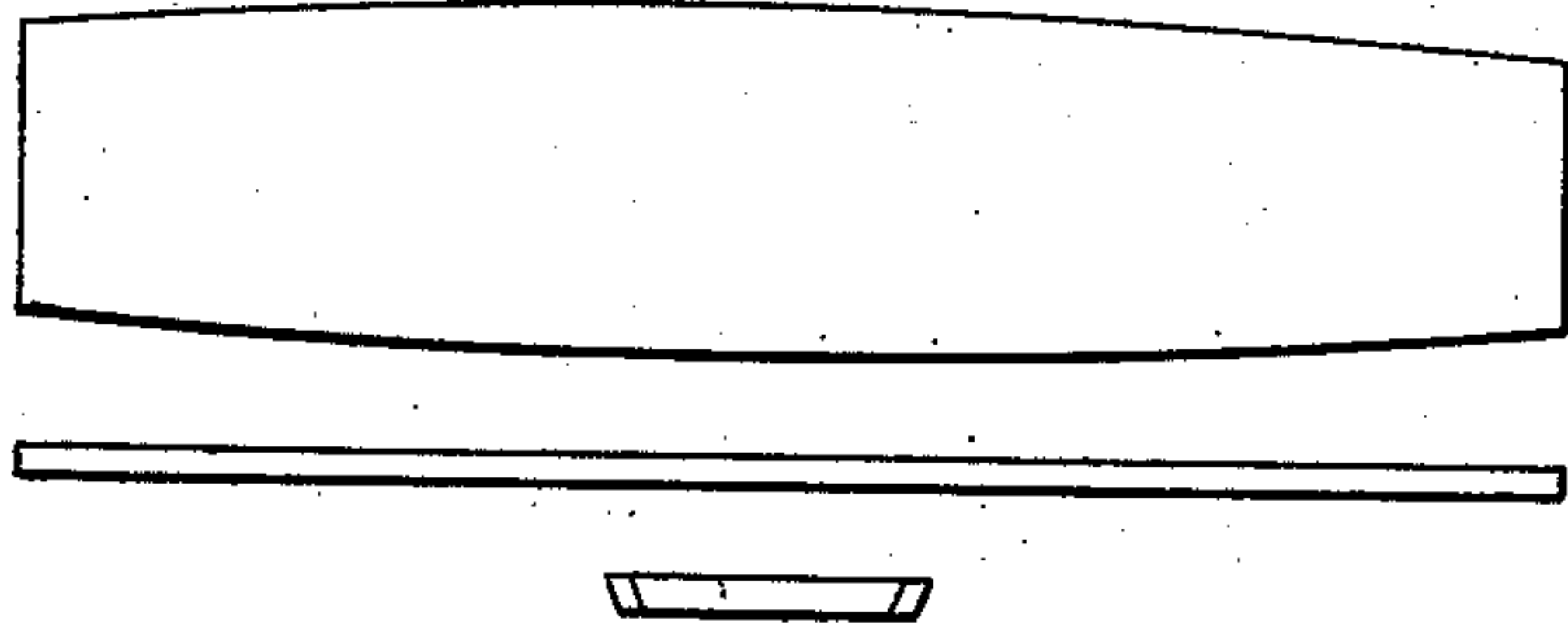


(No Model.)

F. C. ROCKWELL.

DIE FOR FORMING BARREL STAVES.

