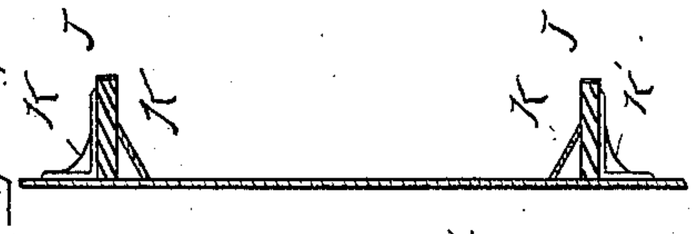
(No Model.) 2 Sheets—Sheet 1.

# R. T. WRAY & J. THOMSON.

## MACHINE FOR MAKING ROOFING.

No. 351,557. Patented Oct. 26, 1886.

Fig. 3.




SEC. ON J—J'.

Fig. 1.

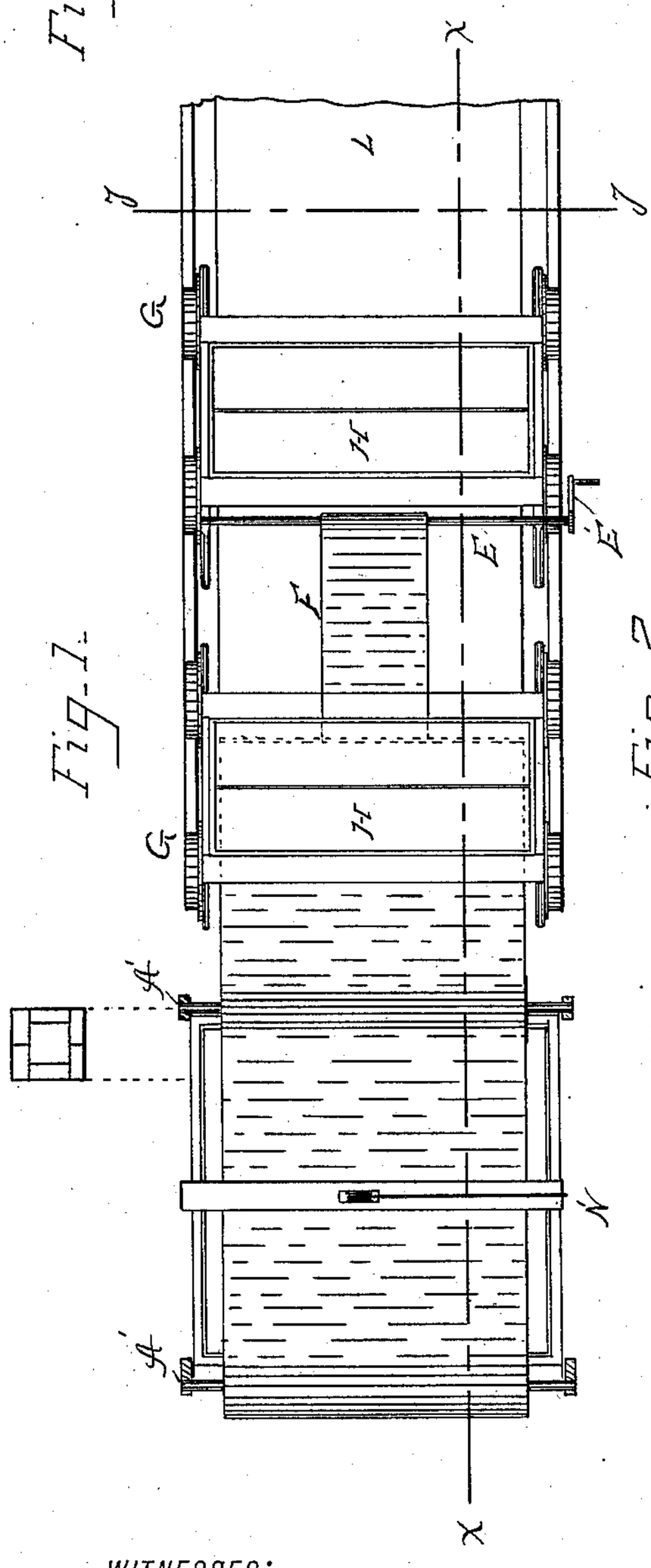
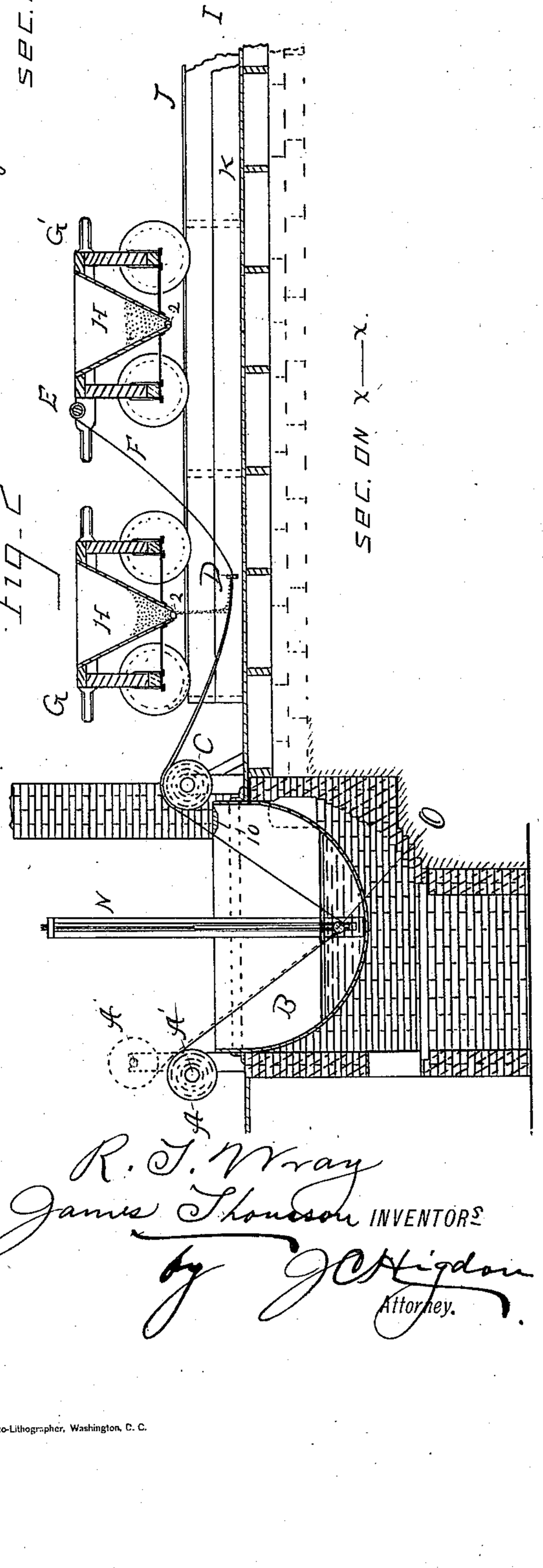



