

(No Model.)

J. W. HEGELER.

RAKE APPLIANCE FOR ORE ROASTING FURNACES.

No. 592,006.

Patented Oct. 19, 1897.

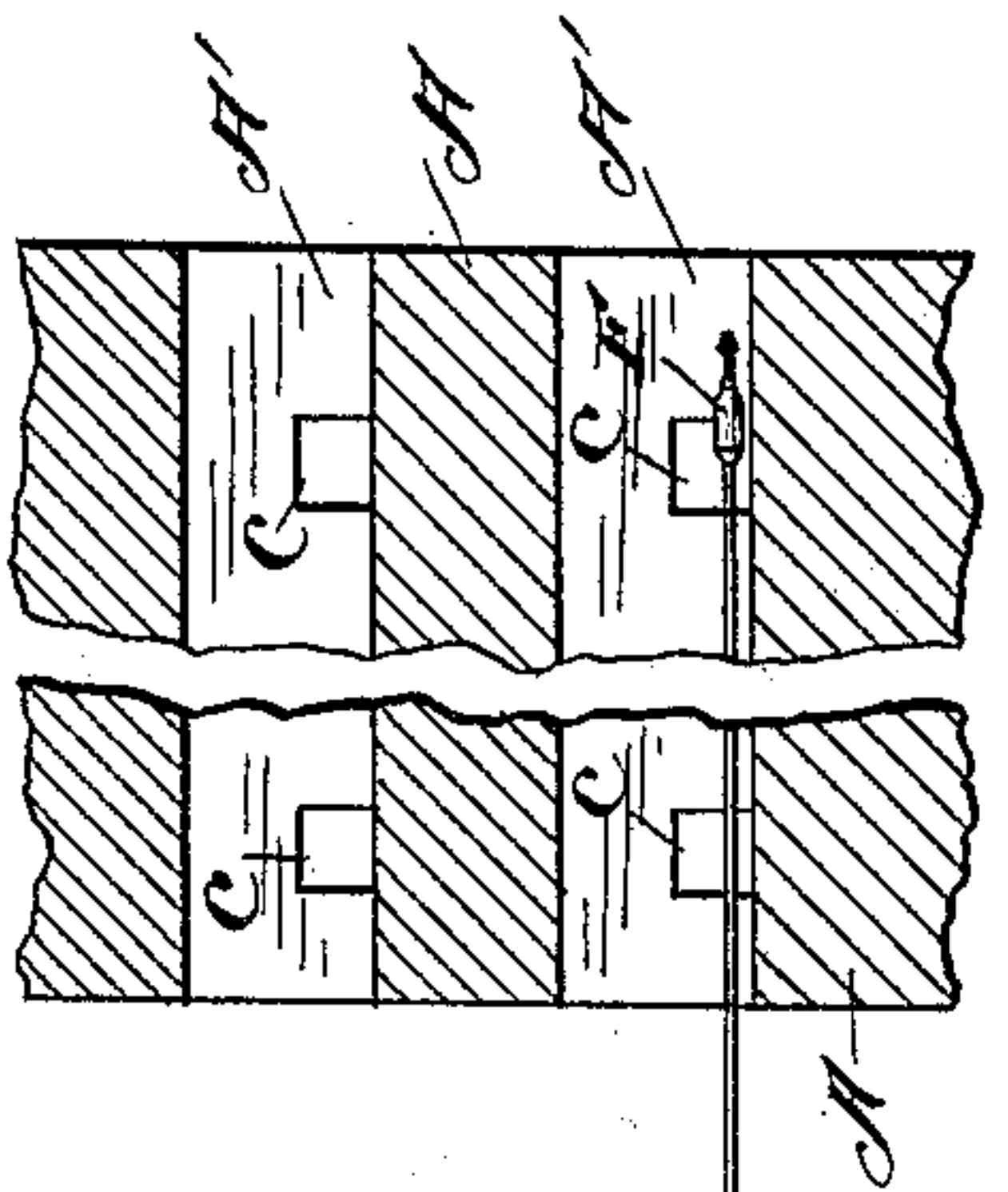


Fig. 1.

