No. 670,613. Patented Mar. 26, 1901.

J. G. JOHNSTON.

DRAG PATTERN.

(Application filed Dec. 13, 1900.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

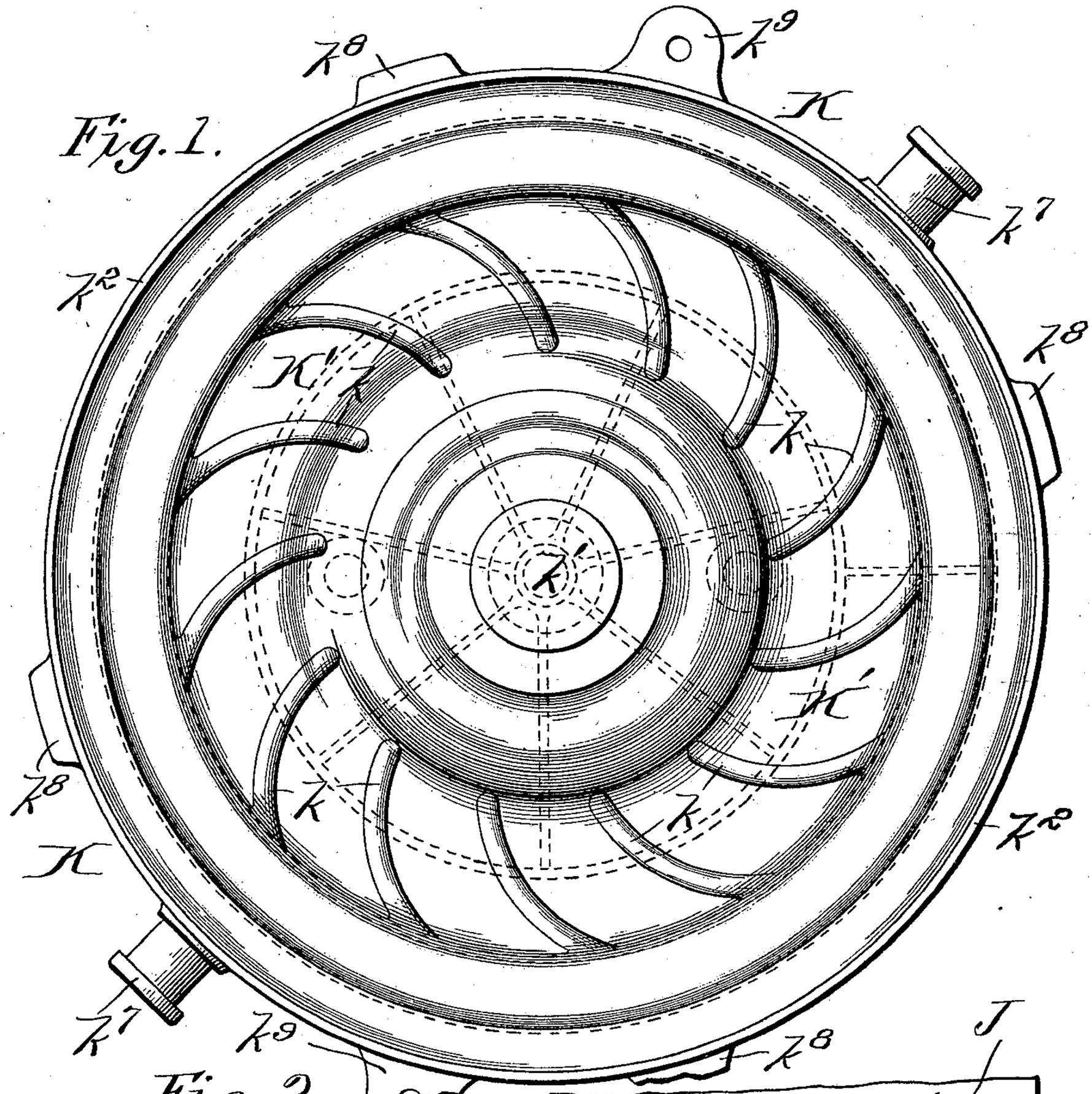
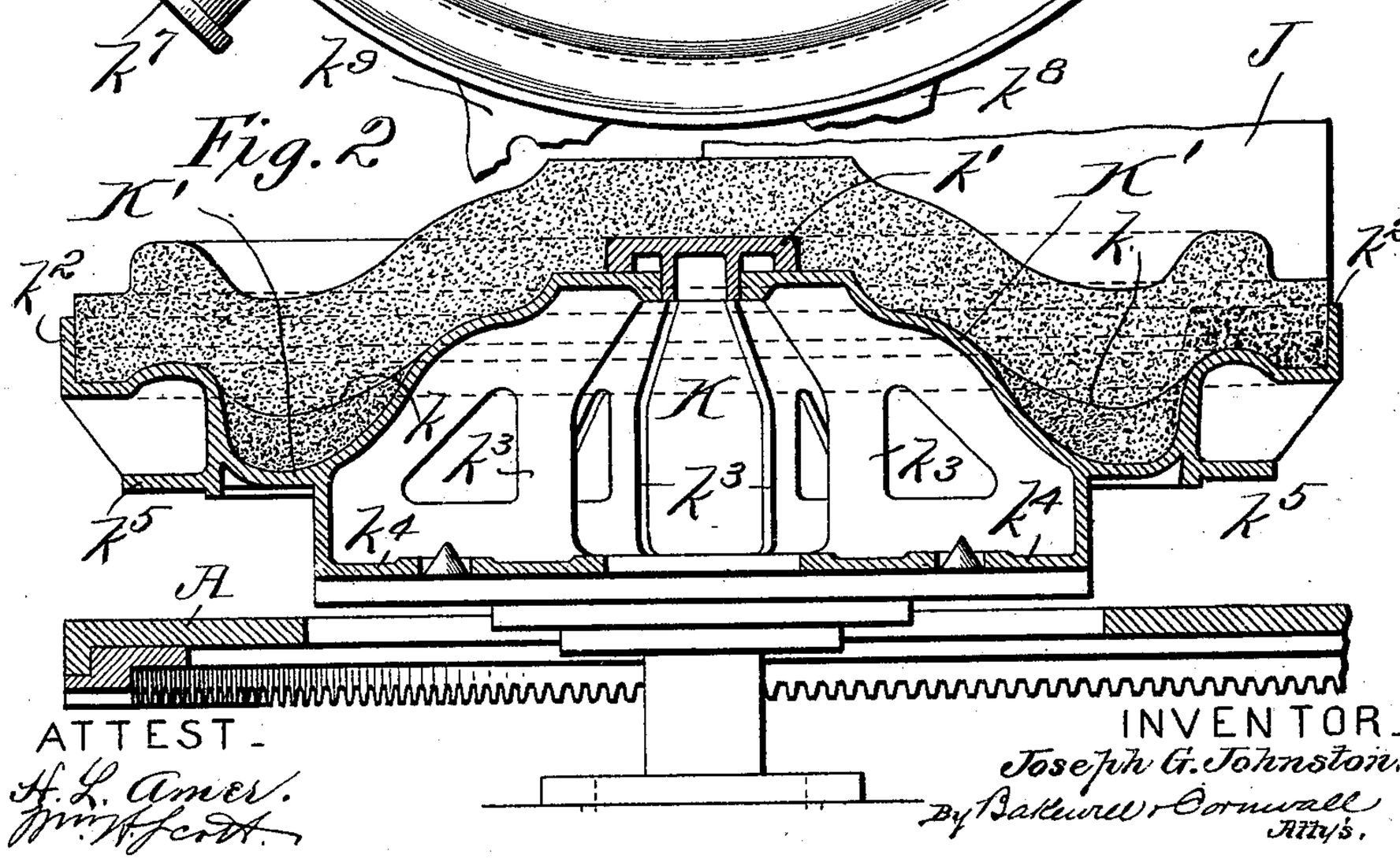


