No. 791,204. PATENTED MAY 30, 1905.

H. A. OWEN & C. T. BURLIN.

SPINDLE FORGING MACHINE.

APPLICATION FILED JULY 6, 1902.

3 SHEETS—SHEET 1.

Fig. 1.

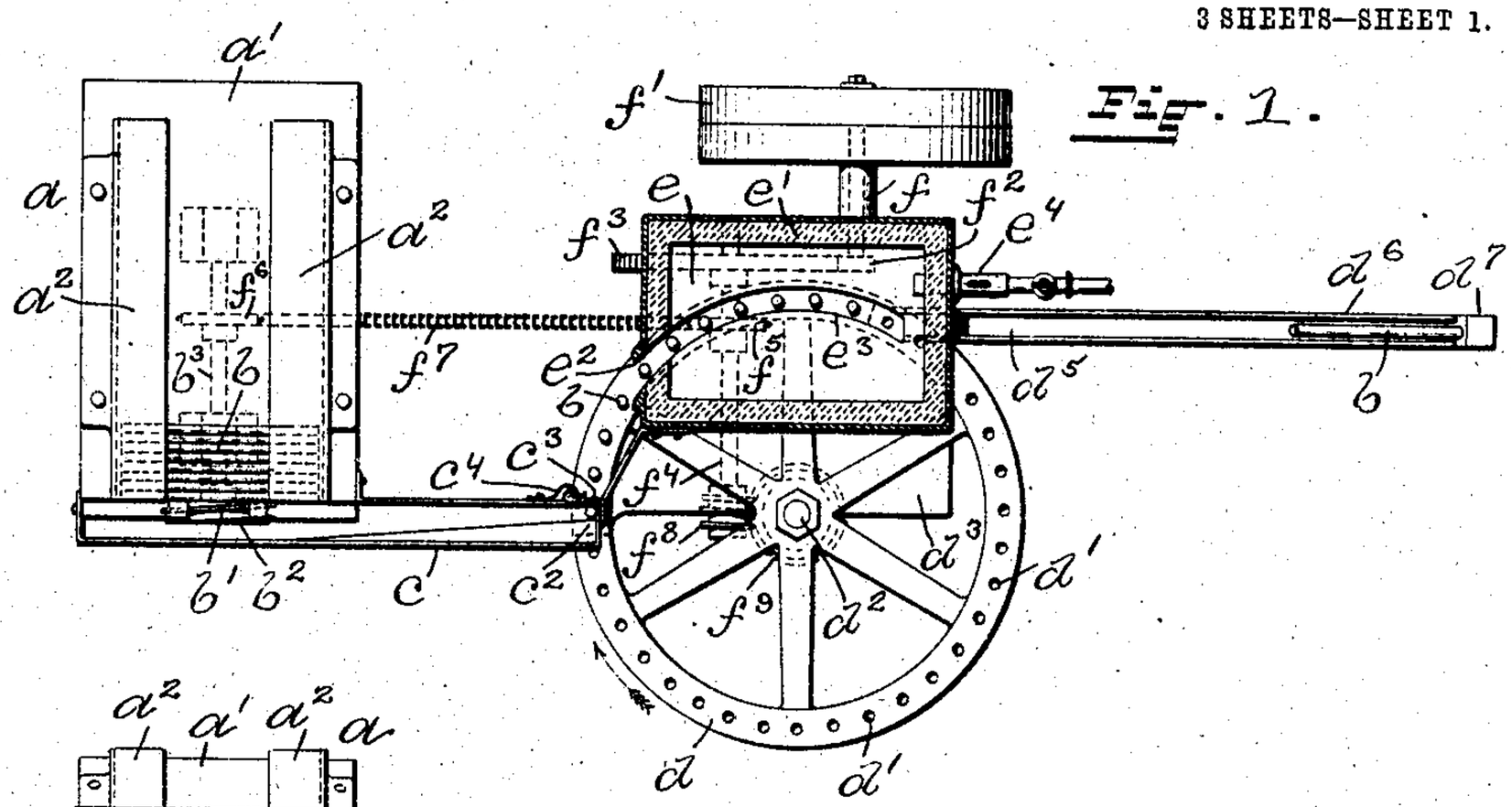

Fig. 2.