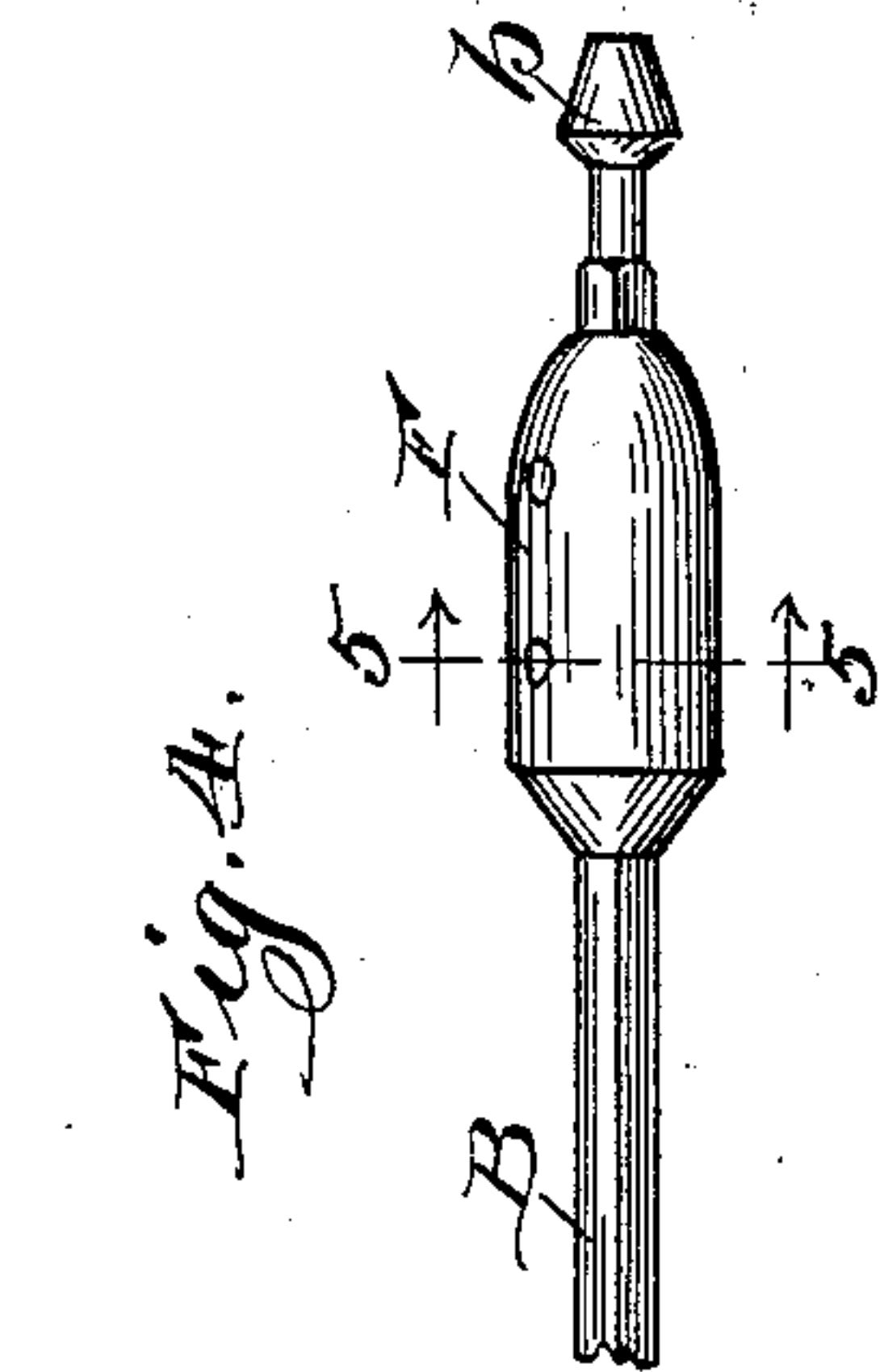
