

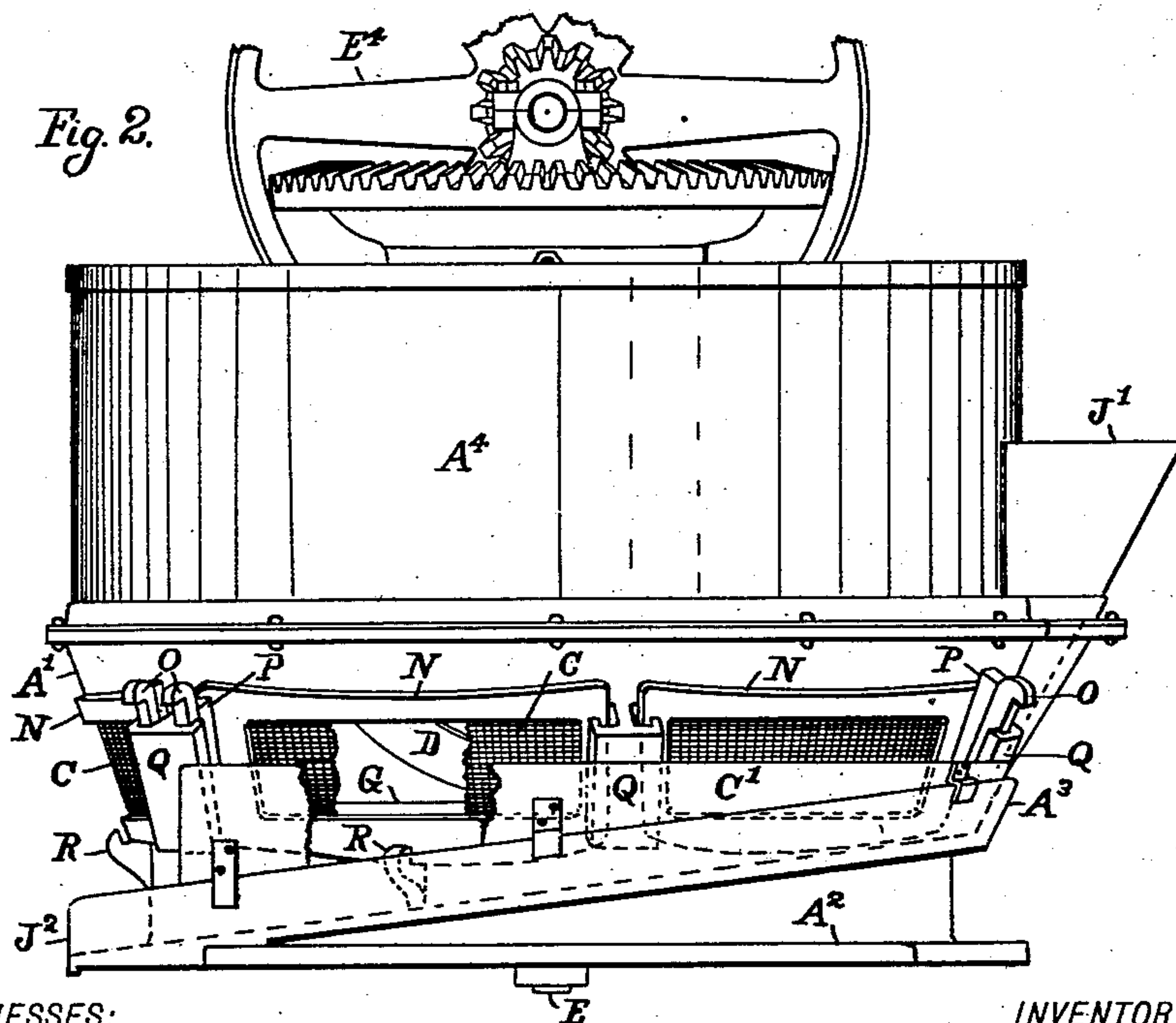
