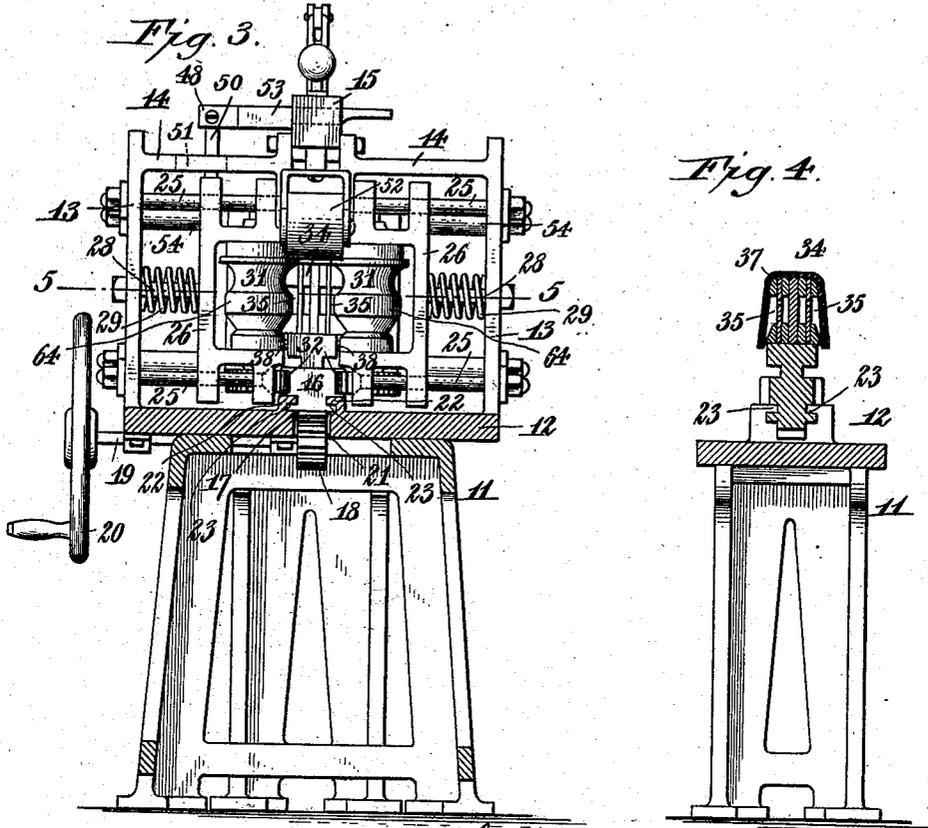
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

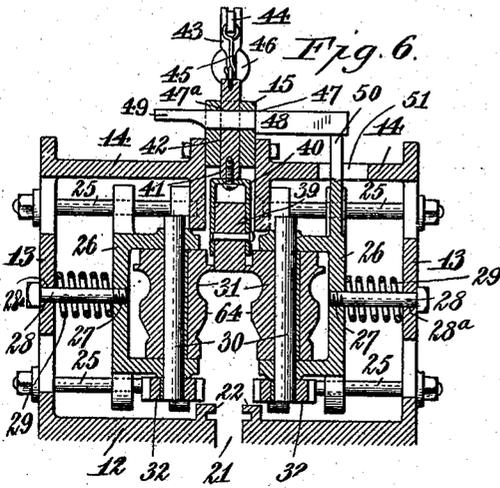


Fig. 7.

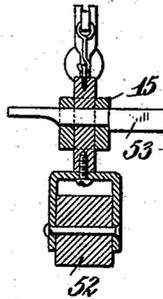


Fig. 8.

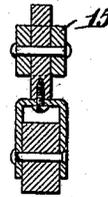


Fig. 9.

