

No. 690,746.

Patented Jan. 7, 1902.

A. F. LUNDEBERG.

APPARATUS FOR PRINTING CARPETS, MATS, &c.

(Application filed Nov. 1, 1900.)

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.

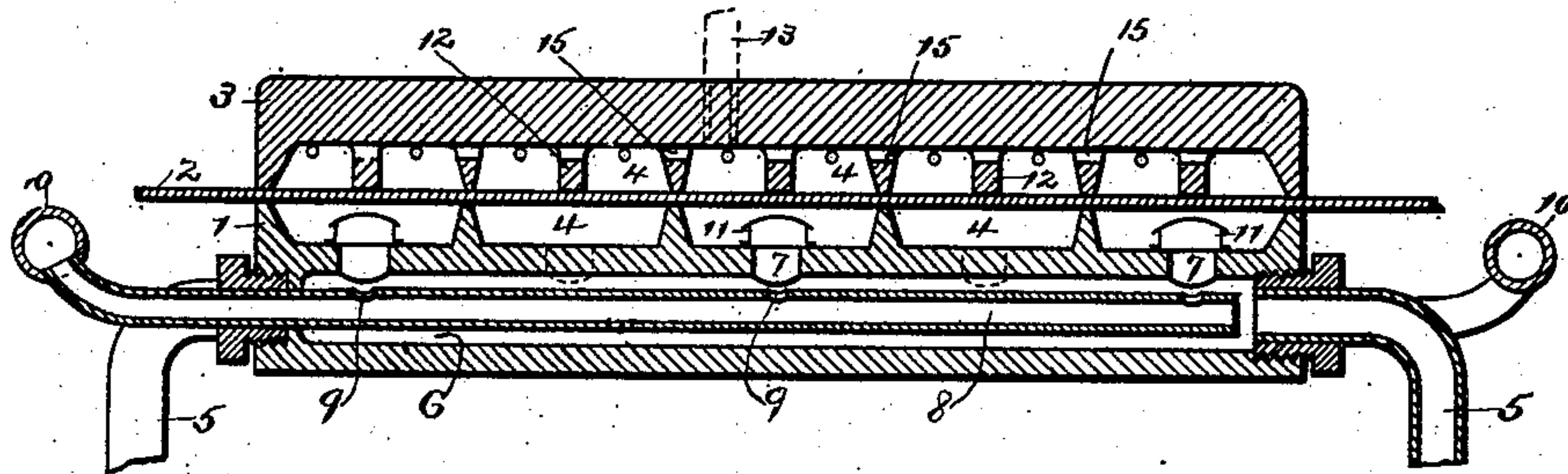
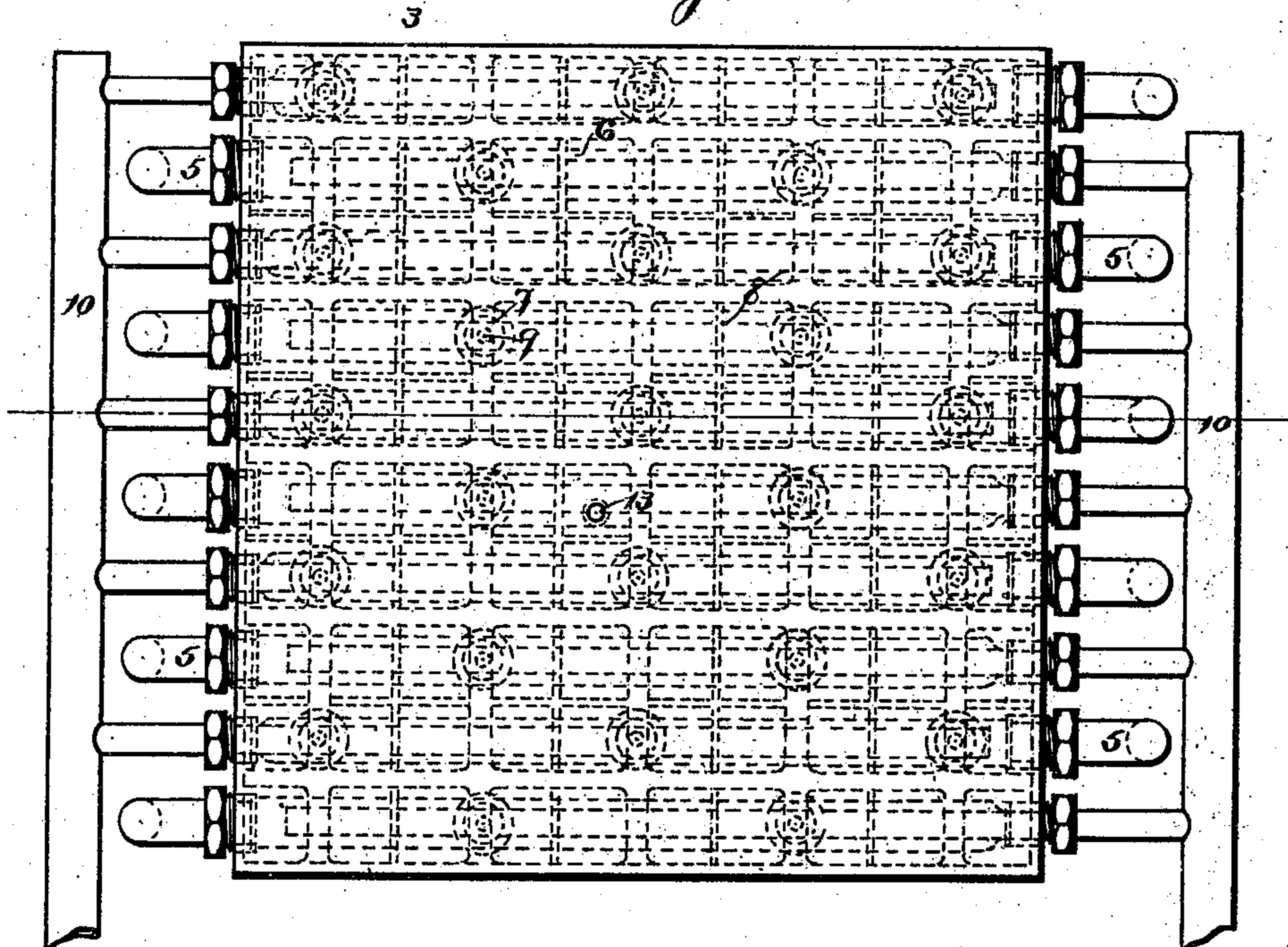


