

(No Model.)

J. B. PITCHFORD.
WATER WHEEL.

No. 460,815.

Patented Oct. 6, 1891.

Fig. 1.

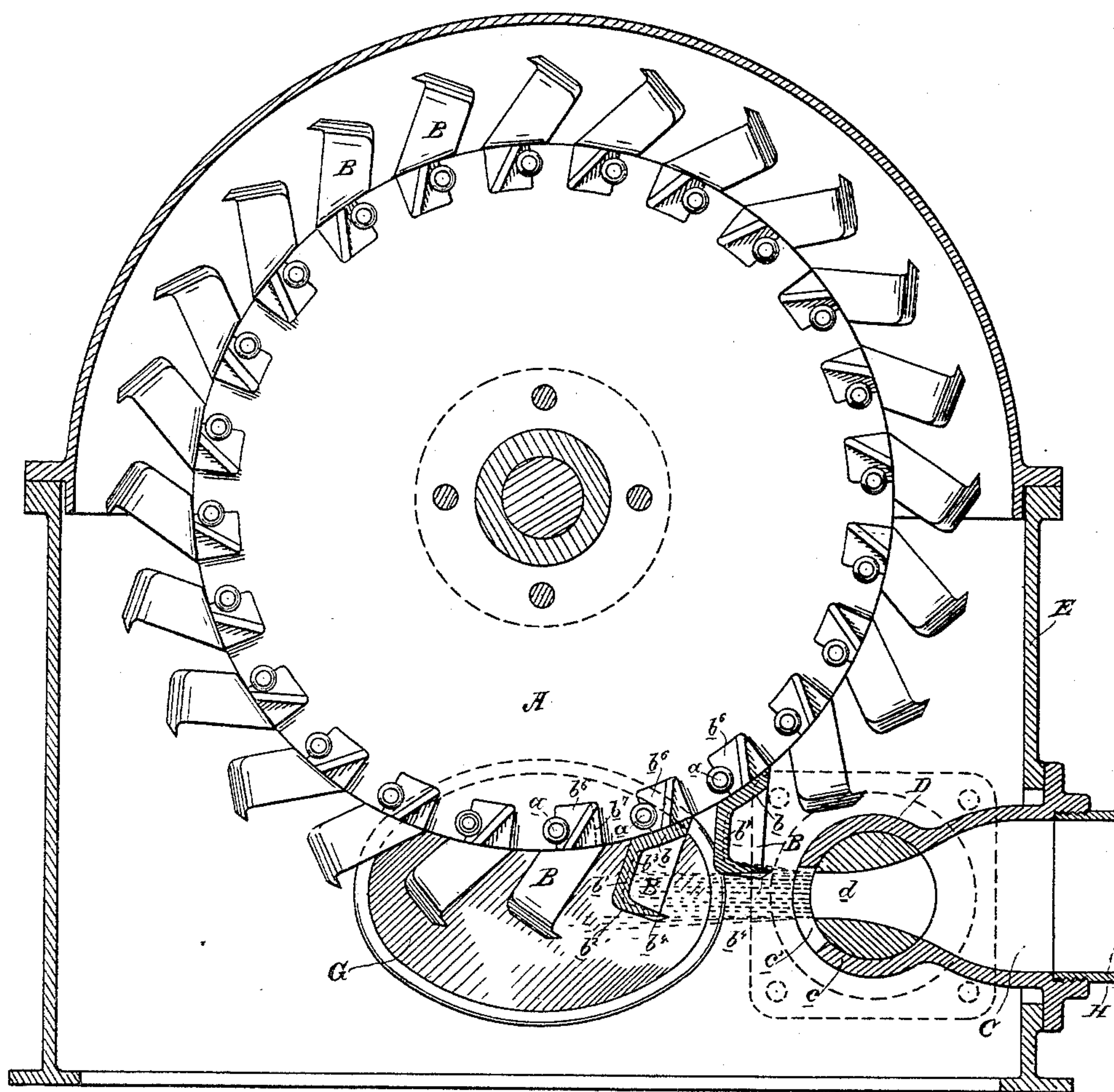
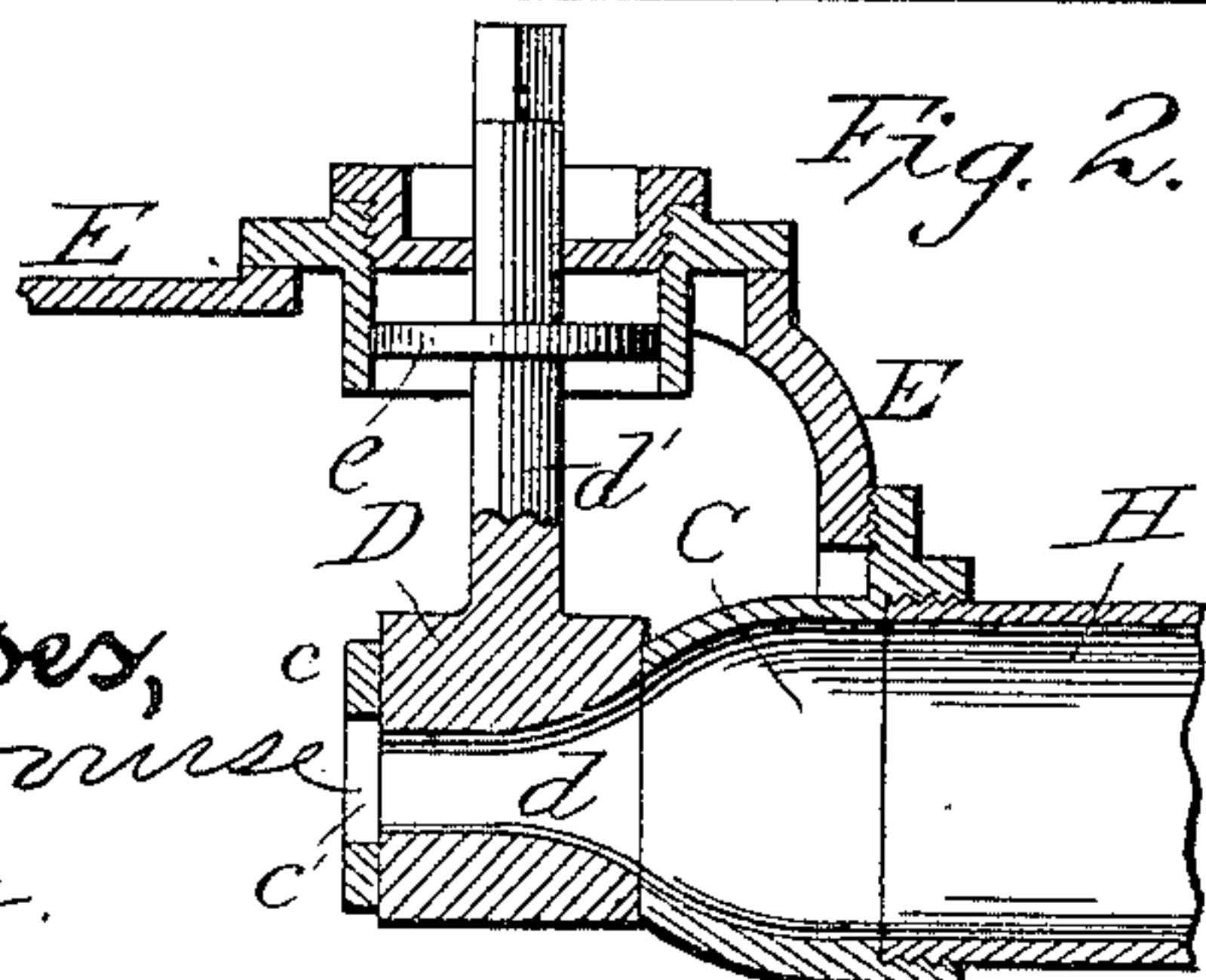


Fig. 2.



