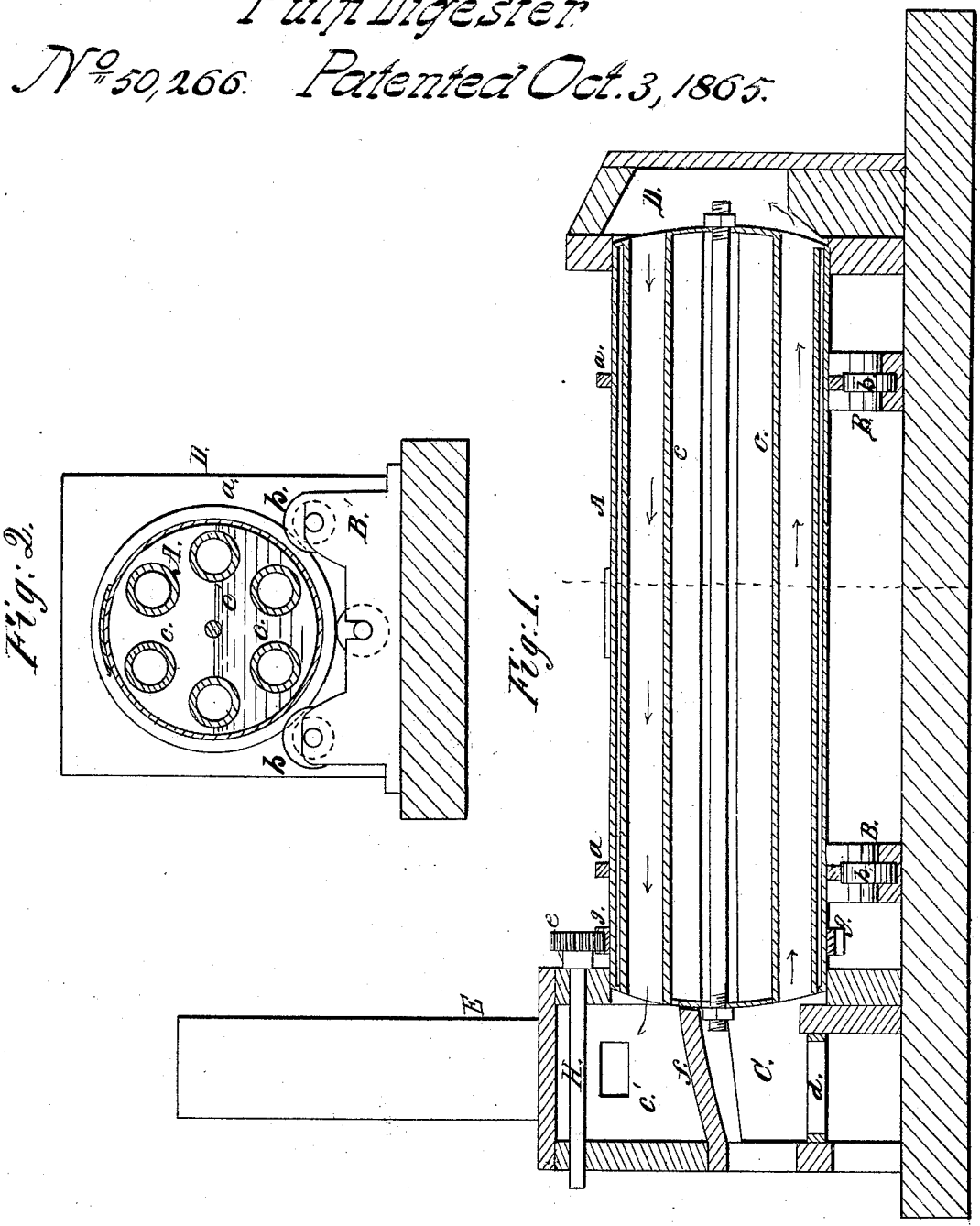
T. A. Nixon.

Pulp Digester.

No. 50,266. Patented Oct. 3, 1865.



Witnesses:

Wm Albert Stuart
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Inventor:

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UNITED STATES PATENT OFFICE.

T. A. NIXON, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVED BOILER FOR TREATING STRAW.

Specification forming part of Letters Patent No. **50,266**, dated October 3, 1865.

To all whom it may concern:

Be it known that I, T. A. NIXON, of Philadelphia, Pennsylvania, have invented an Improved Boiler for Treating Straw, &c., for the Manufacture of Paper-Pulp; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists of a horizontal revolving boiler having tubes through which pass the products of combustion from a fire-place, the said tubes serving the twofold purpose of thoroughly agitating the straw or other fibrous matter and alkali in the boiler and of rapidly communicating the desired heat to the contents, thereby quickly converting the straw, &c., into paper-pulp of a superior quality.

My invention further consists in the combination of the said tubular boiler with a fire-place and roof peculiarly arranged in respect to the tubes, in order that the latter may not be burned by the passage through them of excessively-heated products of combustion.

In order to enable others to make and use my invention, I will now proceed to describe its construction and operation.

On reference to the accompanying drawings, which form a part of this specification, Figure 1 is a sectional elevation of my improved boiler for treating straw, &c., for the manufacture of paper-pulp; and Fig. 2, a transverse section on the line 1 2, Fig. 1.

A is a cylindrical boiler, round which, near each end, extends a band, *a*, each band resting on grooved or flanged pulleys *b*, which turn in suitable bearings in foundation-plates B B′. Through the boiler extend horizontal tubes *c c*, arranged in the manner illustrated in Fig. 2, the said tubes communicating at one end with a fire-place, C, and at the opposite end with a chamber, D, there being a circular opening in the wall of the fire-place, as well as in that of the chamber, into which openings the ends of the boiler fit nicely, but so that it can turn freely.

The fire-place C is provided with the usual grate, *d*. The roof *f* of the fire-place, however, is level, or nearly level, with the center of the boiler-head, as shown in Fig. 1, the chamber C′ above the roof *f* communicating with a chimney, F.

To the boiler, near the front end of the same, is fitted a cog-wheel, *g*, into which gears a pinion, *e*, on a shaft, H, the latter being connected with any suitable driving apparatus.

The straw or other material to be reduced to pulp is placed in the boiler, together with a quantity of alkaline liquor of the proper strength. A fire is then kindled in the fire-place and a rotary motion is imparted to the shaft H and to the boiler. As the boiler revolves the products of combustion from the fire-place will enter those tubes *c* the ends of which are below the roof *f*, and will pass through these tubes to the chamber F, from the latter into the uppermost tubes, *c*, and thence to the chamber C′, and to the chimney. The products of combustion, while at their highest temperature, are thus brought in contact with the surface of those tubes only which are immersed in the liquor, the partially-cooled gases, after escaping from these tubes, being conducted through the upper tubes, which are above the surface of the liquor, and could not therefore be heated to so great an extent without being burned. As the boiler revolves the liquor will be thoroughly and constantly agitated by the tubes, and will be thus raised to a high temperature in a very short time—an important feature, inasmuch as the best pulp is produced by a quickly-applied heat. At the same time the constant agitation of the contents of the boiler causes the straw or other material to be rapidly converted into pulp.

I claim as my invention and desire to secure by Letters Patent—

1. The combination, with a horizontal revolving boiler, of tubes *c c*, through which the products of combustion are caused to pass, and which maintain the contents of the boiler in constant agitation, for the purpose specified.

2. The revolving boiler A, with its tubes *c c*, in combination with the fire-place C and its roof *f*, the whole being arranged substantially as and for the purpose herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

T. A. NIXON.

Witnesses:

CHARLES E. FOSTER,

JOHN WHITE.