

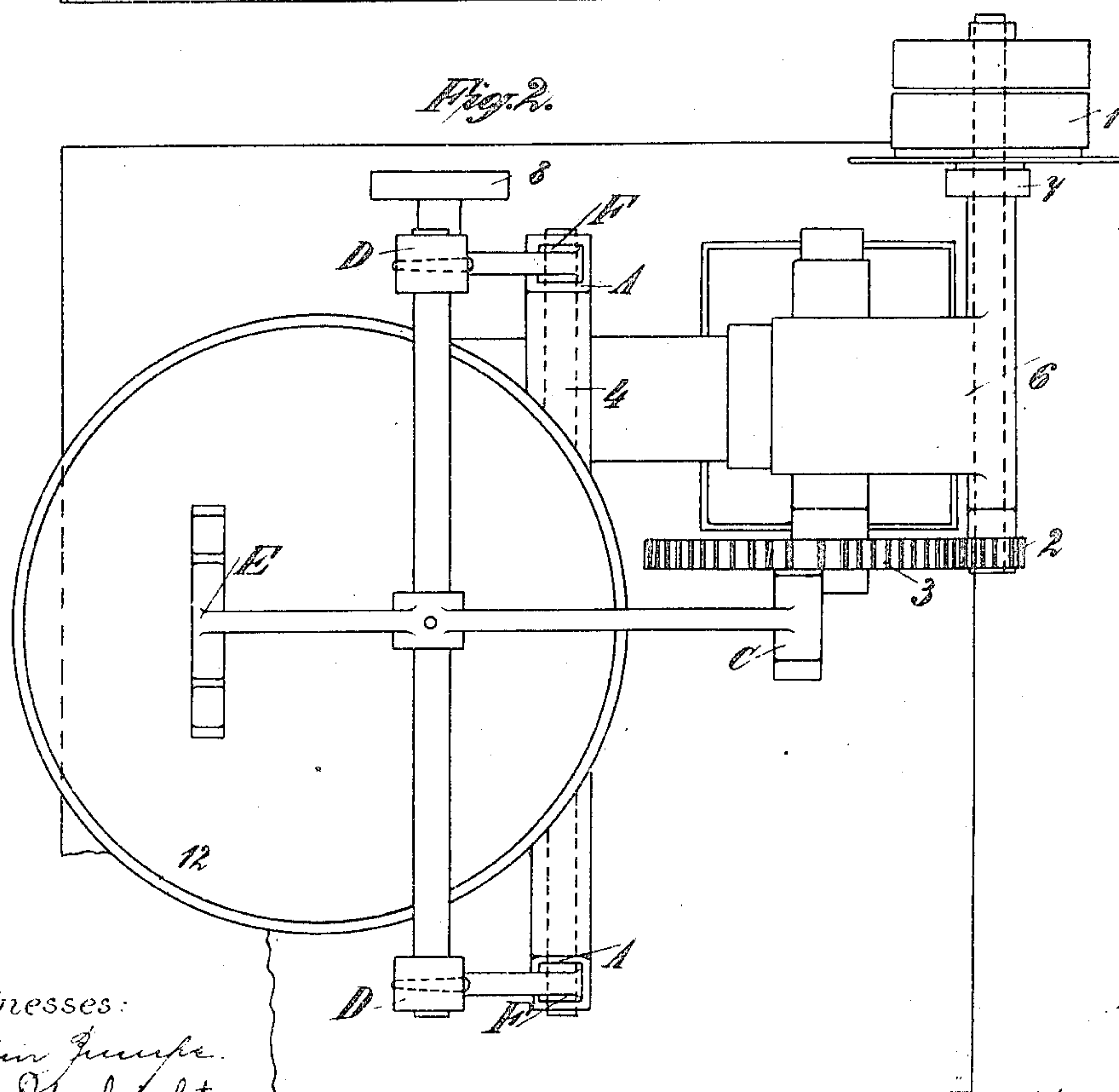