Fig. 2.




SEC. ON X—X.

WITNESSES:
M. S. Higdon
Geo. B. Paxton

R. T. Wray
James Thomson INVENTORS
by J. C. Higdon
Attorney.

(No Model.) 2 Sheets—Sheet 2.

# R. T. WRAY & J. THOMSON.

## MACHINE FOR MAKING ROOFING.

No. 351,557. Patented Oct. 26, 1886.

Fig. 4.

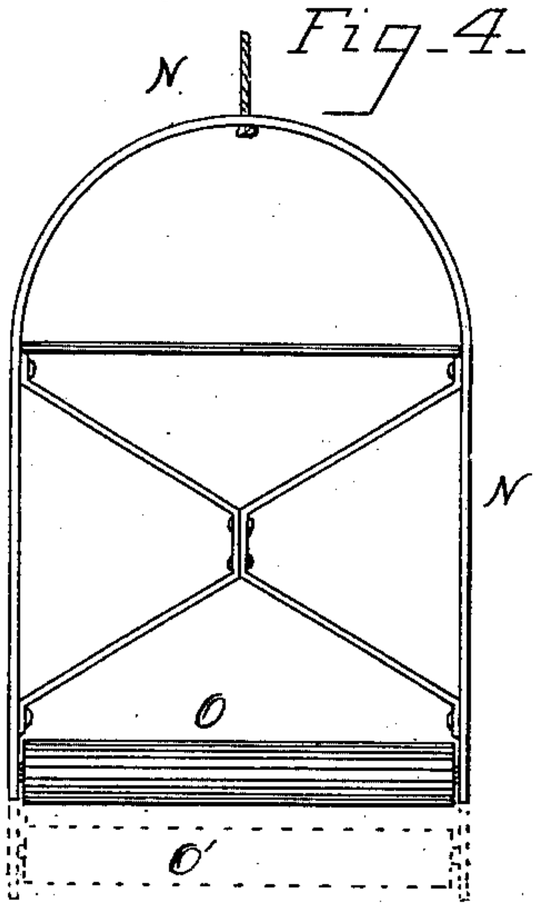



Fig. 5.

