

No. 613,707.

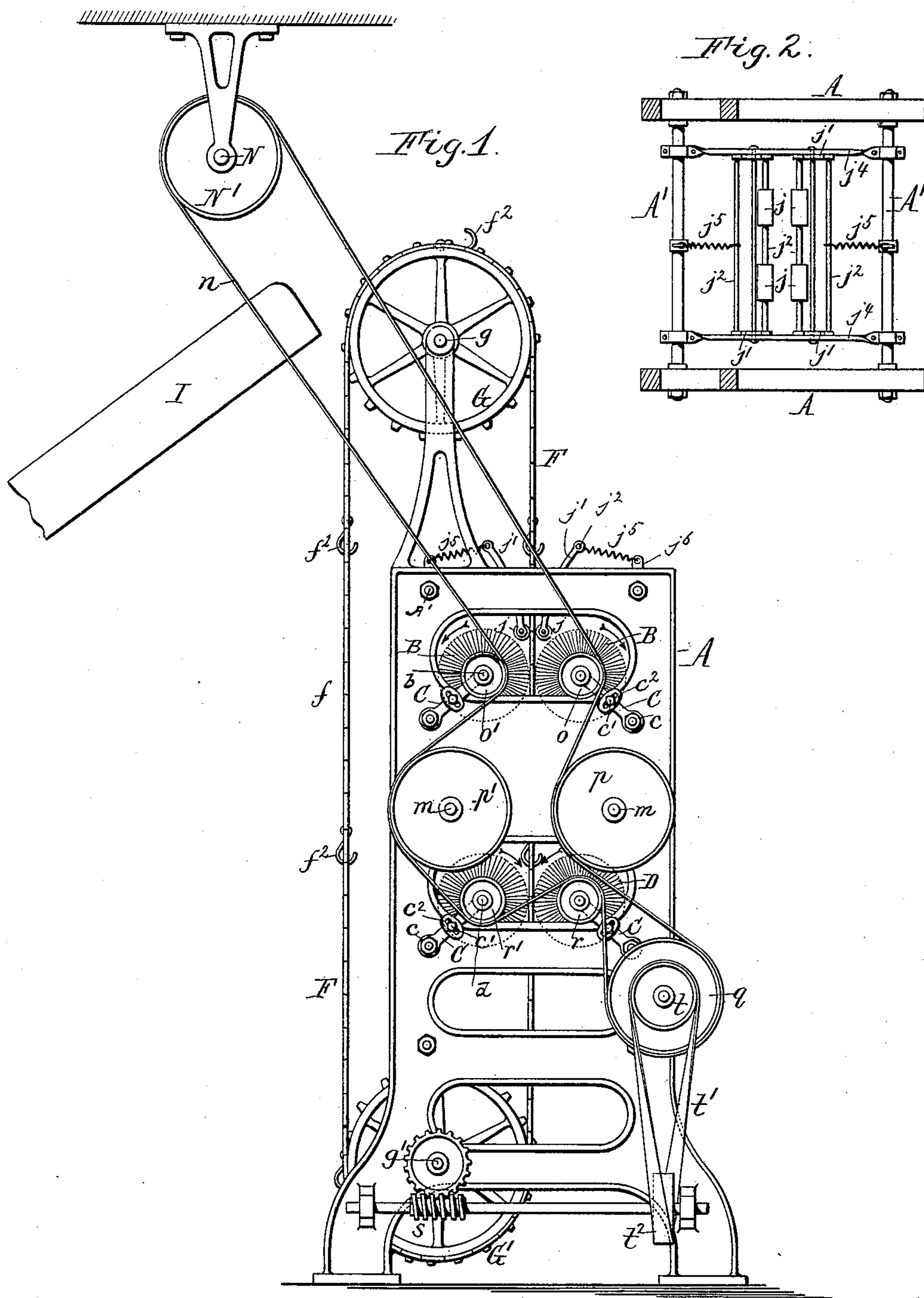
Patented Nov. 8, 1898.

W. C. McKEOWN.  
MACHINE FOR CLEANING CASTINGS.

(Application filed May 31, 1898.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:

Chas. F. Burkhardt.  
Henry L. Deck.

Wm. C. McKewen Inventor.  
By Wilhelm H. Borne. Attorneys.