No. 389,599.  
Fig. 1



Patented Sept. 18, 1888.  
Fig. 6

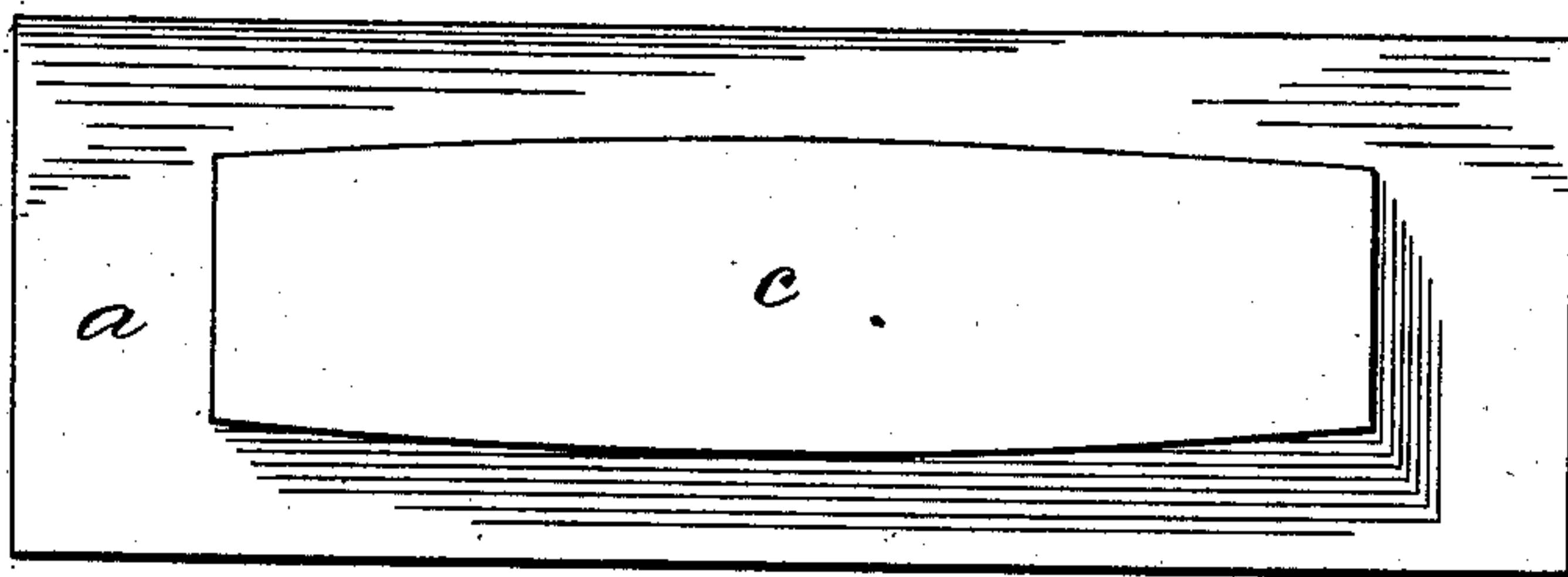
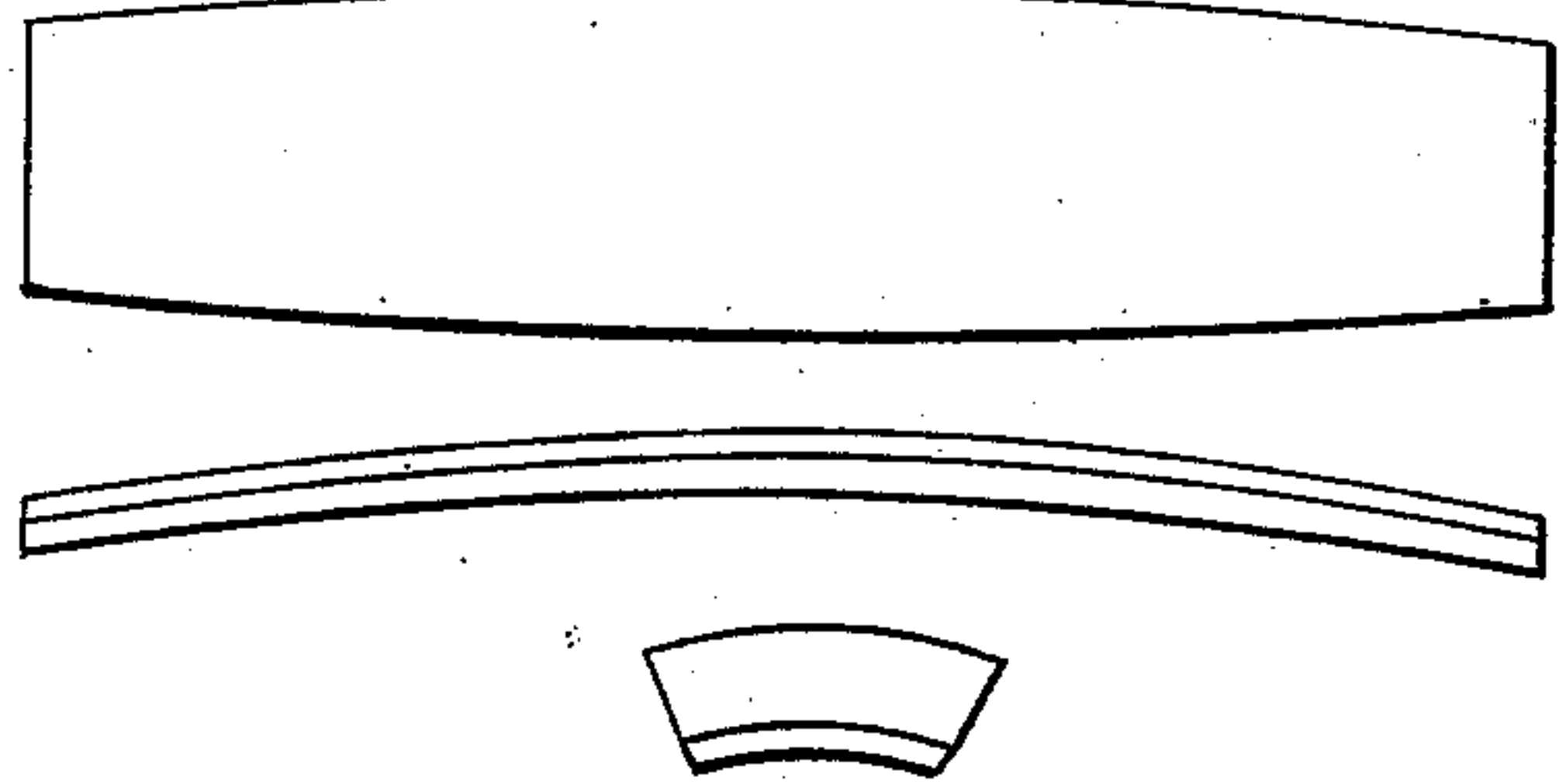


