

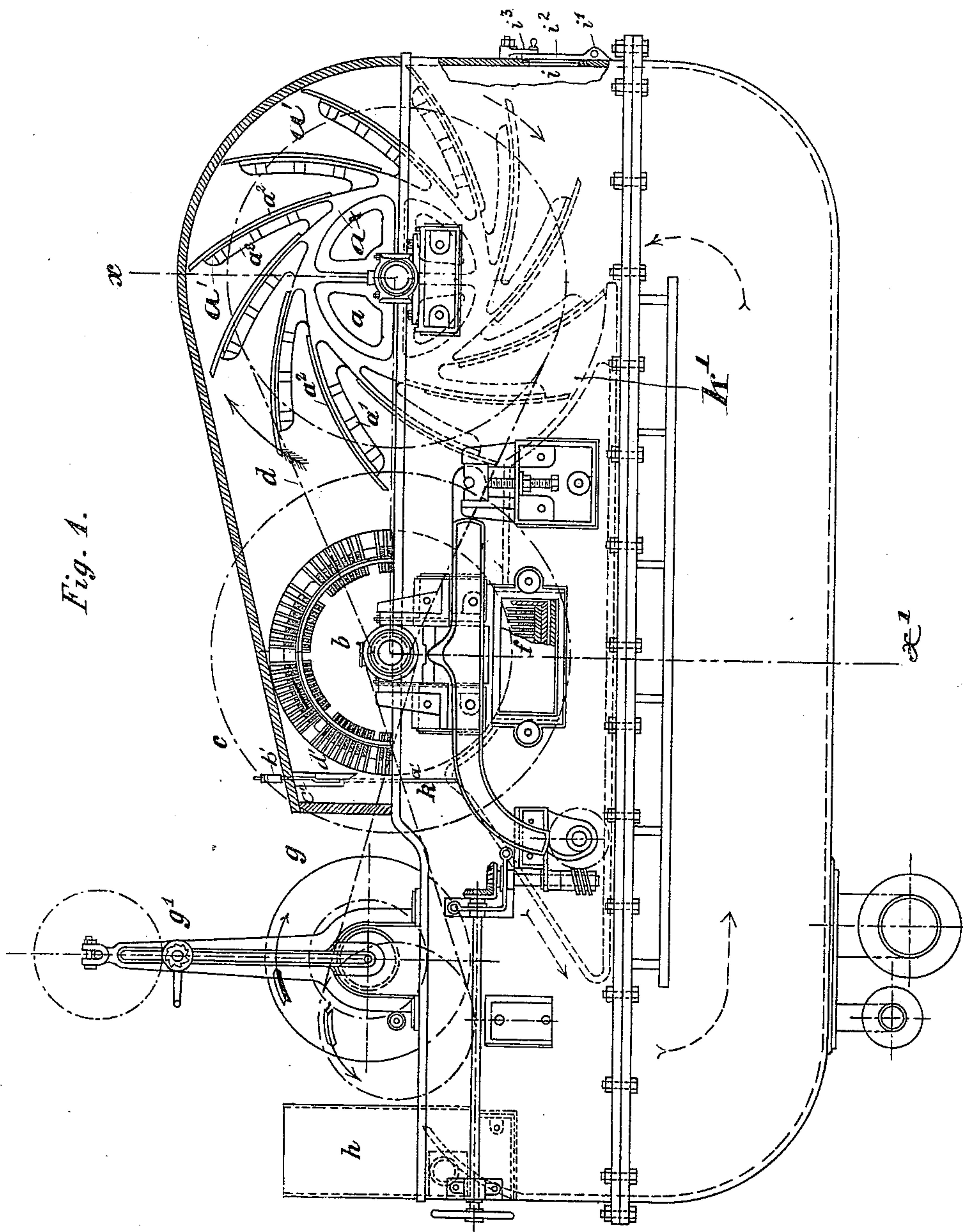
(No Model.)

5 Sheets—Sheet 1.

A. KARGER.  
MACHINE FOR GRINDING PULP.

No. 525,846.

Patented Sept. 11, 1894.



WITNESSES:

*A. B. Decker*  
*R. A. Hopper*

INVENTOR:

*Adolf Karger*  
By his Attorney,  
*G. Dittmar.*

(No Model.)