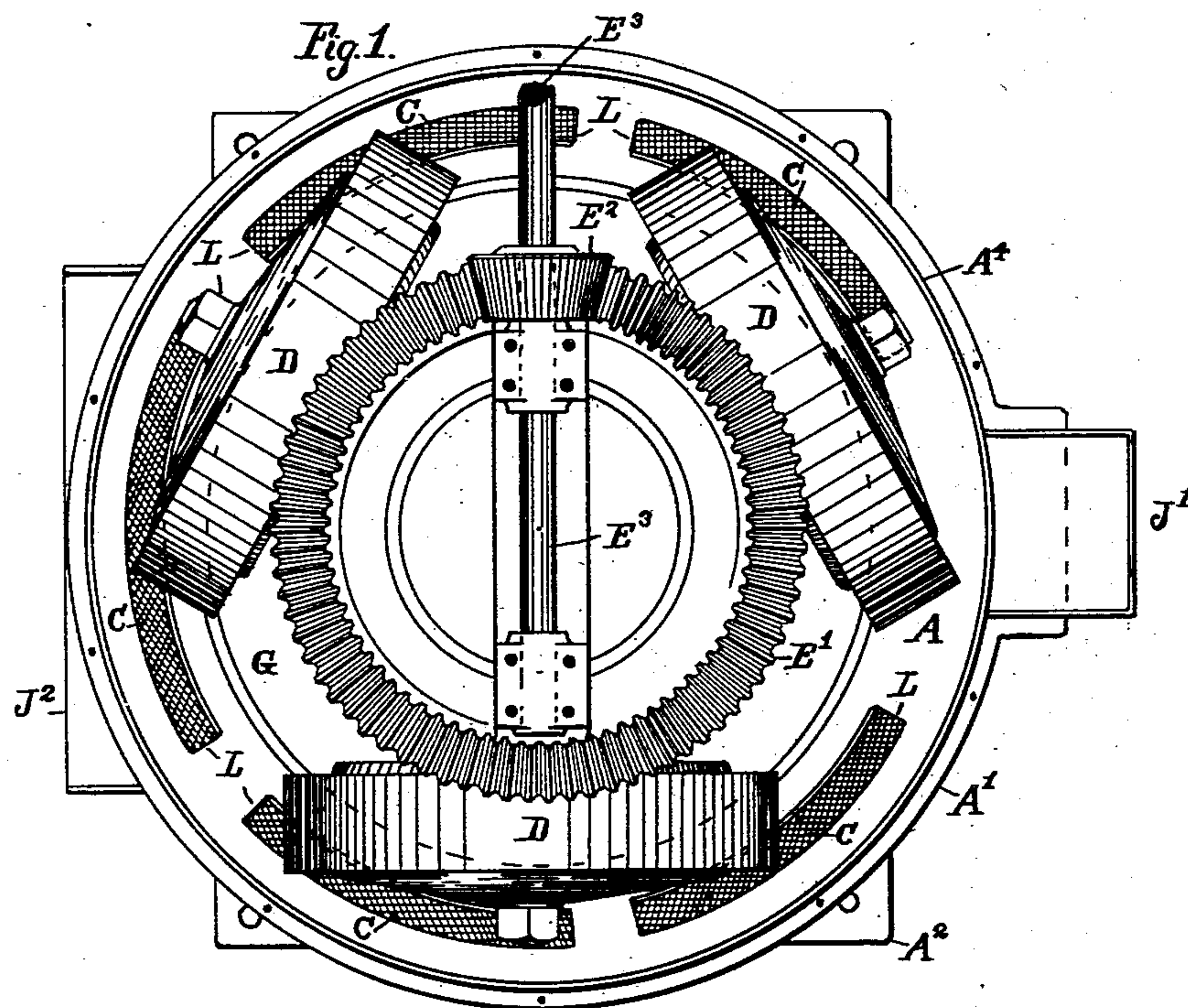
(No Model.)