Fig. 2.



ATTEST-

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(No Model.) 2 Sheets—Sheet 2.

Fig. 3.

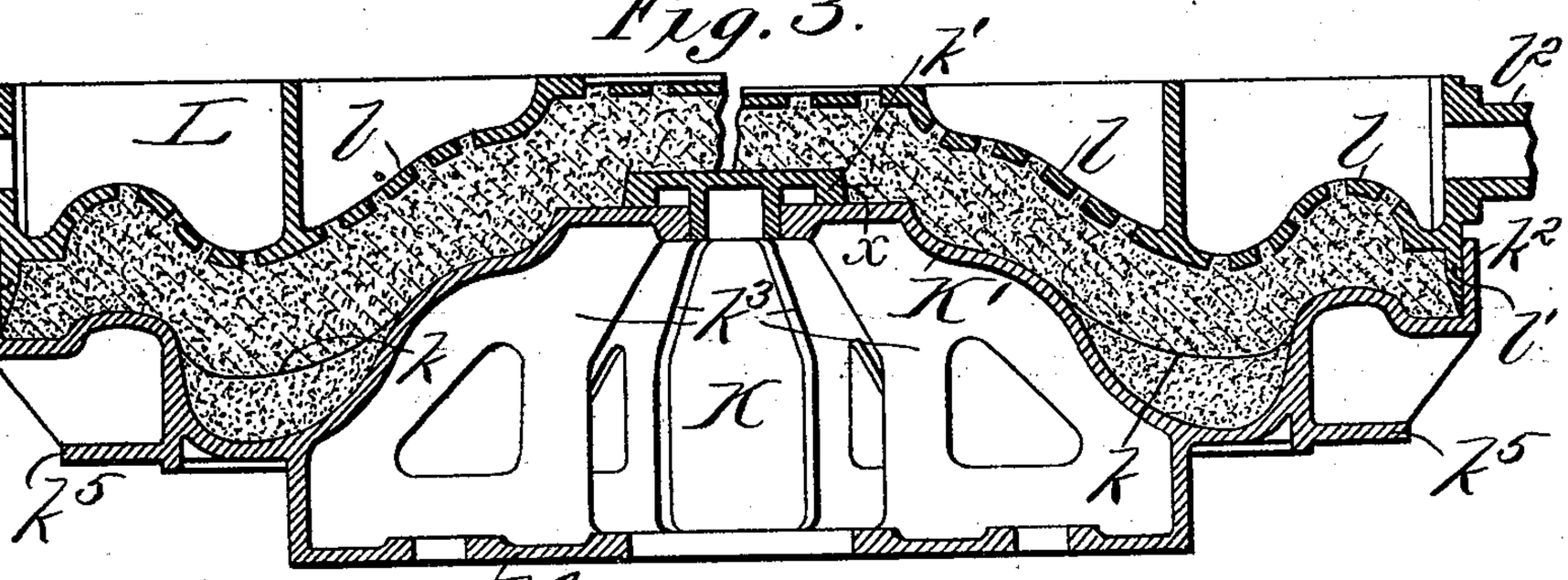


Fig. 4.

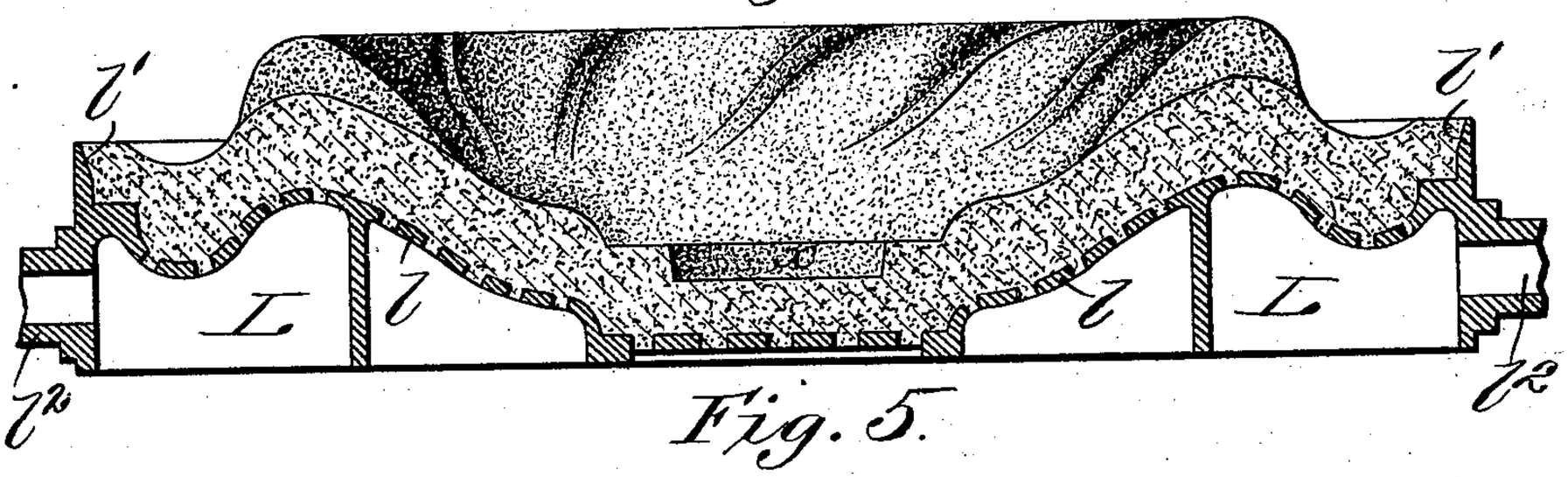


Fig. 5.