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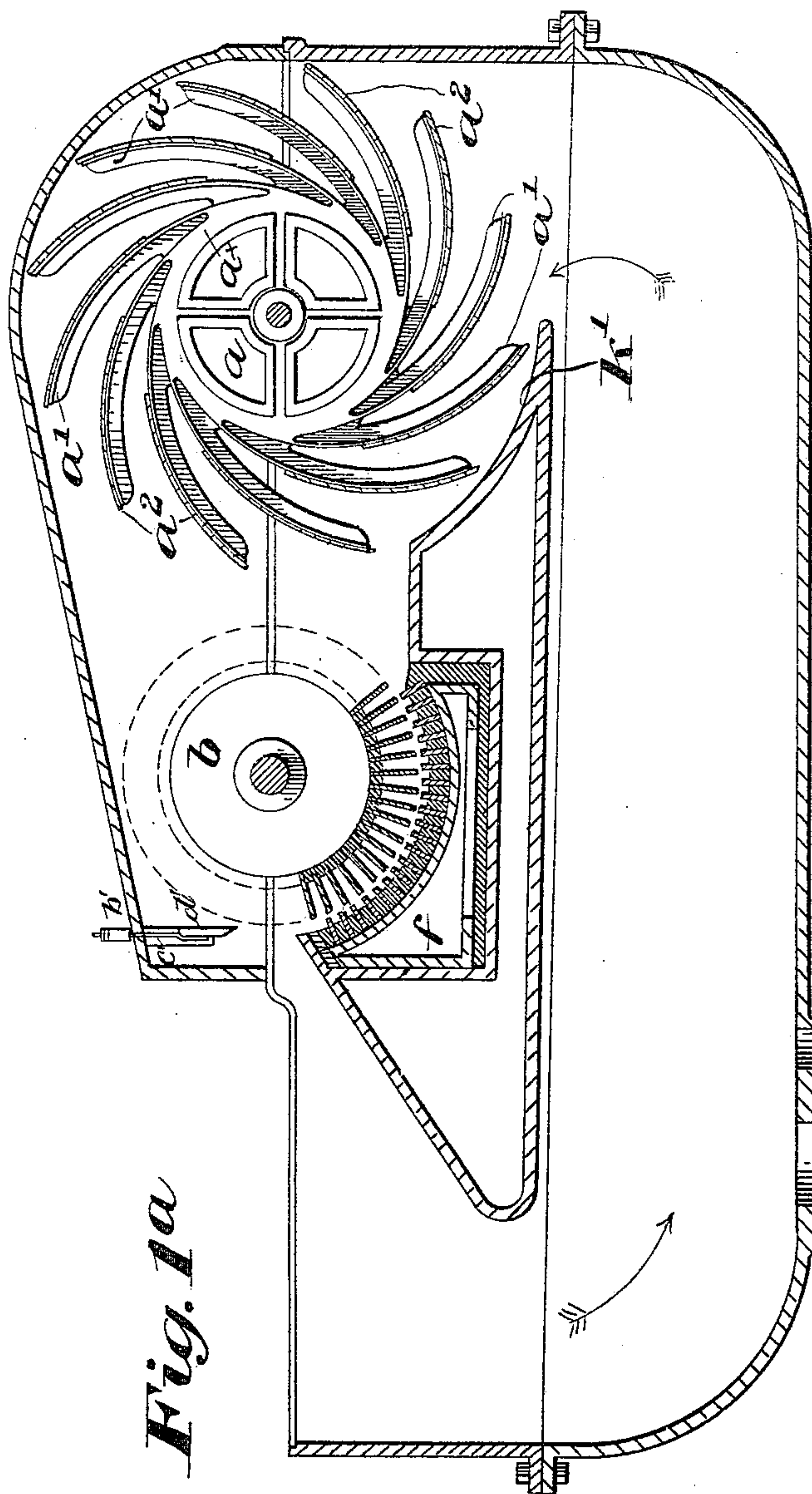