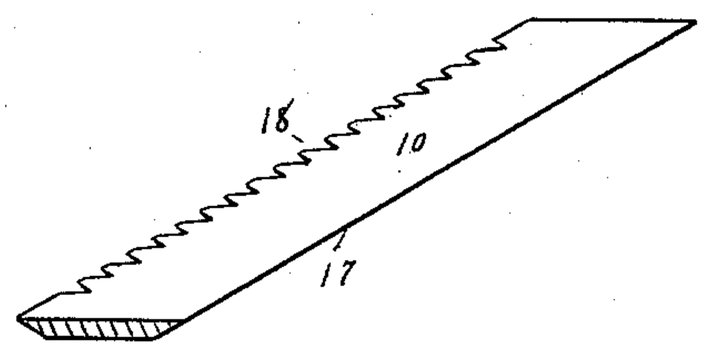



Fig. 6.

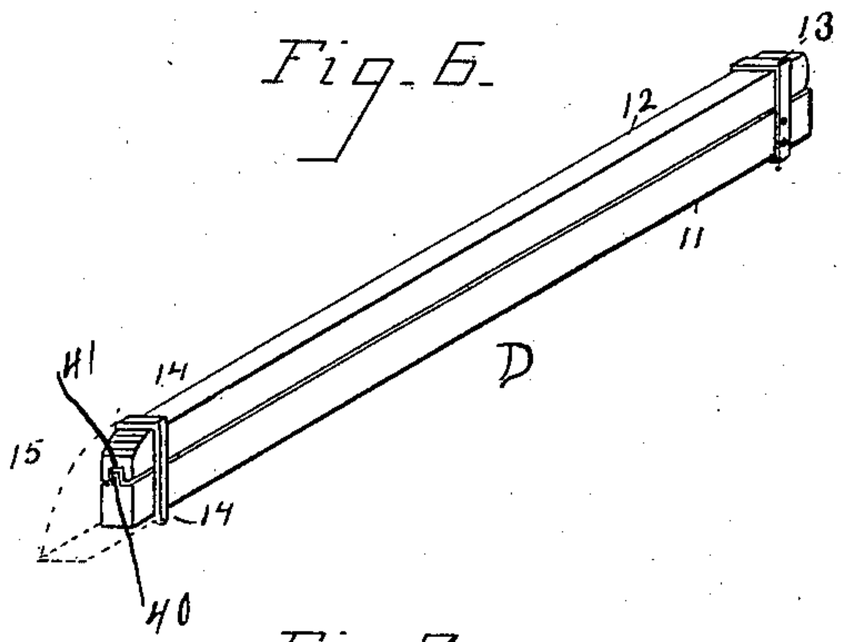
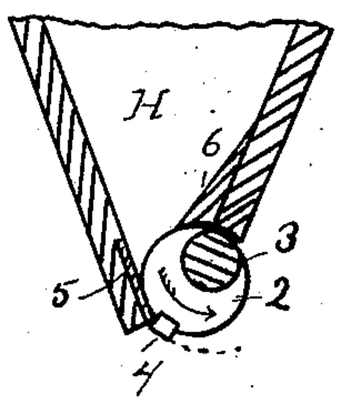
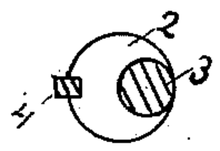



Fig. 9.




SECTION X—X.

Fig. 7.