2 Sheets—Sheet 1.

E. P. JONES.
ORE CRUSHING MACHINE.

No. 563,181.

Patented June 30, 1896.



WITNESSES:

Edw. S. Cobb, —

Wilson D. Bent, Jr.

INVENTOR

Edwards P. Jones

By John Richards
ATTORNEY.

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

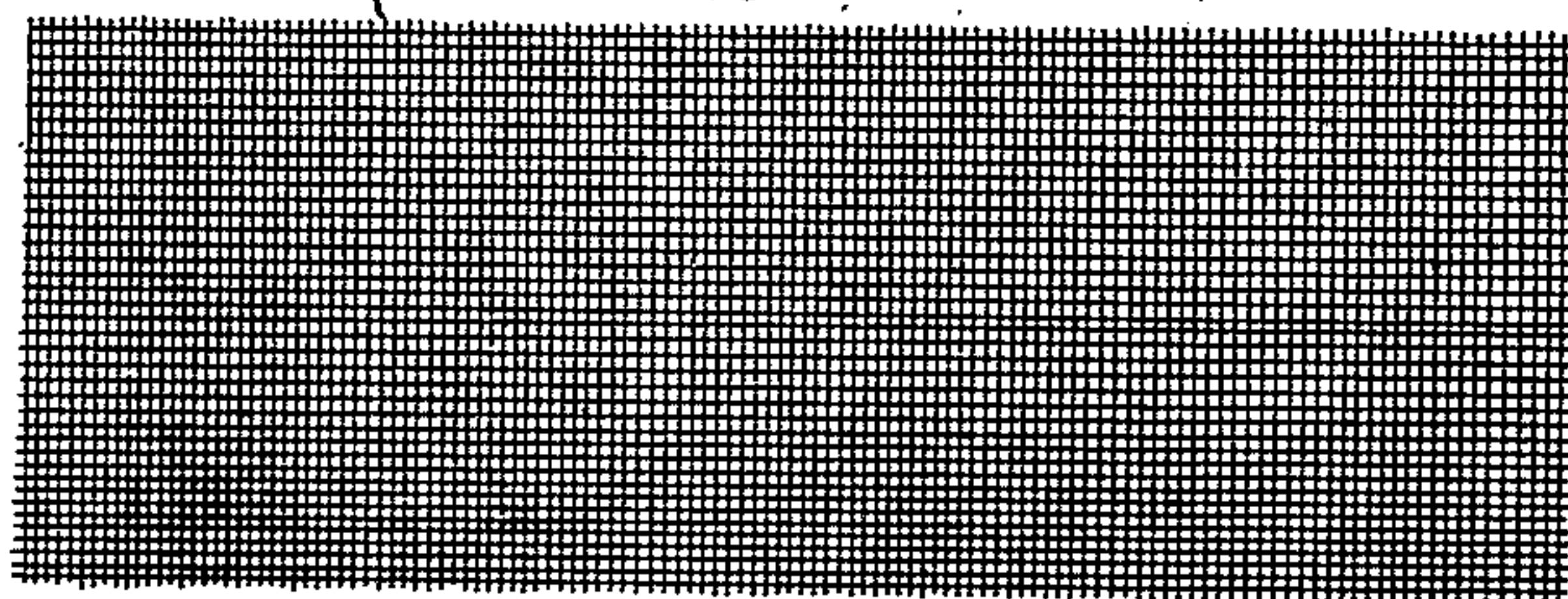


Fig. 4.