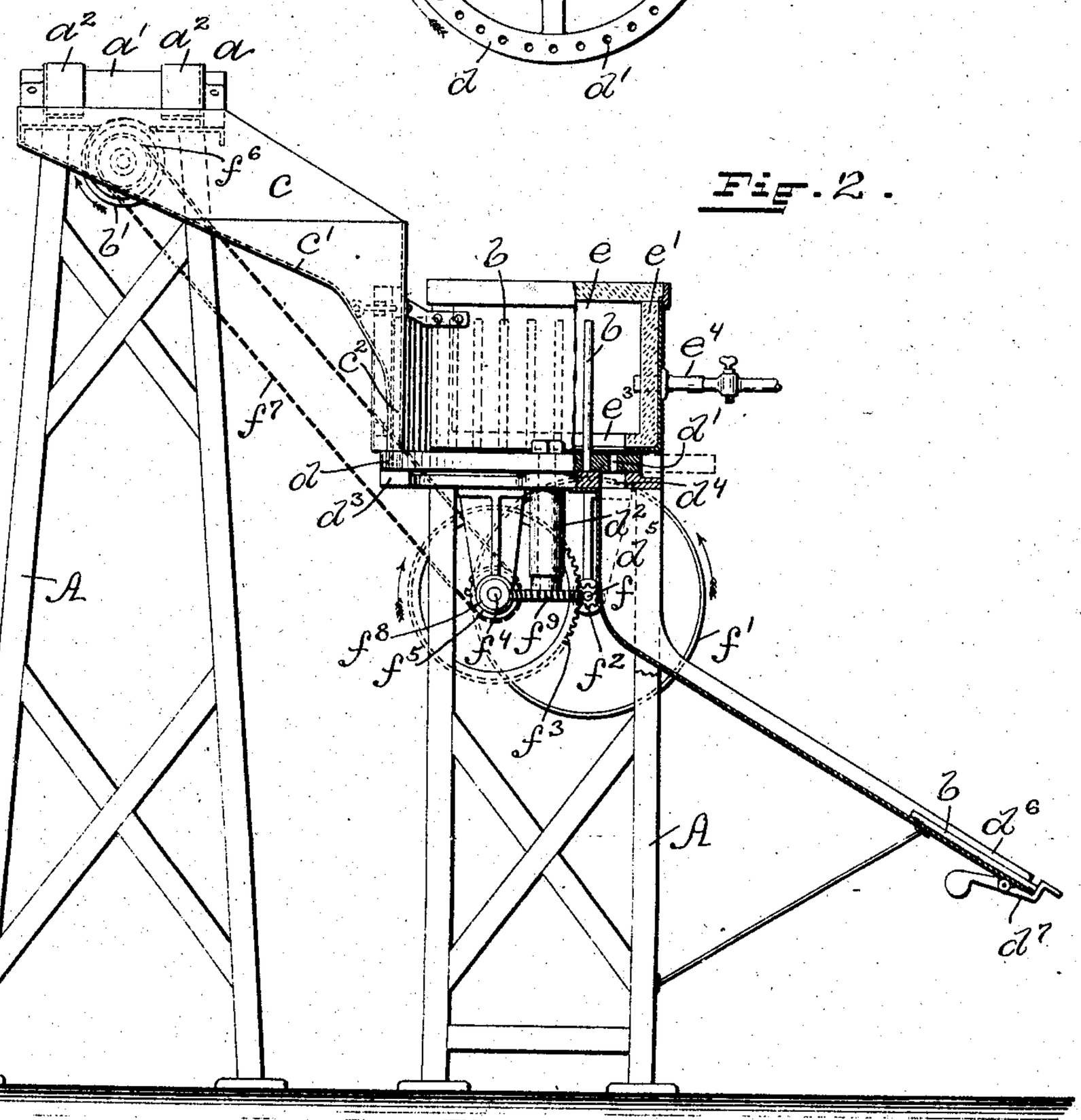

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Fig. 3.