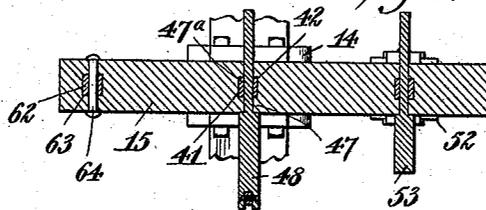
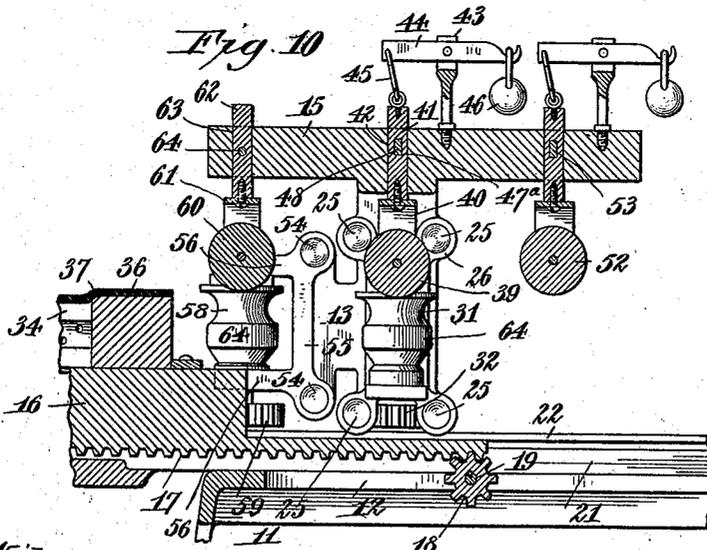


Fig. 10.



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# UNITED STATES PATENT OFFICE.

WILLIAM H. BAKER, OF LOCKPORT, NEW YORK, ASSIGNOR OF THREE-FIFTHS TO JESSE PETERSON, OF LOCKPORT, NEW YORK.

## MACHINE FOR FORMING FIBER ARTICLES.

No. 885,131.

Specification of Letters Patent.

Patented April 21, 1908.

Application filed October 18, 1906. Serial No. 339,526.

*To all whom it may concern:*

Be it known that I, WILLIAM H. BAKER, of Lockport, in the county of Niagara and State of New York, have invented certain new and useful Improvements in Machines for Forming Fiber Articles, of which the following is a specification.

My invention relates to machines for forming fiber articles, and more particularly to a machine in which sheets of fiber are pressed against a form and shaped to the outline of the form.

The object of my invention is the production of a machine which will effectively and quickly press and shape a sheet of fiber around a form, so that the article thus shaped may be clamped or otherwise held to the form and introduced into a heating-chamber for thoroughly drying the formed article.

The invention consists essentially in a suitable traveling-element on which the form is laid over which the fiber-sheet is to be shaped, and pressure-devices to press and shape the fiber sheet around the form.

It also consists in providing fixed and yielding pressure-devices so that a form of irregular outline may be passed through or between the pressure-devices with assurance that the fiber sheet will be pressed against the form at all points.

It further consists in the construction, arrangement, and combination of devices and parts to be hereinafter described and particularly pointed out in the subjoined claims.

In the drawings,—Figure 1 is a side elevation of my improved forming-machine. Fig. 2 is a top plan view of the same. Fig. 3 is an enlarged transverse section taken on line 3—3, Fig. 1. Fig. 4 is an enlarged transverse section taken on line 4—4, Fig. 1. Fig. 5 is a horizontal section through the pressure and forming-devices, taken on line 5—5, Fig. 3. Fig. 6 is a transverse vertical section taken on line 6—6, Fig. 5. Fig. 7 is an enlarged transverse section taken on line 7—7, Fig. 1. Fig. 8 is an enlarged transverse section taken on line 8—8, Fig. 2. Fig. 9 is an enlarged horizontal section taken on line 9—9, Fig. 1. Fig. 10 is an enlarged vertical longitudinal section taken on line 10—10, Fig. 2.

Referring to the drawings in detail, like numerals of reference refer to like parts in the several figures.

Although my invention is adapted for use

in forming articles of various shapes and for different purposes from sheets of fiber or other material possessing similar qualities, it is particularly designed for forming insulating coverings for rails, and the form and arrangement of parts herein shown as applying my invention in a representative way, may be changed without departing from the principle involved.