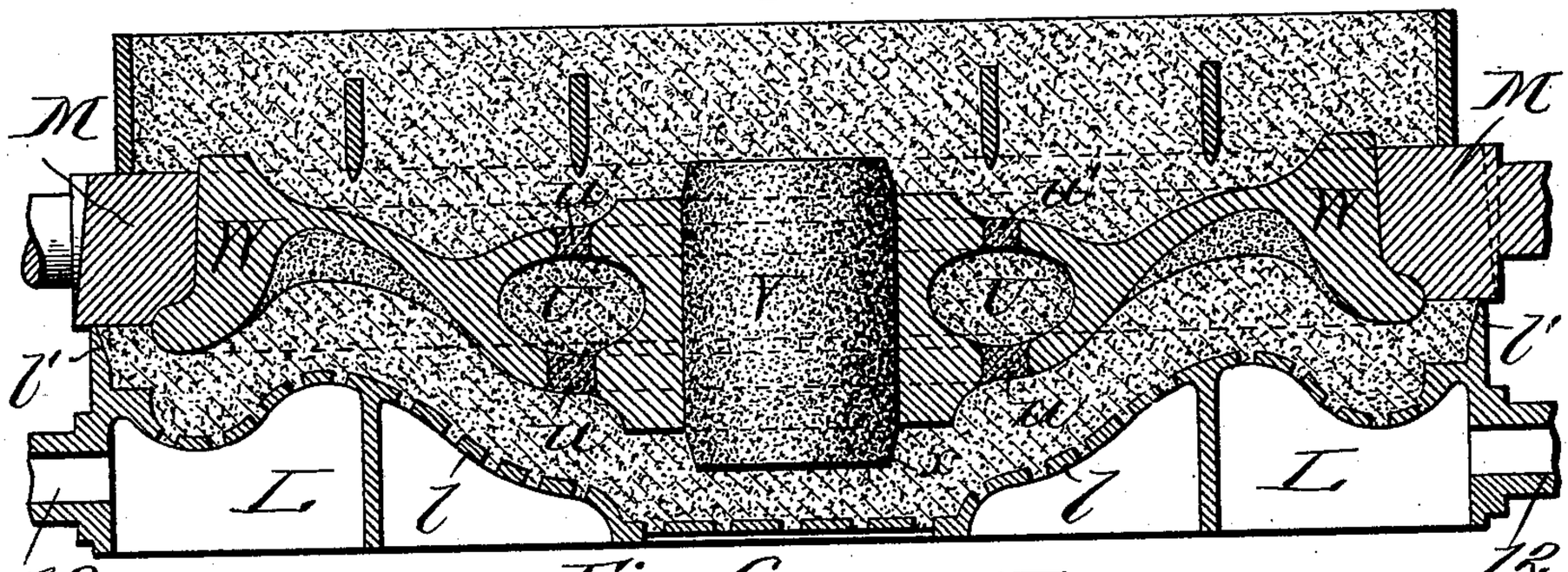
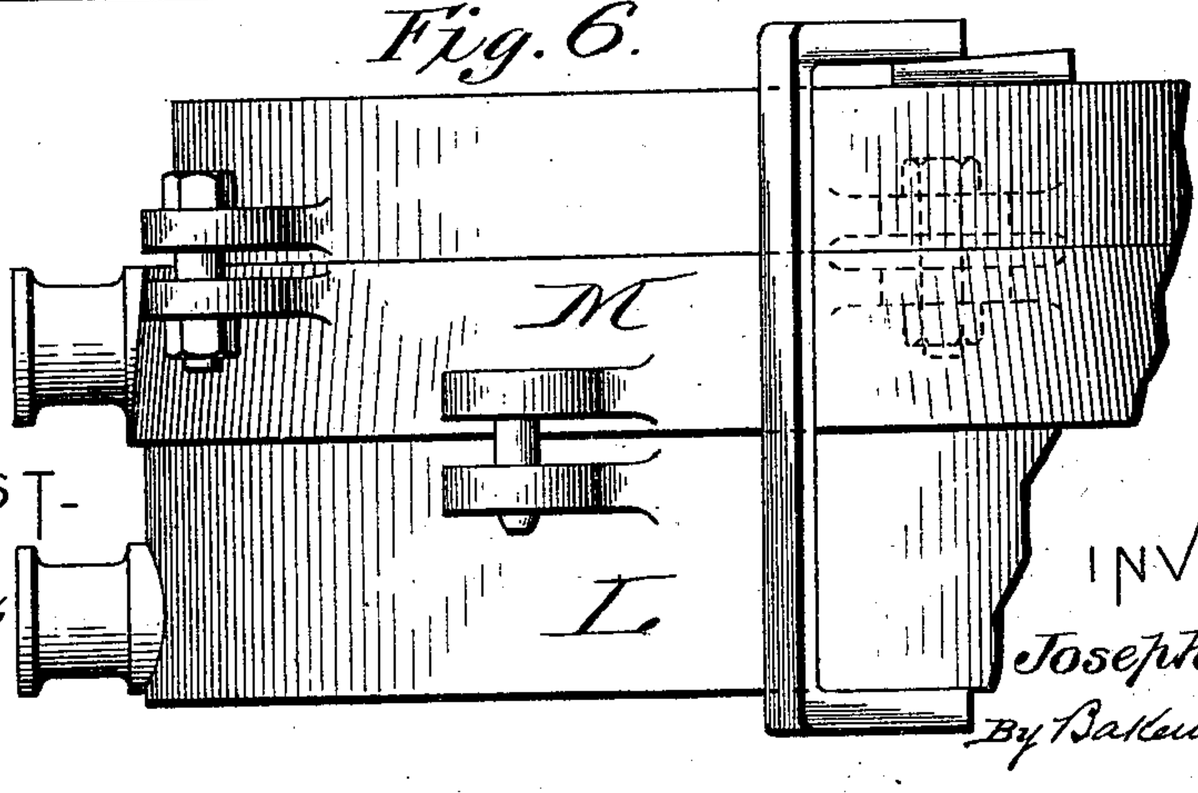