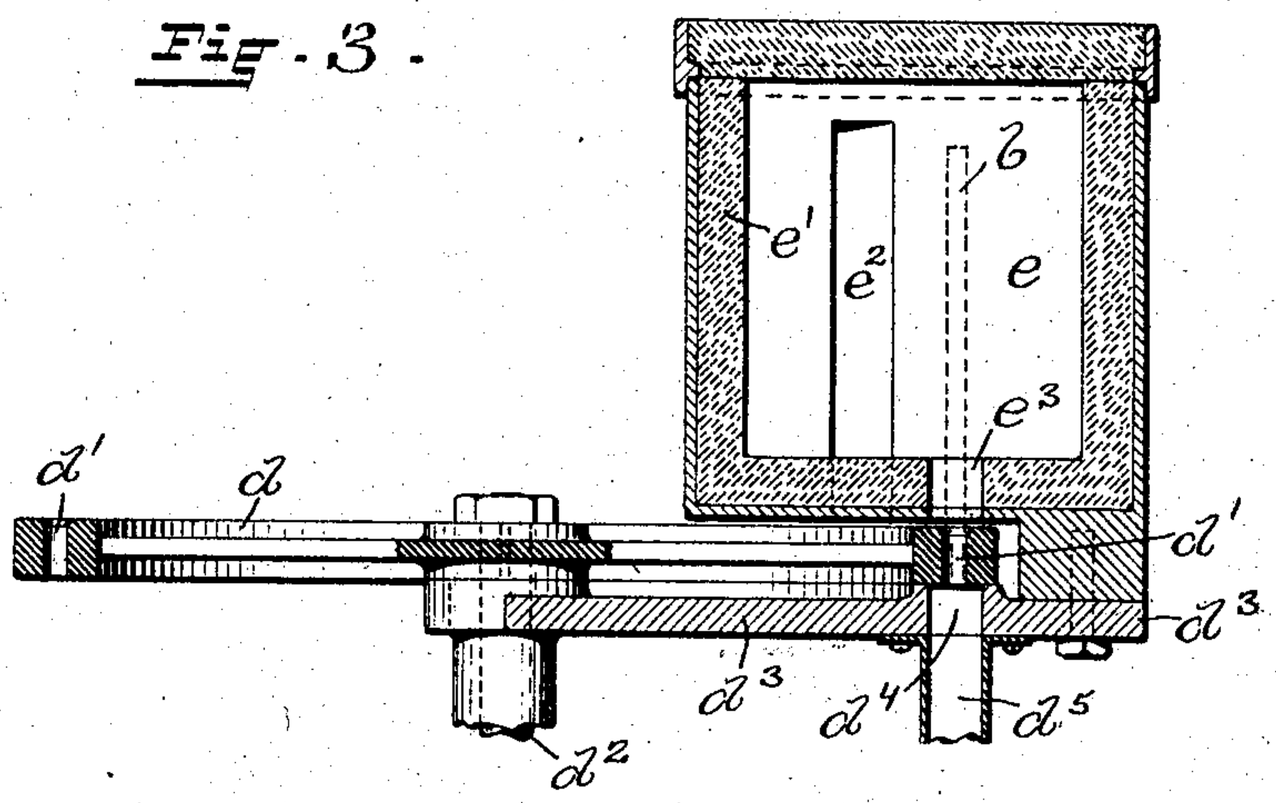


Fig. 4.