The reference numeral 11 designates a frame or support having a table or bed 12, and standards 13 having inwardly extending arms 14 between which is secured a horizontally disposed supporting-bar 15.

Slidable on the table or bed is a form-support 16 constituting a traveling-element having on its under-side a gear-rack 17 into which meshes a gear-wheel 18 secured to the operating-shaft 19 arranged transversely underneath the bed or table and having a crank-wheel 20 for conveniently operating the same. The bed or table is slotted, as at 21, and provided with longitudinal L-shaped guide-ribs 22 at the edges of said slot which fit into grooves 23 formed in the sides of the form-support, thus holding the said form-support in proper relation to the gear 18 on the operating-shaft and guiding the same in its movements. At the rear end of the bed or table, a stop 24 is provided to limit the form-support in its return movement. The standards 13 have guide-rods 25 secured thereto on which are supported roller-supports 26, each of which is provided with a threaded aperture 27 into which fit the threaded ends of studs 28 movable through apertures 28<sup>a</sup> in the standards 13. Between said standards and the roller-supports supported on the guide-rods thereof, are coil-springs 29 which tend to normally retain the roller-supports in their innermost position; the inner ends of said guide-rods being headed to limit the extent of inward movement of said supports. Journaled to revolve in each of said roller-supports is a vertically disposed shaft 30; and to said shafts pressure-rollers 31 are affixed. Gear-wheels 32 are secured to the lower ends of said shafts and are brought into mesh with gear-racks 33 on opposite sides of the form-support when the latter is moved forward, thereby causing said pressure-rollers to revolve.

34 represents a form having longitudinal side grooves 35 and an enlargement 36 at

one end. Over this form, a sheet of fiber 37 is laid while in moist condition so that it may be pressed against the form and assume the exact shape of the latter. On the form-support are opposite extensions or wings 38 which extend from the form-support a distance corresponding with the enlargement on the form; the rear end of said extensions terminating in line or approximately in line with the inner end of the enlargement on the form. Coöperating with said yielding-mounted rollers is a horizontally disposed pressure-roller 39 journaled to revolve in a roller-support 40 having a stem 41 extending upward through a vertical opening 42 in the supporting-bar 15. Secured to the upper side of bar 15 is an upright or arm 43 to which is pivotally secured a lever 44, connected at one end with the stem of the roller-support by a link 45, and having at its other end a weight 46 tending to hold said pressure-roller normally in its elevated position. The supporting-bar 15 is provided with a transverse slot 47, and the stem of said roller-support is also provided with a transverse slot 47<sup>a</sup> normally held in registration with slot 47. Passing through said slots is a retainer-bar 48 having a reduced end portion 49, and being connected with one of the roller-supports 26 by an arm 50 extending upward through a transverse-slot 51 in the inwardly extending arm 14 of one of the standards 13.

At the forward end of the supporting-bar 15 is a finishing-roller 52, which is somewhat wider than the pressure-roller 39, and the manner of supporting the same is similar to that of the roller 39. The retainer-bar thereof, however, which I will designate 53, is not connected to the roller-supports 26, or any other part of the machine, as it is actuated by hand. This will be more clearly set forth hereinafter, in explaining the operation of the machine. The rollers 31 and 39 constitute a set of yieldingly-mounted pressure-rollers adapted to press the sheet of fiber against the smaller or main part of the form.

Secured to each of the standards 13 are two supporting-rods 54, to which is fixedly secured a frame or casting 55 having rearwardly extending lugs 56, in which is mounted a vertically disposed shaft 57 having a pressure-roller 58 secured thereto between said lugs, and a gear-wheel 59 secured to its lower end. Gear-wheels 59 also engage with the gear-racks 33 on the sides of the form-supports and serve to revolve the pressure-rollers 58. By reason of the supporting-rods 54 and the frame 55 being fixedly secured to the standards, the pressure-roller 58 have a fixed position.