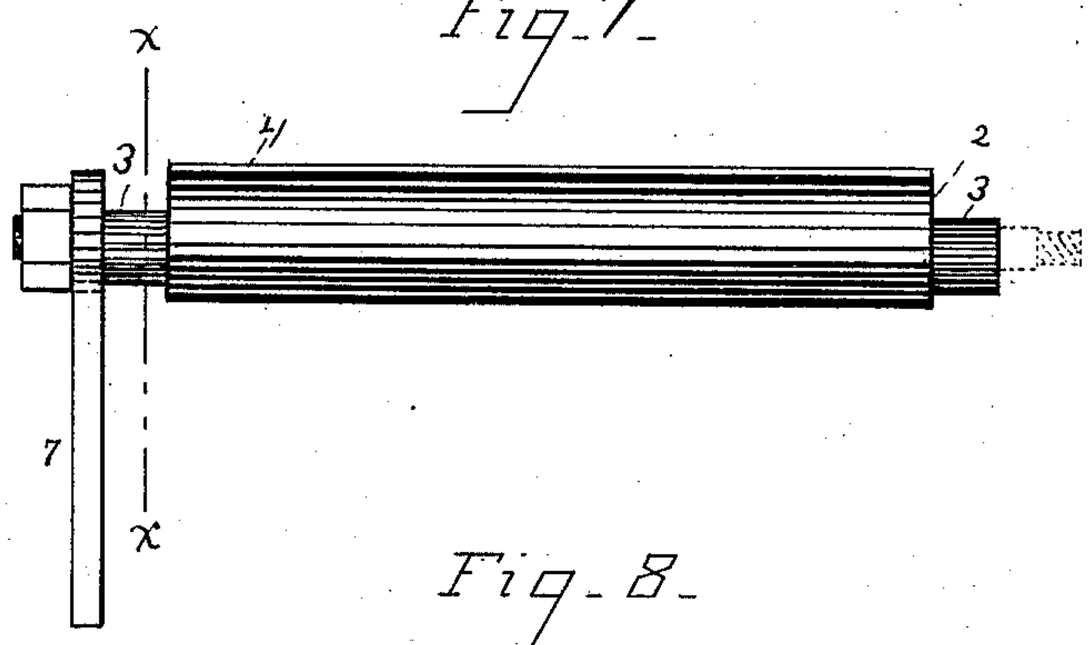
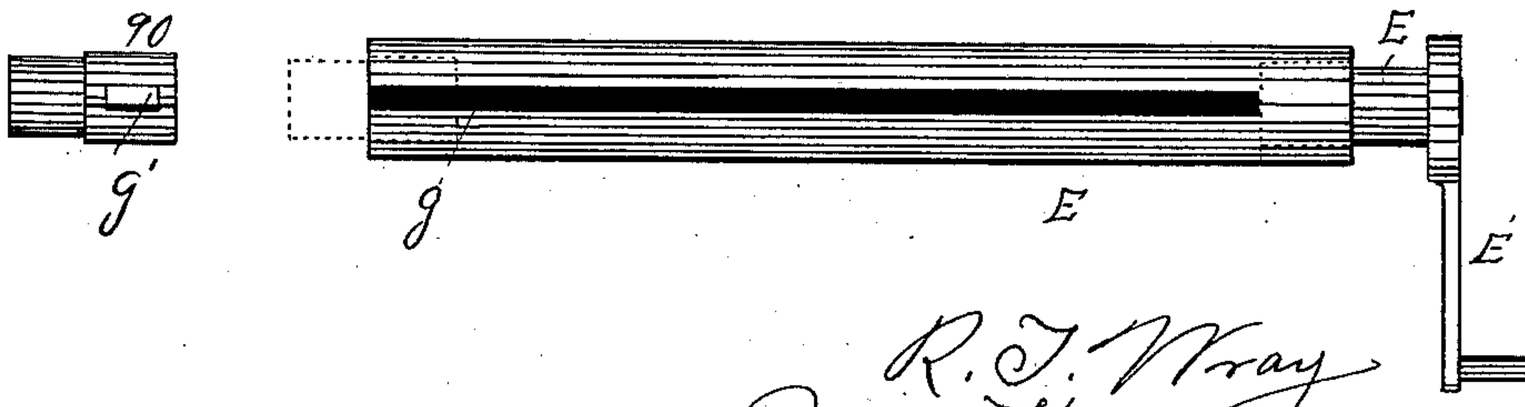



Fig. 8.




WITNESSES:
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INVENTORS
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# UNITED STATES PATENT OFFICE.

ROBERT T. WRAY AND JAMES THOMSON, OF KANSAS CITY, MISSOURI.

## MACHINE FOR MAKING ROOFING.

SPECIFICATION forming part of Letters Patent No. 351,557, dated October 26, 1886.

Application filed June 15, 1886. Serial No. 205,207. (No model.)