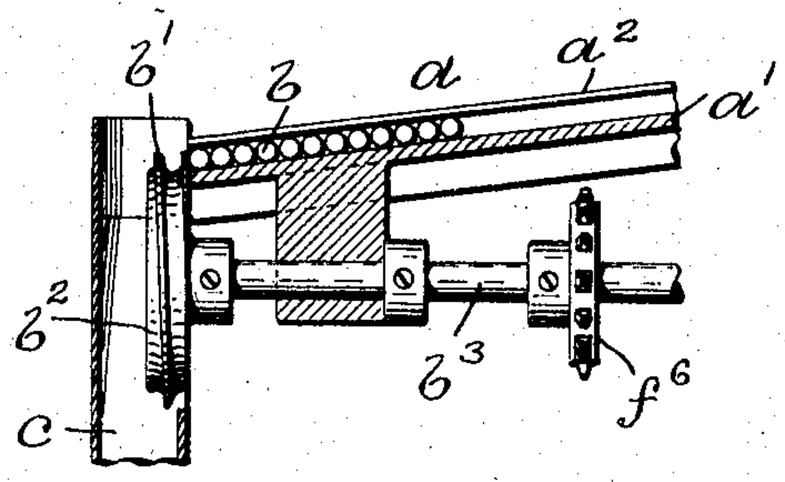


Fig. 5.

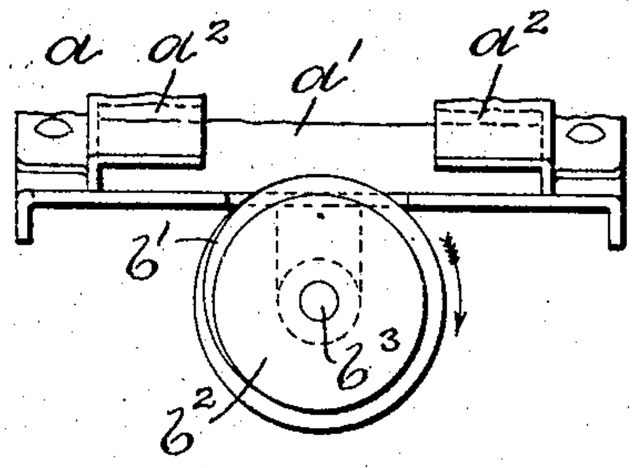


Fig. 6.

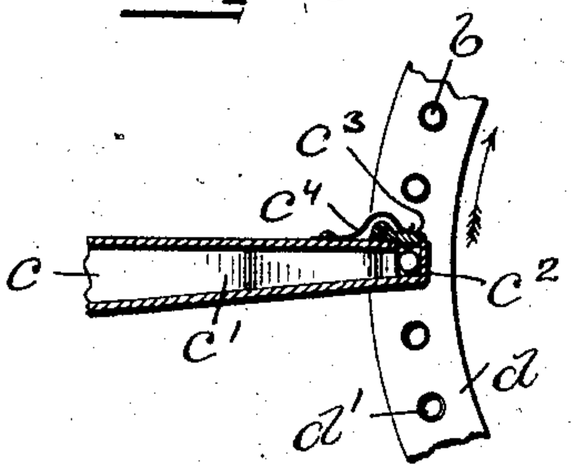
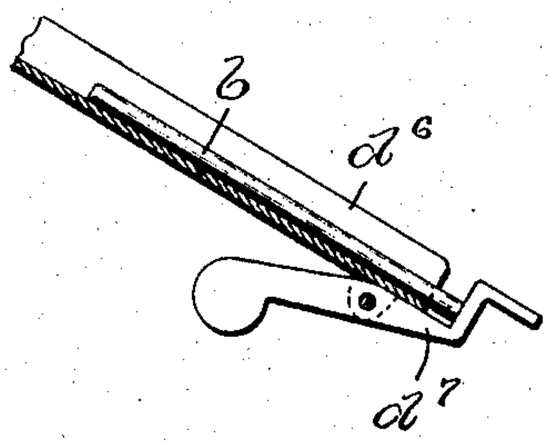


Fig. 7.



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3 SHEETS—SHEET 3.

Fig. 8.