Fig. 1a

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*A. B. Degger*

INVENTOR

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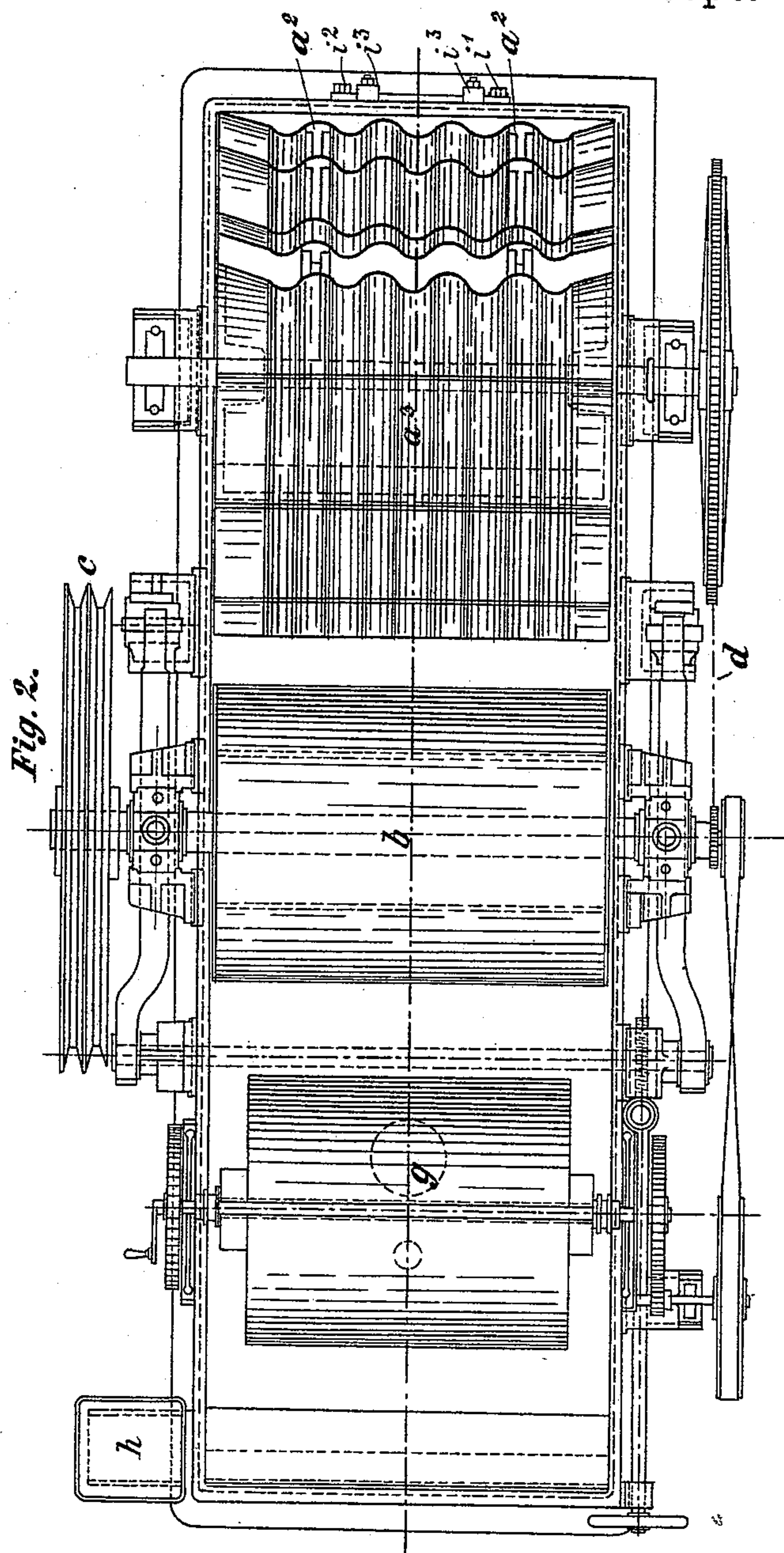
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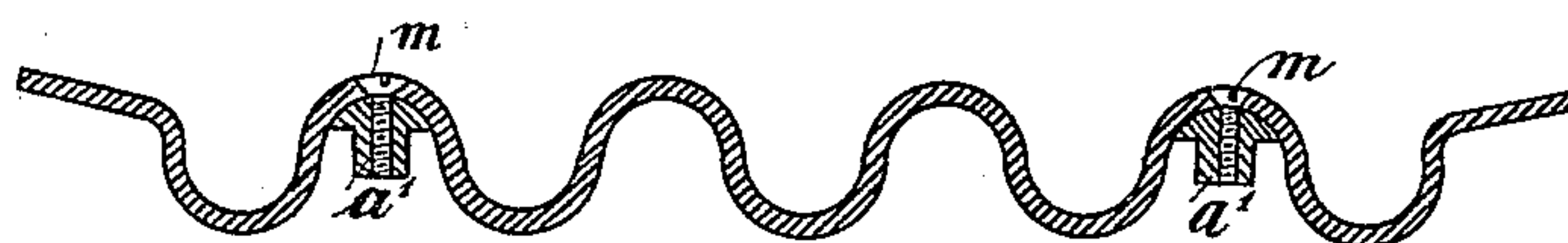
