

(No Model.)

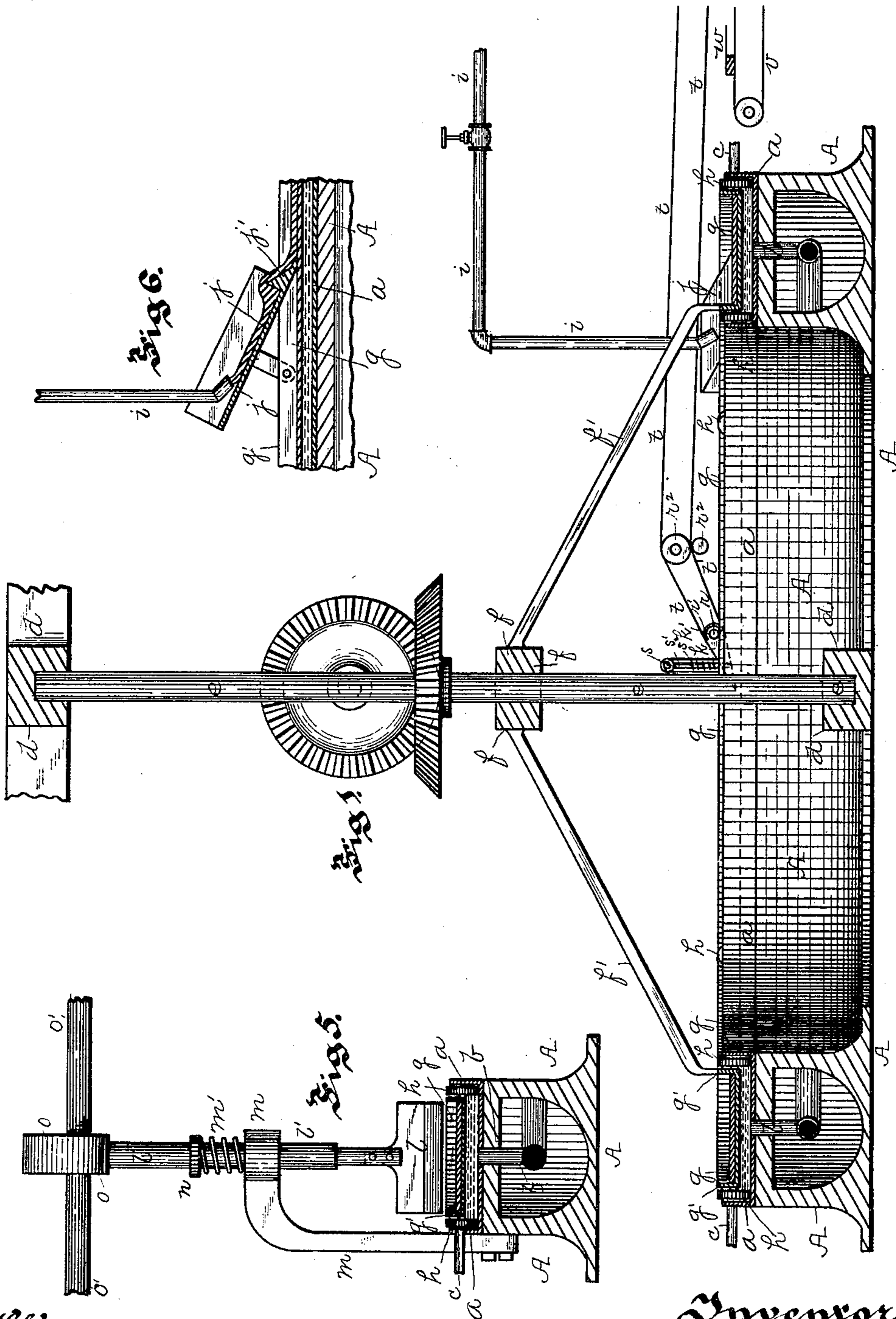
2 Sheets—Sheet 1.

C. KELLER.

APPARATUS FOR SETTING AND LAYING GLUE.

No. 386,590.

Patented July 24, 1888.



Witnesses:
J. H. Rooker
J. E. Barnes.