**No. 613,707.**

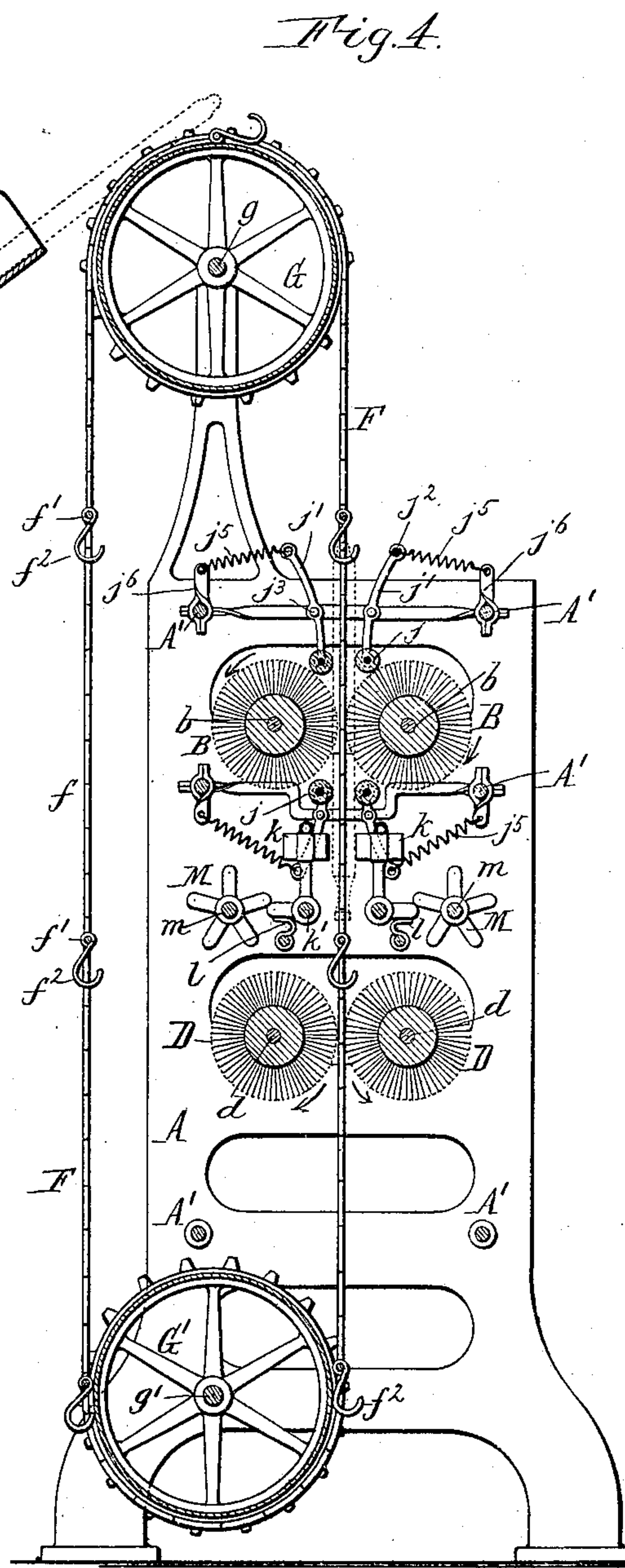
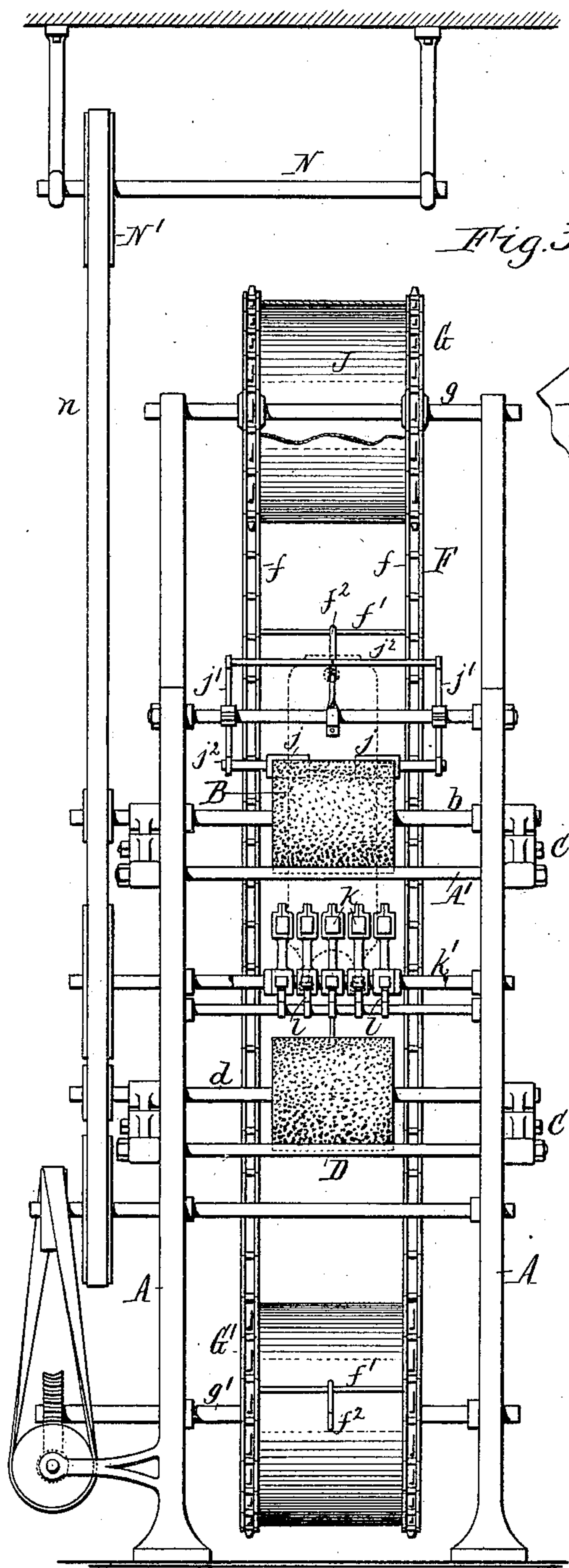
**Patented Nov. 8, 1898.**

