(No Model.)

F. M. MAHAN.

PAPER WHEEL.

No. 290,081. Patented Dec. 11, 1883.

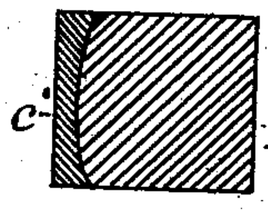

Fig. 4.

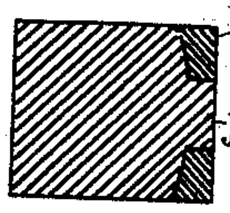

Fig. 5.

Fig. 1.

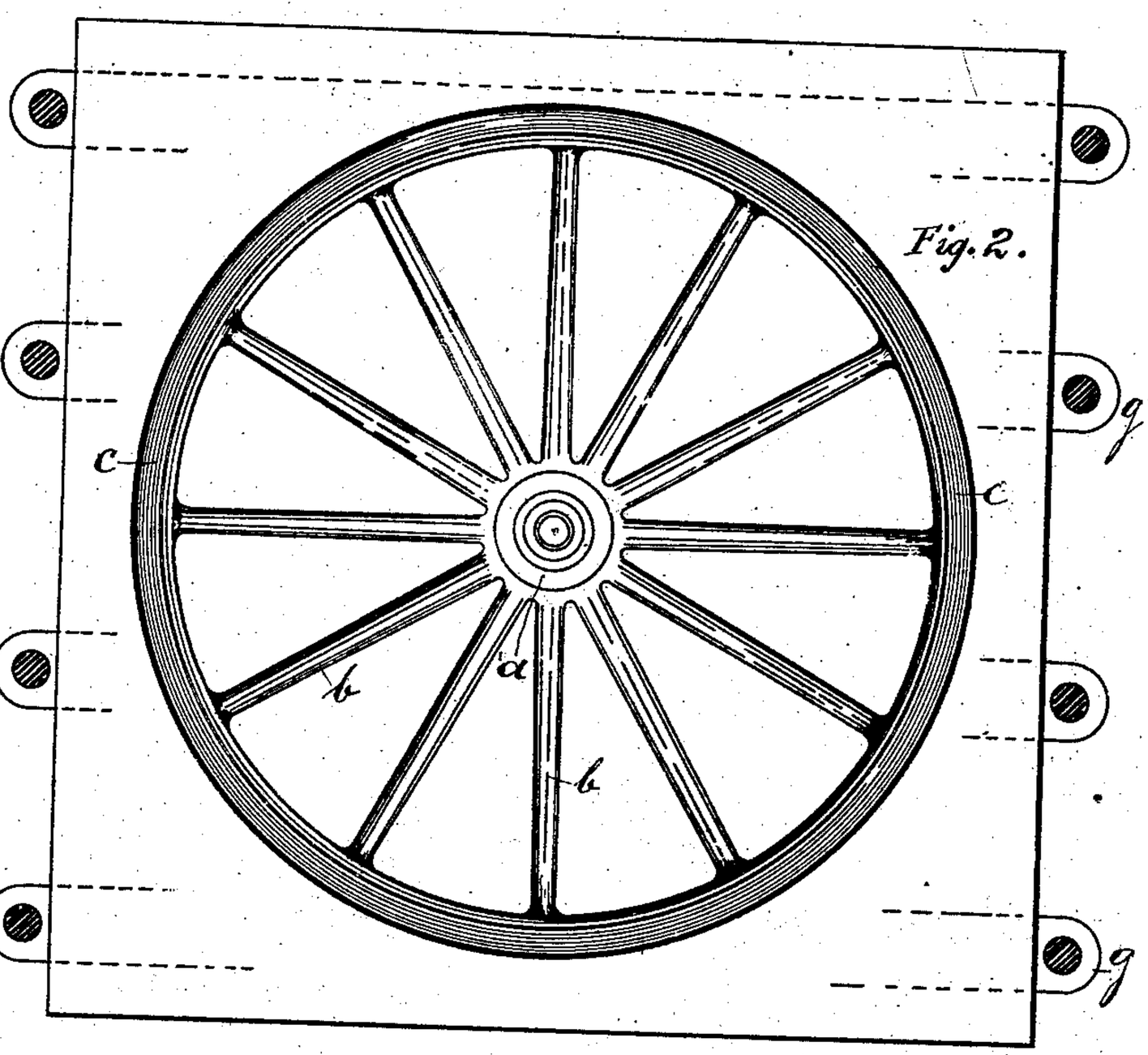

Fig. 2.

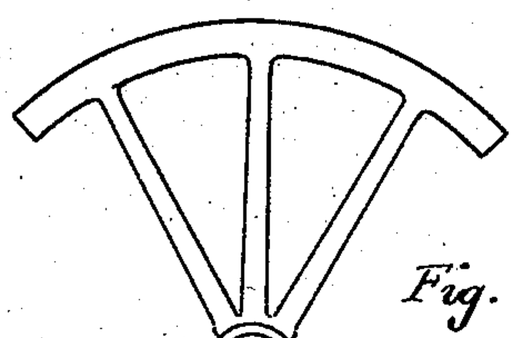

Fig. 3.

