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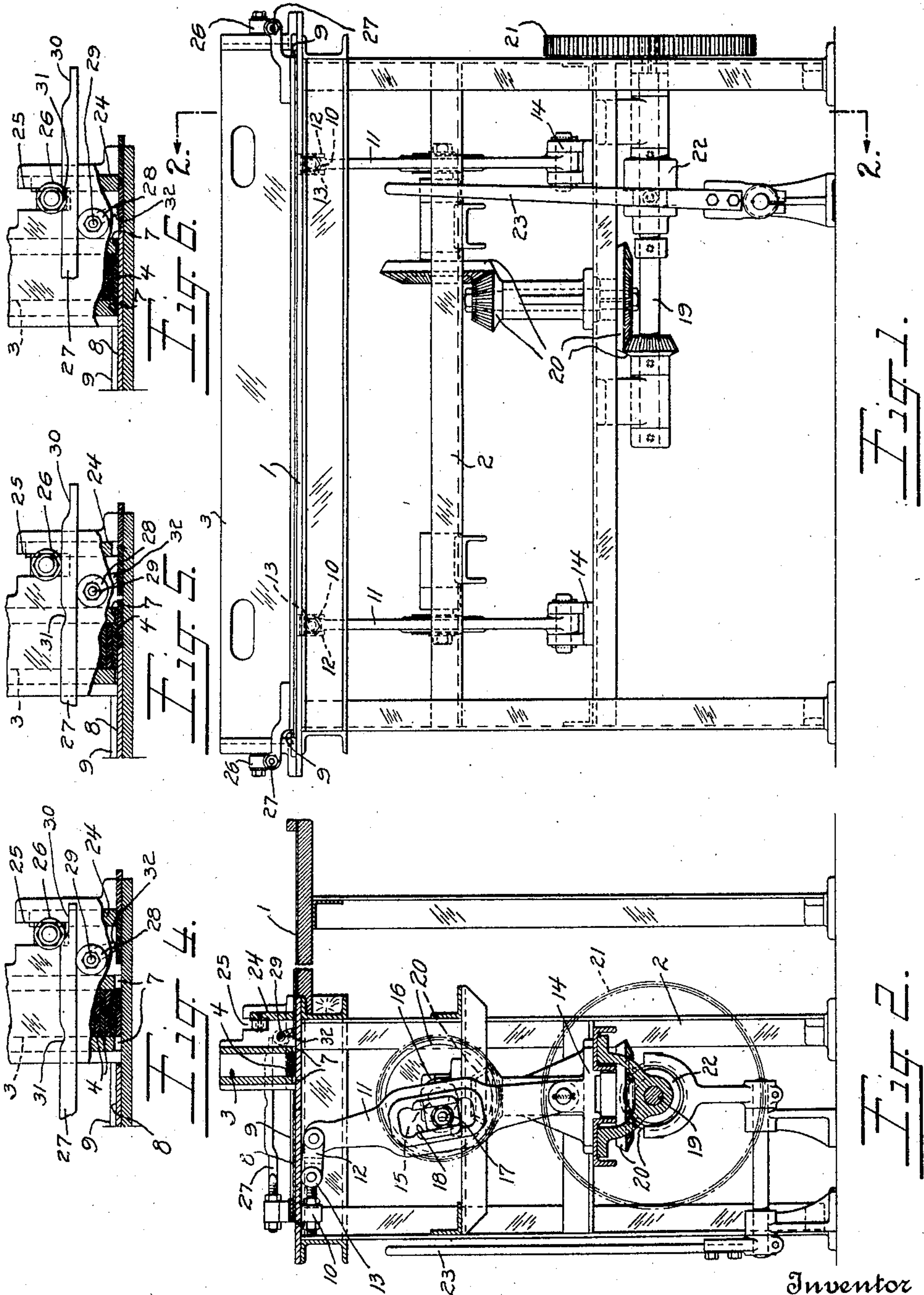
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METHOD AND APPARATUS FOR FORMING SHEET TILING.

FILED SEPT. 30, 1921.