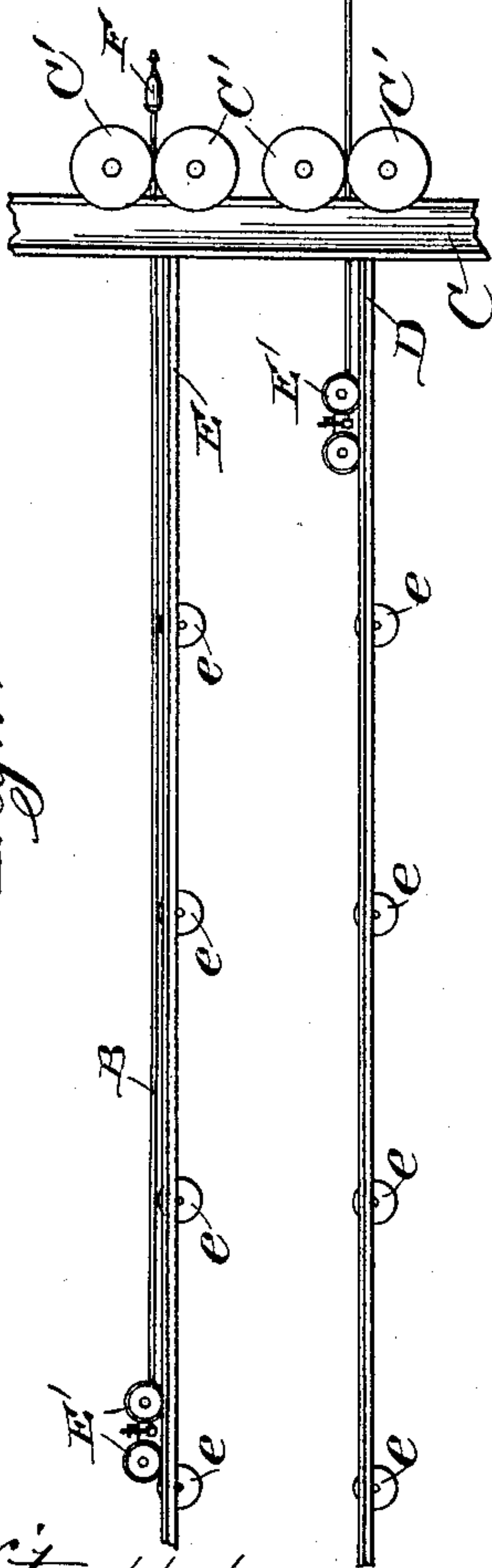