WITNESSES:

W. J. Clayton

Louis Nolting.

INVENTOR

Frank M. Mahan

BY Wm H Lotz

ATTORNEY

UNITED STATES PATENT OFFICE.

FRANK. M. MAHAN, OF CHICAGO, ILLINOIS, ASSIGNOR OF THREE-FOURTHS TO CHARLES B. KELLEY, OF SAME PLACE.

PAPER WHEEL.

SPECIFICATION forming part of Letters Patent No. 290,081, dated December 11, 1883.

Application filed October 12, 1883. (No model.)

To all whom it may concern:

Be it known that I, FRANK. M. MAHAN, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Paper Wheels, of which the following is a specification, reference being had therein to the accompanying drawings.

My invention relates to a new and useful process for making spoked wheels either of one piece or in parts, to the means employed for carrying such process into effect, and to the new articles of manufacture produced thereby.

The object of the invention is the production of a wheel or the separate parts of a wheel of the character described formed from paper-pulp; and to that end the invention consists of the process, the means employed, and the articles produced, as will be described and claimed.

Reference will be made to the drawings, in which Figure 1 is a vertical section of a mold or die for forming the wheel; Fig. 2, a plan of half thereof; Fig. 3, a detail view of a mold for forming the wheel in sections, and Figs. 4 and 5 sectional detail views.

Like letters refer to like parts in each view.

A A′ represent the upper and lower sections of a two-part mold in which the wheel is to be formed, the lower part, A′, being preferably formed in a framing, as shown. At the center of part A′ there is formed a depression, *a*, which in form corresponds to the form of a wheel-hub, and which in depth is equal to one-half the height of such a hub. Radiating from depression *a* are a series of grooves, *b*, which are in depth equal to one-half the thickness of a wheel-spoke, said grooves being in form similar to the form of such spokes. At their outer ends these grooves *b* open into or communicate with a circular groove, *c*, formed in part A′. This last-named groove is equal in depth to one-half the rim of a wheel, and is of the desired width to form such rim, and to allow of the tire *c′* being placed therein, as will be described. The upper part, A, of the mold is formed with a central depression to form the other half of the hub, and with grooves for the spokes and rim of the wheel, as described in connection with part A′, the parts being so arranged that when the two parts are placed together, as shown in Fig. 1, spaces are formed for the complete wheel. Upon part A, and directly over and communicating with the space for forming the hub, is a vertical tube or pipe, B, into which the paper-pulp is fed, and situated within said tube so as to move vertically therein is a plunger, C, driven by a powerful hydraulic pressure to force the pulp to the several grooves of the mold, as will be understood.

The manner of operating the devices to form the wheel is as follows: In the hub-forming depression of part A′ is situated an ordinary box, *d*, for the interior of the hub, and within said box is placed a spindle, *e*, to prevent said box from being injured by the pressure. In the rim-forming groove is placed a tire, which is preferably of the form shown in Figs. 4 and 5, being slightly concaved, as shown. Pulp is then fed into tube B and pressure applied to plunger C, whereby said pulp is forced into the several grooves of the mold. The pulp thus forced into the mold surrounds the hub-box *d*, and is forced against the concaved surface of the tire, whereby said tire is securely held on the rim.

To render the attaching of the tire to the rim more certain, it may be formed with a series of ordinary bolt-holes, into which the pulp would be forced to form pins or bolts *f*, as shown in Fig. 5.

My process may be applied to the manufacture of any style of spoked wheels, or it may be employed to form only the hub or spokes of such wheels, the form of the mold being varied suitably; and, further, the location of the pulp-feeding tube and plunger may be varied.

The manner of securing the two parts of the mold together may be varied considerably, although I prefer the means shown, which consist of a series of strips, *g*, secured to the top and bottom of the mold and held together by bolts and nuts, as shown.

What I claim is—

1. The within-described process for manufacturing spoked wheels of paper, which consists in forcing paper-pulp, under pressure, into a mold suitably constructed, as described.

2. As a new article of manufacture, a spoked wheel made of paper, as described.

3. As a new article of manufacture, a wheel-hub formed of paper-pulp, as described.

4. As a new article of manufacture, a wheel-spoke formed of paper-pulp, as described.

5. A mold for forming spoked wheels of paper, said mold provided with suitable grooves for forming the several parts of the wheel, and in combination with means for forcing paper-pulp to such mold, as described.

6. The within-described method of securing tires to paper wheels, which consists in forcing paper-pulp into suitable openings formed in said tire, as described.

In testimony whereof I affix my signature in presence of two witnesses.

FRANK. M. MAHAN.

Witnesses:
W. J. CLAGETT,
LOUIS NOLTING.