**W. C. McKEOWN.**  
**MACHINE FOR CLEANING CASTINGS.**

(Application filed May 31, 1898.)

(No Model.)

**2 Sheets—Sheet 2.**



Chas F Burkhardt.  
Henry L. Deck. }

*Witnesses:*

Wm. C. McKeown  
Inventor.  
By Wilhelm H. Bonner  
Attorneys.



# UNITED STATES PATENT OFFICE.

WILLIAM C. McKEOWN, OF BUFFALO, NEW YORK, ASSIGNOR TO THE STANDARD RADIATOR MANUFACTURING COMPANY, OF SAME PLACE.

## MACHINE FOR CLEANING CASTINGS.

SPECIFICATION forming part of Letters Patent No. 613,707, dated November 8, 1898.

Application filed May 31, 1898. Serial No. 682,142. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM C. McKEOWN, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Machines for Cleaning Castings, of which the following is a specification.

This invention relates to a machine designed more especially for cleaning radiator sections or loops after coming from the molds.

The object of my invention is the production of a simple and inexpensive machine whereby such sections or loops are cleaned expeditiously and in a thorough and uniform manner.

In the accompanying drawings, Figure 1 is a side elevation of my improved cleaning-machine. Fig. 2 is a horizontal section of the machine, the plane of the section lying between the top of the stationary frame and the upper guide-wheels of the carrier, the carrier and the parts below the upper retarding-rollers being omitted for clearness. Fig. 3 is an end view of the machine, partly in section. Fig. 4 is a vertical longitudinal section of the machine.

Like letters of reference refer to like parts in the several figures.

A represents the upright stationary side frames of the machine, which are firmly tied together by transverse rods  $A'$ .

B B represent a pair of rotary cylindrical cleaners or brushes arranged horizontally between the upper portions of the side frames A and between which the castings to be cleaned are adapted to pass for removing the sand adhering to their surface. These brushes are mounted on transverse shafts  $b b$ , which are preferably supported in adjustable bearings, so that the brushes can be adjusted at the proper distance apart to suit the thickness of the castings and to operate effectively upon the same. The shaft-bearings of the brushes may be made adjustable in any suitable manner; but they are preferably mounted on the free ends of adjustable arms C, which are pivoted at their opposite ends upon the projecting ends of the adjacent tie-rod  $A'$ , as shown at  $c$ , and which are clamped in position after adjustment by bolts  $c'$ , arranged in screw-threaded openings in the side frames

and passing through slots  $c^2$  formed in the arms and curved concentrically with said tie-rod, as shown in Fig. 1.

D D represent a second pair of cleaning-brushes arranged horizontally below the first-described pair of brushes B, with their opposing sides directly below or vertically in line with the opposing sides of the upper pair of brushes, as shown. The shafts  $d d$  of the lower brushes are carried by adjustable supporting-arms C similar to the supporting-arms of the upper brush-shafts, so that the lower brushes can also be adjusted toward and from each other. The brushes are preferably provided with wire bristles. The brushes of each pair are preferably driven in opposite directions, so that their opposing sides turn in the same direction, and the brushes are so driven that the opposing sides of one pair travel in the opposite direction from the opposing sides of the other pair, as indicated by the arrows in Figs. 1 and 4. By rotating the brushes in this manner one pair brushes upward and the other downward, and the inner or under sides of the transverse end members of the radiator-loops, as well as their outer sides, are thereby reached by the brushes and thoroughly cleaned.