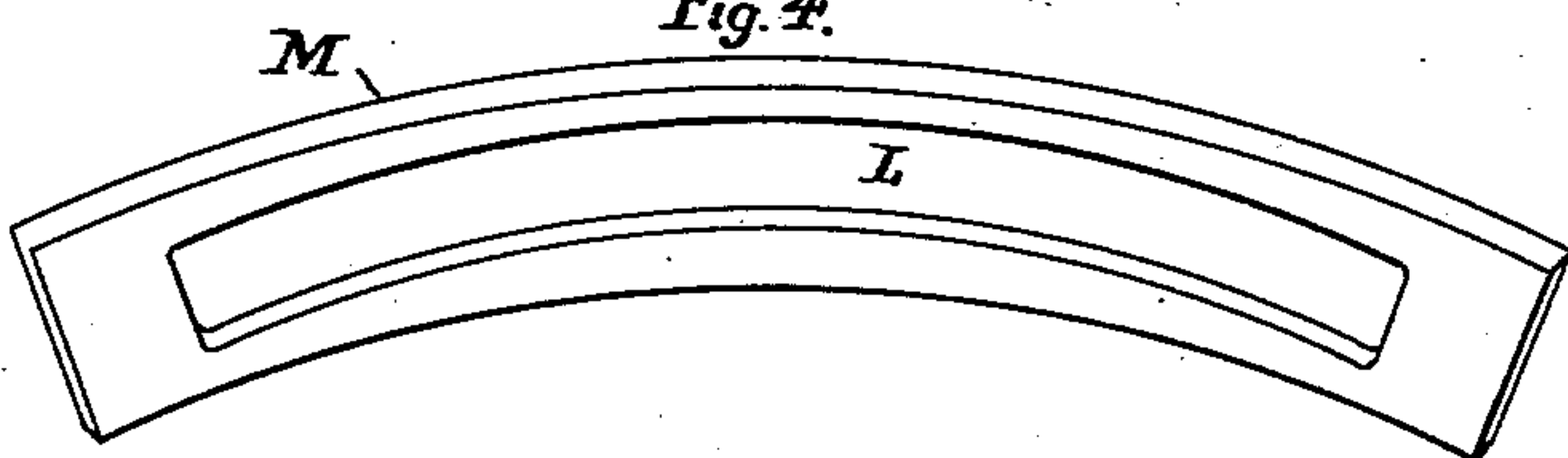


Fig. 5.

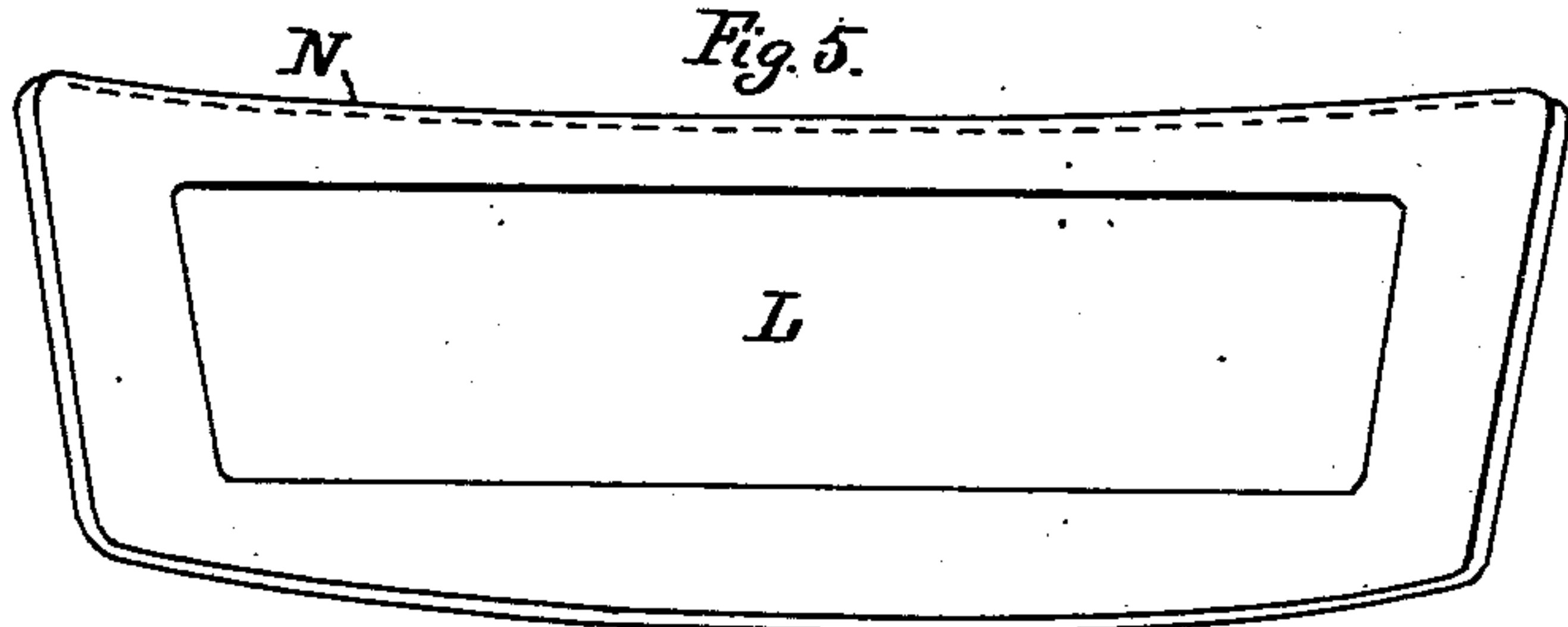


Fig. 7.