Inventor.
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By James D. Ray,
Attorney.

(No Model.)

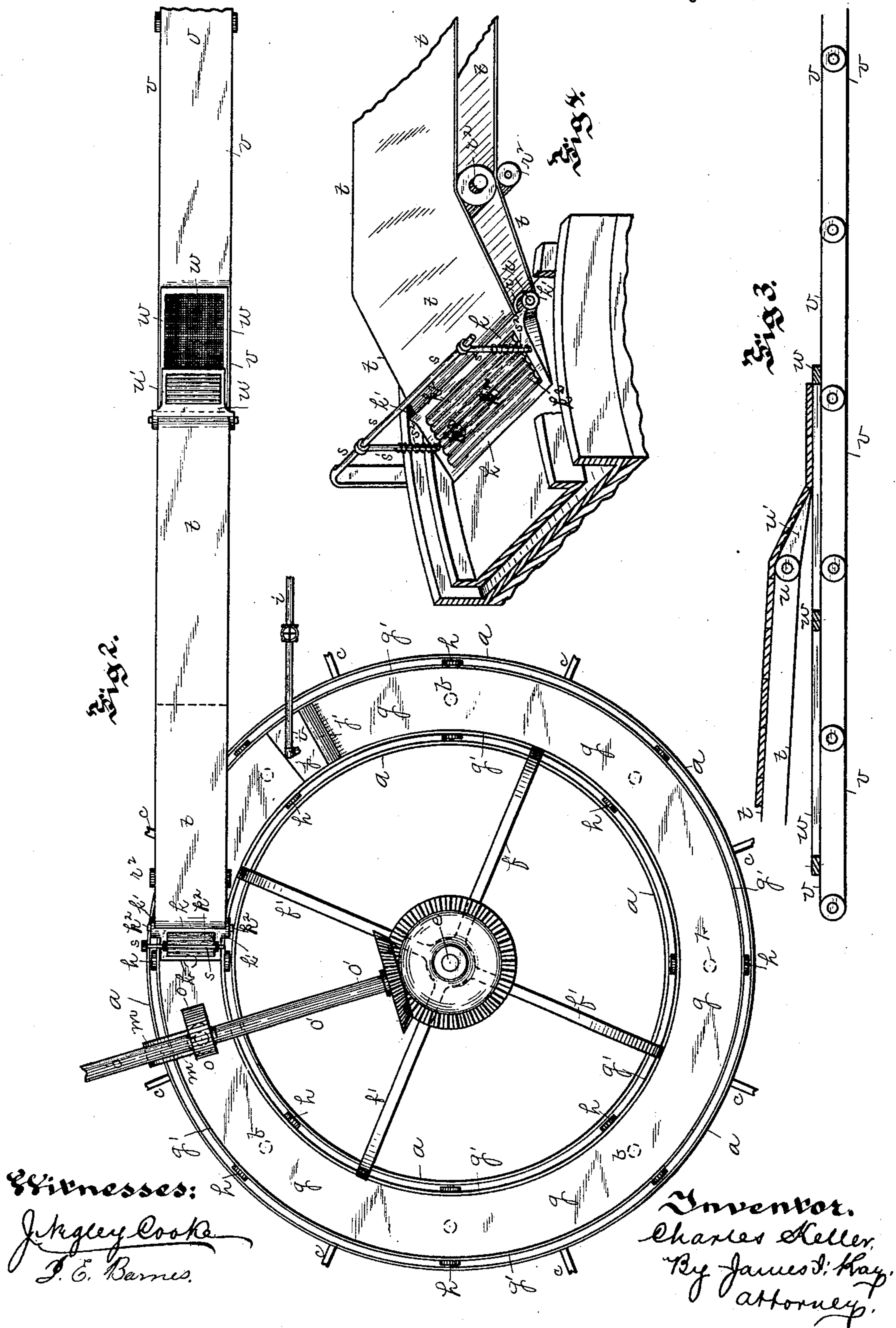
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UNITED STATES PATENT OFFICE.

CHARLES KELLER, OF SPRINGDALE, PENNSYLVANIA.

