

(No Model.)

G. C. BLICKENSDEKFER.
TYPE WHEEL FOR TYPE WRITING MACHINES.

No. 432,296.

Patented July 15, 1890.

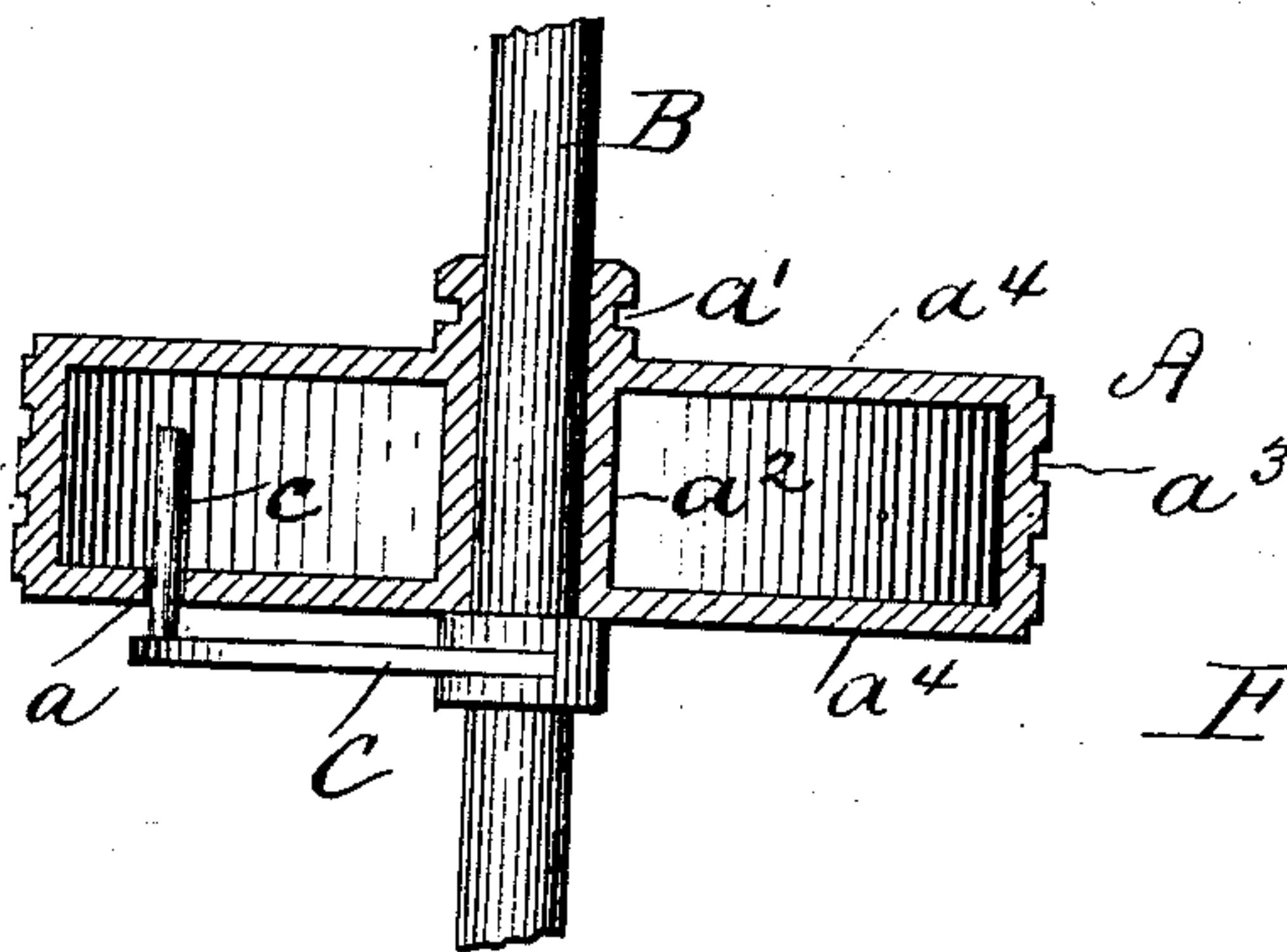


Fig. 1

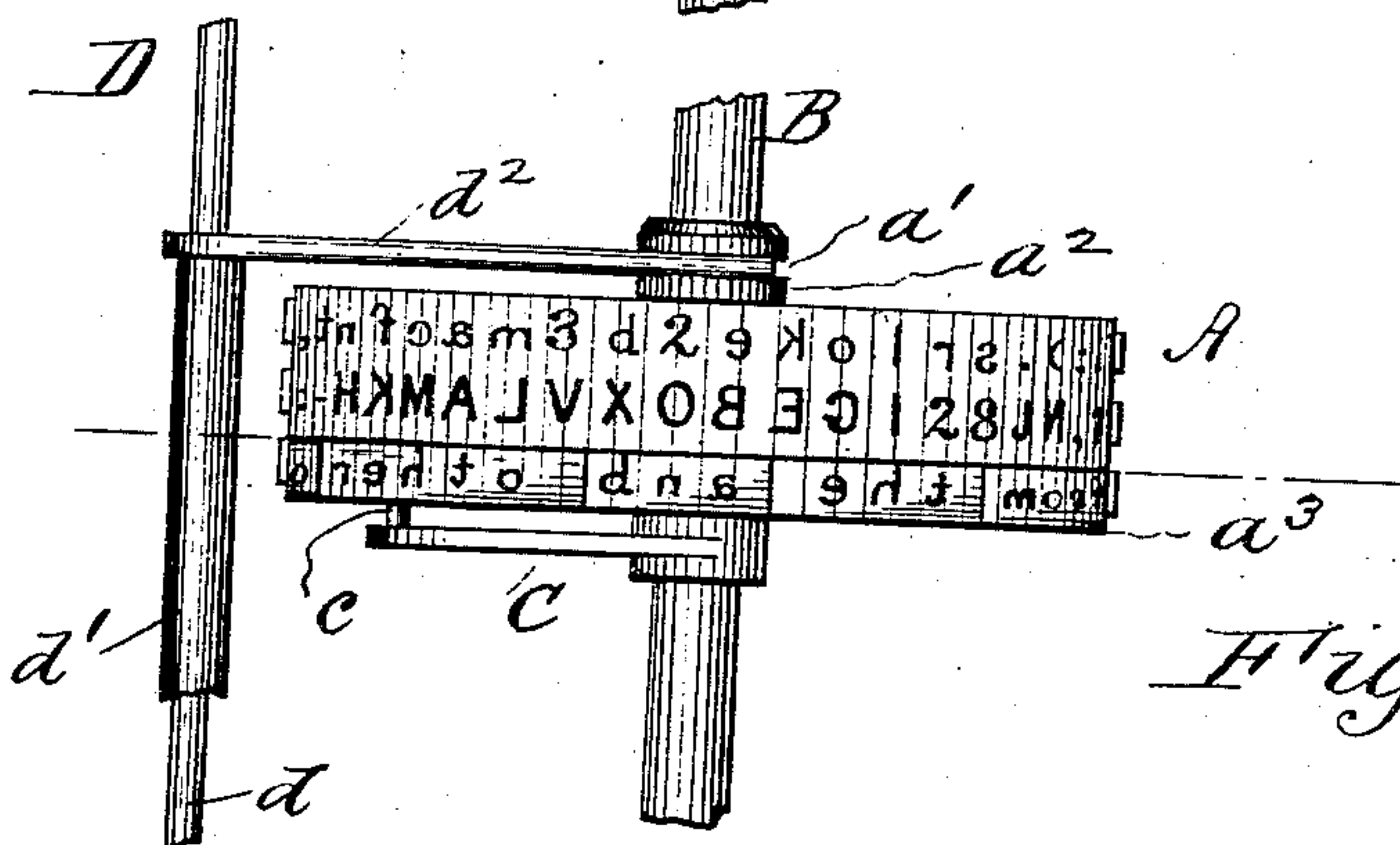


Fig. 2

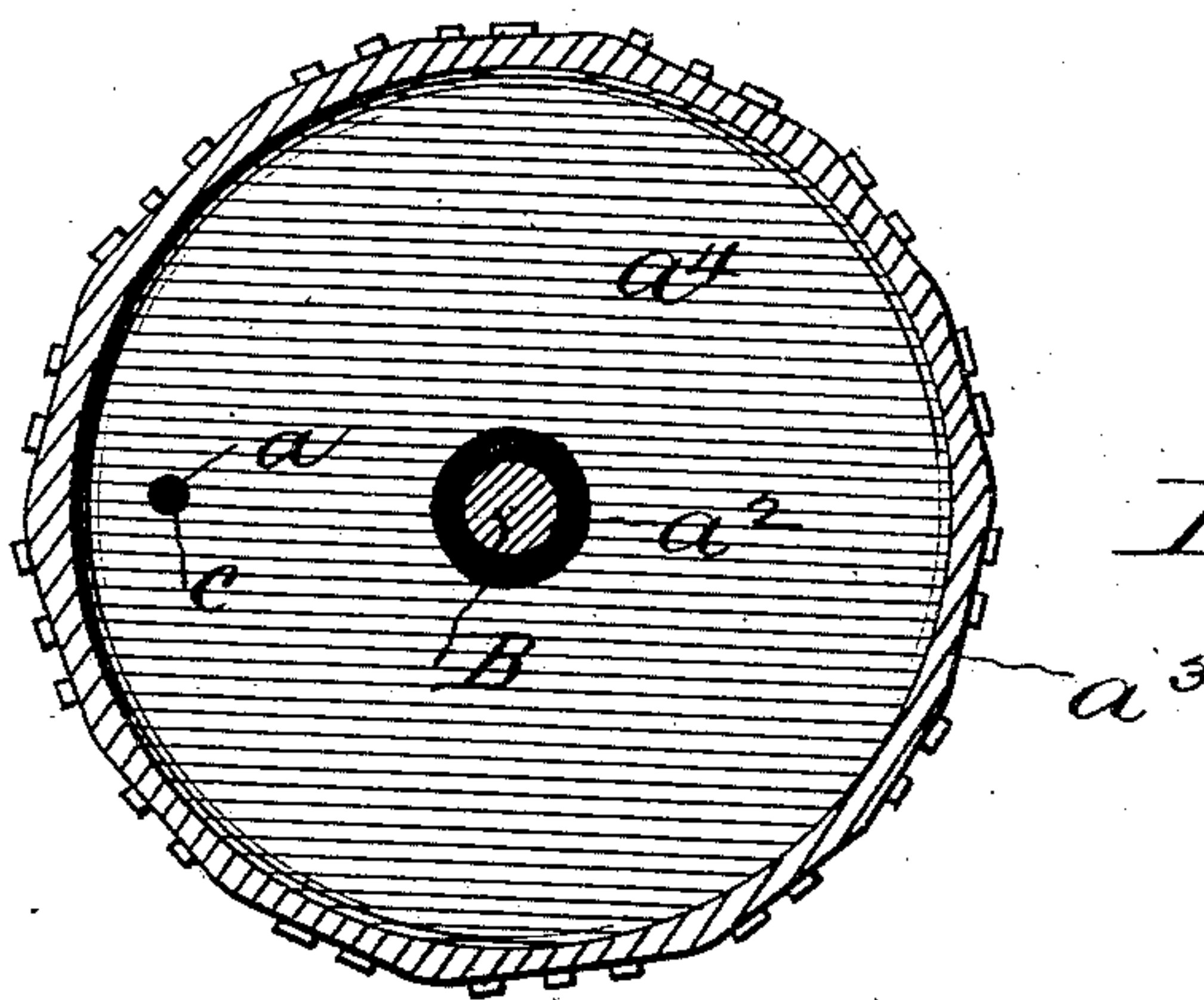


Fig. 3

WITNESSES:

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UNITED STATES PATENT OFFICE.

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TYPE-WHEEL FOR TYPE-WRITING MACHINES.

SPECIFICATION forming part of Letters Patent No. 432,296, dated July 15, 1890.

Application filed July 5, 1889. Serial No. 316,687. (No model.)

To all whom it may concern:

Be it known that I, GEORGE C. BLICKENS-
DERFER, a citizen of the United States, resid-
ing at Stamford, in the county of Fairfield and
State of Connecticut, have invented certain
new and useful Improvements in Type-
Wheels for Type-Writing Machines, of which
the following is a specification.

My invention relates generally to type-writ-
ing wheels of that form which are rotated by
keys or key-levers to bring into position the
desired letter or character to be printed or
written, and particularly to that special form
of the same which has a number of rows or
fields, and the wheel is shifted to bring any
one of these rows into impression position.