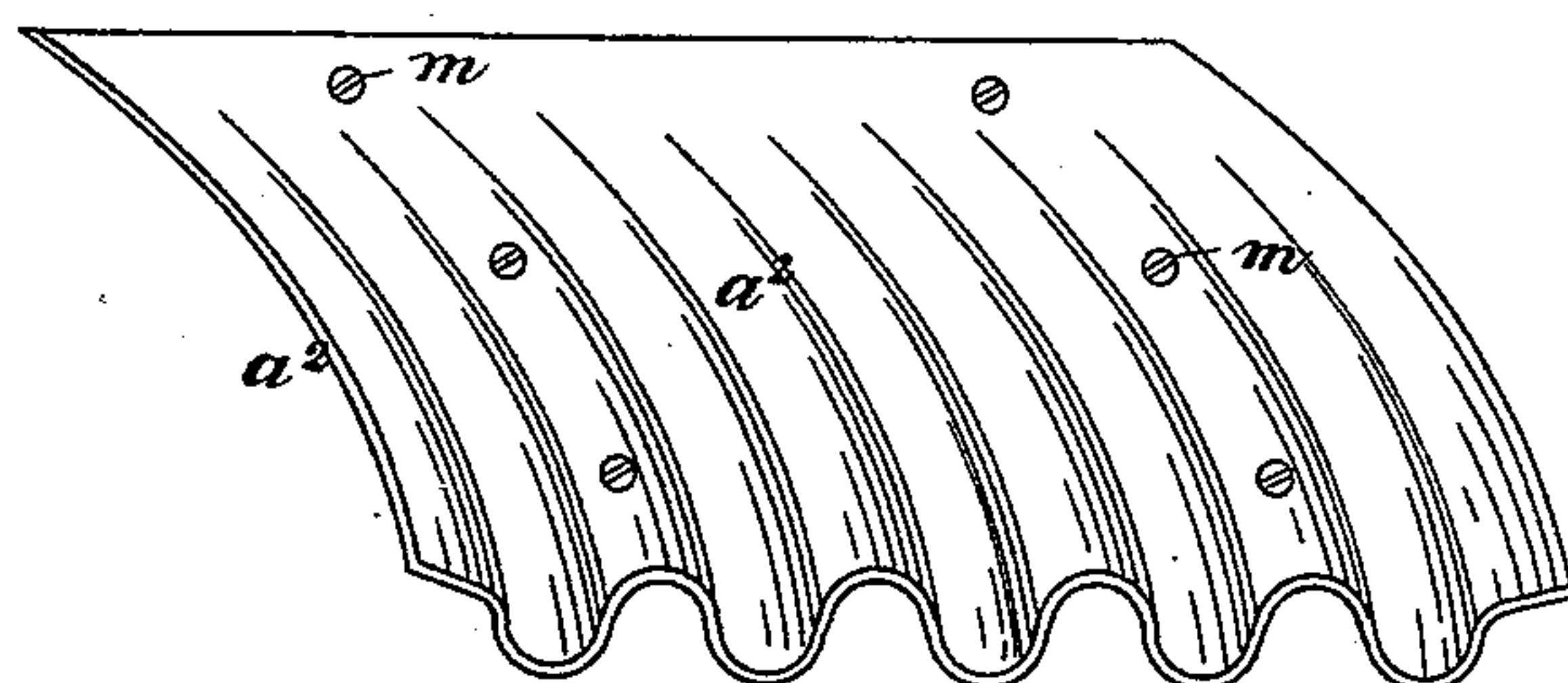
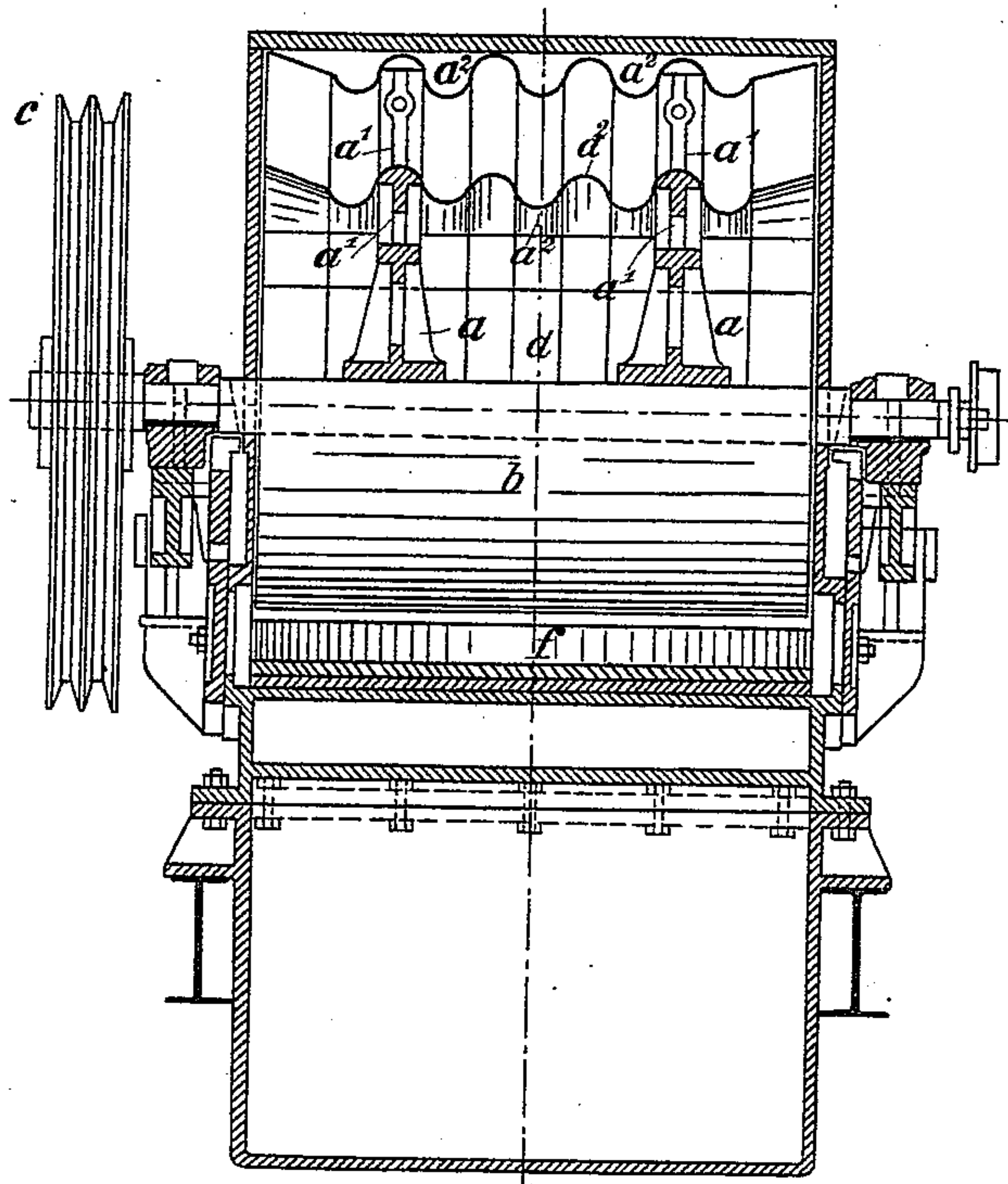
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(No Model.)