Fig. 6.



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UNITED STATES PATENT OFFICE.

JOSEPH G. JOHNSTON, OF DETROIT, MICHIGAN, ASSIGNOR TO THE AMERICAN CAR & FOUNDRY COMPANY, OF ST. LOUIS, MISSOURI.

DRAG-PATTERN.

SPECIFICATION forming part of Letters Patent No. 670,613, dated March 26, 1901.

Application filed December 13, 1900. Serial No. 39,693. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH G. JOHNSTON, a citizen of the United States, residing at the city of Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Drag-Patterns, of which the following is a full, clear, and exact description, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a top plan view of my improved drag-pattern. Fig. 2 is a vertical sectional view of the same arranged on a suitable table for handling, said view also illustrating a sand matrix in said pattern. Fig. 3 is a sectional view of my improved pattern and flask with the sand matrix arranged therebetween, said view showing the flask as broken at its middle portion and the right and left halves in their relative position to said pattern, respectively, before and after said sand matrix has been subjected to pressure. Fig. 4 is a vertical sectional view of my improved flask inverted and its sand matrix after pressure has been applied to the latter. Fig. 5 is a sectional view of a complete mold in which my improved flask is employed; and Fig. 6 is an elevational view of a portion of the same, showing the manner of securing the parts together.

This invention relates to a new and useful improvement in drag or nowel patterns and flasks, the same being designed particularly for use in the formation of the sand matrix for the flask of the drag side of a mold for forming car-wheels.

The object of my present invention is to produce a pattern and flask of the character described which is effective, comparatively light, strong, and susceptible of being handled and manipulated by a molding-machine such as is illustrated, described, and claimed in an application filed by me July 9, 1900, serially numbered 22,987, and entitled "Wheel-molding apparatus."

With this object in view the invention consists in the novel construction, arrangement, and combination of the several parts of my device, all as will hereinafter be described and afterward pointed out in the claims.

To attain said object, I make use of the construction illustrated in the accompanying drawings, wherein like characters designate like parts throughout the several views.

In the drawings, K indicates my improved drag-pattern as an entirety, which is preferably a metallic casting, the same being cored out for the purpose of making it light. This casting consists of an imperforate face-plate K′, shaped to the contour of one surface of the wheel to be cast. This face-plate is provided with ribs *k*, which make impressions in the sand, which is placed thereon, said impressions being designed to receive molten metal and produce upon a wheel which is cast from said pattern the usual strengthening-braces, as is obvious.

k′ indicates a core-print which is seated in an opening in the face-plate K′, said core-print being formed removable in order that different-sized core-prints may be used on the same pattern, the change in the size of said core-prints being made as occasion demands. While in use the core-print is firmly secured to the pattern, it having, however, sufficient taper or draft to enable it to be lifted out of the sand with the pattern when the latter is removed. This core-print above described is employed to form a recess in the sand matrix to provide a seat for the axle-core.