APPARATUS FOR SETTING AND LAYING GLUE.

SPECIFICATION forming part of Letters Patent No. 386,590, dated July 24, 1888.

Application filed July 29, 1887. Serial No. 245,591. (No model.)

To all whom it may concern:

Be it known that I, CHARLES KELLER, of Springdale, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Setting and Laying Glue; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to the manufacture of glue, and more especially to an apparatus for setting and laying the glue. Heretofore this method has been carried out by two methods. In the first the hot glue is run into large and deep setting-pans, which when filled were placed in cooling-rooms and allowed to stand until the glue had gelatinized or set. The mold or cake of glue thus formed was then turned out of the pan on a suitable table and cut into strips by pressing down on it a frame having a series of transverse wires strung thereon, these strips or slices being thrown by hand upon a drying-frame consisting of a net stretched upon a suitable frame, which drying-frame, when covered by the glue strips, was placed in a drying oven or room, where the glue was thoroughly dried. As these operations were performed by hand, they required a number of men and boys, were necessarily slow, and the amount of material which could be set and prepared for the drying oven or room was not as large as the economical working of the glue required.

In the second method the hot liquid glue is applied to the outer periphery of a vertical drum which is cooled by iced water in its interior, the glue dropping off the drum as a sheet, or it is scraped off in pieces after the drum has made part of a revolution, and it is deposited on an endless belt, which conveys it to a suitable point, where it is fed by hand to the drying-frames. The objection to this apparatus, however, is that the thickness of the sheet of glue formed is not readily regulated, and unless the liquid glue is very thick it is not set properly by the time it leaves the drum. A further disadvantage is that the speed at which the apparatus can run is so slow that it does not afford an economical method of procedure.

To avoid these objections and provide an apparatus in which the hot glue will be continuously set or congealed in a sheet of uni-

form thickness, as well as one which will automatically cut the glue sheet into strips or slices and carry and feed these strips onto the drying nets or frames and carry the frame to the ovens or other suitable point is the object of my invention.

To these ends the invention consists in setting or congealing the glue into a continuous sheet, cutting said sheet into strips, and finally stripping said strips from the setting or congealing pan or mold and conveying it away.

The invention also consists in a setting or congealing pan or mold moving in a water-cooled trough, by which the hot glue as it is fed onto the pan from the supply-pipe is set or congealed into a sheet of glue. And the invention further consists in combining with the moving mold or pan a knife for cutting the set or congealed glue into strips or slices, and a device for stripping these slices or the sheets from the pan and conveying them to the drying-frames; and the invention also consists in certain other improvements, all of which will be more fully hereinafter set forth.

To enable others skilled in the art to make and use my invention, I will describe the same, referring to the accompanying drawings, in which—

Figure 1 is a central vertical section of my improved apparatus. Fig. 2 is a plan view of the same; Fig. 3, a detail view showing the manner of feeding the slices onto the drying-nets. Fig. 4 is a detail perspective of the stripping-apron, which strips the slices or strips from the congealing-pan and delivers them to the conveying-table. Fig. 5 is a detail view of the cutting device, and Fig. 6 is a detail view of the arrangement used to obtain a uniform laying of the hot glue on the surface of the congealing-pan.

Like letters refer to like parts in each of the figures of the drawings.

In its preferable form the setting or congealing part of the apparatus consists of an annular trough, *a*, which is supported on a suitable frame, *A*, this trough being provided at intervals with water-inlet pipes *b*, preferably in its bottom, and water outlet pipes *c*, preferably from the sides, so that the trough can be kept filled with a constant supply of cold water flowing through it. In the center of the frame which supports this trough is jour-

naled in suitable bearings, *d*, a vertical shaft, *e*, which has keyed to it a hub, *f*, having radiating arms *f'*, which are secured preferably to the inner side flanges of an annular congealing-pan, *g*, that rests or floats in the annular water-trough *a*. This congealing pan has side flanges, *g'*, of a height sufficient to prevent the water in the trough *a* from flowing into the pan and destroying the consistence of the glue, and it is supported in the trough *a*, so as to be partly immersed in the water, by the arms *f'* only, or, if desired, in addition to the arms, by a series of rollers, *h*, journaled on the under side of the pan, which rollers rest and travel on the bottom of the trough. Instead of the rollers running on the bottom of the water-trough they can be supported on suitable arms extending over the edges of the water-trough and travel on a suitable track on the frame. The setting or congealing pan is rotated in the trough by some suitable motive power being applied to the shaft *e*, and as the pan rotates the hot glue is fed upon the surface of the pan by a supply-pipe, *i*, which is provided with suitable valves for regulating the amount of outflow of glue.