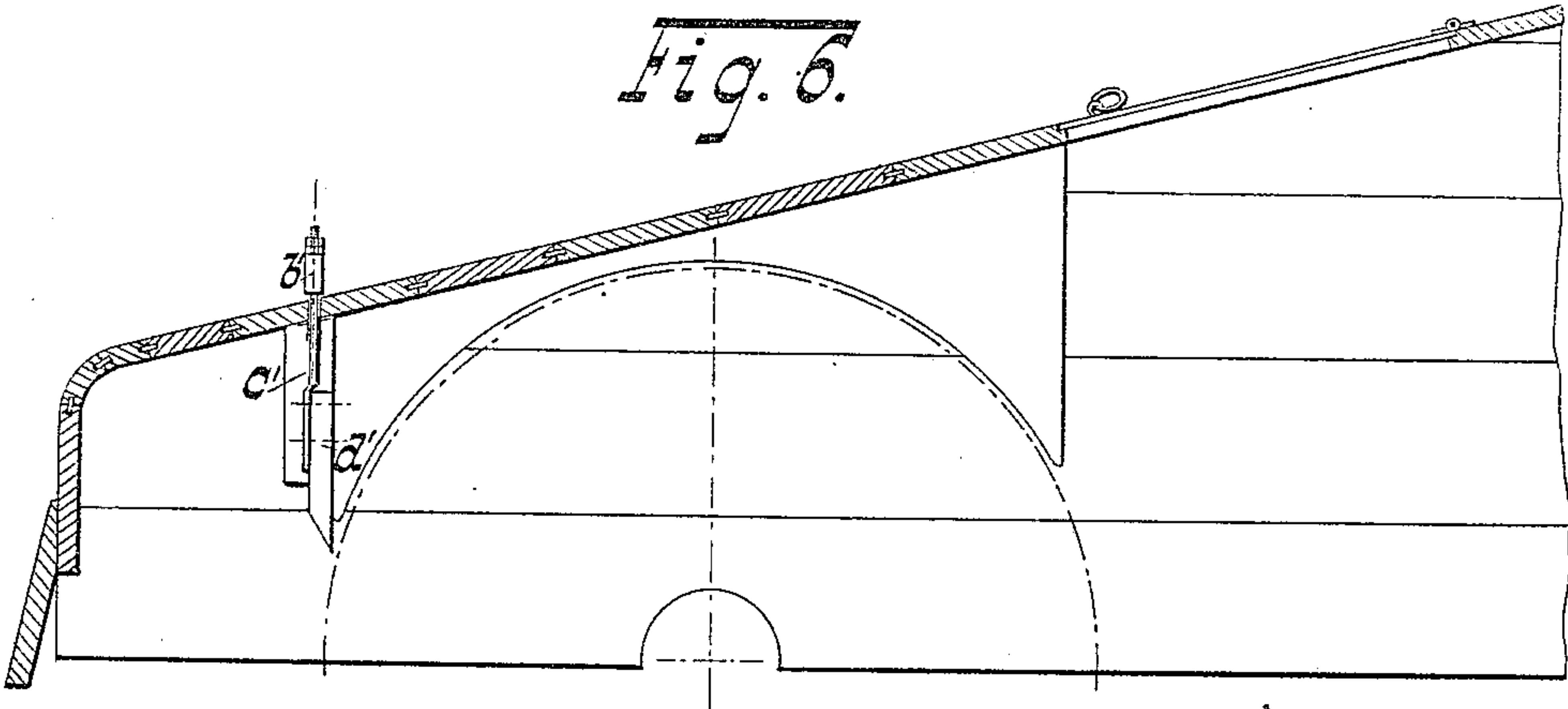
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A. KARGER.  
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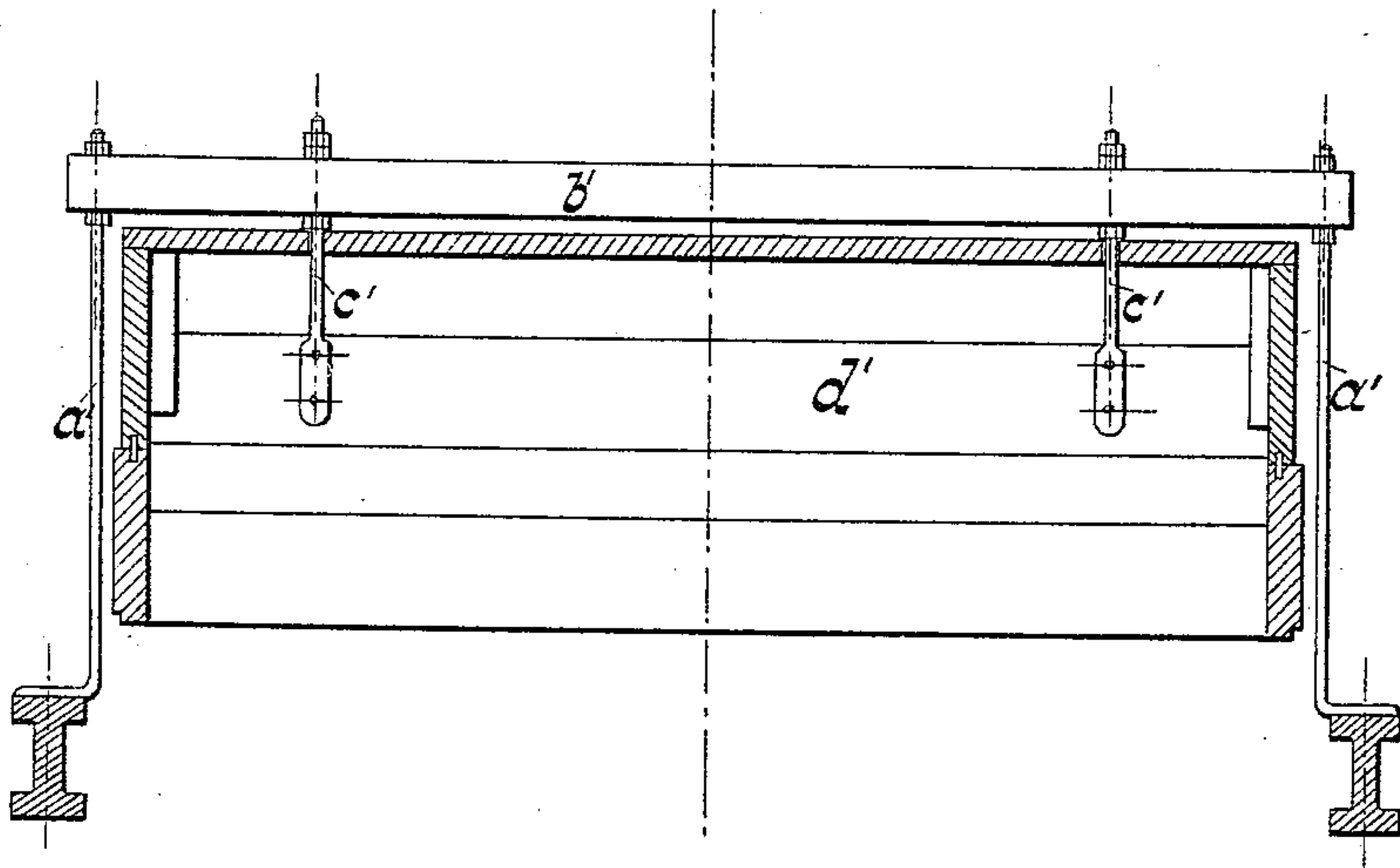
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*Fig. 6.*



