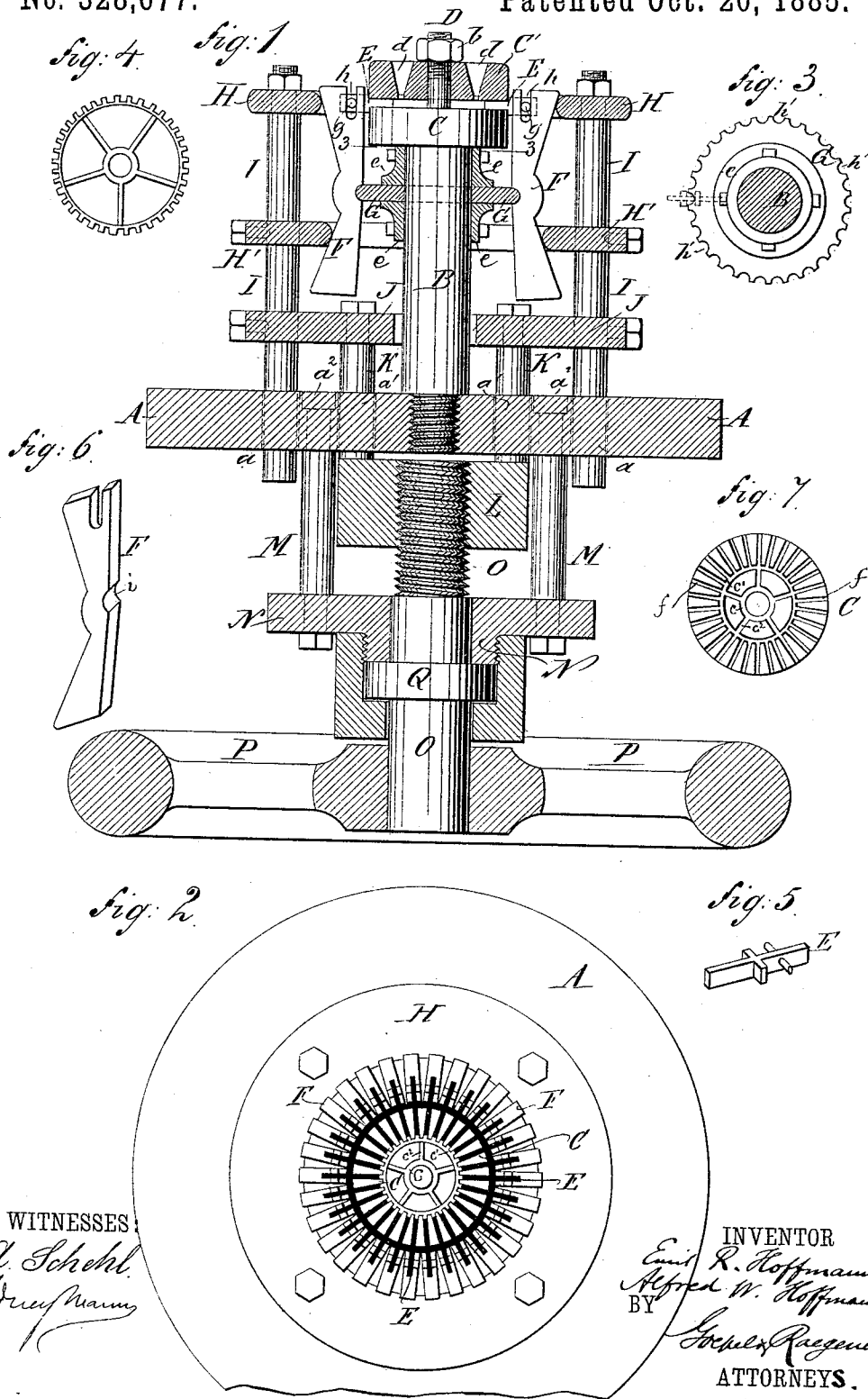


(No Model.)

E. R. & A. W. HOFFMANN.
APPARATUS FOR MAKING TYPE WHEELS.

No. 328,677.

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APPARATUS FOR MAKING TYPE-WHEELS.

SPECIFICATION forming part of Letters Patent No. 328,677, dated October 20, 1885.