In order to insure that the glue will be distributed in an even sheet over the surface of the pan, I prefer to allow the hot glue to fall first upon an inclined chute, *j*, which is provided at its lower end with a weir or dam piece, *j'*, having an inclined outer face, over which the glue falls and distributes itself on the pan. This sheet of glue is gradually set or congealed by the cooling effect of the water in the trough *a* on the pan as the latter rotates around the shaft *e*, and, at a point where the glue is sufficiently congealed, it is cut into strips or cakes by a suitable knife mounted on the trough-frame. This knife may be of any suitable construction, that shown in the drawings, Fig. 5, being a vertically-reciprocating knife-blade, *l*, attached to a rod, *l'*, sliding in guides in the overhanging arm *m*, secured to the side of the trough-frame *A*, and being raised by the spring *m'*, which is held between the upper surface of the arm *m* and a collar, *n*, secured to the rod. To depress this rod and operate the knife automatically, a cam, *o*, is placed on a counter-shaft, *o'*, geared to the main shaft *e*, or other suitable source of power, and by proportioning this gearing and the size of the cam *o* the size of the slices of the glue-sheet may be varied, as the faster the knife reciprocates the smaller the slices, or the slower the knife reciprocates the larger will be the slices if the pan rotates at the same speed. The knife *l* may also be reciprocated by an eccentric on the counter-shaft *o*, in place of the arrangement heretofore described, and, in fact, it is not essential to my invention that any particular form of knife-operating mechanism is employed, as there are many forms which are well adapted for the purpose.

Immediately in the rear of the knife, or nearly so, is the stripper and delivery device for stripping the slices from the pan *g* and conveying

and delivering them onto the drying-nets, this part of the apparatus being preferably arranged tangentially to the congealing-pan for convenience in operating. The stripper consists of an inclined apron, *k*, which is pivoted by ears *k'* to the ends of a roller-spindle, *r*, at the inner end of the conveying-table, hereinafter described. This apron is preferably wedge-shaped in section, and rests at its lower end on the bottom of the congealing-pan *g*, between the side walls of the latter, and for the purpose of easing the travel of the glue cakes or strips upward on the apron it may have a series of anti-friction rollers, *k''*, on its face. If the weight of the apron is not sufficient to hold it firmly against the bottom of the pan, it may be held down by springs, as shown in the drawings, in which case an overhanging arm, *s*, is attached to the outer side of the trough-frame, which arm has the downwardly-projecting rods *s'*, which pass through holes in the outer edge of the apron, and have coiled springs *s''* confined between the arm and the upper surface of the apron. Any other suitable means for holding this apron down on the surface of the pan *g* by a yielding pressure may, however, be employed. The roller-spindle *r*, to which the stripping-apron *k* is pivoted, carries a roller, *r'*, over which an endless conveying-belt, *t*, passes, which forms the conveying-table, this belt also passing over and between two idle-rollers, *r''*, suitably supported back of the roller *r'*, which rollers give to the belt a suitable elevation, and, finally, the belt passes over a driving-roller, *u*, at the point where the glue strips are to be delivered to the drying-frames. At the end of this conveying-belt *t* is an inclined delivery-apron, *u'*, which may be similar in construction to that heretofore described, and delivers the glue strips onto the drying-frames *w*, which are placed upon a table under this apron. These frames may, however, be automatically carried along under the apron, so as to distribute the glue strips uniformly over their surface, and then be carried to the point where they are to be placed in the drying-oven. To accomplish this an endless moving belt, *v*, is placed under the delivery-apron *u'*, on which belt the frames *w* are placed at one end, so that they will be carried under the apron *u'*, and thence by the belt to the oven or other point where the frames are to be taken off. These conveying-tables are supported upon a suitable frame, or by hangers from the roof of the room in which they are located.