*To all whom it may concern:*

Be it known that we, ROBERT T. WRAY and JAMES THOMSON, of Kansas City, Jackson county, Missouri, have invented certain new and useful Improvements in Machines for Making Roofing, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part hereof.

Our improvements relate to an apparatus to be used in the manufacture of fabrics of different kinds into what is commonly known as "ready-made roofing;" and the invention may be said to consist in the devices and the combination and arrangement of devices hereinafter described, and pointed out in the claims.

In the accompanying drawings, which represent the method of carrying out our invention, Figure 1 is a plan view of the apparatus. Fig. 2 is a longitudinal section through the same on line *x x*, Fig. 1. Fig. 3 is a transverse section on line *y y*, Fig. 1, through the combined track upon which the traveling hoppers are supported and the trough into which the sheets are deposited after being sanded. Fig. 4 is a detail view of the movable gate that is located in the vat for holding the fabric beneath the surface of the liquid therein contained. Fig. 5 is a perspective view of a double-edged scraper, also located in the vat, for the purpose of removing a portion of the liquid from the fabric as it issues from said vat. Fig. 6 is a perspective view of a clamp used in uniting the ends of two or more sheets. Fig. 7 is a detail view of an eccentric roller located at the bottom of the bins or hoppers for the purpose of controlling the discharge of the granitic substance therein contained. Fig. 8 represents a hollow mandrel that is used in drawing or winding the fabric from the vat, and which is also used in wrapping up the finished goods. Fig. 9 is a detail section of a portion of the bin or hopper and the eccentric feeding-roller.

In carrying out the invention we make use of a vat, B, in which the tar or similar material is heated and applied to the fabric, and which may be of any approved construction. The vat B is placed near one end of a combined track and trough, I, so that the car G, carrying the hopper H, can approach the vat as near as possible. Another car, G′, very similar in construction to the car G, is located on the track behind the car G, and it carries a hollow mandrel, E, to which the apron F is attached at one end.

An eccentric feed-governing roller, 2, is located at the bottom of the hoppers H, and it is operated by a hand-crank, 7, which may be attached to either of its ends, as may be desired, so that it can be operated from either side of the trough. The operation and construction of this roller are as follows: It is journaled in the hopper eccentrically—that is, the journals 3 are located away from the actual center of the roller, and along its side that is diametrically opposite the said journals a feather or a strip, 4, is inserted securely in a groove. Extending along one side of the opening in the bottom of the hopper is a metal strip, 5, the purpose of which is to form a solid seat or bearing for said feather 4, and against which said feather is forcibly seated when the feed is shut off. Another strip, 6, which may be either of wood or of metal, is located in the hopper just above the roller 2, and it is attached to one side of the hopper and extends down very near to the outer surface of said roller, and the purpose of which is to guide the sand or other substance in its passage between the metal plate 5 and the feather 4. With this construction, then, it should be obvious that by turning the roller toward the left hand in Fig. 9 the feather 4 will be removed from the plate 5, and the sand will be allowed to feed through the bottom of the hopper and down onto the fabric beneath, as shown more clearly in Fig. 2.

The combined track and trough I is composed of a bottom, L, which should have a width corresponding to the width of the fabric that is to be worked, sides or rails, J, which should be faced with metal to withstand the wear occasioned by the wheels of the cars, guide-boards K, placed inside the trough and inclined outwardly, and braces K′, located on the outside of the trough at suitable distances apart, for the purpose of preventing the sides J from spreading apart.

The function of the guide-boards K is as follows: In lowering the sheets to the bottom of

the trough they would not lie evenly if some sort of means were not used to keep their respective edges parallel. Therefore, as the sheets are being lowered their edges will first come in contact with the inclined guide-boards K, and they will thereby be guided properly to place, one upon the other in the trough.

The gate N, for depressing the fabric in the vat, is located in a suitable framing above the said vat, so that it can be raised or lowered by means of the suspending-rope N′, and in its lower end a roller, O, is journaled. In this connection we may say that when roofing of three thicknesses or more is to be made, the lower end of said gate can be extended downwardly in some way, and another roller, O′, can be located just below the other one, as shown by the dotted lines in Fig. 4.

A scraper, 10, having teeth, 18, formed upon one of its sides, and having upon the other side a knife-edge, 17, is located near the top of the vat for the purpose of removing some of the fluid from the under side of the fabric as it issues therefrom, as shown. The object of forming a knife-edge on one side of said scraper is to remove all of the fluid composition from one side of the fabric whenever desired, as in making roofing composed of a single sheet.