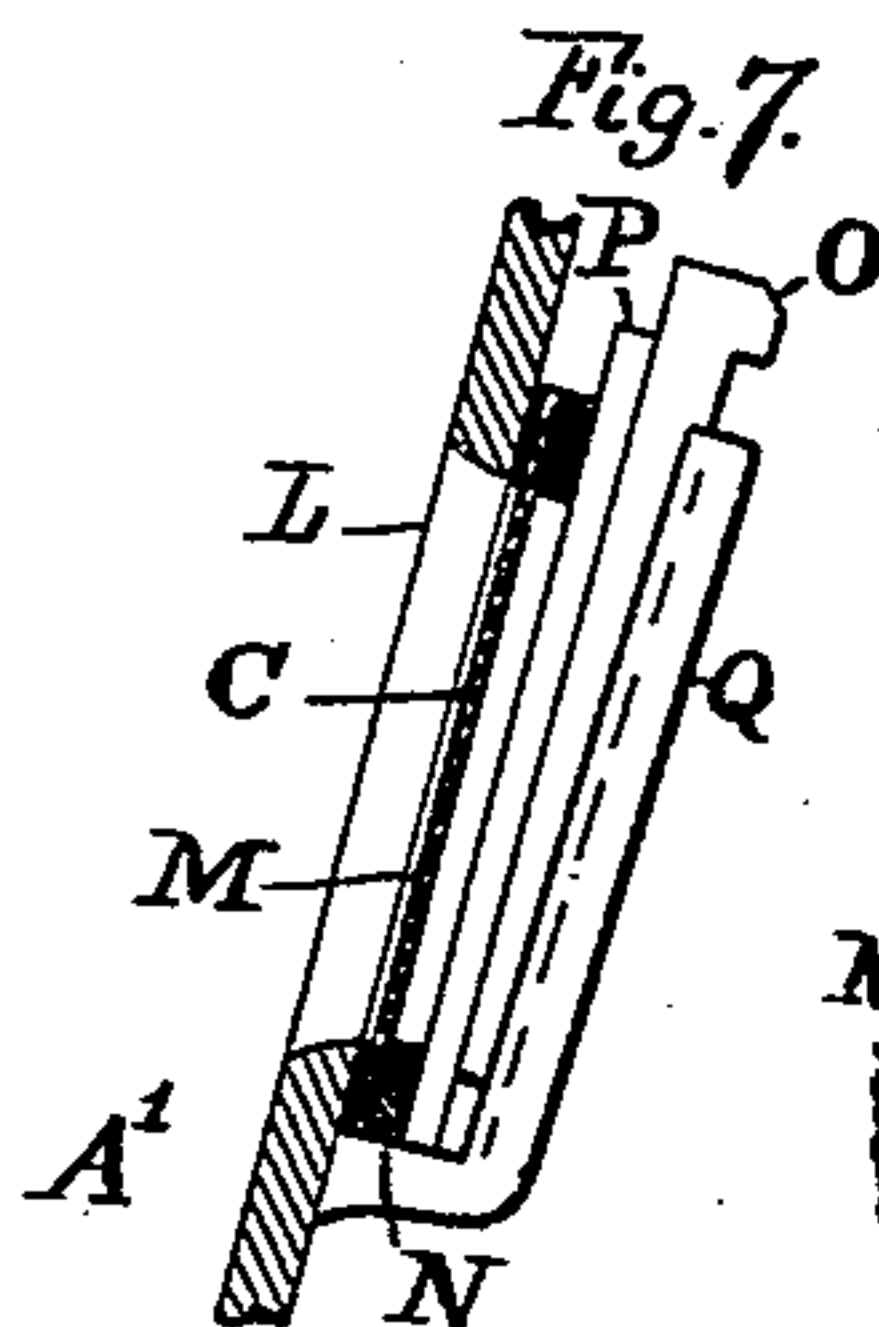


Fig. 6.