The operation of the apparatus is as follows: The glue coming out of the supply-pipe *i* flows down the chute *j* and is checked by the dam *j'* until it accumulates a sufficient amount to flow over the dam, which it will do in a uniform sheet onto the rotating pan *g*. The glue is thus laid upon this pan *g* in a sheet as the pan moves under the chute *j*, and as the pan moves around in the cold water of the trough *a* this sheet of glue becomes gradually set or congealed until it is thoroughly set by the time it

reaches the knife *l*. The sheet is there cut by the knife *l* into strips of the right size, and as the pan moves from the knife these strips or slices are stripped from the pan by the apron *k*, sufficient impact being given to the strips by the motion of the pan to carry them up to the moving conveying-table. This table, by its traveling belt *t*, conveys the glue strips to the drying-frames *w*, which are conveyed to the ovens by the conveying-belt *v*, or moved by hand to the ovens, as desired. These frames are of the ordinary construction—that is, a frame having a suitable net stretched thereon. It will thus be seen that the entire operation of setting the glue, cutting it into strips, and spreading these strips on the drying-frame is performed automatically and rapidly by the apparatus, so that a large amount of material can be treated in a short time.

The apparatus does not require more than two men or boys for its operation, which is a very material reduction in the amount of labor heretofore required to do the same work. My improved apparatus is also capable of being used to congeal and harden other substances than glue, which are to be cast into cakes or strips, such as candy, starch, &c.

Having now described my invention, what I claim is—

1. In an apparatus for manipulating glue, the combination of a continuously-moving mold, a supply-pipe for delivering glue to the same, and a reciprocating knife mounted on the supporting-frame across the pan for cutting the glue into strips, substantially as and for the purpose set forth.

2. In an apparatus for manipulating glue, the combination of an annular trough, means for supplying the same with water, and an annular congealing-pan supported within said trough, substantially as and for the purpose set forth.

3. In apparatus for manipulating glue or like substances, the combination of a continuously-moving congealing-pan, a knife mounted on the supporting-frame for cutting the congealed glue into strips in the pan, and a stripper in the rear of said knife for stripping said strips from the pan, substantially as and for the purpose set forth.

4. In apparatus for manipulating glue and

like substances, the combination of a continuously-moving congealing-pan, a cooling-trough in which the same travels, a stripper for stripping the congealed glue from the pan, and a conveyer back of said stripper for conveying the strips away from the pan, substantially as and for the purpose set forth.

5. In apparatus for manipulating glue, the combination of a continuously-moving congealing pan or mold, a stripper for stripping the glue from the pan, a conveyer back of said stripper, and a continuously-moving table under the end of the conveyer for the support of the drying-frame, substantially as and for the purpose set forth.

6. In apparatus for manipulating glue, the combination, with an annular trough, of means for supplying the same with a continuous current of water, with an annular rotating congealing-pan supported by a vertical shaft in said trough, substantially as and for the purpose set forth.

7. In apparatus for manipulating glue or like substances, the combination of a continuously-moving mold or pan, a cooling-trough in which the same travels, and a stripper for stripping the congealed glue from the pan and conveying it away, substantially as and for the purpose set forth.

8. In an apparatus for manipulating glue, the combination of the water-trough *a*, congealing-pan *g*, rotating in said trough, a stripper, *k*, held down against the surface of said pan, and a conveying-table, *t*, in the rear of said stripper for conveying the material away, substantially as and for the purpose set forth.

9. In the apparatus for manipulating glue, the combination of a water trough, *a*, the congealing-pan *g*, rotating in said trough, a knife, *l*, supported by said trough, a stripper, *k*, held down against the surface of said pan in the rear of said knife, and a conveying-table, *t*, in the rear of said stripper for conveying away the material, substantially as and for the purpose set forth.

In testimony whereof I, the said CHARLES KELLER, have hereunto set my hand.

CHARLES KELLER.

Witnesses:

N. S. STOCKWELL,
JAMES I. KAY.