Fig. 2.

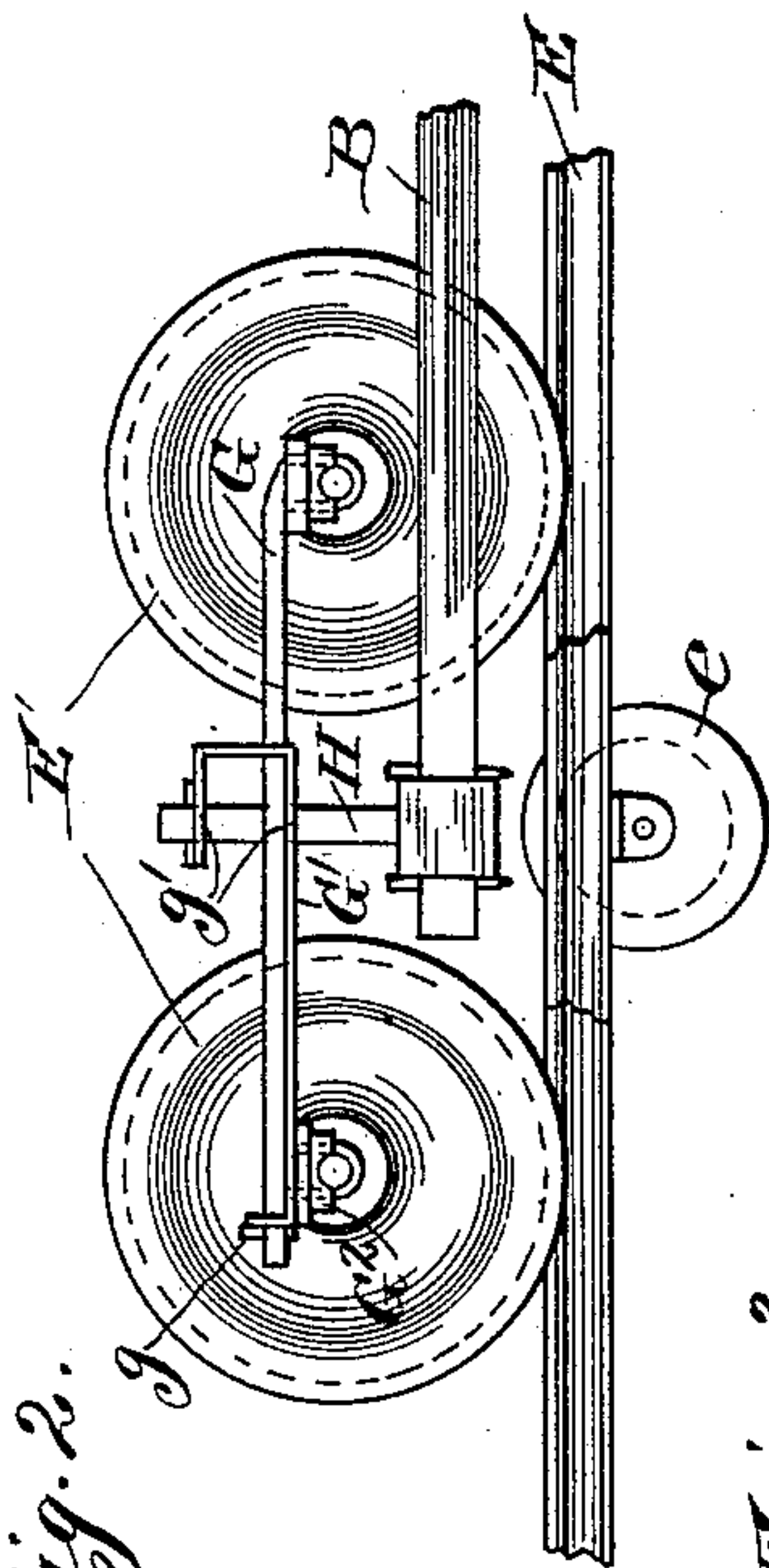


Fig. 3.