Witnesses,
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UNITED STATES PATENT OFFICE.

JOHN B. PITCHFORD, OF SAN FRANCISCO, CALIFORNIA.

WATER-WHEEL.

SPECIFICATION forming part of Letters Patent No. 460,815, dated October 6, 1891.

Application filed October 31, 1890. Serial No. 369,965. (No model.)

To all whom it may concern:

Be it known that I, JOHN B. PITCHFORD, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Water-Wheels; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of water-wheels in which buckets upon the rim of the wheel receive the impact of a stream of water under head or pressure; and my invention consists of the construction and combination of devices hereinafter described and claimed.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a vertical section of the outer case and nozzle and of two of the buckets, the wheel and remaining buckets being in side elevation. Fig. 2 is a horizontal section of the nozzle device.

A is the body of the wheel. This is made of any suitable metal, such as steel, iron, or bronze plates, and it may be made of a solid disk or plate similar to a circular saw, or it may have an annular rim with radial arms, which are properly secured to a hub. In both cases the wheel is light and thin, thus offering the least wind resistance, and is yet strong and durable.

B are the buckets. These are secured upon the rim of the wheel by means of lugs b^6 , extending from their inner sides and fitted in sockets in the wheel-plate, somewhat similar to the manner of securing removable saw-teeth in a circular saw. These lugs are held therein by means of rivets or bolts a , which are seated half in the plate and half in the lug. The forward edge of the lugs are grooved at b^7 to fit and overlap the forward edges of the sockets, whereby any side movement is prevented. By this connection the buckets may be readily fitted and as easily removed when required. These buckets have inner sides b , central portions b' , and outer sides b^2 . The inner and outer sides converge toward the central portion, and said portion is raised to form a central ridge b^3 , from which it curves to each side and joins the discharging ends. The under surface of the outer side b^2 is cut or ground away to form the inclined lip b^4 , this cut-away portion being at the front center of said side and preferably effected by the use of a revolving cutter, emery-wheel, or grindstone.

H is a water-coupling. To this is fitted the rear end of the nozzle-pipe C, the other end of which is formed into a cylindrical seat c for the nozzle-plug D. In the front of the seat is made the port c' . The nozzle-plug D has a port d , made through it, the exit end of said port being sufficiently smaller than the port c' in the seat to permit the free passage of the stream, and said port d is made tapering and forms the nozzle, from which the stream is directed into the buckets. The parts are inclosed in the casing E, (see Fig. 2,) through a suitable stuffing-box e , in which a stem d' from the end of nozzle-plug D extends, and its outer end is formed to receive a key or wrench, by which it can be turned. It will be seen that by turning the nozzle-plug D downwardly its stream may be taken partially out of the buckets or wholly under and clear of them, thereby regulating the speed of the wheel, and by turning it farther down, so that its nozzle-port will move wholly out of line with the port c' of the seat, the stream will be shut off altogether. Thus a perfect control of the wheel is possible.

E is the exterior case of the whole wheel. This whole casing may be made of glass or one side thereof, or, as herein shown, a pane G may be inserted at a point opposite where the stream plays upon the buckets. This is for the purpose of determining the correct position of the nozzle and obtaining a view of the reactionary effect of the water when leaving the buckets.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

In a water-wheel having peripheral buckets, the combination of a water-coupling, the nozzle-pipe fitted thereto and having the cylindrical seat provided with a front port, an oscillatory plug fitted within the cylindrical seat and provided with a tapering port which forms a nozzle, the inclosing casing of said seat and plug, and a stem connected with the plug and passing through a stuffing-box in the casing, substantially as herein described.

In witness whereof I have hereunto set my hand.

JOHN B. PITCHFORD.

Witnesses:

LINCOLN SONNTAG,
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