The pattern K is surrounded by a circumferential flange k^2 for retaining the sand and is provided upon the under face of the face-plate K′ with webs k^3, which webs are formed integral with a bottom wall k^4, which in turn is connected by a circumferential flange to said face-plate. A supporting-flange k^5 extends horizontally from the face-plate K′ and is provided with a finishing-rib k^9 at its lower inner edge, designed to bear upon a suitable rest—such, for instance, as a turn-table A. Radially-arranged strengthening-webs support the face-plate K′ above this flange k^5 for the purpose of giving strength to the same, while the pattern-ribs *k′* also strengthen the pattern. This construction makes a very rigid pattern and one well able to resist the strain to which it is subjected when in use.

k^7 indicates trunnions arranged on the outer

face of the circumferential flange k^2, which trunnions are designed to be engaged by and coöperate with a bail of a crane or air-hoist when it is desired to raise or reverse the pattern.

k^8 indicates lugs or ears designed to coöperate with standards or posts which support said pattern when the same is being separated from its flask by the use of a machine such as illustrated in an application filed by me on December 13, 1900, and serially numbered 39,692.

k^9 indicates lugs or ears on the pattern, which are provided with fixed dowel-pins designed to engage correspondingly-arranged holes formed in lugs or ears on the drag-flask for centering the parts when they are being placed together.

L indicates the drag-flask, having a perforated face-plate l, which is surrounded by a circumferential flange l', whose inner edge is beveled or knife-like and of such diameter as to fit within the circumferential flange k^2 of the pattern K. This face-plate l is shaped to the contour of the sand matrix carried by the pattern and over which it is placed, which sand is shaped on one side by a sweep J. The perforations formed in this face-plate l are to permit the escape of the gas formed by the meeting of the molten metal and the sand. The face-plate is further strengthened by skeleton webs or braces, which are both radially and concentrically arranged, and, like the pattern K, it is provided with trunnions l^2.

Having described the construction of my improved pattern and flask in detail, I will now describe the manner in which the same is employed in making a sand matrix.

The pattern K is arranged in the position shown in Fig. 2 of the drawings and a proper quantity of sand poured therein. The upper face of the sand is shaped by the use of a sweep, after which the flask L is placed on the sand, the knife-edge of the latter fitting within the circumferential flange of the pattern. This assembly of the pattern and flask is now placed in a press and pressure administered thereto, resulting in the sand matrix becoming pressed to the desired degree. The circumferential flanges and the strengthening-ribs of the flask rest on a horizontal plane, so as to distribute the stress in compressing the sand evenly throughout the whole structure. After this action the assembly is removed from the press and inverted, as shown in Fig. 3, and the pattern removed, leaving the sand matrix on the flask, as is illustrated in Fig. 4.

In Figs. 5 and 6 I have shown the manner in which my improved flask L is arranged with relation to a complete mold and how the parts are locked together. In making a casting of a car-wheel the drag-flask is formed with its sand-matrix as above described. A cope-flask is then formed with a sand matrix. A chill-ring M is then arranged between the two, proper cores having been previously inserted where desired, and the parts then clamped together, after which the mold is ready to receive a charge of molten metal, as is well understood.

In Fig. 4, x indicates the core-print.

Fig. 5 shows the core V in position. U indicates the circular core supported on feet u, and u' represents the chaplets preventing the ring-core from floating. W indicates the cast wheel.

I am aware that minor changes in the arrangement, construction, and combination of the several parts of my device can be made and substituted for those herein shown and described without in the least departing from the nature and principle of my invention.

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

1. The herein-described pattern comprising a face-plate, a circumferential flange, a bottom plate located beneath the face-plate, said plate being strengthened by webs, a supporting-flange, and strengthening-webs between said supporting-flange and the face-plate; substantially as described.

2. The combination with a pattern comprising a face-plate and a circumferential flange, of a flask comprising a perforated backing-plate, and a beveled circumferential flange designed to telescope within the flange of the pattern; substantially as described.

In testimony whereof I hereunto affix my signature, in the presence of two witnesses, this 4th day of December, 1900.

JOSEPH G. JOHNSTON.

Witnesses:
DAVID W. HAWKSWORTH,
JOHN STEENSON, Jr.