For type-wheels of the above-described
character it is very desirable that it should
be very light in weight, as it is normally at a
state of rest and the inertia of the wheel must
be overcome by the fingers through the me-
dium of the key-levers. It follows, therefore,
that the lighter the wheel the greater the ease
with which its inertia will be overcome. The
wheel, however, should not be lightened at
the expense of strength and durability. This
is particularly the case where the wheel is
shiftable upon its shaft to bring any one of
the different rows or fields of characters con-
tained upon the wheel into position and
wherein the axial hub or sleeve for the shaft
is more or less subject to a jarring motion due
to making the impression and to the return
of the sleeve to its normal position. To
strengthen the wheel at its axial hub or sleeve
is one of the objects of my invention. Again,
where the type-wheel is also used as a ham-
mer to make the impression of the desired
letter it is essential to strengthen the wheel
radially. Arms or spokes radiating from a
hub will not answer the purpose, as that part
of the periphery between the arms or spokes
would have nothing to support it and the con-
cussion due to the blow of the wheel against
the impression roller or platen would soon
either twist the wheel out of shape or break
it. To strengthen the wheel at this point is
another object of my invention. These ob-
jects are accomplished by making a hollow
wheel of hard rubber or analogous suitable

material and entirely closing the space at the
top and the bottom of the wheel between the
perimeter of the wheel and its hub or sleeve
by solid webs.

My invention has for its further object to
provide a cheap, light-weight, strong, and
durable type-wheel having several or a num-
ber of rows or fields of characters on its pe-
riphery by forming the hub or sleeve, the pe-
riphery, the top and bottom webs connecting
the sleeve and periphery of the wheel, as
well as the rows or fields of characters on the
wheel integral or in one piece.

My invention has for its still further object
to increase the scope of the type-wheel, and
to this end I place upon the wheel one, two, or
more letter words, so arranged that the let-
ters of each word will be upon the same hori-
zontal line, so that when an impression of the
word is made the word type or character will
strike the paper or platen evenly from end to
end of the word. The word characters con-
stitute, preferably, a separate field or row,
called a "word-row" or "field," and each word
is formed on a line or surface on the periphery
corresponding to the chord of a segment of a cir-
cle. The length of each such chord varies with
the number of letters in the word, so that one
part of the periphery of the wheel is made up
of a series of chords or segments for words,
while the remaining part is circular for sin-
gle letters and other single characters.

The invention consists of constructions and
combinations comprising a type-wheel, as will
hereinafter be particularly described in the
specification, and pointed out in the claims.

Reference is to be had to the accompanying
drawings, in which—

Figure 1 represents the wheel in section
and its shaft, the supporting-arm, and guide
in elevation. Fig. 2 represents an elevation
of the wheel, its shaft, the supporting-arm,
guide, part of the tilting frame, and a sleeve
having a lifting-arm for the wheel; and Fig.
3, a horizontal section of the wheel through
a word-row.

A represents the type-wheel, which in the
drawings is represented mounted loosely upon
a shaft B, and supported thereon by an arm
C, carrying a vertical guide-pin c of some

length, which presses into a hole a in the type-wheel to permit the latter to be adjusted or shifted vertically on said shaft to bring any of the rows or fields on the type-wheel into impression position, said guide-pin c connecting the type-wheel to the shaft, so as to rotate with it, and said guide-pin is made of an extended length to maintain the connection between the shaft and the type-wheel as the latter is shifted vertically, so that it will always be in engagement with the shaft to rotate therewith. As further shown in the drawings, the type-wheel shaft B is mounted in a tilting frame D , to admit of the type-wheel being used as a hammer to make the impression, and upon one of the side bars d of frame D is a sliding sleeve d' , carrying an arm d^2 , which loosely embraces an annular groove a' at one end of the axial hub a^2 or sleeve of the type-wheel, so as not to interfere with the rotation of the type-wheel on the shaft and to admit of the wheel being shifted vertically, as shown and described in another pending application filed by me of an even date herewith, Serial No. 316,591.

The wheel consists of a periphery a^3 , an axial hub or sleeve a^2 , solid top and bottom webs $a^4 a^4$, connecting the periphery a^3 and sleeve or hub a^2 , and rows or fields of characters on periphery a^3 , all of which are formed in one piece to make a hollow type-wheel having solid webs, and it is made of hard rubber or other suitable analogous material.