Fig. 2.



WITNESSES

A. Berne
Chas. H. Smith

INVENTOR

A. F. Lundberg

PER

L. W. Terrell & Son attys

No. 690,746.

Patented Jan. 7, 1902.

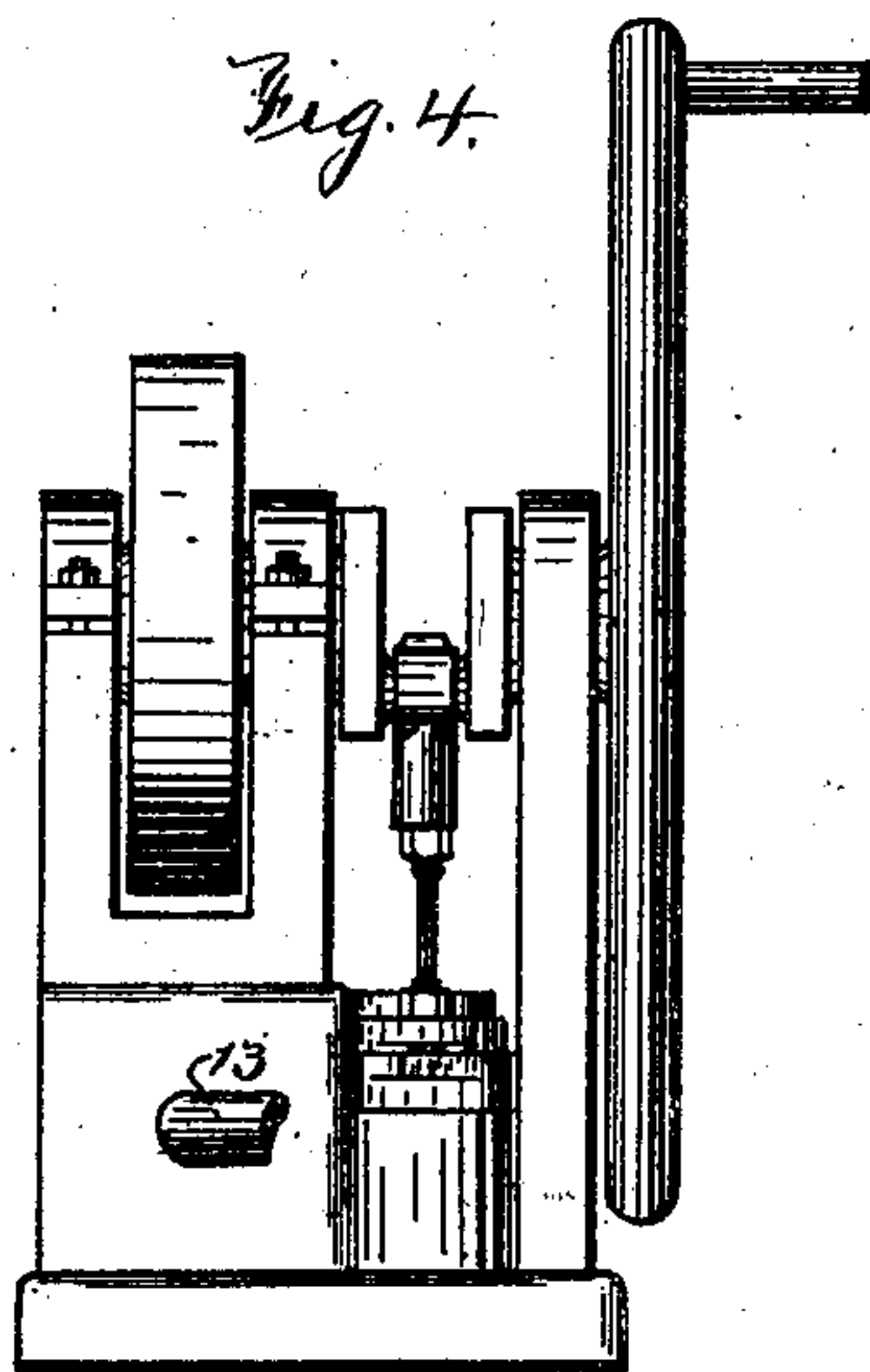
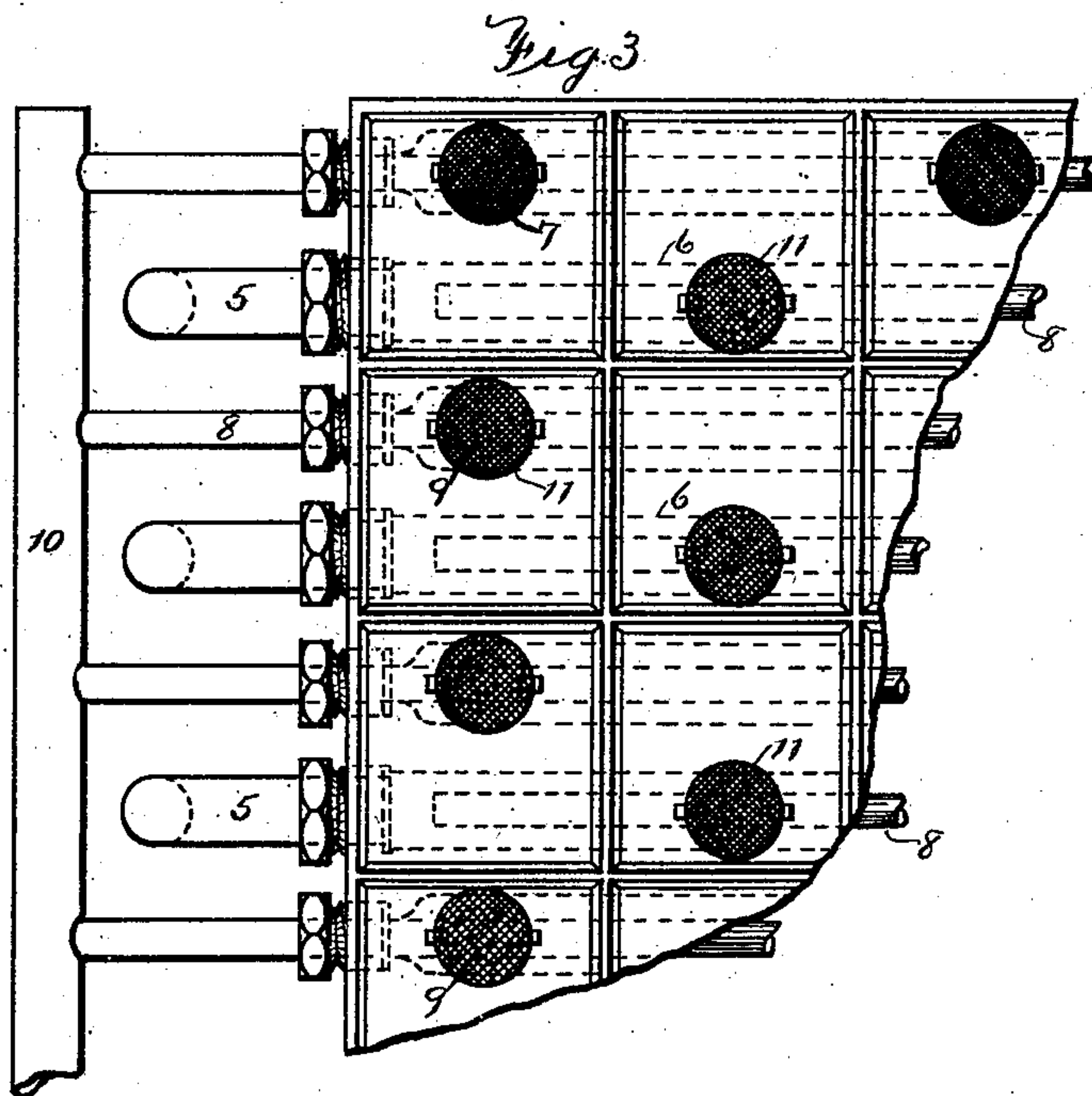
A. F. LUNDEBERG.