Coöperating with the pressure-rollers 58 is a horizontally disposed pressure-roller 60 revoluble in a support 61 having a stem 62 entering an opening 63 in the supporting-bar

15. A pin 64 passes through said bar and stem and holds said pressure roller in a fixed position. Rollers 58 and 60 constitute a set of pressure-rollers having a fixed position, and adapted to press the sheet of fiber against the enlarged end portion of the form. It is to be noted that in the shaping of the fiber sheet in the form herein shown, three sides of the form are to be covered with the sheet. The opposite vertical rollers of each set of pressure-rollers act against the sides of the form when carried forward between the rollers, while the upper or horizontally disposed roller of each set of pressure-rollers, acts against the top of the form.

Each of the horizontally disposed rollers of each set of pressure-rollers lie in contact with their coöperating side rollers, so that the fiber sheet is acted upon at all points. In the machine herein illustrated, each of the side pressure-rollers has an enlargement 64 to correspond to the side grooves 35 in the form, but as these forms differ in shape, the shape of the rollers must necessarily be changed to conform to the outline of the form.

The horizontal pressure-roller 52 I have termed a finishing-roller; since it acts against the fiber sheet when shaped over the form, to remove the slight ridge left by the roller where the horizontal roller of each set comes in contact with the vertical rollers.

The operation of the machine is as follows: The form over which the fiber sheet is to be shaped is placed upon the form-support 16 with the enlarged end 36 forward; the form-support being at the rear end of the machine. After this is done, the sheet of fiber in moist condition is placed over the form and bent or pressed down toward or against the sides of the form by hand. The operating shaft is now revolved to cause the form-support to travel forward, carrying the form between the pressure-devices, whereupon the fiber-sheet is first acted upon by the first set of pressure-rollers which have a fixed position, and act to press the fiber-sheet against the enlarged forward end of the form on the sides and top thereof. After the enlarged end of the form has passed between the first set of pressure-rollers and before the fiber-sheet comes in contact with the second or yieldingly-supported set of rollers, the extensions or wings 38 on the form-support engage the lower ends of the yieldingly-supported side pressure-rollers and force the same and their supports 26 outward against the action of the springs 29 so that the second set of rollers do not come in contact with that portion of the fiber-sheet shaped over the enlarged portion of the form by the first set of rollers, or at least do not exert undue pressure against the sheet at such point. Simultaneously with this action, the upper or horizontally disposed roller 39 of said set

of yieldingly-supported rollers is elevated to clear the top of that portion of the fiber-sheet formed over the enlarged end of the form, by causing the retainer-bar 48 to be moved outward in the slot 47 of the bar 15, so as to bring the reduced portion 49 thereof in line with the slot 47<sup>a</sup> in the stem of the roller-support 40, whereupon the weight 46 acts to elevate the pressure-roller 39 through the intervention of lever 44 and its connection to said stem.

The extensions or wings 38 clear the yieldingly-supported side rollers just as the smaller or main portion of the form reaches said rollers, at which moment the springs 29 act to return the roller-supports 26 to permit the yieldingly supported set of pressure-rollers to act against the fiber-sheet for the purpose of shaping the same over the remainder of the form.

In order that the finishing-roller may act upon the enlarged portion of the shaped article to remove the crease or edge formed by the contacting edges of the first set of rollers, the retainer-bar 53 is drawn outward by hand to bring the reduced portion thereof in line with the slot in the stem of the roller-support in which the finishing-roller is mounted. This action results in the roller being elevated in the same manner as the horizontal roller of the set of yieldingly-supported pressure-rollers; it being essential, however, that the extent of elevation be just sufficient to have said finishing roller bear against the enlarged portion of the shaped article. When the inner end of the enlarged portion of the shaped article reaches the vertical center of said finishing-roller, the operator forces the retainer-bar 53 inward to wedge said roller into its lower position, which is gaged to bring the roller in contact with the top of the smaller or main portion of the article. After the form and the shaped article thereon have been moved clear of the finishing-roller, they are removed from the machine, and the shaped article clamped against the form by means of suitable clamping-devices; after which they are placed in a drying-chamber to dry the article thus shaped. After the form and the article shaped thereon have been removed, the form-support is returned to the rear end of the machine by reversing the direction of movement of the operating-shaft, when another form is placed thereon and the same operation repeated.