2 SHEETS—SHEET 1.



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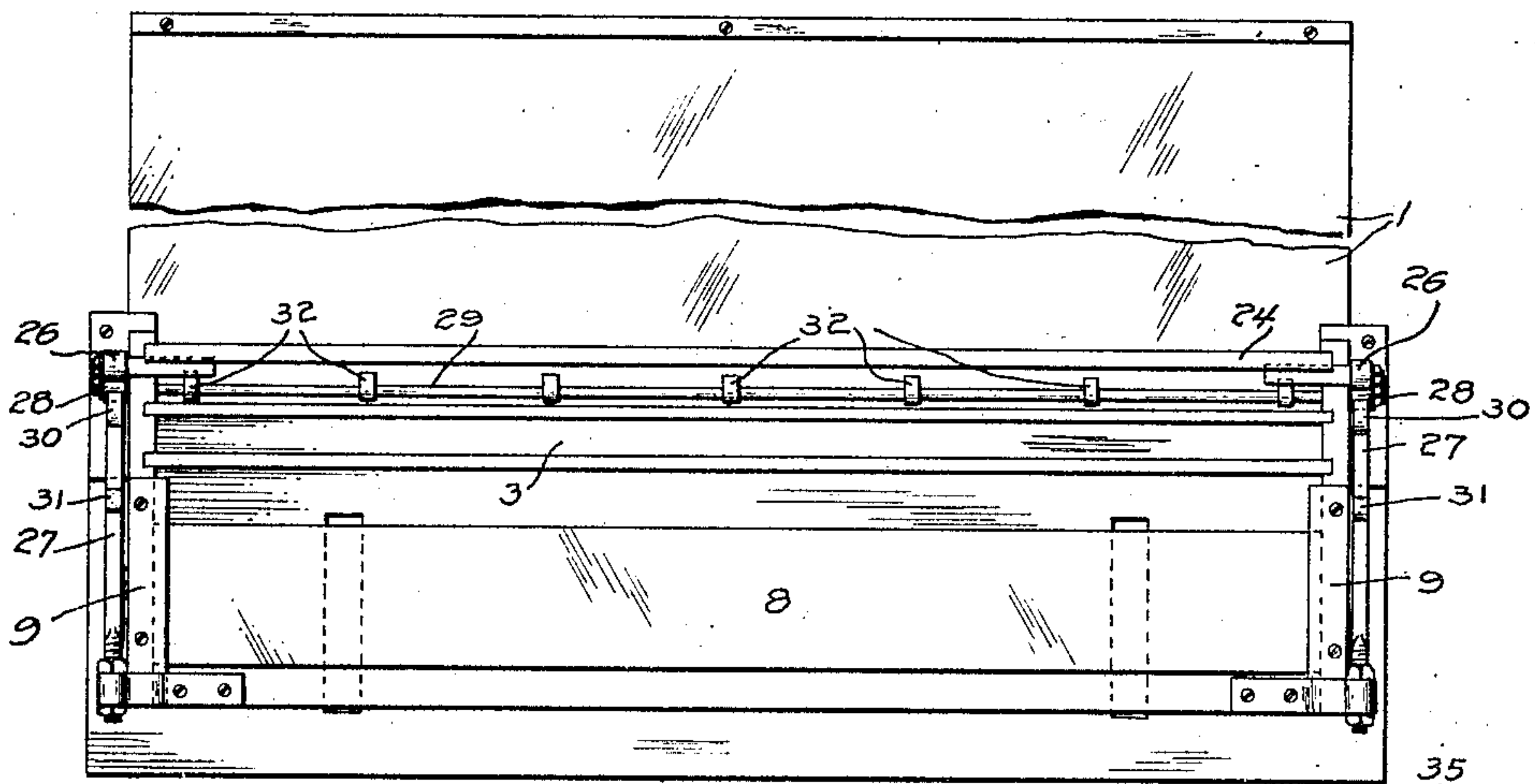