APPARATUS FOR PRINTING CARPETS, MATS, &c.

(Application filed Nov. 1, 1900.)

(No Model.)

2 Sheets—Sheet 2.



WITNESSES

A. F. Lundberg
Chas. H. Smith

INVENTOR
A. F. Lundberg
PER *L. W. Lurwell & Son*
ATTYS

UNITED STATES PATENT OFFICE.

AUGUST FREDRIK LUNDEBERG, OF STOCKHOLM, SWEDEN.

APPARATUS FOR PRINTING CARPETS, MATS, &c.

SPECIFICATION forming part of Letters Patent No. 690,746, dated January 7, 1902.

Application filed November 1, 1900. Serial No. 35,083. (No model.)

To all whom it may concern:

Be it known that I, AUGUST FREDRIK LUNDEBERG, mechanical engineer, a subject of the King of Sweden and Norway, and a resident of Observatoriegatan 16, Stockholm, in the Kingdom of Sweden, have invented certain new and useful Improvements in Apparatus for Manufacturing Carpets or Mats in Through-Colored Patterns, of which the following is a specification.

The extensive use gained by the well-known carpets composed of some cork composition and the like has made it desirable to produce such carpets in through-colored patterns, since a carpet of this description does not suffer from the defect common to carpets with surface-colors only—viz., that the colors are soon worn off. This invention therefore relates to an apparatus by means of which the said through-coloring of the carpet can be accomplished in a simple manner, so as to produce a perfectly-clear pattern through the entire thickness of the carpet.

It consists of two printing-blocks between which the carpet is placed and which blocks, both the upper and the lower one, contain depressions or cells corresponding to the details of pattern and being exactly alike in both blocks, so as to be directly opposite one another when the blocks are placed together, of passages and pipes for introducing the coloring liquids into the cells of the lower block, of other passages or pipes for introducing air or other suitable gas in the same cells for drying the carpet subsequent to the through-coloring, and of means for creating a vacuum in the upper block, as will be more fully described below.