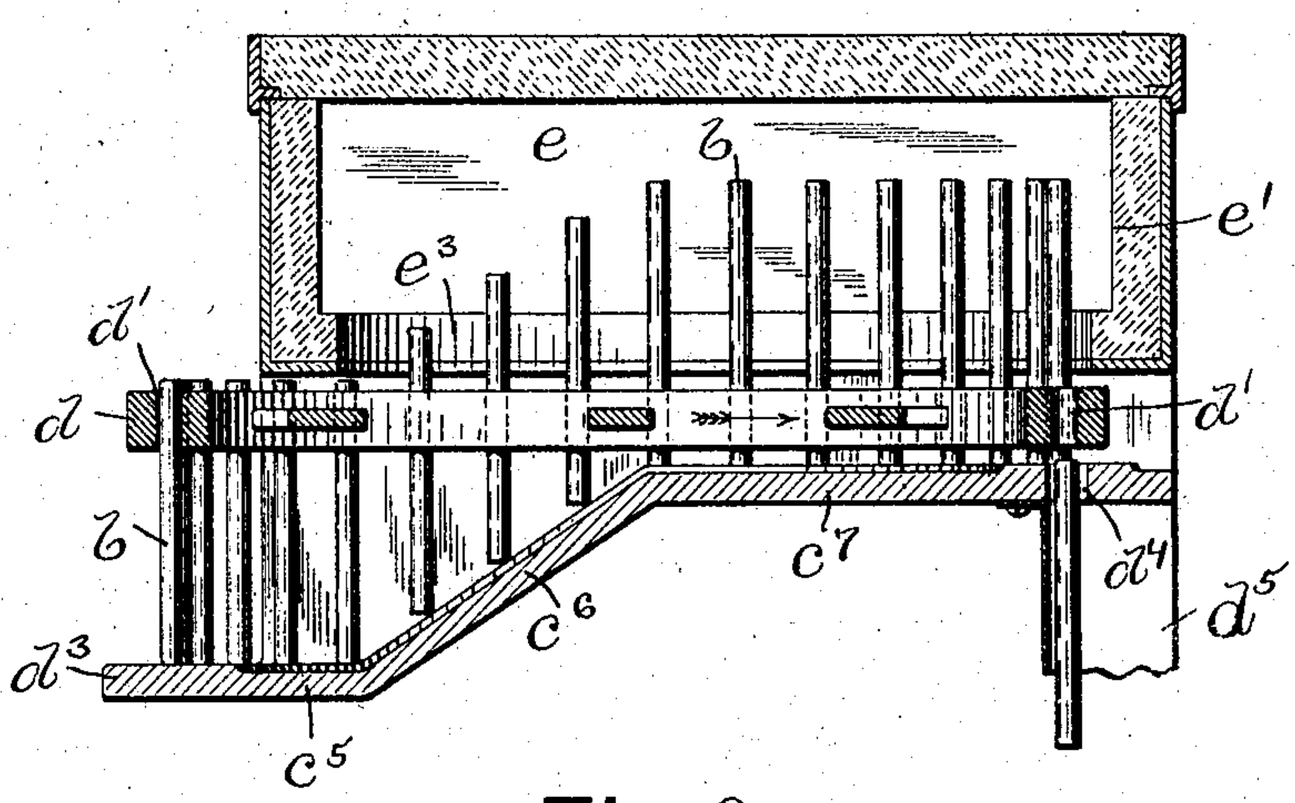