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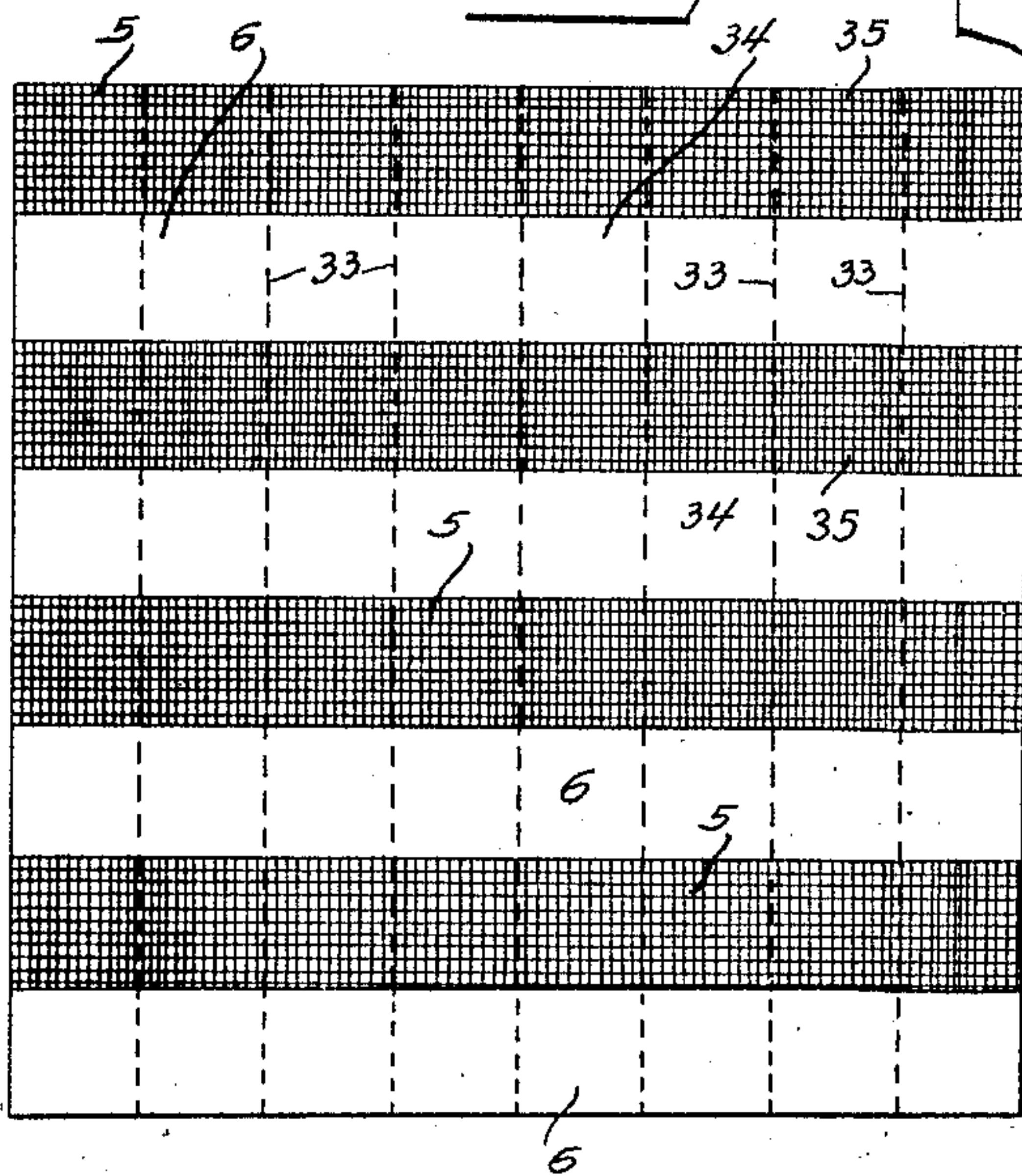