F is a carrier whereby the castings to be cleaned are moved past or between the cleaning-brushes B and D. This carrier preferably consists of a pair of upright endless belts or sprocket-chains  $f$ , running around sprocket-wheels  $G G'$  and having one side thereof (preferably the ascending side) arranged to run between the cleaning-brushes of each pair. The upper sprocket-wheels  $G$  are secured to a shaft  $g$ , journaled in standards surmounting the side frames A, while the lower sprocket-wheels are mounted on a shaft  $g'$ , journaled in the side frames below the lower pair of brushes. The carrier F is provided at proper intervals with hooks or other suitable attachments for the castings. In the construction shown in the drawings the chains of the carrier are connected by rounds or tie-rods  $f'$ , carrying loose depending hooks  $f^2$ , which face inwardly on the descending side of the carrier, where the castings are applied to the same, and outwardly on the ascending side of the carrier, as shown in Figs. 1 and 4.



I is an inclined delivery-chute arranged on the descending side of the carrier F and extending from a point opposite the upper sprocket-wheels G to the floor of the foundry or other place where the cleaned castings are to be deposited. A drum J is arranged between the upper sprocket-wheels G to prevent the cleaned castings from swinging against the shaft of said wheels in passing over the shaft. This drum may consist of a sheet-metal band secured between the sprocket-wheels in any suitable manner, as shown in Fig. 3.

When the opposing sides of the upper brushes move upwardly, they have a tendency to throw the castings in the same direction, rendering them liable to become detached from the carrier and injure persons near the machine. In order to prevent this, suitable checking or retarding devices are arranged adjacent to the upper pair of brushes. The devices shown in the drawings consist of two pairs of horizontal rollers  $j$ , which are arranged, respectively, above and below the opposing sides of the upper brushes and bear yieldingly against opposite sides of the casting, so as to retard its ascent as it emerges from the upper brushes, and thereby overcome the above-mentioned objection. Each of these rollers is mounted in a swinging frame composed of upright arms or end bars  $j'$  and connecting-rods  $j^2$ , the rollers being mounted on the inner rods. These arms are pivoted upon transverse rods or pivots  $j^3$ , which are carried by longitudinal bars  $j^4$ , secured at their ends to the tie-rods A' of the side frames, as shown in Figs. 2, 3, and 4.

$j^5$  represents springs which tend to swing the retarding-rollers of each pair toward each other. Each of these springs is attached at its inner end to the outer connecting-rod  $j^2$  of the swinging frame and at its opposite end to an arm  $j^6$ , secured to the adjacent tie-rod A'. The retarding-rollers are recessed or composed of separated sections, as shown in Fig. 2, so that the rollers clear the raised bosses at the ends of the radiator-loops.

$k$  represents knockers or hammers arranged between the two pairs of cleaning-brushes on opposite sides of the portion of the carrier which passes between the brushes and adapted to strike against the radiator-loops or castings as they pass by the knockers, so as to jar the same and loosen the sand core for causing the sand to flow out of the usual nipple-holes at or near the lower ends of the radiator-loops. In the construction shown in the drawings these hammers consist of upright bell-crank levers, which vibrate upon transverse rods or shafts  $k'$ , secured to the side frames of the machine. The upper arm of each of these levers carries a hammer-head of wood or other suitable material, while its lower arm extends outward horizontally from the hub of the lever and is operated on by a spring  $l$ , which bears against the under side of the arm and tends to swing the upper arm

or hammer of the bell-crank forwardly into the path of the ascending castings.

M represents rotary tappet-wheels having arms or tappets which successively trip the lower arms of the bell-crank levers, so as to retract the hammers or vibrate them in the opposite direction after being swung forwardly by their springs, thus causing the hammers to deliver blows against the castings as the latter pass from the lower to the upper pair of cleaning-brushes. The tappet-wheels are mounted on transverse shafts  $m$ , journaled in the side frames A. A sufficient number of hammers are arranged on each side of the carrier to extend across the width of the castings, as shown in Fig. 3.