The manner of forming this wheel is substantially as follows: Wedge-shaped dies having their apices formed upon a concave line with the desired character in *intaglio* and forming when put together a cylindrical opening are arranged on a base-plate having a stem to form the axial opening. The inside of these parts is covered with the proper plastic compound, as is also the inside of a cap-plate which closes the upper part of the mold. A little water is placed in the mold before the parts are clamped together, and when clamped placed in a furnace and heated to a sufficient temperature to make the water turn to steam, which forces the rubber into all the interstices of the mold, where it hardens. After the mold has remained in the furnace a sufficient time it is taken out and the clamps removed from the mold, so that the dies can be removed without the characters on the wheel being injured. It is obvious that any desired character can by this means be cast or blown upon or integral with the wheel. In many cases, especially where two or more letter words are used, the space in which the words are cast can be so arranged that the faces of the letters of each word will be upon the same horizontal line, so that when an impression is made the word type or character will strike the paper evenly from end to end of the same. The space for the word is varied to suit the number of letters in the word, and is always formed in a line corresponding to the chord of a segment of a circle.

so that the printing of the words will be uniform. The single letters or characters are formed on circular parts or surface of the periphery of the wheel, as is usual, so that the surface of the periphery of the type-wheel is partly circular and partly made up of chords of segments of circles, varying in length to correspond with the number of letters in the word.

For rapidity of writing words or like characters I prefer to assemble all the words in one or more rows containing only word characters and called "word-rows," and the surface of the periphery of the wheel for the word-rows will consist of a series of varying lengths of chords or segments of circles, as more plainly shown in Fig. 3, while that for the single letter or character rows will be circular or round, as is usual.

From the foregoing it will be noted that as the webs $a^4 a^4$ of the type-wheel are in the form of solid disks which close both ends of the wheel completely, the periphery a^3 of the wheel will have a continuous brace between it and the axial hub or sleeve, and the latter is correspondingly braced. The type-wheel is therefore of light weight, so that its inertia is easily overcome and its axial hub or sleeve as well as the periphery a^3 are strengthened to resist the concussion due to the blow of the wheel upon the platen when said wheel is used as a hammer and to the shifting of the wheel when it is arranged to move vertically on its shaft. The described continuous bracing for the periphery a^3 and the hub of the type-wheel permits of cutting away or forming the chords of segments of circles on the type-wheel periphery a^3 for the word characters without weakening said periphery when it has a narrow width in cross-section, as more fully illustrated in Fig. 3 of the drawings, such narrow width of cross-section keeping down the weight of the type-wheel. The opening a for the guide-pin c , as shown in the drawings, is formed in the lower web a^4 , and this opening also permits the fluid and gases, if any remain after the wheel is made, to escape from the interior thereof.

While I have illustrated the special form of type-wheel carrying-shaft connection between the type-wheel and its shaft and shifting connection for the type-wheel, I do not limit myself thereto, as it is evident that any or all of said parts may be varied to suit different kinds or makes of type-wheel writing-machines, and are herein only shown as one form of the same for use with a shiftable rotating and oscillating type-wheel embodying my improvements, said type-wheel, it is obvious, being applicable for use in various kinds or makes of type-wheel writing-machines.

What I claim is—

1. A hard-rubber hollow type-wheel consisting of an axial hub or sleeve, a periphery and top and bottom solid webs between said axial hub or sleeve and periphery formed in one piece, substantially as set forth,

2. A hard-rubber hollow type-wheel consisting of an axial hub or sleeve, a periphery, top and bottom solid webs between said axial hub or sleeve and periphery, and one or more rows or fields of type or characters on said periphery formed in one piece, substantially as set forth.

3. A hard-rubber hollow type-wheel consisting of an axial hub or sleeve, a periphery, top and bottom solid webs between said axial hub or sleeve and periphery, and one or more rows or fields of type or characters on said periphery, and part of said periphery being circular and part of it corresponding to chords of segments of circles for word type or characters, substantially as set forth.

4. A hard-rubber hollow annular type-wheel consisting of an axial hub or sleeve, a periph-

ery, top and bottom webs connecting said axial hub or sleeve and periphery, and one or more rows or fields of type or characters, part of which type or characters are logotypes or words, substantially as set forth.

5. A hard-rubber hollow type-wheel consisting of an axial hub or sleeve, a periphery, top and bottom solid webs between said axial hub and periphery, an annular groove *a'* in said hub exterior to one of said webs, and all of said parts formed in one part, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE C. BLICKENSDECKER.

Witnesses:

S. J. VAN STAVOREN;
CHAS. F. VAN HORN.