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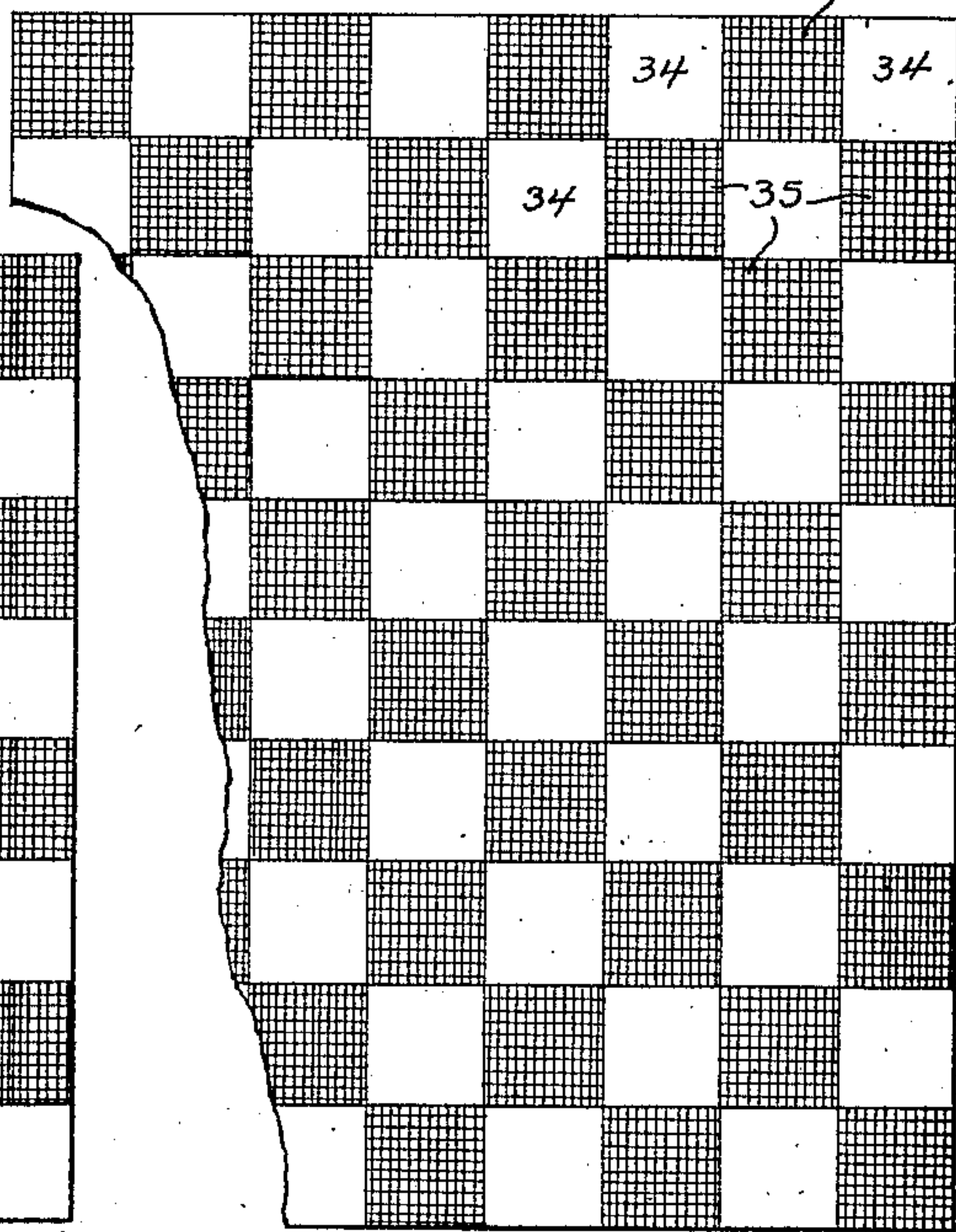
2 SHEETS—SHEET 2.