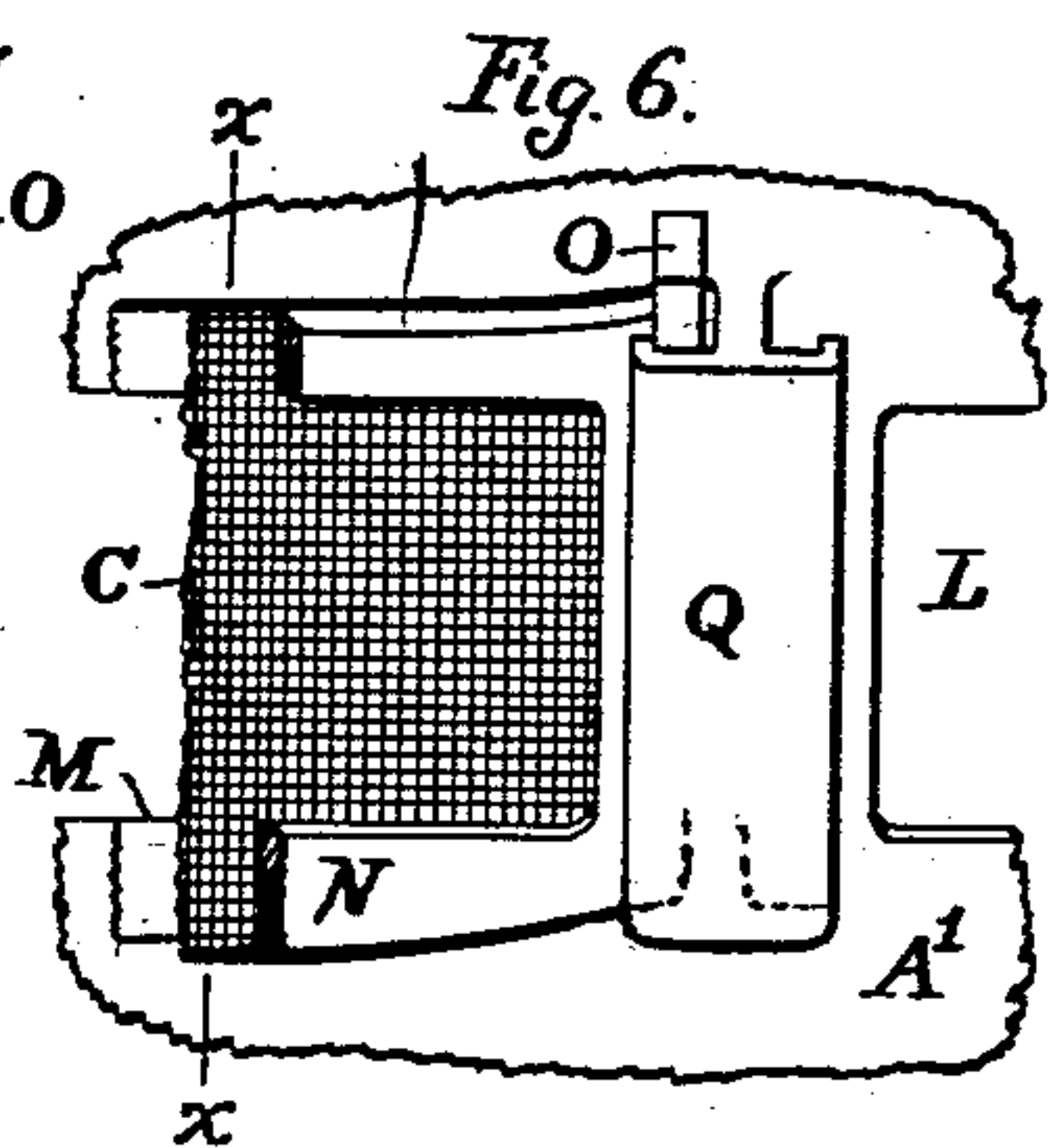


Fig. 9.