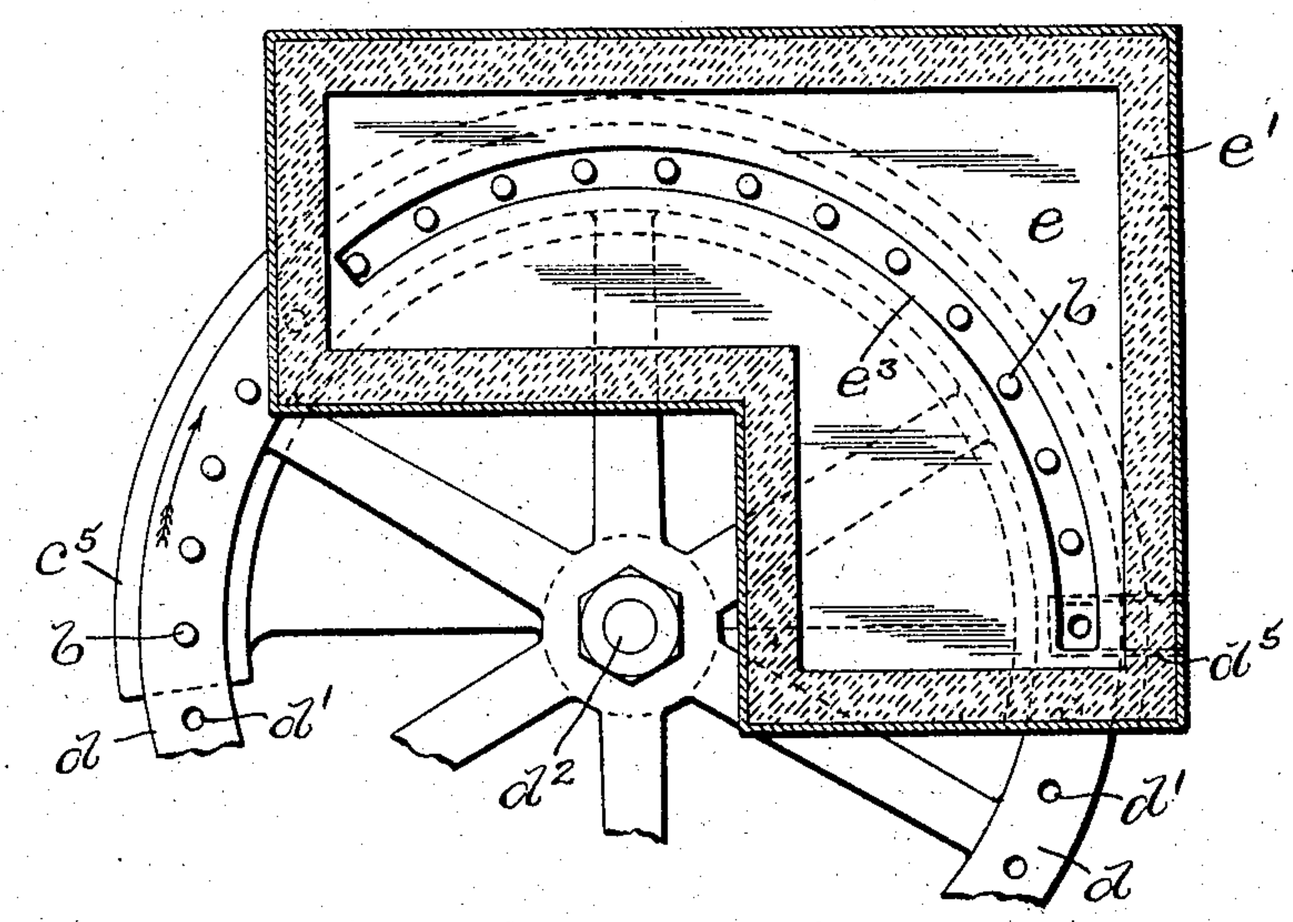