*Fig. 3.*



*Fig. 7.*



*Fig. 8.*

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# UNITED STATES PATENT OFFICE.

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## METHOD AND APPARATUS FOR FORMING SHEET TILING.

Application filed September 30, 1921. Serial No 504,514.

*To all whom it may concern:*

Be it known that I, WILLIAM J. KENT, a citizen of the United States, and a resident of Brooklyn, county of Kings, and State of New York, have invented certain new and useful Improvements in Methods and Apparatus for Forming Sheet Tiling, of which the following is a specification.

This invention relates to a method and apparatus for forming sheet tiling, and the primary object is to cheapen the cost of manufacturing goods of this character.

Referring to the drawings forming a part of this application,

Fig. 1 is an elevation of the machine viewed from the rear;

Fig. 2 is a sectional view through the plane 2—2, Fig. 1, viewed arrow-wise.

Fig. 3 is a plan view of the machine;

Figs. 4, 5, and 6 are fragmentary details partly in section showing different positions of the operating parts.

Fig. 7 shows a sheet of tiling material formed of strips; and

Fig. 8 shows a sheet of tiling material formed of squares.

The machine comprises a table 1 supported upon a frame-work 2, and a magazine or source of supply 3 supported at one end of the table.

The material from which the sheet tiling is made is in the form of relatively long strips 4 which are placed in the magazine one upon another to form a stack, the magazine or source of supply being preferably of the proper length and breadth to accommodate the strips so as to permit of an easy working fit. The strips are usually cut from sheets of contrasting color as shown by way of illustration in Fig. 7 where the product is shown comprising the alternate strips 5 and 6 of contrasting colors. The strips may be made from sheets of rubber compound suitably colored to provide the desired contrasting colors and either raw, or partially or wholly vulcanized; or they may be made from any other suitable material.

The stack of tiling 4 is supported on the plane of the table 1, and the front and rear walls of the magazine 3 are open at their base to provide the slots 7 to permit the passage therethrough of a pusher bar 8 and the bottom-most strip of the stack which is pushed or forced by the pusher bar through

the forward slot 7 into contact with the partially formed sheet of tiling supported on the table 1, the slot through which the strip passes being only high enough to permit the egress of the strip while serving as a stop to prevent the strip immediately above from being moved outward.

The pusher bar or plate 8 rests in the plane of the table 1 and is restricted to its movement through the magazine by being confined at its ends in slots 9 permitting only of a reciprocatory movement to provide for the strip ejecting operations. The plate is provided with lugs 10 depending through slots formed in the table of sufficient length to permit the required movement of the plate. These lugs are secured to rocker arms 11 by means of the links 12 and eye bolts 13, the lower ends of the arms 11 being pivoted in brackets 14 secured to the frame 2. A shaft 15 is revolvably mounted in journals secured to the frame and has secured at each of its ends a crank 16 provided with an anti-friction roller 17. These rollers engage the walls of the slots 18 formed in the respective arms 11 intermediate their ends, whereby a rotation of the shaft 15 will effect a rocking of the arms 11 which will in turn impart the required reciprocatory movement to the plate 8.

The shaft 15 may be driven by any suitable means, in the present instance it is shown as being driven by means of the drive shaft 19 journaled in bearings secured to the frame, and a train of gears 20 connecting the two shafts. The shaft 19 is shown provided with a gear wheel 21 which may be connected with any source of power, and a clutch 22 is provided having an operating arm 23 for connecting and disconnecting the shaft 19 with the drive wheel 21.

A presser bar 24 is secured in front of the magazine 3 in slots 25 to permit an up and down movement of the bar. Anti-friction rollers 26 are secured at either end of the bar and engage cam rods 27 secured at their rear ends to the plate 8 and supported at their forward ends upon the anti-friction rollers 28 loosely mounted on a shaft 29 secured to the frame. The cam rods 27 are provided with depressed surfaces 30—31 for permitting of raising or lowering the presser bar as the pusher plate moves to and fro as will later more fully appear. A series of dogs 32 freely mounted on the shaft



29 have their free ends adapted to rest upon the strip last applied to the partially formed sheet at such an angle that the strip may be freely advanced with the sheet while preventing any rearward movement of the strip.

In operating the machine the magazine or source of supply 3 is provided with a stack of the strips of rubber or other material arranged in alternate colors so that they will be fed out upon the table in the predetermined order to give the desired color effect. While I prefer to use but a single stack in which the variously colored strips are arranged in the desired order, I may if desired, use a stack for each color. One or both of the longitudinal edges of the strips are provided with an adhesive such as rubber cement or the like so that they will adhere along their longitudinal edges when brought into contact upon the table. The wheel 21 which may be any type of power transmission, being connected to any desired source of power as for instance the gear wheel of an electric motor (not shown), the arm 23 is swung to operate the clutch 22 thereby driving the shaft 19, and through the train of gears 20, the shaft 15. This effects a rocking of the arms 11, the forward movement of which carries the pusher plate 8 into the magazine 3 where it contacts with the bottom-most strip and forces it out of the magazine through the forward slot 7, the cam rods 27 moving simultaneously with the plate 8. Referring to Fig. 4 it will be noted that the depressed surfaces 30 are beneath the rollers 26 thereby permitting the presser bar 24 to rest directly upon the joint between the two strips that were last to be forced from the source of supply or magazine and applied to the partially formed sheet. The plate 8 is then in its initial position ready to advance and is spaced somewhat from the lowermost strip in the magazine. While it is covering this space the cam rods 27 have moved to bring their raised portions beneath the rollers 26 thereby raising them and the presser bar 24, the latter being now free from the sheet. The continued forward movement of the pusher plate 8 brings it into contact with the bottom-most strip and forces it through the forward slot 7 as shown in Fig. 5 where it is about to contact along its longitudinal edge with the sheet partially formed upon the table. Fig. 6 shows the strip as having been brought into contact with the partially formed sheet, the adhesive material along the edges effecting a secure bond between the strip and partially formed sheet, and as having forced the sheet and last-applied strip along the table to the extreme position produced by the forward movement of the pusher plate 8. During this movement the presser bar 24 is in raised position and the pressure of the pusher