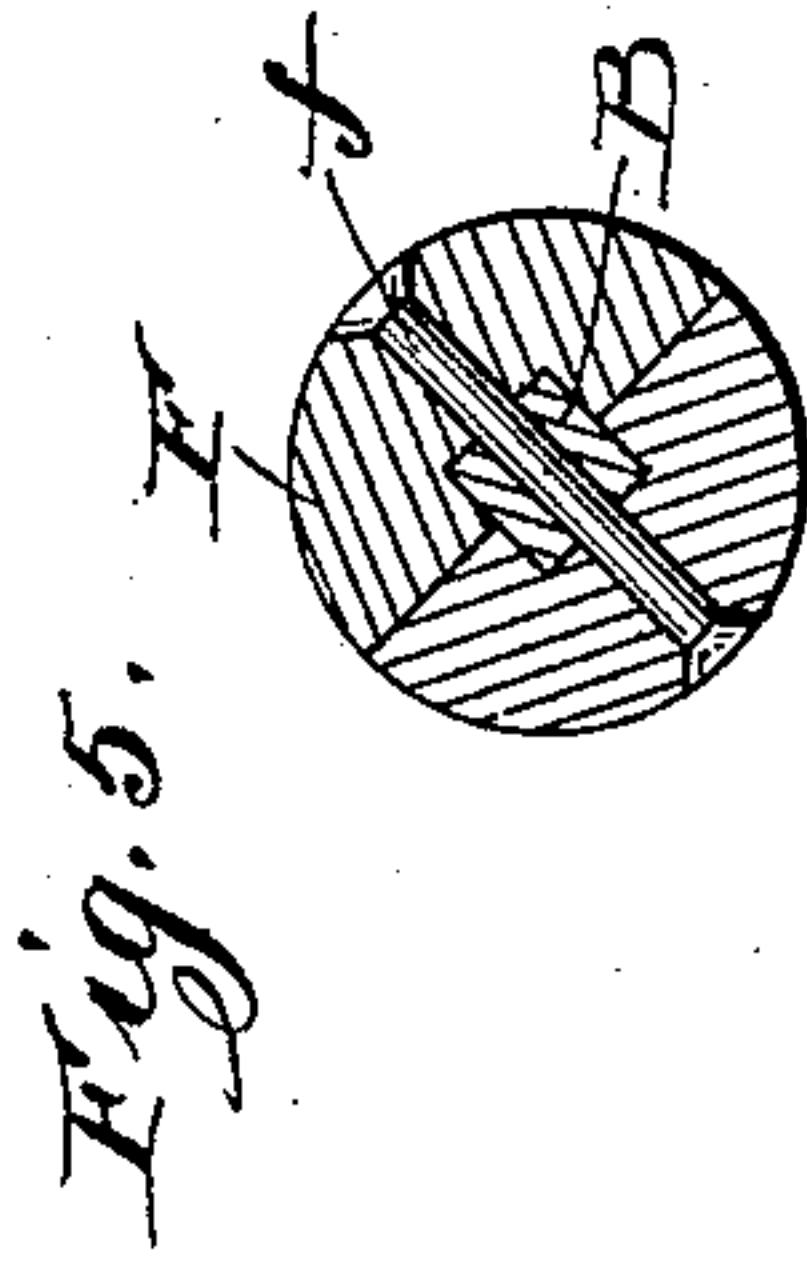


Fig. 5.

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UNITED STATES PATENT OFFICE.

JULIUS W. HEGELER, OF LA SALLE, ILLINOIS.

RAKE APPLIANCE FOR ORE-ROASTING FURNACES.

SPECIFICATION forming part of Letters Patent No. 592,006, dated October 19, 1897.

Application filed April 3, 1897. Serial No. 630,498. (No model.)

To all whom it may concern:

Be it known that I, JULIUS W. HEGELER, of La Salle, in the county of La Salle and State of Illinois, have invented certain new and useful Improvements in Rake Appliances for Ore-Roasting Furnaces, of which the following is a specification.

My invention relates to improvements in appliances for operating the rakes of furnaces of the class shown in Letters Patent of the United States to Edward C. Hegeler, No. 303,571, dated August 12, 1884, for "Furnace for roasting zinc and other ores," in which the rakes are detachable and long rods are thrust through the furnace and connected with the rakes in order to haul them through the furnace for moving the ore in the roasting process. In the operation of the appliances shown in said patent, with furnaces or ovens from about forty or fifty to one hundred feet long, the rake-rods become so bent or warped by the heat that it is difficult to keep them in place in their supports or get them to work easy therein; and the detachable guide there shown, with oblique arms extending from the front end of the rods backwardly to the sides of the oven, is necessary in order to prevent the end of the rods from being caught in the cleaning-holes at the sides when being thrust through the furnace. The guides have to be attached and detached for each operation and this requires considerable time.

The objects of my improvements are to provide simple and efficient means for supporting the rake-rods so that they may be worked more easily and without binding in their support and for preventing them from catching in the cleaning-holes of the oven without the use of the detachable guides, in order to save time and increase the working capacity of the plant. I attain these objects by the means illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation, partly in section, showing a fragment of the means for supporting and operating the rods in connection with the furnace. Fig. 2 is an enlarged side elevation showing the rear end of the rod in conjunction with a truck for supporting the same on a track. Fig. 3 is a top or plan view of the part shown in Fig. 2. Fig. 4

is a detail showing the front end of the rod provided with a shoe. Fig. 5 is a detail showing a section on the line 5 5 of Fig. 4.