Application filed August 16, 1884. Serial No. 140,772. (No model.)

To all whom it may concern:

Be it known that we, EMIL R. HOFFMANN and ALFRED W. HOFFMANN, of the city, county, and State of New York, have invented certain new and useful Improvements in Apparatus for Making Type-Wheels, of which the following is a specification.

The object of this invention is to provide an apparatus for the economical production of type-wheels for printing-telegraph instruments, type-writing machines, and other purposes.

In the accompanying drawings, Figure 1 represents a central vertical section of this improved apparatus for making type-wheels. Fig. 2 is a plan of said apparatus with the upper section of the mold thereof removed. Fig. 3 is a horizontal section on line 3 3 of Fig. 1 of the upright post and the ring attached thereto, against which the levers for actuating the type-bars are fulcrumed. Fig. 4 is a side view of a type-wheel produced by this apparatus. Fig. 5 is a perspective view of one of the type-bars. Fig. 6 is a perspective view of one of the levers for actuating a type-bar. Fig. 7 is a face view of one of the mold-sections.

Similar letters of reference indicate corresponding parts in the different figures.

An iron table, A, preferably circular in form, constitutes the base of this apparatus. This table is designed to be elevated from the floor by means of legs or other means of support, (not shown,) and is provided with a central screw-threaded socket-hole, and with holes *a a' a''* extending vertically through the same.

An upright center post, B, provided with a screw-threaded shank at its lower end and with an extension-spindle, D, at its upper end, is secured to the table A, its threaded shank taking into the screw-threaded central socket of said table.

A two-part mold, in which the type-wheels are cast, is supported on the post B, the lower section, C, being secured directly to said post and the upper section, C', being vertically adjustable on the extension-spindle D thereof. A screw-nut, *b*, at the upper end of said spindle serves to clamp the upper section of the mold in position on the lower section when

a type-wheel is being cast. The mold sections are each provided on their faces with circular grooves *c c'* and radial grooves *c''* for forming the spider frame and rim of a type-wheel, and the upper section is provided with ingates *d*, through which the molten metal enters the mold. The faces of these mold-sections are also provided beyond the type-wheel grooves with radial grooves *f*, in which a series of type-bars, E, are adapted to slide. These type-bars are provided at their inner ends with letters, figures, or other configurations, either countersunk or in relief, according to the characters to be produced on the periphery of the type-wheel, and in operation are slid inward so that their inner ends press against the type-wheel during the casting thereof, and slid outward when the newly-cast type-wheel has cooled sufficiently to permit its withdrawal.

A simple mechanism is provided for actuating the type-bars. A series of vertical levers, F, equal in number to the number of type-bars, are fulcrumed against a ring, G, secured to the post B below the mold-sections by means of rigid collars *e*, bolted or screwed to said post. Pins *g* at the outer ends of the type-bars take into vertical slots *h* in the upper ends of said levers, so that as the levers are oscillated the type-bars are pushed in or drawn out as the case may be. The ring is provided with a series of notches, *h'*, around its circumference, into which the levers fit, and the levers are severally provided at their points of contact with the ring with notches *i*, whereby respectively lateral and vertical displacement of the levers is prevented.

Any suitable mechanism may be employed to oscillate the levers for pushing in and drawing out the type-bars. As shown, the levers are somewhat in the form of a double wedge broadest at its ends and narrowest at its mid-length, the double incline being on the outer edge of the levers. Rings H H', secured to a vertically-movable frame, surround the circular series of double-wedge-shaped levers above and below their pivotal points, and as said frame is raised the upper ring, H, acts upon the upper parts of the levers and swings them inward, causing the type-bars to be pressed against the casting, and as it is lowered

the lower ring, H', acts upon the lower parts of the levers and throws the upper ends outward, causing the type-bars to be withdrawn. The said vertically-movable frame may be
 5 composed of the guide-rods I, which slide in the holes *a* of the table and to which the rings are clamped, of horizontal connecting-bars J, and short guide-rods K, which extend through holes *a'* of the table, being provided with a
 10 nut, L, attached to their lower ends underneath the table. Dependent rods M, fixed at their upper ends in holes *a''* of the table, support at their lower ends a box, N, in which a vertical spindle, O, is supported. The spindle O is screw-threaded at its upper end and
 15 takes into the nut L, and is provided at its lower end with a hand-wheel, P, and within the box N with a collar. The spindle is only susceptible of axial motion, the collar Q preventing vertical motion thereof. When the
 20 hand-wheel is turned in one direction, the frame carrying the rings for actuating the levers is raised, and when turned in the opposite direction said frame is lowered, and thereby
 25 respectively the type-bars are pushed in toward the center of the mold or drawn out therefrom.