plate 8 at the rear of the joint between the strips, and the yielding back pressure of the moving sheet applied from the forward side of the joint produces an effectual pressing from both sides of the joint which effects the desired union between the strips and the adhesive applied to their engaging edges. When the sheet is in substantially its final position as shown in Fig. 6 the second depressions 31 of the cam rods 27 have reached the rollers 26 thereby causing the presser bar 24 to drop directly upon the joint just formed tending to further press it and smooth it out to make a flush upper and lower surface across the joint. The rocker arms 11 then begin to swing rearwardly and to carry with them the pusher plate 8 and rods 27 and when the rearward movement has been completed the parts are again in the positions shown in Fig. 4 with the presser bar 24 resting once more upon the newly formed joint. During this rearward movement any tendency there might be of the last strip moving back with the presser plate 8 on account of the adhesive that might be present on the contacting edges or otherwise is prevented by the series of grips or dogs 32.

As the shaft 15 rotates continuously, the cycle of operations just described is continuously repeated until a sheet formed of strips of any desired length is produced. The sheet may be utilized as thus composed of strips if desired and where formed of green or partially cured rubber it can be subjected to the final vulcanization process in any usual or preferred manner and thereby produce a sheet vulcanized as a unitary whole as illustrated in Fig. 7 (disregarding the dash lines), same being composed of the alternating strips of contrasting colors 5 and 6. Generally, however, it is desired to form sheets of tiling of squares or other designs and therefore the sheet thus formed of strips is usually cut longitudinally into strips such as the strips 33 indicated in Fig. 7 by the dotted lines. These strips are formed of the squares 34—35 of alternating colors and they may then be assembled as shown in Fig. 8, first applying an adhesive to their contacting longitudinal edges, thereby forming a sheet composed of alternating squares 34—35 of different colors. The sheet shown in Fig. 8 may be formed from the strips shown in dotted lines in Fig. 7 in any desired manner. I prefer, however, to place the strips formed by cutting the sheet Fig. 7 along the dotted lines in the magazine of the machine and repeating the operations already described thereby forming the sheet shown in Fig. 8. In this way such a sheet may be made of any length and of a width equal to the length of the magazine, and where a wider sheet is desired the sheets may be assembled together to give any required width.

It will be noted that the strips cut from



the sheet shown in Fig. 7 have squares of different colors at their ends. This is desirable where such strips are solely used in forming the sheet shown in Fig. 8. In such instances the strips are placed in the magazine, alternate strips being turned end for end so that when they are fed out upon the table they will form a checker block sheet similar to that shown in Fig. 8 instead of reforming the sheet shown in Fig. 7. Of course instead of charging the magazine with the consecutive strips cut from the same sheet the alternate strips may be taken from another sheet if desired having the colored blocks changed about to give the checker board effect as shown in Fig. 8 in the finished sheet.

As many apparently widely different embodiments of this invention may be made without departing from the spirit thereof, it is to be understood that I do not intend to limit myself to the specific form of the invention as set forth except as indicated in the appended claims.

Having thus described my invention, what I claim and desire to protect by Letters Patent is:

1. A machine for forming sheets from relatively long strips of material which comprises, an assembling table, a source of strip supply, a pushing member adapted to engage one of the longitudinal edges of the strips to force the respective strips directly from the source of supply into contact along their longitudinal edges with the longitudinal edge of the strip just previously applied from the said source of supply to the partially formed sheet on the table and means for moving said member in a path from said source of supply to the sheet being formed on the table.

