

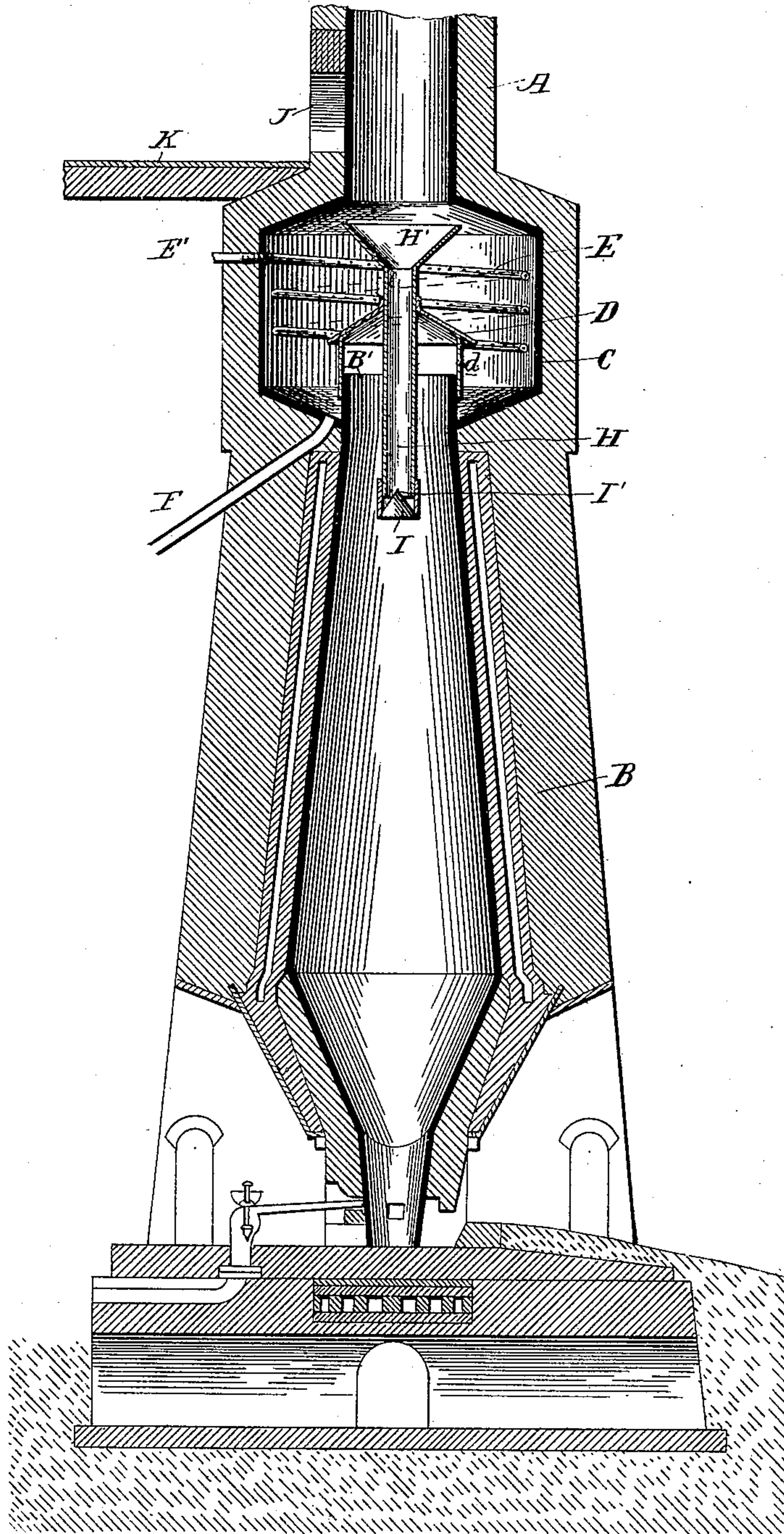
(No Model.)

T. W. BARNES.

SPARK EXTINGUISHER AND SMOKE PURIFIER.

No. 389,916.

Patented Sept. 25, 1888.



WITNESSES

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THOMAS W. BARNES, OF VASSAR, ASSIGNOR OF ONE-HALF TO JOHN G. TRUMP AND LEANHARD SCHUELL, OF RICHVILLE, MICHIGAN.

SPARK-EXTINGUISHER AND SMOKE-PURIFIER.

SPECIFICATION forming part of Letters Patent No. 389,916, dated September 25, 1888.

Application filed September 3, 1887. Serial No. 248,672. (No model.)

To all whom it may concern:

Be it known that I, THOMAS W. BARNES, a citizen of the United States, residing at Vassar, in the county of Tuscola and State of Michigan, have invented certain new and useful Improvements in Spark - Extinguishers and Smoke-Purifiers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention is a spark-arrester and smoke-purifier; and it consists in the parts which will be hereinafter specified, and pointed out in the claims.

In the accompanying drawing, the figure represents a central vertical section of a smelting-furnace provided with my improvement.

The objects of my invention are to extinguish the sparks which ascend with smoke, to destroy the offensive odors arising as the products of combustion, and to arrest and save the mineral substances which are usually lost in smoke, especially precious metals.

The letter A represents the upper part of the smoke-stack, and B the lower part thereof.