*Fig. 7.*



Attest:—  
J. H. Karger  
F. Dittmar

Inventor:—  
Adolf Karger  
By G. Dittmar.  
att'y



# UNITED STATES PATENT OFFICE.

ADOLF KARGER, OF ALOISTHAL, AUSTRIA-HUNGARY.

## MACHINE FOR GRINDING PULP.

SPECIFICATION forming part of Letters Patent No. 525,846, dated September 11, 1894.

Application filed July 18, 1892. Serial No. 440,426. (No model.)

*To all whom it may concern:*

Be it known that I, ADOLF KARGER, of Aloisthal, near Eisenberg-on-the-March, Austria-Hungary, have invented certain new and useful Improvements in Machines for Grinding Pulp, of which the following is a specification.

The present invention relates to improvements in rag engines of the kind wherein the stuff circulates in a vertical plane and has for its object, first, to produce an intimate mixture of the pulp in all the parts of the trough as well as an accelerated and even grinding of the stuff; second, to regulate the feeding of the stuff to the roller of the rag-engine; third, to admit of an easy and thorough cleaning and emptying of the trough. The first named object is attained by a revolving roller with paddles having a surface more or less undulated in the whole depth. The feeding of the stuff is effected by the peculiar disposition of the paddle roller in front of the beater. For the purpose of cleaning, a manhole is provided which can be hermetically closed by a door.

In the accompanying drawings an underground rag-engine provided with my improvements is shown.

Figure 1 is an elevation of the same partly in section. Fig. 1<sup>a</sup> is a longitudinal mid section of the engine. Fig. 2 is a plan view. Fig. 3 is a cross section of the rag engine on line  $x-x'$  Fig. 1, showing the lower half of the beater in elevation. In Figs. 2 and 3, I have not deemed it necessary to show the several knives of the beater in detail but have merely represented said beater generally as its construction is well known. Fig. 3<sup>a</sup> shows a modification of the undulations for the paddles of the revolving roller. Fig. 4 is a perspective view of a paddle on an enlarged scale showing how the undulations run out in a curved smooth surface. Fig. 5 illustrates the means for fastening the paddles on the curved arms of the carriers. Figs. 6 and 7 are details of a device used to prevent or reduce as far as possible the throwing out of the stuff.

The shafts of the paddle wheel  $a$  and the beater  $b$  receive motion through the rope or belt pulley  $c$  upon the beater shaft which transfers its revolutions by means of chains  $d$

(belts or gear wheels) to the paddle roller  $a$  with suitably, decreased speed.

$f$  is the trough block provided with a series of cutters, arranged in a curved plane conforming to the surface of the beater roll.  $g$  is the washer with the ordinary device for raising and lowering the same.

$h$  is the feed hopper and  $i$  the manhole.

The disposition and arrangement of the paddle roller driver  $a$  are shown in Figs. 1 and 3. It is composed of two wheel frames or spiders  $a^x$ , keyed upon the shaft and provided with curved arms  $a'$  to which are fastened paddles  $a^2$  of wrought or cast metal having also the same curved form and being undulated in section.

The undulations can have the ordinary form as shown in Fig. 3 or they can be deeper or shallower or be bent in zigzag or in broken straight lines as shown in Fig. 3<sup>a</sup>. The undulations can be also decreased in depth toward the shaft so that they run out gradually into a plane curved (non-undulated) surface as Fig. 4 clearly exhibits. The fastening of the undulated paddles upon the arms  $a'$  is effected by screws  $m$  as shown in the section Fig. 5.