2. A machine for forming sheets from relatively long strips of material which comprises, an assembling table, a supply source for supporting a stack of strips, a pushing member adapted to engage one of the longitudinal edges of the strips to force the respective strips directly from the stack into contact along their longitudinal edges with the longitudinal edge of the strip just previously applied from the said source of supply to the partially formed sheet on the table and means for moving said member in a path from said source of supply to the sheet being formed on the table.

3. A machine for making sheets from strip material which comprises, an assembling table, a source of strip supply, a member adapted to engage one of the longitudinal edges of the strips for feeding the strips directly from the supply source into contact along their longitudinal edges with the longitudinal edge of the strip just previously applied from the said source of supply to the partially formed sheet on the

table and means for simultaneously pressing upon adjacent strips directly across the joints connecting them.

4. A machine for making sheets from strip material which comprises, an assembling table, a source of strip supply, a member adapted to engage one of the longitudinal edges of the strips for feeding the strips directly from the supply source into contact along their longitudinal edges with the longitudinal edge of the strip just previously applied from the said source of supply to the partially formed sheet on the table, means for momentarily simultaneously pressing upon adjacent strips directly across the joint connecting them, and means for repeating the pressure previous to another strip being applied.

5. A method of making sheets from strips of material coated with an adhesive along a longitudinal edge to permit contacting edges of adjacent strips to adhere together, comprising applying pressure upon a longitudinal edge of the respective strips to move the strips successively into contact along their longitudinal edges with the partially formed sheet, and without interruption of the movement of the strips brought into contact, continuing the pressure to move the sheet thus formed thereby subjecting the joints between adjacent strips to the action of the applied pressure on one side and to the yielding back pressure of the moving sheet on the opposite side.

6. A method for making sheets from strips of material coated with an adhesive along their longitudinal edges to permit contacting edges of adjacent strips to adhere together comprising, forcing the strips together by pressure applied along their longitudinal edges and simultaneously pressing upon adjacent strips directly across the joint connecting them.

7. A method for making sheets from strips of material coated with an adhesive along their longitudinal edges to permit contacting edges of adjacent strips to adhere together comprising, applying pressure to move the strips successively into contact along their longitudinal edges with the partially formed sheet and continuing the pressure to move the sheet thus formed thereby subjecting the joint between adjacent strips to the action of the applied pressure on one side and to the yielding back pressure of the moving sheet on the opposite side, and simultaneously pressing upon adjacent strips directly across the joint connecting them.

8. A method for making sheets from strips of material coated with an adhesive along their longitudinal edges to permit contacting edges of adjacent strips to adhere together comprising, applying pressure to move the strips successively into contact along



their longitudinal edges with the partially formed sheet and continuing the pressure to move the sheet thus formed thereby subjecting the joint between adjacent strips to the action of the applied pressure on one side and to the yielding back pressure of the moving sheet on the opposite side, simultaneously pressing upon adjacent strips directly across the joint connecting them, and releasing said last-mentioned pressure before another strip is applied.

9. A method of making sheets from strips of material, comprising coating the strips with an adhesive along their longitudinal edges to permit contacting edges of adjacent strips to adhere together, applying pressure to move the strips successively into contact along their longitudinal edges with the partially formed sheet, and without interruption continuing the pressure to move the sheet thus formed thereby subjecting the joints between adjacent strips to the action of the applied pressure on one side and to the yielding back pressure of the moving sheet on the opposite side, cutting the sheet longitudinally into strips, and forming a sheet by securing the strips thus formed along their longitudinal edges.

10. A method of making sheets from strips of material, comprising coating the strips with an adhesive along their longitudinal edges to permit contacting edges of adjacent strips to adhere together, applying pressure to move the strips successively into contact along their longitudinal edges with the partially formed sheet, and without interruption continuing the pressure to move the sheet thus formed thereby subjecting the joints between adjacent strips to the action of the applied pressure on one side and to the yielding back pressure of the moving sheet on the opposite side, cutting the sheet longitudinally into strips, applying pressure to move the strips successively into contact along their longitudinal edges with the partially formed sheet, and without interruption continuing the pressure to move the sheet thus formed thereby subjecting the joints between adjacent strips to the action of the applied pressure on one side and to the yielding back pressure of the moving sheet on the opposite side.

Signed at New York, county of New York, and State of New York, this 18th day of August, 1921.

WILLIAM J. KENT.