In the drawings annexed the apparatus referred to is shown in Figure 1 in a transverse section, and in Fig. 2 in a plan view. Fig. 3 is a plan view of a corner of the lower color-block, and Fig. 4 is an end elevation of a vacuum-pump.

1 and 3 designate the two printing-blocks, and 2 the carpet placed between them. Both blocks have depressions or cells 4, corresponding to the pattern required. These depressions or cells are exactly alike in both blocks, so that the edges of the cells in one block will be exactly opposite those in the other when the blocks are placed one on top of the other.

If the carpet be placed between the blocks and the latter be pressed forcibly together, there will consequently, owing to the penetration of the edges of the cells into the surface of the carpet, be produced closed chambers 4 on both sides of the carpet, each of said chambers being well shut off from the adjacent chambers close to the surface of the carpet in the same block as well as from all the chambers in the opposite block, excepting that directly opposite, which is only separated from the former by the carpet itself. This is of particular importance for the purpose in question, inasmuch as when the depressions of one block are filled with coloring liquid and a suction is produced in the depressions of the other block the coloring liquid in each depression will be drawn perpendicularly through the carpet. The coloring liquids are distributed, according to the pattern desired, in the different depressions of the bottom block, (therefore called the "color-block" below,) the depressions of which, called "color-cells," are connected either in groups or rows with each other through pipes 5, passages 6 in the block proper, and apertures 7, the latter located in the bottom of the cells. The pipes 5 issue from the respective color-reservoirs. In the pipes are inserted smaller pipes 8, provided with perforations 9 directly below the holes 7. The pipes 8 communicate with the pipes 10, which may run together into one single pipe. The object of these pipes 8 10 is to facilitate the emptying of the cells and make possible the passage of the adhering coloring liquid into and through the carpet, as will be more fully explained below. The cells in the upper block, called the "suction-block," communicate with one another through holes 15 in the cell-walls, said holes being situated close to the bottom of the depressions, and consequently at a slight distance from the carpet. There are, moreover, in the cells of the upper block perforated supports 12 for the carpet. The upper block is connected with an air-pump through a pipe 13. The operation of the apparatus is as follows: On placing the carpet on the color-block and the suction-block on top of the carpet and on applying a sufficient pressure to both blocks to compress the carpet between them the color-

ing liquids are introduced into the cells of the color-block by means of the pipes 5. The liquids are subsequently made to pass into the carpet by creating suction in the upper block alternatively while simultaneously exerting a pressure on the coloring liquid in the color-block. When the coloring-matter has been thus sucked or sucked and forced through the carpet, so as to barely appear on the upper side of the carpet, (for observing which a few glass-covered sight-holes may be provided on the upper side of the suction-block,) air is admitted to the cells of the color-block through the pipes 8 and 10, and said air passing upward in the cells through the perforations 9 forms a layer next to the bottom side of the carpet. To admit of this, an outlet is provided for the coloring liquid from the cells through the same pipe as previously served for supplying it to said cells. To prevent the colors from spattering the carpet when air is admitted, screens 11 are applied over the apertures 7. The suction in the upper block meantime is allowed to continue. At the under side of the carpet there is now no other coloring liquid in contact with the carpet than that which adheres to the surface as a thin film. By the continued suction this liquid is also sucked into the carpet, being thus kept from spreading on the removal of the carpet. It is essential that this be done if the completed carpet is to present a perfectly clear pattern. The suction may be continued until the carpet is perfectly dry, heated air being suitably employed for the purpose referred to. The best plan is, however, not to carry the drying operation further while the carpet remains between the blocks than is required for the purpose mentioned above in order that the blocks may not be engaged longer than necessary. The operation described also allows of the treatment of the same piece of carpet several times while it still remains between the blocks by the exchange of liquids. For instance, an impregnating material is first used, then on drying the carpet a coloring liquid, and on a second drying another impregnating fluid, &c. On completing the treatment of one section of the carpet the suction-block is lifted off and the carpet moved for treatment of another section, &c.

It is evident that the carpet, fabric, or cardboard after treatment may be used for various purposes—for instance, as a covering for articles of furniture, as table-covers, &c.; also in the making of chess and checker boards.