Fig. 9.



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UNITED STATES PATENT OFFICE.

HENRY A. OWEN AND CHARLES T. BURLIN, OF WHITINSVILLE, MASSACHUSETTS, ASSIGNORS TO THE WHITIN MACHINE WORKS, INCORPORATED, OF WHITINSVILLE, MASSACHUSETTS.

SPINDLE-FORGING MACHINE.

SPECIFICATION forming part of Letters Patent No. 791,204, dated May 30, 1905.

Application filed July 5, 1902. Serial No. 114,327.

To all whom it may concern:

Be it known that we, HENRY A. OWEN and CHARLES T. BURLIN, citizens of the United States, residing at Whitinsville, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Spindle-Forging Machines, of which the following is a specification.

This invention has reference to a machine for heating the blanks for spinning-machine spindles.

The object of the invention is to automatically convey the blanks to the heating-furnace, heat the blanks, and convey the heated blanks to a convenient point to be forged.

The invention consists in the peculiar and novel construction and the combination of the coöperating parts whereby the handling and the heating of the blanks are facilitated, as will be more fully set forth hereinafter.

In carrying out the invention we have provided a suitable magazine or receptacle in which any desired spindle-blanks may be placed. An automatically-operating selector delivers at predetermined intervals a blank from the magazine into a conveyer, by which it is delivered to a carrier, which carries the blank through the heater. The heated blank is now dropped into a conveyer, by which it is carried to a convenient point to be forged or otherwise formed into a spindle.

Figure 1 is a plan view of our improved machine, shown partly in section. Fig. 2 is a side elevation of the same, shown partly in section. Fig. 3 is a vertical sectional view, on an enlarged scale, showing the carrier and heater in relation to the conveyer by which the heated blanks are supplied to the forger. Fig. 4 is a top view, partly in section, showing the relation of the selector with the magazine and the conveyer. Fig. 5 is an end view of the selector, taken at right angle to Fig. 4, showing its relation with the magazine. Fig. 6 is a detail view, partly in section, showing the blank-holder on the end of the first conveyer in connection with the carrier. Fig. 7 is a side view, partly in section, of the delivery end of the conveyer of heated blanks, showing the counterweighted stop. Fig. 8 is a vertical sectional view, on an enlarged scale, of a furnace which has no side opening, the blanks being lifted up into the heater, the means for lifting the blanks, and the relation of the several parts. Fig. 9 is a plan view of the carrier and the heater, the heater being shown in section.

Similar marks of reference indicate corresponding parts in all the figures.

In the drawings, A A indicate the frames forming the support of the machine, and *a* the magazine, consisting, as shown in the drawings, of the plate *a'* and the guide-flanges a^2 a^2. The magazine is placed in an inclined position, so that the blanks *b* when placed on the plate *a'* will roll or slide down on the plate, guided by the flanges a^2 a^2, until the foremost one of the blanks *b* bears against the worm *b'* on the peripheral surface of the worm-disk b^2, rotatably mounted on the shaft b^3. At each rotation of the worm-disk b^2 the foremost one of the blanks in the magazine moves onto the worm-disk and, carried endwise by the worm, drops into the conveyer-chute *c*, the bottom of which has the incline *c'*, which curves and terminates in the vertical end portion c^2. Each blank as it is dropped slides down the conveyer *c* and assumes the vertical position as it enters the end portion c^2, which has a vertical opening closed by the hinged gate c^3, held in the closed position by the spring c^4. The blank *b* is supported on the carrier *d*, which is perforated by a series of holes *d'*. The carrier consists of a wheel the hub of which is secured to the shaft d^2, through which rotary motion is imparted to the carrier. The rim of the carrier is perforated at intervals with the holes *d'*, into which the blanks *b* fit with a loose sliding fit.

When a hole *d'* of the carrier registers with the blank *b* in the end of the conveyer c^2, the blank drops into the hole *d'* and would drop through the same, but is supported on the stationery plate d^3, which extends from the end of the conveyer *c* to the point of discharge under the rim of the carrier. The blank which has entered the hole *d'* of the carrier is

moved out of the end c^2 by the carrier. The spring-pressed gate opens by the force exerted by the carrier on the blank and is closed by the spring c^4 for the reception of the next blank released by the worm.