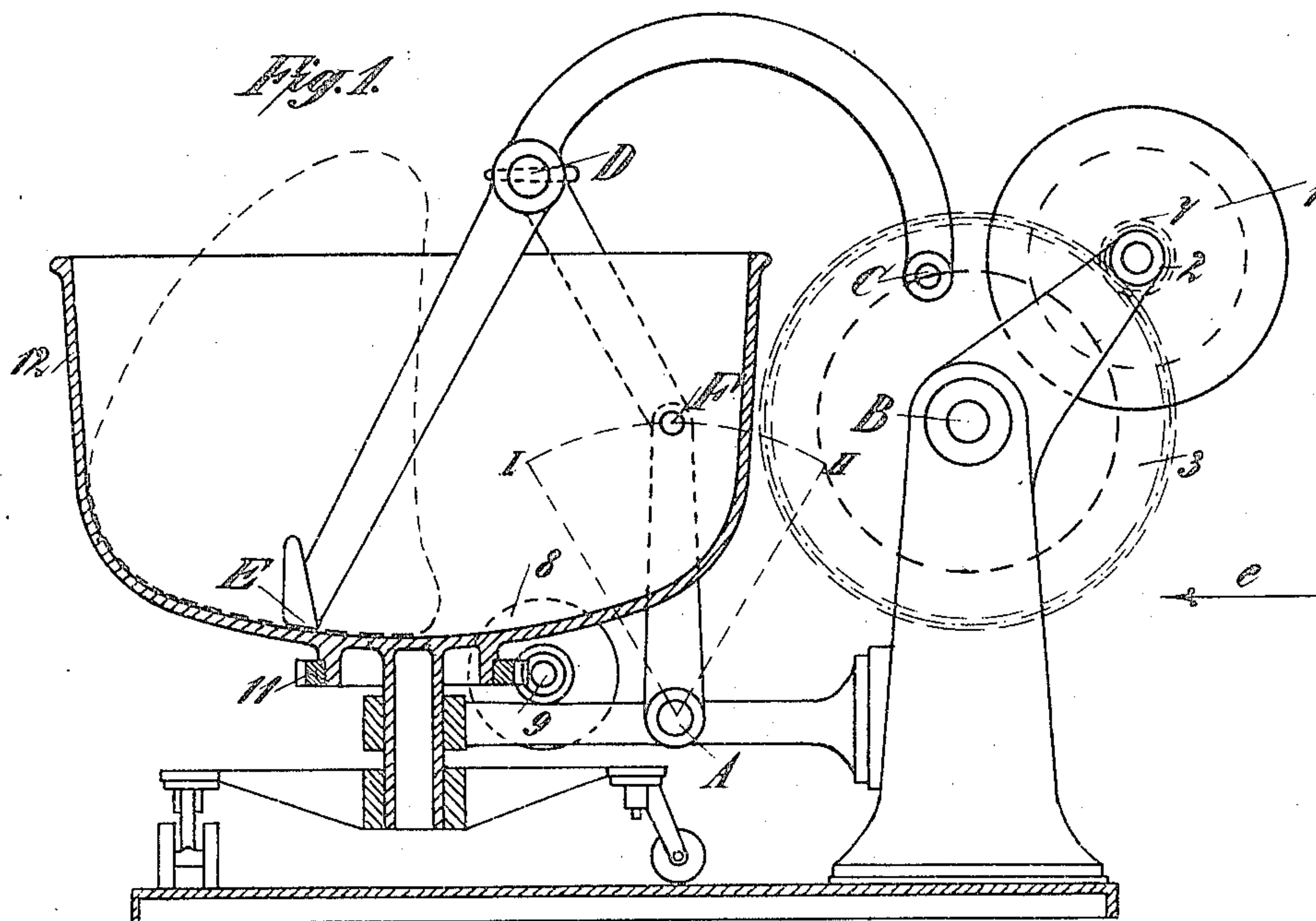
No. 828,609.