I claim as my invention—

1. In an apparatus for printing carpets, mats, &c., in varicolored patterns, the combination with an upper sucking-block and a lower opposing pattern-block having pattern edges forming cells, of means connected to the sucking-block for creating a vacuum in the interior of the same, means also connected to the pattern-block for introducing colored fluids in the cells thereof, and means for in-

troducing air or gas into the said cells for interrupting the contact between the fluid and the material to be colored when the fluid has partly penetrated the latter, substantially as specified.

2. In an apparatus for printing carpets, mats, &c., in through-colored patterns, the combination with pressure-blocks having cells whose edges correspond forming the pattern and between which the material to be printed is placed, of a vacuum-pump in connection with the cells of one block, supply-conduits beneath the cells of and within the other block, there being suitable openings between the said conduits and cells, supply-pipes for the coloring liquids leading to the said conduits and other supply-pipes for gas and air leading to and extending within said conduits, substantially as and for the purposes set forth.

3. In an apparatus for printing carpets, mats, &c., in through-colored patterns, the combination with pressure-blocks having cells whose edges correspond forming the pattern and between which the material to be printed is placed, of a vacuum-pump in connection with the cells of one block, supply-conduits beneath the cells of and within the other block there being suitable openings between the said conduits and cells, screens covering the top of said openings, supply-pipes for the coloring liquids leading to the said conduits, and other supply-pipes for gas and air leading to and extending within said conduits, and having holes corresponding with the said openings, substantially as and for the purposes set forth.

4. In an apparatus for printing carpets, mats, &c., in through-colored patterns, the combination with an upper pressure-block having cells or depressions whose edges form the pattern, and a vacuum-pump connected to said cells, of a lower pressure-block having cells whose edges correspond with those of the said upper block, supply-conduits in the said lower block and having suitable openings from said conduits to said cells, screens covering the tops of said openings, supply-pipes for the coloring liquids leading to one end of each of said conduits, and other supply-pipes for gas and air leading to the other end of each of said conduits and extending within the same, the said supply-pipes for the coloring liquid and the gas and air being arranged alternately, substantially as and for the purposes set forth.

5. In an apparatus for printing carpets, mats, &c., in through-colored patterns, the combination with an upper sucking pressure-block and a lower opposing pattern-block having cells whose edges form the pattern and between which blocks the material to be printed is placed, of a vacuum-pump in connection with the sucking-block, supply-conduits beneath the cells of and within the pattern-block, there being suitable openings between the said conduits and cells, supply-

5 pipes for the coloring liquids leading to the
said conduits and other supply-pipes for gas
or air leading to and extending within said
conduits, substantially as and for the pur-
poses set forth.

10 6. In an apparatus for printing carpets,
mats, &c., in through-colored patterns, the
combination with an upper sucking pressure-
block and a lower opposing pattern-block hav-
ing cells whose edges form the pattern and
between which blocks the material to be
printed is placed, of a vacuum-pump in con-
nection with the sucking-block, supply-con-
duits beneath the cells of and within the pat-
tern-block there being suitable openings be-
tween the said conduits and cells, screens cov-
ering the top of said openings, supply-pipes
for the coloring liquids leading to the said con-
duits, and other supply-pipes for gas or air
20 leading to and extending within said conduits,
and having holes corresponding with the said
openings, substantially as and for the pur-
poses set forth.

7. In an apparatus for printing carpets,

mats, &c., in through-colored patterns, the 25
combination with an upper sucking pressure-
block having cells or depressions whose edges
form the pattern, and a vacuum-pump con-
nected to said block, of a lower pressure pat-
tern-block having cells whose edges corre- 30
spond with the pattern-supply conduits in the
said lower block and having suitable open-
ings from said conduits to said cells, screens
covering the tops of said openings, supply-
pipes for the coloring liquids leading to one 35
end of each of said conduits, and other sup-
ply-pipes for gas or air leading to the other end
of each of said conduits, the said supply-pipes
for the coloring liquid and the air being ar-
ranged alternately, substantially as and for 40
the purposes set forth.

In witness whereof I have hereunto signed
my name in the presence of two subscribing
witnesses.

AUGUST FREDRIK LUNDEBERG.

Witnesses:

ERNST SVANQVIST,
A. F. LUNDBORG.