The clamp D is composed of a lower part, 11, which is provided with a raised tongue, 40, a stirrup, 13, which is rigidly attached to one end of the lower part, an upper bar, 12, which is provided with a groove, 41, which corresponds to the dimensions of said tongue in the lower part, and one end of which is adapted to engage the rigid stirrup, and a hinged or removable stirrup, 14, for clamping together the free ends of both upper and lower parts.

The mandrel E is composed of a main portion or body, which is preferably hollow and of tubular form, although it can be made of a solid round shaft, if so desired, a removable journal, 90, from one side of which a lug, *g′*, projects at a right angle thereto, a rigid journal-piece, E″, which is secured in the end of the tube that is opposite the removable journal, and which carries a hand-crank, E′, for the purpose of rotating the mandrel, and, lastly, a slot, *g*, which is formed in one side of the tubular body. The operation of this mandrel is as follows: The end or ends of the fabric that is to be wound upon the mandrel is inserted in the slot, and the mandrel is or can be rotated at once, and the end will not be drawn out of the said slot because of the friction of the surface of the fabric upon the edges of the slot.

Although our apparatus may be used for making roofing that is composed of a single layer of roofing-paper, yet, with slight changes, it can be used in preparing roofing that is composed of three or more layers of paper or other fabric.

The method of using the apparatus may be thus described: The fabric or paper composing the upper layer of the roofing is in the form of a roll, A, and is mounted upon a roller, A′, that is located upon the side of the vat that is opposite the track J. The free end of the web is passed down under the roller (or rollers, as the case may be) O, that is located in the lower portion of the gate N, thence up and over the scraper 10, over another roller, A′, which carries another roll of paper, C, and then it is ready to be drawn out and sanded. The web C, forming the bottom layer of the roofing-sheet, is located on the roller that is nearest the trough I, and in the operation of joining together the fabric of the two rolls the free end of the roll C and the end of the roll A are placed together, the stirrup 14 of the clamp D is removed from its place, the two parts of the clamp are opened out and the said ends are placed between them. The two parts of the clamp are then brought forcibly together, (the tongue of the lower part engaging a depression in the fabric which corresponds to the groove in the upper part,) and then the stirrup 14 is driven on the free ends of the parts, thus compressing the fabric that is located between them and securely holding the two ends together until they are to be released, which operation can be accomplished in a moment by driving the stirrup 14 off the said ends of the clamp. One end of the apron F is also secured to the ends of the fabric by being clamped in place by the clamp D, and its opposite end is secured to the hollow mandrel E by being inserted in the slot *g*, as hereinbefore described. By the use of the apron F the ends of the fabric can be lowered into the vat thereby, and can be covered with a coating of the fluid. Whereas, if the apron were not used and the ends of the fabric were attached directly to the hollow mandrel on the car G′, said ends could not be lowered into the vat, and they would therefore not receive a coating of the liquid that is contained in said vat, and whatever portion that was not coated would have to be thrown away as waste material. Hence the importance of the combination of the apron, the clamp, and the hollow mandrel. When the ends of the tarred fabric come up out of the vat, as they can be made to do by winding the apron F upon the mandrel E a sufficient distance, the feed-roller 2 at the bottom of the hopper carried by the car G is opened, allowing a stream of sand to fall upon the hot liquid that is carried by the fabric, and at the same time the car G′, carrying the mandrel E upon its framing, is run out by hand or by any suitable power to the end of the track J, the first car, G, following up behind the car G′ and sanding the fabric as it goes. After a suitable length of the sheet has been reached the first car, G, is immediately run back to the starting-point, so as to be out of the way, the clamp D is removed from the ends of the fabric, the apron F is rolled up also out of the way, and the car

G′ is run back slowly, its feed-roll 2 being slightly opened, so as to deposit a thin layer of sand upon any spot upon the fabric that may have been missed by the first car, G. Thus the sanding operation is very thoroughly and quite quickly performed. The sanding being completed the fabric is cut off at the web C, and the operation is repeated to make another sheet and until the pile of sheets reaches such a thickness as will impose a substantial weight upon the underlying sheets, when the pile may be permitted to stand any desired length of time.

It will be best to let the sanded sheets stand in the trough as long as is convenient, as the weight of the superimposed sheets will then cause the sand to be more securely embedded in the tarred surface of the paper, and hence a more durable roofing will be the result.