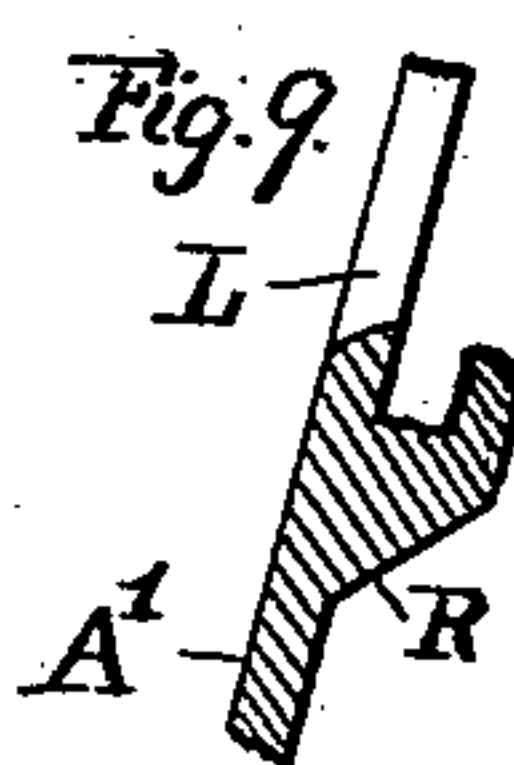
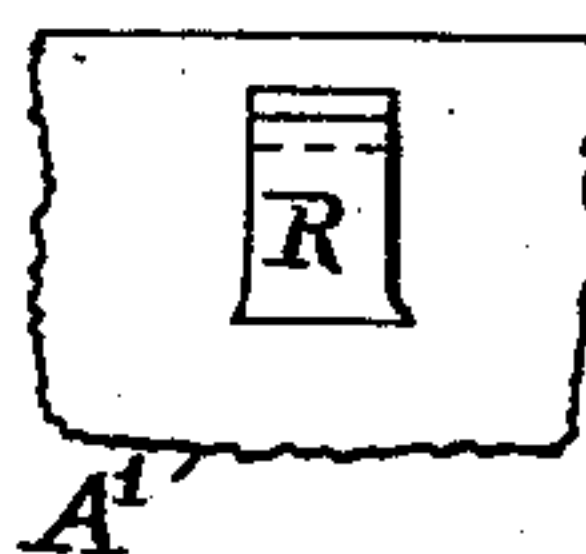


Fig. 8.



WITNESSES:

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INVENTOR

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UNITED STATES PATENT OFFICE.

EDWARDS P. JONES, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO THE
RISDON IRON AND LOCOMOTIVE WORKS, OF SAME PLACE.

ORE-CRUSHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 563,181, dated June 30, 1896.

Application filed September 24, 1895. Serial No. 563,548. (No model.)

To all whom it may concern:

Be it known that I, EDWARDS P. JONES, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented certain new and useful Improvements in Machines for Crushing Ore; and I hereby declare the following specification and the drawings therewith to be a complete description of my improvements, together with the manner of constructing and applying the same.

My invention relates to that class of ore-crushing machines in which the operation is performed in flaring pans, or those of a conical form, embracing various modifications, of which the Chilian mill is typical.

My improvements consist in so constructing the discharge-screens that form a portion of the flaring or conical walls of the pan that these screens can be inverted and reversed, so as to present, after wearing in one position, a new surface to withstand the abrasive action of the ore or sand as it is thrown outward by the crushing mechanism.

The object of my invention is to attain a double or greatly-increased endurance of the screens, the wear of which forms a considerable part of the expense in crushing quartz or other silicious material.

The screens employed to prevent the escape of the material from crushing or pulverizing machines consist of thin perforated sheets of metal or webs of woven wire, having meshes the size of which are commonly expressed by the number of perforations in one inch of length or width, as for example forty, sixty, or eighty mesh screens. These screens, of whatever material or construction, are thin, subjected to rapid abrasive wear on the inside next the crushing mechanism, and such wear occurs principally in one plane corresponding to the top of the dies, or the surfaces between which the crushing is done, and as this plane is commonly below the horizontal center of the screen, a double service, or a greatly-increased service, is attained by reversing the screens when worn in their first position. This is easily done when the screens are mounted on a flat surface, as in the case of common stamp-batteries, but for application on a flaring or conical surface such reversal of the screens calls for special appliances and devices which

form the subject of my invention. These devices are shown in the accompanying drawings, in which—

Figure 1 is a plan view of an ore-crushing machine provided with my improvements. Fig. 2 is a side elevation of the same machine. Fig. 3 is a flat view of one of the wire screens such as is employed for the machine shown in Figs. 1 and 2. Fig. 4 is an elastic gasket placed between the screen and a retaining frame or plate. Fig. 5 is the clamping or retaining plate employed to hold the screens in place. Fig. 6 is a front view of the fastening devices to hold the ends of the screen-frames. Fig. 7 is a section on the line *xx* of Fig. 6. Fig. 8 is a front view of one of the ledges to support the weight of the fastening-frame and adjust its position vertically. Fig. 9 is a view of Fig. 8 at a right angle thereto.