Paddles of the above described kind produce during their revolution an intimate mixture of the paper stuff not only in longitudinal direction of the rag-engine but also transversely to the same. Thus not only the most appropriate mixing and even grinding of the stuff is obtained but also the time for grinding is abbreviated and power is economized because of the stuff passing at the slowest speed along the sides of the engine on account of friction and that the stuff between the beater and the sides,—having not yet passed between the beater and the block—is led continuously from the sides toward the middle of the rollers and forced to pass between the beater and the block.

In the ordinary forms of rag engine wherein the driver is arranged behind the beater, the beater has always as far as I am aware, been placed at the crest of the breasting or mid-feather. This construction has the disadvantage that the stuff is fed in such excessive quantities to the beater roll from the driver or paddle wheel that the beater is unable to



properly perform its function and to remedy this defect it has been necessary to provide conduits to lead the excess of pulp back from the midfeather into the trough.

5 In order to obtain an even feeding and to dispense with the necessity of leading back an excess of stuff and in order to effect the work of beating and whipping the stuff by the cutters of the beater, so important for ob-  
 10 taining smooth and elastic fibers, I arrange as shown in Fig. 1 the driver or paddle wheel in front of the beater, and in such a way that the stuff from the deeper part  $k'$  of the trough is lifted and guided in almost a horizontal  
 15 direction toward the lower periphery of the beater in order to make it pass between the same and the block. Thus it will be seen that the beater has still to lift the stuff over the highest point  $k$  of the trough. By this  
 20 means the rising of the pulp before the beater and the consequent clogging of the beater and interruption of the operation is prevented. Moreover a beating and whipping is effected before and behind the block and  
 25 the work of the beater is completely separated from the work of the paddle roller. It is self evident that this arrangement is not only intended for the herein described undu-  
 30 lated driver but that it can be employed just as well with the ordinary known driving rollers.

In order to admit of thorough and easy cleaning of the trough of the rag-engine a manhole is provided in the side immediately  
 35 opposite to the paddle roller which can be closed by a door  $i^2$  hung in hinges  $i'$  at the lower corners. A rubber packing can be used and a turn-button  $i^3$  insures a perfectly tight joint. Through this man-hole the rag-engine  
 40 can be thoroughly cleaned in the back part and when empty the stuff remaining in the bottom and hanging on the sides (which is of course whole-stuff) can be removed by scrap-  
 45 ers or by means of a jet of water and let off through the bottom valve of the rag-engine. In this way the necessity of entering the lower part of the rag engine which was necessary heretofore for cleaning the same is en-  
 50 tirely dispensed with.

Further improvement relates to a device by which the throwing out of the finished stuff over the beater is reduced to its lowest de-  
 55  $d'$  is a slide, which may be of wood or metal, which slide is hung in vertical guides from

the cap of the engine in front of the beater roll, and at a point above that at which the engagement of the beater roll with the block ceases. This slide as herein shown is hung  
 60 on metal straps  $c'$  passing through the cap and secured to a transverse yoke  $b'$  there- above, to which yoke are connected bars  $a'$  on each side of the cap, said bars  $a'$  being  
 65 connected in any preferred manner with a suitable lifting device, whereby said slide  $d'$  may be lifted out of proximity to the beater roll or lowered into position.

Having thus described my invention, what I desire to secure by Letters Patent is—

1. The roller provided with paddles  $a^2$   $a^2$  70 each formed of a sheet of metal having its outer end bent in an undulating line, the bends disappearing at the inner edges of the sheet as set forth.

2. In a rag engine, the combination with a 75 trough, and a midfeather arranged therein, of a block on said midfeather, a beater roll mounted in bearings above said block and a paddle wheel arranged behind said beater, said midfeather having an upwardly inclined 80  
 portion arranged in front of said beater roll on the side thereof opposite the driver, substantially as set forth.

3. In a rag engine the combination with a 85 trough and a midfeather arranged therein, said midfeather having an upwardly inclined forward end and a horizontal portion in the rear of said inclined portion, of a block mounted on said midfeather between said 90  
 horizontal and upwardly inclined portions thereof, a beater roll, mounted in bearings above said block, and a paddle wheel arranged behind said beater on the side thereof adjacent to the horizontal portion of the mid- 95  
 feather, substantially as set forth.

4. In a rag engine the combination with a 100 trough and a block mounted therein, of a beater roll mounted in bearings above said block, and a paddle wheel having paddles each of which consists of a sheet of metal bent to an undulated section in the plane of the axis of the roller, substantially as set forth.

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

ADOLF KARGER.

Witnesses:

W. B. MURPHY,  
 PAUL BERGER.