The carrier d is rotatably mounted below the heating-chamber e, lined with the refractory material e'. In the preferred form the heating-chamber e is supported on the plate d^3 and is provided at one end with the vertical slot e^2 in the wall and the segmental slot e^3 in the bottom, through which the spindle-blanks are carried into the heating-chamber. The heating-chamber may be heated in any suitable manner, preferably by means of the gas or oil burner e^4. The blanks are subjected to the heat for the time necessary to prepare them for forging. Near the end of the segmental slot e^3 in the bottom of the heating-chamber the plate d^3 has the opening d^4, through which the spindle-blank b passes when the hole d', supporting the blank, registers with the opening. The conveyer d^5 receives the heated blank and guides the same to the end d^6 of the conveyer. On this end d^6 the counterweighted stop-lever d^7 is pivotally connected and serves to arrest the descent of the heated blank, so that the forger may conveniently grasp the blank.

As shown in Figs. 8 and 9, a portion of the stationary plate d^3 is placed sufficiently below the carrier, as at c^5, to allow the tops of the blanks to pass under the bottom of the heater, the plate gradually rising, as at c^6, until the blanks have been lifted up into the furnace and the flat surface of the plate d^3 is reached, as shown at c^7, the blanks being moved along by the carrier d until the opening d^4 is reached, through which the blanks b drop into the conveyer d^5.

The machine may be operated by any prime motor conveying power to the various parts to operate at the relative speed required. In the preferred form, as shown in the drawings, the shaft f is provided with the pulleys f'. One of these is a loose and the other a tight pulley. The pinion f^2 on the shaft f gears with the gear f^3 on the counter-shaft f^4, the sprocket-wheel f^5 on which is connected by an endless chain f^7 with the sprocket-wheel f^6 on the shaft b^3, by which the worm-disk b^2 is rotated. The worm f^8 on the counter-shaft f^4 engages with the worm-gear f^9, secured to the shaft d^2 of the carrier d.

We do not wish to confine ourselves to the exact construction of the driving mechanism or the operative parts, as these may be modified without materially affecting the result.

Having thus described our invention, we claim as new and desire to secure by Letters Patent—

1. In a machine of the nature herein described, the combination with the horizontally-rotatable carrier, holes in the carrier for the reception of the blanks, and a plate extending under a part of the carrier, of a heating-chamber having a slot in one of the vertical walls and a slot in the bottom for the passage of the blanks into and through the chamber, and means for rotating the carrier, as described.

2. In a spindle-forging machine, the combination of the following instrumentalities: a magazine for the reception of the spindle-blanks, a selector for releasing one blank after the other at predeterminate intervals, a rotatable carrier, perforations in the carrier for the reception of the spindle-blanks, means for inserting the blanks into the holes of the carrier, means for supporting the spindle-blanks in the carrier, means for rotating the carrier, a heating-chamber having the inclosing walls covered with refractory material, means for discharging the heated blanks, and means for heating the chamber, as described.

3. In a spindle-forging machine, in combination, a heating-chamber having openings for the passage of the blanks through the same, a burner for heating the chamber, a revoluble blank-carrier, means for supporting the blanks terminating at a point within the heating-chamber for the discharge of the heated blanks, a conveyer, and a counterweighted stop at the delivery end of the conveyer, as described.

4. In a machine of the nature herein described, the combination of a heating-chamber, a carrier for the reception of the blanks, a plate formed to lift the blanks into the heating-chamber upon the rotation of the carrier, and means for rotating the carrier, and means for supporting the blanks terminating at a point within the heating-chamber, as described.

5. In a machine of the nature herein described, the combination with the heating-chamber e provided with the slot e^2 in the wall and the slot e^3 in the bottom of the heating-chamber, and the plate d^3, of the carrier d rotatably supported on the plate d^3, the holes d' in the rim of the carrier, the opening d^4 in the plate d^3, and means for rotating the carrier, whereby the blanks may be carried into the heating-chamber and the heated blanks discharged, as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

HENRY A. OWEN.
CHARLES T. BURLIN.

Witnesses:
ADA E. HAGERTY,
J. A. MILLER, Jr.