Fig. 2

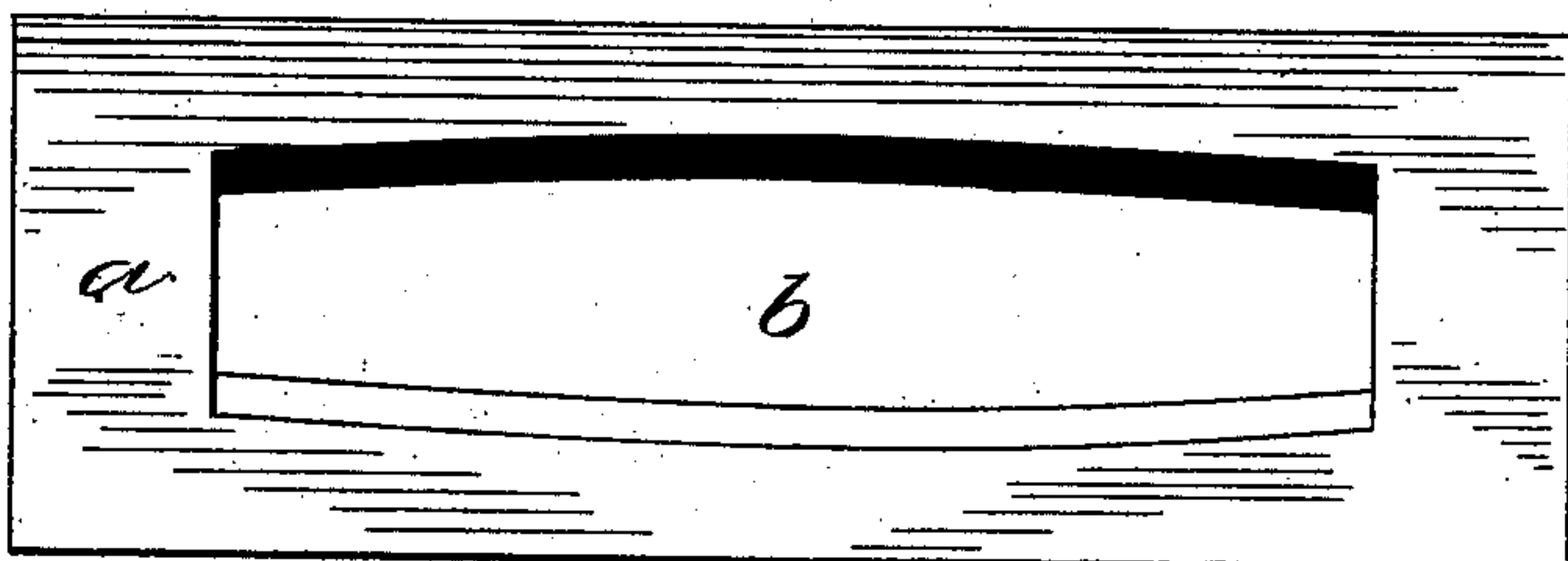


Fig. 3

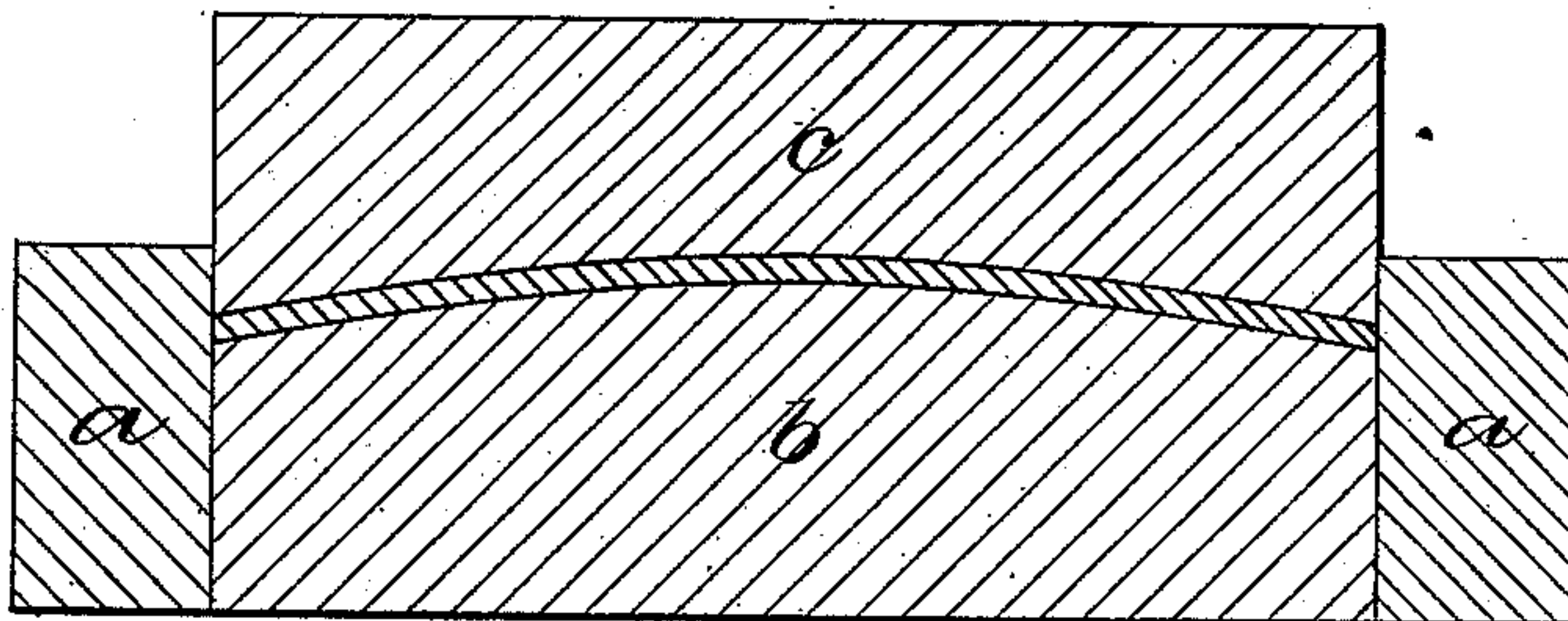


Fig. 4

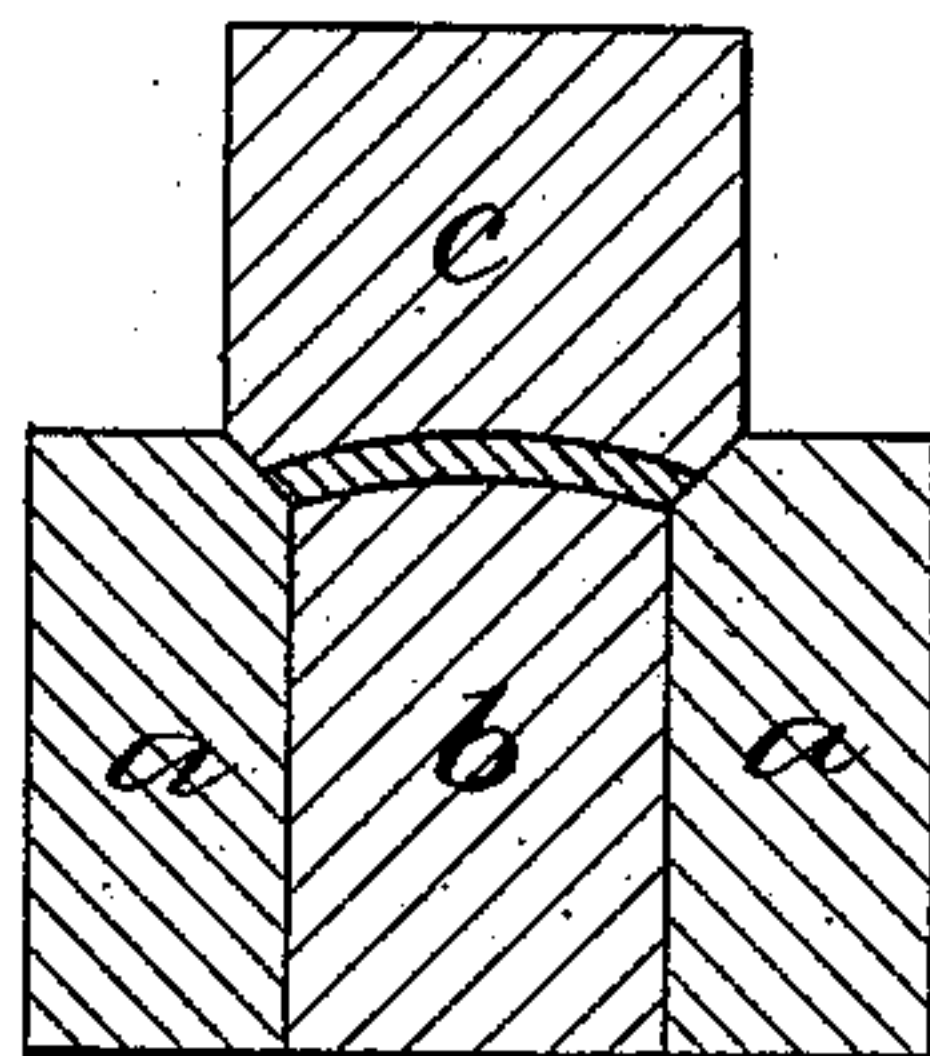


Fig. 5

Witnesses:

*Henry L. Rickard*  
*W. A. Smith*

Inventor,

*Frederick C. Rockwell,*  
*by Harry P. Williams*  
*Atty.*



# UNITED STATES PATENT OFFICE.

FREDERICK C. ROCKWELL, OF HARTFORD, CONNECTICUT.

## DIE FOR FORMING BARREL-STAVES.

SPECIFICATION forming part of Letters Patent No. 389,599, dated September 18, 1888.

Application filed December 9, 1887. Serial No. 257,404. (No model.)