N is a main shaft or a counter-shaft from which power is transmitted to the rotary brushes, the hammers  $k$ , and the carrier F by any suitable driving mechanism. The driving mechanism shown in the drawings consists of a belt  $n$ , which runs around a pulley N' on the main shaft N, thence around a pulley  $o$ , mounted on the upper right-hand brush-shaft  $b$ , thence around a pulley  $p$ , mounted on the right-hand tappet-shaft  $m$ , thence around an idler  $q$ , thence over and under pulleys  $r$   $r'$  on the lower brush-shafts  $d$   $d'$ , thence around a pulley  $p'$  on the left-hand tappet-shaft, and thence around a pulley  $o'$  on the upper left-hand brush-shaft. The carrier F is slowly driven by a worm  $s$ , meshing with a worm-wheel secured to the shaft of the lower sprocket-wheels G', and the shaft of the worm is in turn driven from a pulley  $t$ , secured to the idler  $q$  by a twisted belt  $t'$ , running around said pulley and a pulley  $t^2$ , mounted on the worm-shaft.

A pit, which is not shown in the drawings, is located underneath the carrier for receiving the sand which falls from the castings.

In the use of the machine the radiator-loops or similar castings are suspended from the hooks  $f^2$  of the carrier, as shown by dotted lines in Figs. 3 and 4, the operator standing on the floor on the descending side of the carrier and attaching the castings thereto at that point. The attached castings, after passing around the lower sprocket-wheels G', ascend between the lower pair of rotary brushes D and are subjected to the cleaning action of these brushes, and after passing the same the castings encounter the hammers  $k$ , which tap the same and loosen the sand core therein, the sand flowing out of the nipple-holes near the lower ends of the castings. After passing these hammers the castings enter between the retarding-rollers  $j$  and the upper pair of brushes B, which latter remove any adhering sand not removed by the first pair of brushes, thus thoroughly cleaning the castings and at the same time emptying the same of the coring-sand. The cleaned castings, after leaving the upper pair of brushes, pass over the drum J, between the upper sprocket-wheels G, and upon arriving at the head of the chute I are discharged upon the latter. As soon as a cast-



ing becomes overbalanced on the descending side of the drum it slides down the chute and automatically detaches itself from its suspension-hook  $f^2$ , which latter now swings down to its former depending position by gravity, as shown in Figs. 1 and 4.

As the castings are cleaned, jarred, and discharged automatically, my improved machine requires the attention of but a single attendant for successively attaching the castings to the carrier, thus not only greatly expediting the operation of cleaning the castings, but effecting a considerable saving in labor and enabling the castings to be produced at correspondingly smaller cost.

If desired, a single pair of brushes or more than two pairs of brushes may be employed, and if the machine is to be used only for cleaning castings the hammers or knockers and their operating mechanism may be omitted.

I claim as my invention—

1. The combination with a stationary frame, of two pairs of rotary brushes journaled in the frame, a carrier for the castings arranged to pass between the brushes of each pair, whereby the castings attached to the carrier are cleaned on both sides, and driving mechanism for said brushes whereby the opposing faces of one pair thereof are driven in the opposite direction from the opposing faces of the other pair, substantially as set forth.

2. The combination with the stationary frame, of a rotary brush adapted to run in contact with the castings, adjustable arms pivoted at one end to the frame and carrying the brush-shaft at their opposite free ends, clamping devices for holding said arms in position, and a carrier for the castings arranged to move past said brush, substantially as set forth.

3. The combination with a pair of cleaning-brushes and a carrier for conveying the castings past the brushes, of a retarding device arranged adjacent to the brushes for

preventing the latter from throwing the castings out of engagement with the carrier, substantially as set forth.

4. The combination with a pair of cleaning-brushes and a carrier for conveying the castings between the brushes, of yielding retarding-rollers arranged adjacent to said brushes and adapted to bear against opposite sides of the castings, substantially as set forth.

5. The combination with a pair of cleaning-brushes and a carrier for conveying the castings between the brushes, retarding-rollers arranged adjacent to said brushes, pivoted arms or frames carrying said rollers, and springs operating on said arms and tending to move said rollers toward each other, substantially as set forth.

6. The combination with a carrier for conveying the castings through the machine, of a vibrating hammer or knocker for jarring the castings arranged adjacent to the carrier, and actuating mechanism for said hammer, substantially as set forth.

7. The combination with a carrier for conveying the castings through the machine, of a vibrating hammer for jarring the castings arranged adjacent to the carrier, a spring for swinging the hammer toward the carrier, and a rotary tappet-wheel for retracting the hammer, substantially as set forth.

8. The combination with the stationary frame, of rotary brushes journaled in said frame and adapted to run in contact with the castings, a carrier arranged to convey the castings past said brushes, a vibratory hammer arranged adjacent to said carrier, and actuating mechanism for said hammer, substantially as set forth.

Witness my hand this 7th day of May, 1898.

WM. C. McKEOWN.

Witnesses:

JNO. J. BONNER,  
ELLA R. DEAN.