It is to be understood that the form-support need not necessarily be given a rectilinear movement, nor is it necessary that the pressure-devices must consist of rollers, in order to embody the principle of my invention; it being apparent to any one skilled in the art to which this invention appertains that many equivalents may be substituted for the devices and parts herein combined for operation, and therefore I do not wish to

limit myself to the devices and parts herein shown as the preferred arrangement only, but desire the appended claims to be given the broadest interpretation permissible by the prior art.

Having thus described my invention, what I claim is,—

1. In a machine for forming articles from fiber sheets, the combination with a form over which a sheet of fiber is to be shaped, and yieldingly-mounted pressure-rollers adapted to press the fiber sheet against the form.

2. In a machine for forming fiber articles from fiber sheets, the combination of a traveling element adapted to carry a form over which a sheet of fiber is to be shaped, pressure-rollers having a fixed position and adapted to press the sheet against said form, and yieldingly-mounted pressure-rollers also adapted to press said sheet against the form.

3. In a machine for forming articles from fiber sheets, the combination with a frame, of a traveling element having a gear-rack and adapted to carry a form over which a sheet of fiber is to be shaped, an operating shaft having a gear in mesh with said gear-rack, and pressure-rollers above and on opposite sides of said traveling element to press the sheet of fiber against the form carried by said traveling-element.

4. In a machine for forming articles from fiber sheets, the combination with a frame, of a traveling element having a gear-rack and adapted to carry a form over which a sheet of fiber is to be shaped, an operating shaft having a gear in mesh with said gear-rack, pressure-rollers above and on opposite sides of said traveling element to press the sheet of fiber against the form carried by said traveling element, and a pressure-roller above the traveling element on a plane above the first mentioned pressure-rollers.

5. In a machine for forming articles from fiber sheets, the combination of a traveling element having opposite gear-racks and adapted to carry a form over which a sheet of fiber is to be shaped, of revoluble pressure-devices between which said form is to be passed on movement of said traveling element, said pressure-devices including gear-wheels adapted to mesh with said gear-racks to cause said pressure-devices to rotate when in contact with the fiber sheet on said form.

6. In a machine for forming articles from fiber sheets, the combination of a traveling element adapted to carry a form of irregular shape over which said fiber-sheet is to be shaped and having extensions to conform to the irregular shape of the form, and yieldingly-mounted pressure-rollers engaged by said extensions to cause said rollers to bear with even pressure against the fiber sheet at all points in the length of the form.

7. In a machine for forming articles from

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fiber sheets, the combination with a frame or support, of a traveling element movable on said frame adapted to carry a form of irregular shape over which the fiber-sheet is to be shaped and having extensions corresponding with the irregular shape of said form, a yielding-mounted frame, and pressure-rollers revoluble in said yielding-mounted frame adapted to press the fiber sheet against the form.

8. In a machine for forming articles from fiber sheets, the combination with a frame or support having a bed or table, a traveling element guided for rectilinear movement on said bed or table and adapted to carry a form of irregular shape over which the sheet of fiber is to be shaped, mechanism for actuating said traveling element, a pair of pressure-rollers arranged on opposite sides of and above said traveling element and having a fixed position, and a second pair of yielding-mounted pressure-rollers in rear of said first mentioned pair of pressure-rollers.

9. In a machine for forming an insulating covering from a fiber-sheet, the combination with a frame or support having a bed or table and standards rising from said bed or table, of an elongated form-support having a gear-rack on its underside and opposite side gear-racks, said form-support being adapted to carry an elongated form having an enlarged end and over which a sheet of fiber is to be shaped, an operating shaft having a gear in mesh with said first mentioned gear-rack, a horizontally supported pressure roller located above said form-support and having a fixed position, a pair of vertically supported pressure-rollers also having a fixed position, a yielding-mounted horizontally supported pressure-roller in rear of said first mentioned horizontally supported pressure-roller, and a pair of yielding-mounted vertically supported pressure-rollers in rear of said first mentioned pair of vertically supported pressure-rollers.