The mandrel E, which is attached to the framing of the car G′, can easily be used for the purpose of forming the sheets into marketable rolls, and the operation of forming the rolls may be thus described. One end of the sheet is inserted in the slot *g*. The mandrel is then revolved by means of the crank E′ until all of the sheet has been rolled up. The mandrel carrying the roll is then removed from its bearings upon the framing of the car, the removable journal 90 is withdrawn from the end of said mandrel, and the mandrel is then withdrawn from the roll, after which the operation is to be repeated for another roll.

It will be observed that the removable journal 90 is provided with a lug, *g′*, upon one side for engaging the slot *g*, and for the purpose of preventing the mandrel from turning without moving it in the same direction. We will say that the advantages possessed by this construction over those of a solid mandrel are very apparent. For instance, if the mandrel were constructed of a solid shaft and the journal 90 were not removable, but were securely fixed to the main body of the mandrel, it could not be used for the purpose of forming the sheets into rolls for the reason that the end of the sheet being located in the slot could not be withdrawn in the same way that it was inserted, but it would have to be cut off or broken off in some way before the mandrel could be separated from the finished roll, while by the use of the mandrel with the removable journal the end of the sheet is readily disengaged from the slot, and the mandrel can easily be withdrawn.

We are aware that an apparatus for conducting the operations of tarring the web, uniting thereto an untarred web, and sanding the other side, or uniting thereto a second untarred web at one and the same time has been before constructed, and therefore we do not claim such, broadly; but,

Having thus described our invention, what we claim is—

1. A feeding device for roofing-machines, consisting of an eccentric roller journaled in the feed-opening of the hopper or bin that contains the sanding material, substantially as described.

2. The combination, with a bin or hopper for containing the sanding material, of a cylindrical roller journaled in the feed-opening of said hopper eccentrically, and a hand-crank or equivalent device for rotating the roller, and for the purpose of feeding the material past the roller, substantially as described.

3. The combination of the bin or hopper H, the roller 2, provided with journals 3, which are located away from the center of the roller, feather 4, formed upon or secured to the roller, and a hand-crank, such as 7, substantially as and for the purpose described.

4. The combination of the bin or hopper H, the roller 2, journaled eccentrically in said hopper, feather 4, secured to the roller, metal strip 5, located at one side of the feed-opening in the hopper, strip 6, located in the hopper above the roller and extending down near the outer surface thereof, and a hand-crank, 7, for operating the roller, substantially as and for the purpose described.

5. The combination, in a machine for making roofing, of a vat for containing tar or similar material, rollers for carrying webs of roofing-paper, located near the vat, a gate carrying a roller or rollers and located in the vat for depressing the material therein, a track or trough arranged upon the ground or floor at one side of the vat, a car arranged to travel upon said track, and carrying a bin or hopper for sanding the material as it issues from the vat, and another car arranged to travel upon the track behind the first-mentioned car, also arranged to sand the material, and to which the end of the material or fabric is secured, substantially as and for the purposes described.

6. The combination of the vat B, gate N, combined track and trough I, cars G and G′, carrying hoppers H, mandrel E, carried by car G′, and apron F, secured to the mandrel, substantially as and for the purpose described.

7. A combined track and trough for use in making roofing, the same consisting of bottom L, sides or track J, inclined side pieces, K, and outside braces, K′, substantially as described.

8. The combination, in a roofing-machine, of a track arranged at some distance above the surface of the ground or floor, and adapted to form sides for a trough, in which the fabric or sanded material is to be deposited, and a car or cars carrying a hopper arranged to travel upon said track, substantially as shown and described.

9. In a roofing-machine, the clamp D, composed of a lower part, 11, provided with a tongue, 40, stirrup 13, rigidly attached to one end of said lower part, and upper part, 12, provided with groove 41, and a hinged or re-

movable stirrup, 14, for clamping together the free ends of both parts, substantially as set forth.

10. In a roofing-machine, the hollow mandrel E, composed of a main body, which is preferably tubular in form, removable journal 90, carrying lug *g'*, rigid journal-piece E'', carrying hand-crank E', and slot *g*, formed in one side of the tubular body, substantially as and for the purpose described.

In testimony whereof we affix our signatures in presence of two witnesses.

ROBERT T. WRAY.
JAMES THOMSON.

Witnesses:
J. W. NORTON,
JAMES F. MISTER.