PATENTED AUG. 14, 1906.

H. KIRCHER.  
DOUGH KNEADING MACHINE.

APPLICATION FILED MAY 11, 1905.

3 SHEETS—SHEET 1.



Witnesses:  
Arthur J. J. J.  
Fred. J. J.

Inventor  
Heinrich Kircher  
by J. J. J. J.

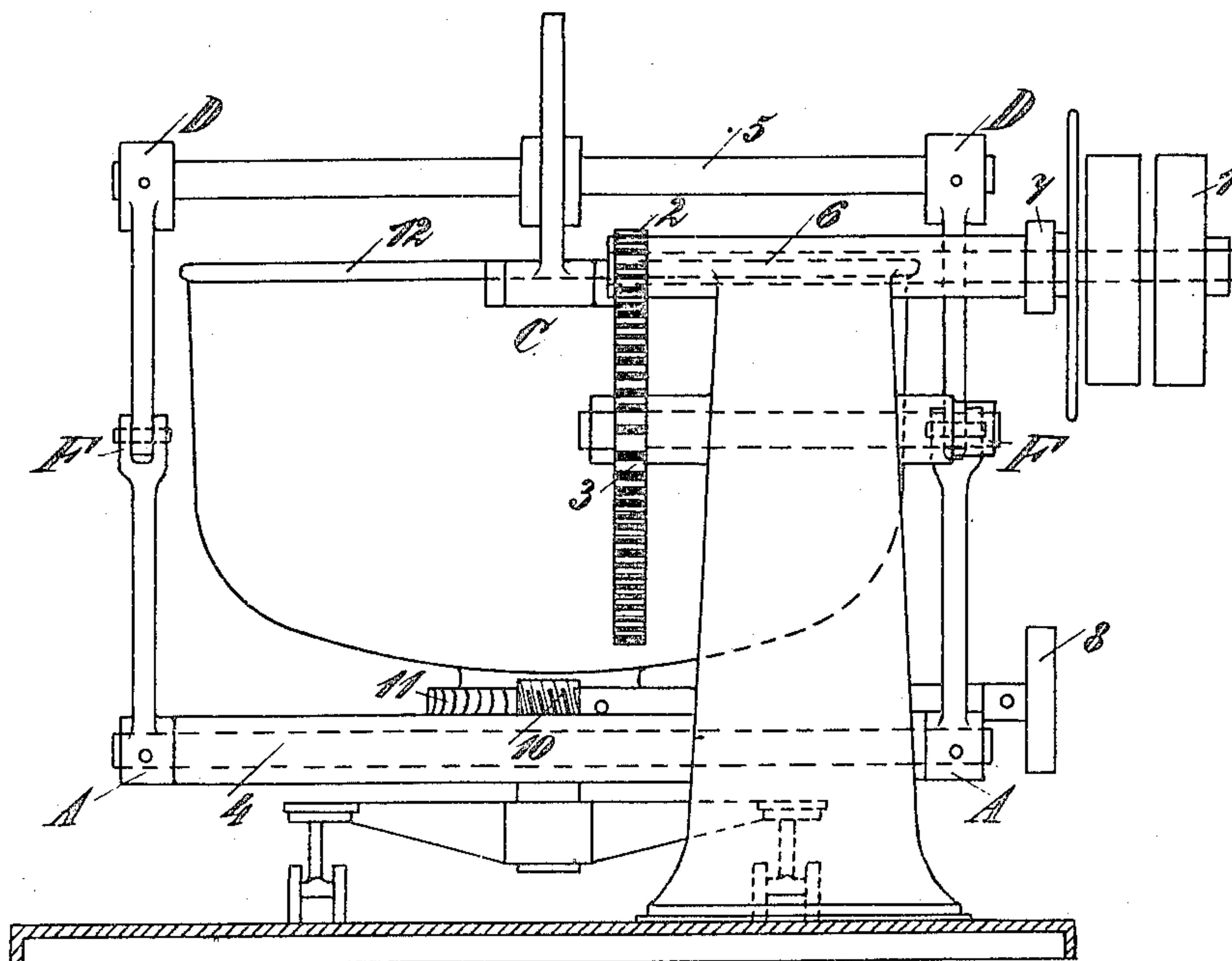
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3 SHEETS—SHEET 2.