The operation is as follows: The type-bars having the required characters at their inner ends are first adjusted in the radial grooves of
 30 the lower mold-section, C, and the upper mold-section, C', is then adjusted upon and clamped to the lower mold-section. The hand-wheel P is turned so as to raise the movable ring-carrying frame and cause the upper ring, H,
 35 to set the type-bars in proper position, so that their inner ends will surround the outer circumference of the wheel to be cast. The molten metal is then poured into the mold through the ingates *d* and the wheel is cast.
 40 The casting is allowed to remain in the mold undisturbed until sufficiently cool and hard, and then the hand-wheel is turned in the opposite direction and the ring-carrying frame thereby lowered, so that the lower ring oscillates the levers in the opposite direction and
 45 causes the withdrawal of the ends of the type-bars from the casting. The upper mold-section is then raised and the casting taken out of the mold and finished. The faces of the
 50 type on the type-wheel may then be copper or steel plated, according to the work for which the type-wheels are required.

In casting the type-wheels, the rim of a wheel
 55 may either be cast integral with the spider-frame thereof, or the spider-frame may be stamped separately and then placed in the mold and the rim cast around it. In place of metal any other suitable material may be used,
 60 such as hard rubber or other plastic compounds which will harden in the mold.

It is advisable in casting the type-wheels to move the type-bars slightly forward after the metal has set, so as to produce a sharp im-

pression of the type on the periphery of the 65 rim. This, however, is only necessary when very sharp outlines are required.

Instead of casting the type-wheels, they may be formed from cold metal by first making the blanks by machine, then placing them in
 70 the mold and pressing the type-bars inward by turning the spindle so that the characters on the ends thereof are reproduced on the rim of the wheel. Wheels thus constructed may be copper or steel plated, as in the case
 75 of cast wheels.

For type-wheels of different sizes different lengths of type-bars are required, the radial grooves for the type-bars being always of equal width, so that any set of type-bars can
 80 be used in any one of the molds. After the type-bars have been arranged in place, any number of type-wheels can be quickly and conveniently and cheaply turned out, so that the tedious and expensive hand-labor
 85 required for engraving the same is thereby avoided.

We claim as our invention, and desire to secure by Letters Patent—

1. The combination of a type-wheel mold,
 90 radially-guided type-bars having raised or countersunk types at their inner ends, vertically-oscillating levers that engage the outer ends of the type-bars, and means, substantially as described, whereby the oscillating levers and
 95 type-bars are moved in outward or inward direction, substantially as described.

2. The combination of the type-wheel mold having radial grooves in its adjoining faces, radially-guided type-bars, oscillating levers
 100 engaging the type-bars at their outer ends, said levers being double-wedge shaped, vertically-reciprocating rings engaging said wedge-shaped levers, and means, substantially as described, for raising or lowering said rings,
 105 so as to move the type-bars in inward or outward direction, substantially as specified.

3. The combination of an upright post having a fixed ring, a type-wheel mold supported by said post and provided with radial grooves,
 110 radial type-bars arranged in grooves of said mold, oscillating wedge-shaped levers pivoted to the said fixed ring on the supporting-post and adapted to engage the outer ends of the type-bars, rings engaging the outer tapering faces
 115 of the oscillating levers, a vertically-movable frame to which said rings are fixed, and an axially-turning spindle for raising and lowering said frame, substantially as described.

In testimony that we claim the foregoing as
 120 our invention we have signed our names in presence of two subscribing witnesses.

EMIL R. HOFFMANN.
 ALFRED W. HOFFMANN.

Witnesses:

PAUL GOEPEL,
 SIDNEY MANN.