10. In a machine for forming articles from fiber sheets, the combination of a traveling form-support adapted to carry a form having an elevated portion over which a sheet of fiber is to be shaped, a horizontally disposed pressure-roller having a fixed location and adapted to press the fiber-sheet against the elevated portion of the form, and a vertically movable horizontally disposed pressure-roller yielding to the enlarged portion of the form and serving to press the fiber sheet against the remaining portion of the form.

11. In a machine for forming articles from fiber sheets, the combination with a frame or support, of a traveling form-support adapted to carry a form having an enlarged portion and over which a sheet of fiber is to be shaped, said form-support having extensions on opposite sides coincident with

the enlarged portion of the form carried thereon, a set of pressure-rollers having a fixed position and serving to press the fiber sheet against the enlarged portion of the form, and a set of yielding-mounted pressure-rollers moved away from the form by said extensions on the form-support and adapted to press the fiber sheet against the smaller or remaining portion of the form when disengaged from said extensions.

12. In a machine for forming articles from fiber sheets, the combination with a frame or support, of a movable form-support adapted to carry a form over which a sheet of fiber is to be shaped, guide-rods secured to said frame or support, a roller-supporting-frame movable on said guide-rods, a spring serving to retain said roller-supporting-frame in its innermost position, and a pressure-roller carried by said roller-supporting-frame and adapted to press the fiber sheet against the form.

13. In a machine for forming articles from fiber sheets, the combination with a frame or support, of a movable form-support adapted to carry a form over which a sheet of fiber is to be shaped, a bar secured to said frame and having intersecting slots arranged at right-angles, a roller-support having a stem passing through one of said intersecting slots and provided with an opening adapted to register with the other of said intersecting slots, a pressure-roller mounted in said roller-support adapted to press the fiber sheet against one side of the form, a retainer-bar passing through the last mentioned of said intersecting slots and the opening in the stem of the roller-support and having a reduced portion, means tending to draw said roller-support outward, guide-rods on the frame or support, a roller-supporting-frame guided for movement on said guide-rods and having connection with said retainer-bar to bring the reduced portion thereof in line with the stem of said roller-support when said roller-supporting frame is moved outward so as to permit the said pressure-roller to move outward, a spring serving to retain said roller-supporting frame in its inner position, and a pressure roller mounted in said roller-supporting frame.

14. In a machine for forming articles from fiber sheets, the combination of a frame including a bar having intersecting slots arranged at right-angles; a roller-support having a stem passing through one of said intersecting-slots and provided with an opening registering with the other of said intersecting slots, a retainer-bar passing through the latter slot and the said opening and having a reduced portion, said retainer-bar normally holding said roller-support in its innermost position, a pressure-roller mounted in said roller-support to be moved outward when

the retainer-bar is moved to bring the reduced portion thereof in line with the opening in the stem of said support.

5 15. In a machine for forming articles from sheet fiber or the like, the combination of a movable element adapted to carry a form of irregular shape over which a sheet of fiber is to be shaped, and pressure-devices between which the form is moved, each of said pressure-devices acting to shape the sheet of fiber  
10 over different portions of said form.

16. In a machine for forming articles from sheet fiber or the like, the combination of a rectilineally movable element, and a removable form thereon over which a sheet of  
15 fiber is to be shaped, of pressure-devices in-

cluding rollers adapted to press the fiber sheet against the form.

17. In a machine for forming articles from fiber sheets or the like, the combination with  
20 a movable element, of a removable form thereon over which sheets of fiber are to be shaped, and pressure-devices including rollers corresponding with the outline of that portion of the form with which they cooperate.  
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In testimony whereof, I have affixed my signature in the presence of two subscribing witnesses.

WILLIAM H. BAKER.

Witnesses:

WALTER A. PLANT,  
LAWRENCE HOOKER.