Similar letters of reference are employed to designate like parts in the different figures of the drawings.

The main member of the machine consists of a conical pan *A'*, a base-plate *A³*, constituting a supporting-frame cast or formed integrally with an oblique channel *A²*, into which flows the pulverized ore as it escapes from the sides of the pan *A'* through the openings *L* and the screens *C*.

The crushing elements in the present machine consist of the heavy rollers *D*, impelled by a suitable connection to the wheel *E'*, a pinion *E²*, and a horizontal shaft *E³*, to which the driving power is applied by a pulley *E⁴*, or in any other suitable manner.

The rollers *D* rest upon a circular die-ring *G*, or when in operation upon a stratum of ore interposed between the rollers and dies, as will be understood, such machines being well known and extensively employed.

The pan *A'* is made flaring or of conical form, so as to attain in some degree the aid of gravity in discharging, and for other operating objects that will be understood. Around its sides are a series of oblong perforations or escape-ways *L*, covered by the screens *C*, as seen in Fig. 1.

The crushing machinery is inclosed by an extension *A⁴* of the main frame, consisting of a cylinder made of sheet metal and provided with a spout *J'* through which broken ore is supplied to the machine.

Referring now to the screens C and the mechanism for supporting the same, these are made of woven-wire fabric, or of perforated sheet metal, Fig. 3 representing one of the former as it is prepared for use on the machine shown in Figs. 1 and 2.

The screens C are made oblong and rectangular in form, large enough to cover the perforations L when the screen is bent to fit around the conical contour of the pan A', the edges overlapping a varying amount to accommodate the oblique and curved surfaces.

On the inside of the screens C are placed elastic gaskets M, preferably of india-rubber, and over this the retaining-frames N, held by the keys O, fitting in the grooved ledges Q, cast on the main frame A', a piece of wood P being inserted between the keys O and the retaining-plates N, as seen in Figs. 2 and 7.

The grooves in these ledges Q do not extend through the bottom, but terminate, leaving a step or ledge to sustain the screen-frames N, as shown by dotted lines in Fig. 6. These strips of wood P, being elastic and adhesive in nature, are to guard against displacement of the keys O by the jar and concussion of the crushing action, also to prevent the keys from being jammed by corrosion. Thus it will be seen that the screens C present the same form and area externally as when cut in a curved form to fit around the conical or flaring sides of the pan A'.

At the bottom of the screen-frames N are lugs R, wide enough to receive a key that will press the frames and screens at the bottom close against the sides of the pan A', and resist any pressure that may arise from banking the crushed ore against the screens at the bottom on the inside.

As the principal impingement of the partly-crushed material falls against the inside of the screens C at their bottom, near the plane

of the die-ring G, or approximately in that plane, the principal wear takes place below the center of the screens C, which if made in the usual form to fit the openings L, the screens would have to be replaced as soon as worn at the bottom, but with my improvement the members O, P, and N are removed, the screens C inverted, presenting a comparatively new surface in the plane of principal wear, thus securing a double service under ordinary conditions of use.

Having thus explained the nature and objects of my invention and the manner of its application, what I claim as new, and desire to secure by Letters Patent, is—

1. In an ore-crushing machine, a pan having an outwardly-flaring peripheral wall and openings formed in said wall, and provided with invertible discharge-screens.

2. In an ore-crushing machine, the combination with a pan having an outwardly-flaring peripheral wall, of openings formed in said wall, invertible discharge-screens, locking-keys for said screens, gaskets at the rear of said screens, and a wedge at the rear of the keys to prevent displacement of the same.

3. In an ore-crushing machine, the combination with a pan having an outwardly-flaring peripheral wall provided with openings, of invertible discharge-screens for said openings, crushing-rollers in the pan, gearing to rotate said rollers, a hopper for reception of the material, and an oblique channel for escape of the crushed ore.

In testimony whereof I have hereunto affixed my signature in the presence of two witnesses.

EDWARDS P. JONES.

Witnesses:

ALFRED A. ENQUIST,
WILSON D. BENT, Jr.