*Fig. 3.*



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by Frank Briesend Att'y

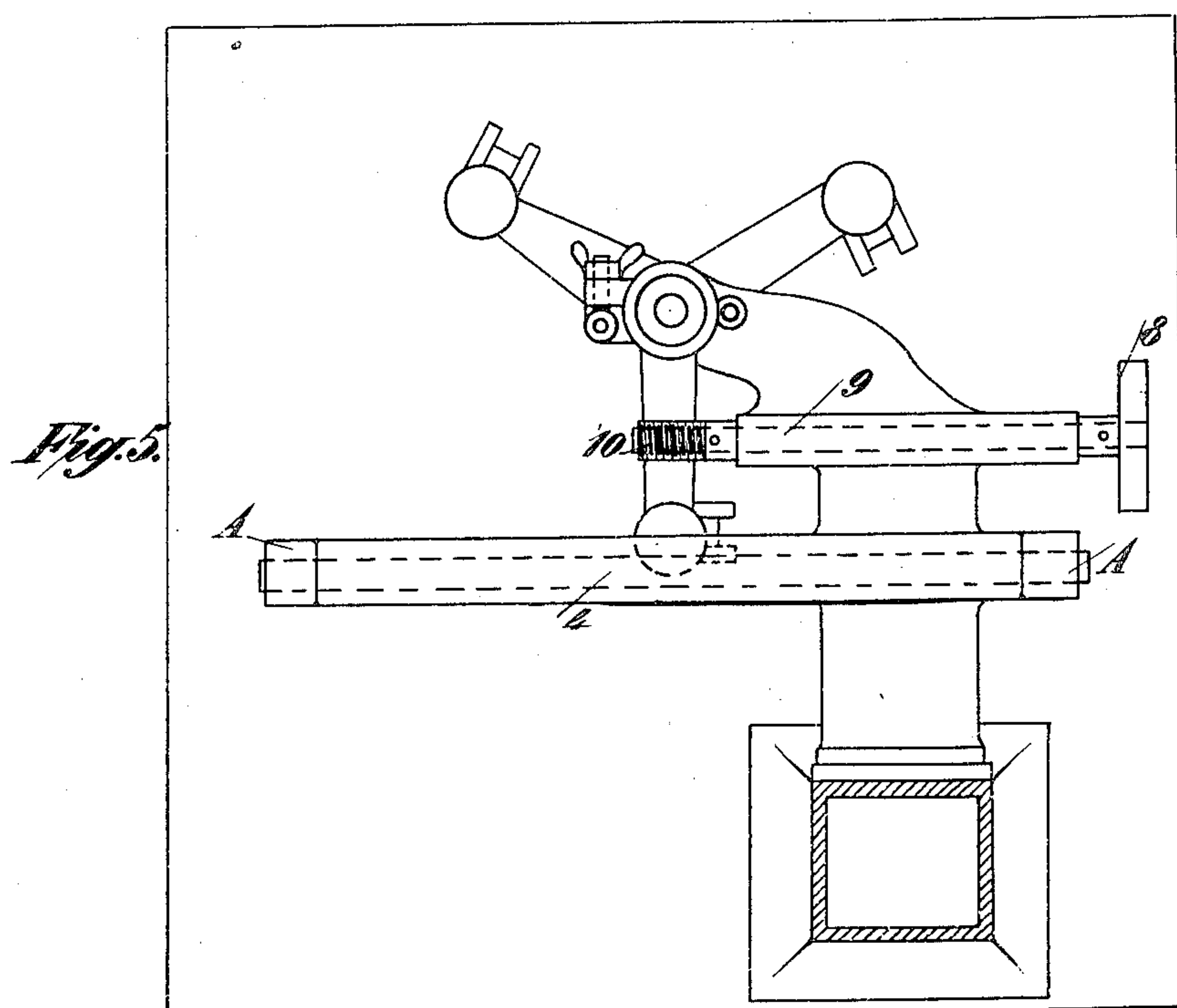