C represents an enlarged or drum portion, which is secured to and in communication with the stack aforesaid. The upper end, B', or flanged continuation of the lower stack-section, B, extends through and above the floor of the drum C. The drum and connected stack are made water-tight.

D represents a conical hood secured to and mounted above the upper end of the stack or flanged portion B' within the drum. This hood is sufficiently elevated above the stack-opening to permit the sparks and smoke to pass out beneath it and thence upward. A series of supporting-strips, d, are interposed between the upper end of the stack B' and its hood D.

E represents a perforated coiled pipe. This pipe is preferably curved spirally within the drum C. The upper end of the drum is provided with a small side opening for the reception of a water-supply pipe, E'. This supply-pipe is connected to the upper end of the perforated drum-pipe E. The lower end of the

pipe E is preferably closed. The floor of the drum C is provided with an opening, in which is secured the upper end of a discharge-pipe, F. The lower end of the pipe F opens into a settling-tub. (Not shown.)

The letter H represents a pipe provided on its upper end with a hopper-shaped top, H'. The lower end of said pipe has secured thereto and suspended therefrom a strong conical cap, I. This cap is suspended by arms I'. These arms are strong and rigidly unite the cap to the lower end of the pipe. The hood D is provided with a central opening for the reception of the pipe H. Said hood and pipe are rigidly united.

J represents a side feed-door within the stack above the drum, and K indicates a platform for the reception of ore. It is customary for an attendant to shovel the ore from the platform into the door J, which communicates with the furnace. The feed or supply door, being located above the furnace, compels the attendant to inhale the fumes and offensive odors which arise from the furnace. The odors, when inhaled, are injurious to health, and particularly affect the lungs. To purify the smoke and obviate these injurious results is one of the prime objects of my invention.

Water is admitted through the supply-pipe E' into the perforated spirally-arranged pipe E within the drum. Water thus admitted after passing into the pipe E passes out of the perforations thereof in a numerous series of sprays. The hood D prevents the sprayed water from falling into stack B and furnace L. The upper end of the stack projection B' within the drum is sufficiently elevated above the floor of the drum to permit the accumulation of considerable water on said floor without producing an overflow in the pipe. The body of the perforated pipe is preferably located between the mouth of the hopper and the lower edge of the hood. This arrangement is to prevent the water spray from coming in contact with the furnace-fire. Ore thrown into the door falls into the hopper, and thence through the pipe. The conical cap is suspended sufficiently below the lower end of said pipe to permit the ore to pass out freely. The cap has a double function. It

serves to spread the ore that is fed into the furnace, and also prevents the smoke, &c. from passing up through the pipe H.

It will be observed from the foregoing that
5 the smoke and products of combustion, precious
metals, &c., from the furnace must pass through
the drum and through the water spray. The
sparks of course are extinguished by contact
10 with the spray. The sparks and other parti-
cles of matter arising therewith not smoke
are arrested and fall with the spray to the floor
of the drum, and are thence conveyed through
the pipe F to the settling-tub or other conven-
15 dient receptacle. By thus forcing all the pro-
ducts of combustion into contact with the water
spray a threefold advantageous result is pro-
duced: First, the sparks are extinguished; sec-
ond, the offensive odors in the smoke are de-
20 stroyed, and, third, the mineral substances
which arise with the products of combustion
are saved.

Having thus described my invention, I claim
as new and desire to secure by Letters Patent
of the United States—

25 1. The combination, with a smoke-stack pro-
vided with a drum in communication there-
with, of a flanged continuation of the lower
stack-section opening into said drum above
the floor thereof, of a hood mounted above the
30 opening in said flanged portion, said hood
being provided with an opening, of a furnace-
feed pipe having open ends secured in said
opening, and of a perforated pipe mounted in
the drum, substantially as described.

35 2. The combination, with a smoke-stack pro-
vided with a drum in communication there-
with, of a flanged continuation of the lower
stack-section opening into said drum above

the floor thereof, of a hood mounted above
the opening in said flanged portion, said hood 40
being provided with an opening, of a furnace-
feed pipe mounted in said opening, the upper
end of said feed-pipe being provided with a
hopper, and of a perforated pipe mounted in
the drum, substantially as described. 45

3. The combination, with a smoke-stack pro-
vided with a drum in communication there-
with, of a flanged continuation of the lower
stack-section opening into said drum above
the floor thereof, of a hood mounted above the 50
opening in said flanged portion, said hood
being provided with an opening, of a furnace-
feed pipe mounted in said opening, of a cap
mounted immediately below the lower end of
said feed-pipe, and of a perforated pipe 55
mounted in the drum, substantially as de-
scribed.

4. The combination, with a smoke-stack pro-
vided with a drum in communication there-
with, of a flanged continuation of the lower 60
stack-section opening into said drum above
the floor thereof, of a hood mounted above the
opening in said flanged portion, said hood being
provided with an opening, of a furnace-feed
pipe mounted in said opening, and the upper 65
end of said pipe being provided with a hopper,
the lower end thereof being provided with a
cap secured below the opening in said lower
end, substantially as described.

In testimony whereof I affix my signature in 70
presence of two witnesses.

THOMAS W. BARNES.

Witnesses:

ALICE A. BARNES,
ARMITTA HORNE.