*To all whom it may concern:*

Be it known that I, FREDERICK C. ROCKWELL, of Hartford, Connecticut, have invented certain new and useful Improvements in Dies for Forming Barrel-Staves, of which the following is a full, clear, and exact description.

My invention relates to the class of dies that are used to form barrel-staves by pressure from wood, pulp, or other suitable fibrous material; and the object of my invention is the production of a die which will form a barrel-stave from a blank in a better manner than any prior die, and which at the same time can be made to remove the finished stave from the chase, and thus facilitate the manufacture of staves.

Referring to the accompanying drawings, in which my die is fully illustrated, Figure 1 shows in plan, side, and end views the blank used. Fig. 2 is a plan view of the die. Fig. 3 is a plan view of the same with the upper follower removed. Fig. 4 is a view in central vertical longitudinal section, with a stave in place between the followers. Fig. 5 is a view in vertical cross-section of the same. Fig. 6 shows in plan, side, and end-views the completed stave.

My improved dies are more especially intended to press staves to shape from wooden boards, and this has previously been accomplished by dies having open sides, which have the objection that the material is crowded toward the edges and is liable to splinter, which of course produces an imperfect stave. Dies have also been made of two pieces, the upper follower forcing the material into the socket in the chase. This has been found to be impracticable, for the reason that the blank thus pressed is not easily removed from the socket into which it has been pressed, and after it has been removed the edges have to be trimmed to form the proper bevel to make a tight barrel or cask; and this is exceedingly difficult to accomplish. By the use of my dies these objections are overcome and the manufacture of pressed barrels made practicable.

In the drawings, the letter *a* denotes the chase, which is made of any desirable material in any suitable shape. This chase has a central opening of a size that will just receive the lower follower, *b*, which is made of hard ma-

terial, with its upper end convexed to the shape which the inner side of the stave is to receive. Two sides of the upper edges of the opening through the chase are beveled to a degree which it is intended that the stave shall have when finished to form a tight barrel. The upper follower, *c*, which is made of any desirable metal, has its under face concaved to the shape which the outer side of the stave will have, and its longer bottom edges beveled to fit the bevel made along the upper edges of the opening through the chase, so that when these two beveled surfaces fit tightly together there will be an opening between the curved faces of the followers equal to the thickness of the finished stave.

The dies are operated as follows: The lower follower is placed in the chase, which is supported in a press in any convenient manner. A flat blank, which has been previously steamed or otherwise treated, and which has its edges chamfered to approximate the final bevel, is placed in the chase on the lower follower, and the upper follower is brought down with great force by means of hydraulic or other pressure, which bends the blank to the desired form and compresses the fibers of the material in such manner as to give strength to the stave and a hard smooth edge with the desired bevel. If it is desired, pressure may also be applied to the lower follower, which will aid in properly spreading the fibers of the wood and make the stave less liable to split or crack. After sufficient pressure has been exerted, the upper follower is raised by any suitable mechanism, and the lower follower is caused to follow up and push the stave from the mold.

By making the edges of the opening in the chase beveled, as shown, some of the strain which would naturally come on the lower follower is taken by the chase, which is backed up more firmly than the lower follower, which is movable. These bevels also give a smooth, hard, and even finish to the edges of the stave on the proper angle to make a tight joint when a barrel is made up without any further manipulation.

Another advantage resides in my dies in the fact that staves of different thicknesses can be worked with the same chase and lower follower, the upper follower merely being made

with a larger or smaller base, to determine the distance between the two followers, while in the old forms it requires a complete die for each thickness of material from which staves are  
5 made.

I claim as my invention—

The herein-described die for forming barrel-staves, which consists of the chase having an oblong opening through it, the upper edges of  
10 the opening on the two longer sides being cut away on a bevel from the edge of the lower follower, the oblong lower follower with con-

vexed upper face fitting the opening through the chase, and the oblong upper follower with concaved under face, the two longer bottom  
15 edges of the concaved face being beveled off to fit and come to a bearing on the beveled upper end of the opening through the chase, substantially as specified, and for the purpose set forth.

FREDERICK C. ROCKWELL.

Witnesses:

H. R. WILLIAMS,

G. G. HADDOW.