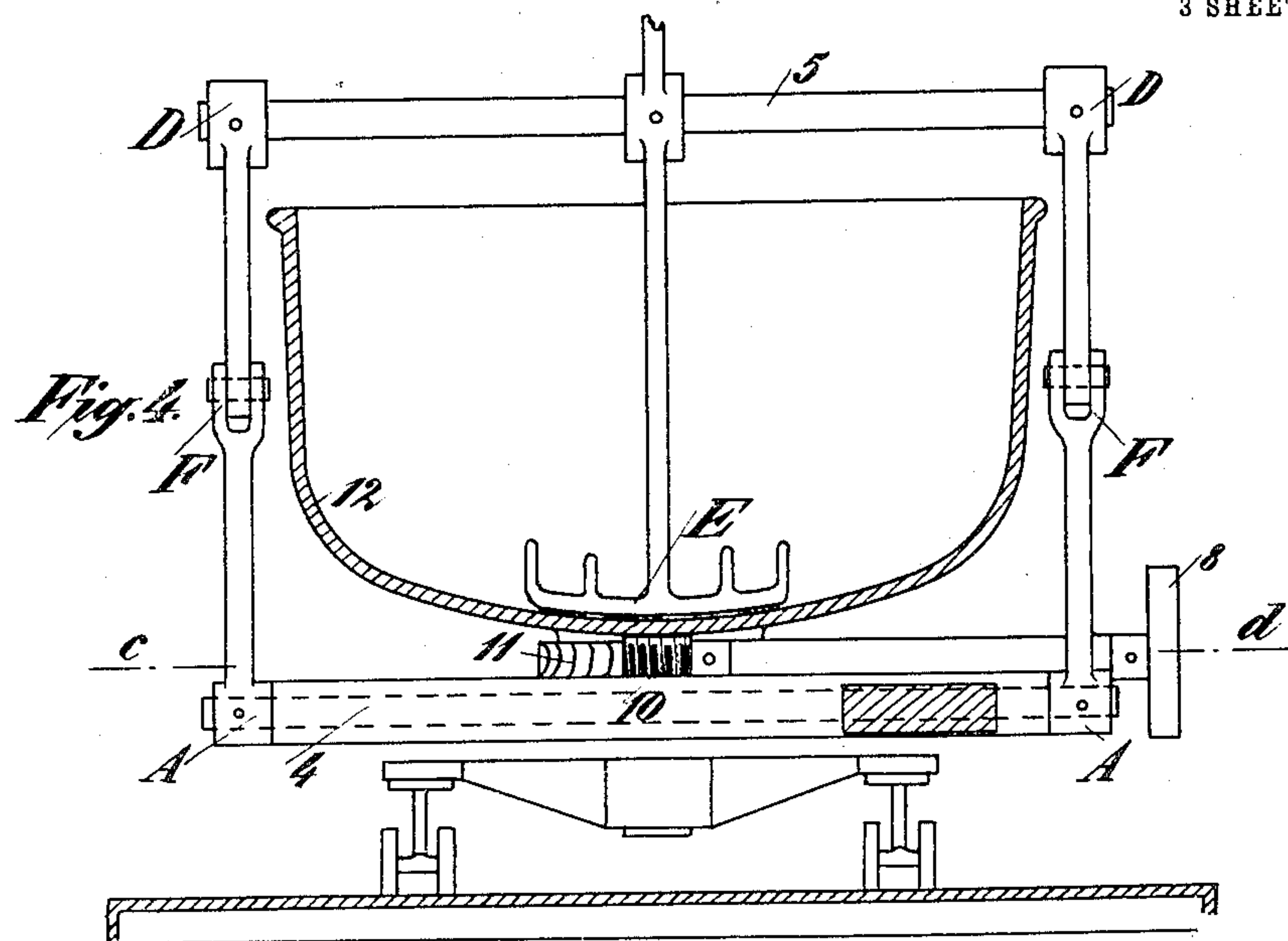
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3 SHEETS—SHEET 3.