In the drawings, A designates a section of the furnace, which is usually upward of fifty feet in length, the ovens being open at both ends.

B designates the rods employed to pull the rakes through the ovens. The front end of each rod is provided with an arrow-head *b* or hook for connecting it with the rake. The rods are supported in a suitable framework C, provided with wheels C', which are clamped to the rods so that when rotated one way they will thrust the rods through the ovens and when their motion is reversed the rods will be drawn back, the rear ends of the rods being usually carried in troughs or angle-irons of the frame. The side walls of the ovens are provided with cleaning-holes *c* at suitable intervals. The construction as thus far described is in accordance with the description given in the prior patent mentioned and the plant constructed thereunder. The means provided in the present invention comprises a separate track E on the frame instead of a trough or angle-irons for each rod, a truck E', connected to the rear end of each rod, and a series of flanged rollers *e* between the track-rails for supporting and keeping the rods in place, so that they may be worked easily, and a cast-iron shoe F, connected as a fixture to the front end of the rod just back of the arrow-head or hook for preventing it from catching in the cleaning-holes and from being worn by sliding on the bottom of the oven. The track is laid upon the framework in vertical plane with the longitudinal center of the oven and is adapted to carry and keep the rear end of the rod in vertical plane with the central line along the oven-bottom in the direction of its length.

In the drawings the track is shown as being on the same level with the bottom of the oven; but this is not essential, as it may be curved up or down to a considerable extent, if desired, the rod being sufficiently slender to adapt itself by its weight to such curvature. The truck has a T-plate G mounted on the front axle and a plate G' mounted on the rear axle and having its front end bent upwardly and backwardly, as shown in Fig. 2,

and provided with an opening in the up-
turned part through which the rearwardly-
projecting part of the T-plate can pass.
There is also a plate G^2 on the rear axle with
5 an upturned flange g , having a similar opening
for a like purpose. There are holes through
said plate and the rearwardly-projecting part
of the plate at g' for a hanger H , by which the
rear end of the rod B is connected with the
10 truck at a point below the axles.

The shoe F is made in halves secured to-
gether upon the rod by rivets f . It is made
with a bevel at the front end and is of suffi-
cient length as regards the cleaning-openings
15 to pass them if in contact with the sides of
the oven without being caught thereby. The
shoe is thicker than the rod and is placed
back from the arrow-head on the end thereof
so as not to interfere with the attachment of
20 the rake, and owing to the greater thickness
it prevents the arrow-head from rubbing
against the bottom of the furnace, or the
sides in case the rod should be deflected in
either direction, so as to bring it against the
25 side. The chief cause of the rod's being so
deflected, when used without a guide, is its
being bent or warped near the forward end
by the heat while passing through the fur-
nace. The shoe, owing to its greater thick-
30 ness and to its being made of cast-iron, is not
liable to be bent or warped by the heat, and

being straight it not only keeps the forward
end of the rod straight but tends to keep it
in a straight course through the furnace, so
that ordinarily it will not be deflected toward 35
either side.

What I claim is—

1. In a rake appliance for ore-roasting fur-
naces the combination with the rake-rod of a
supporting-frame provided with a track, a se- 40
ries of flanged rollers between the track-rails
and a truck connected to the rear end of the
rake-rod as specified.

2. In a rake appliance for ore-roasting fur-
nace the rod B provided with an arrow-head, 45
in combination with a cast-iron shoe F se-
cured to the rod near the arrow-head, said
shoe being bevel-pointed and thicker than
the rod and having a length greater than the
width of the cleaning-openings of the furnace 50
whereby it is adapted to operate substantially
as specified.

3. In a rake appliance for ore-roasting fur-
naces the combination with a track E provided
with flanged rollers, of a rod B with an arrow- 55
head at the front end, and a truck E' at its
rear end adapted to the track and rollers all
arranged and adapted to operate as specified.

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Witnesses:

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