*Witnesses:*

Arthur Jupp &  
Fred Crichton

Inventor

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# UNITED STATES PATENT OFFICE.

HEINRICH KIRCHER, OF CANNSTATT, GERMANY, ASSIGNOR TO THE FIRM OF CANNSTATTER MISCH-UND KNETMASCHINEN-FABRIK, CANNSTATTER DAMPFBACKOFEN-FABRIK, WERNER & PFLEIDERER, OF CANNSTATT, GERMANY.

## DOUGH-KNEADING MACHINE.

No. 828,609.

Specification of Letters Patent

Patented Aug. 14, 1906.

Application filed May 11, 1905. Serial No. 260,054.

*To all whom it may concern:*

Be it known that I, HEINRICH KIRCHER, a subject of the King of Württemberg, residing at Cannstatt, Germany, have invented certain new and useful Improvements in Dough-Kneading Machines, of which the following is a specification.

In the kneading-machines used hitherto it was necessary to take off the kneading-arm to allow of the dough-dish being removed. This caused considerable trouble to the bakers, especially in large machines of the class described. Therefore several devices have been applied for facilitating the taking off of the kneading-arm.

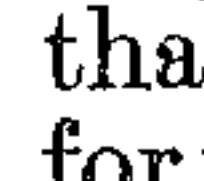
The object of the present invention is to do away with these drawbacks and to remove the dough-dish without taking off the kneading-arm previously. The realization of this idea necessitates a special construction of levers and guide-rods which impart a certain movement to the kneading-arm, which construction forms a characteristic of the present invention. The arrangement of the levers and guide-rods of the kneading-machine is such as to give a good outer appearance to the machine and to restrict the space which it occupies.

The kneading-machine is represented on the accompanying drawings, in which—

Figure 1 is a sectional elevation of the machine. Fig. 2 is a plan view. Fig. 3 is a view of the machine in the direction of the arrow *e*, Fig. 1; Fig. 4, a side elevation, partly in section, of the machine; and Fig. 5 is a section taken on the line *cd* of Fig. 4.

The construction and the working of the machine are as follows:

The machine may be operated from a power-shaft, or it may be directly coupled to a suitable motor. The pulley 1 rotates the toothed wheels 2 and 3, meshing with each other. To the wheel 3, which turns on shaft B, is secured the crank-pin C, which is engaged by the kneading-arm C D E. To make the end of the kneading-arm describe the curve shown in Fig. 1, a special arrangement of levers and guide-rods is necessary. On both sides of the dough-dish the arms A F, Fig. 4, are arranged, which are connected by a common shaft 4 and oscillate round point A into the positions denominated I and

II in Fig. 1. On the common shaft 5 the levers D F are on both sides of the dough-dish rigidly connected to the kneading-arm C D E and extend over the dough-dish 12 in form of a bow. The levers D F are at F rotatably connected with the levers A F to constitute toggles. It may be remarked that this bow F D D F if sufficiently strongly constructed, may also be arranged on one side only and that the form of a  was shown here only for reasons of suitability. Experiments made with several positions of the fulcrums and connection-points of the arms A F have shown that when the form of curve described by the end of the kneading-arm shown in Fig. 1 is retained, while the distance between the arms A F, the cranks C B, and the dough-dish 12 is increased, the machine becomes inconveniently long and cannot well be conveniently used, because it would occupy too much room. For this reason the part of a circle described by the ends of the levers A F is laid for the greatest part thereof into the plane of the dough-dish and the crank C D is arranged as near as possible to the dough-dish 12, which arrangement permits a compact construction of the machine. A pulley 7 is arranged on the shaft 6, which rotates the worm 10 and the worm-wheel 11 by means of the pulley 8 on the shaft 9, and thereby rotates the dough-dish during kneading.

As the kneading-arm C D E and the arms D F are firmly secured to a common shaft 5, it will readily be understood that the operative end E of the kneading-arm will describe the curve shown by dotted lines in Fig. 1. The inoperative end of the kneading-arm describes a circle around shaft B, and thus causes the kneading-arm C D E to oscillate around the pivots F, which in turn oscillate around shaft 4. The play of the levers A F, which support the kneading-arm, is limited by the movement of the end C of the kneading-arm. The combined movement of the end C and levers D F will thus cause the end E to describe the curve desired. The end of the arm first moves along the flat bottom of the dough-dish with comparatively slow speed, then rises slowly upward and moves most rapidly forward and downward immediately after reaching its climax. This curve,



or the corresponding movement of the end of the kneading-arm, fulfils the requirement absolutely necessary for many doughs, especially doughs for white bread—namely, that  
5 the dough is raised high and thereby drawn out and then falls back from a comparatively great height into the dough-dish. This movement completely resembles the work of the bakers' hands, which make a similar  
10 movement to get a loose dough infiltrated with air, which operation is called to "knead air into the dough." When the end E of the kneading-arm is at its climax and the machine has been stopped, the dough-dish may  
15 be removed.

I claim—

1. A dough-kneading machine provided

with a kneading-arm, means for imparting a circular movement to one end of said arm, and a toggle-lever operatively connected to  
20 the arm, substantially as specified.

2. A dough-kneading machine provided with a shaft, a kneading-arm secured thereto, means for imparting a circular movement to one end of the kneading-arm, and toggle-le-  
25 vers supporting the shaft, substantially as specified.

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

HEINRICH KIRCHER.

Witnesses:

FRANZ PURCH,

ERNST ENTENMAN.