

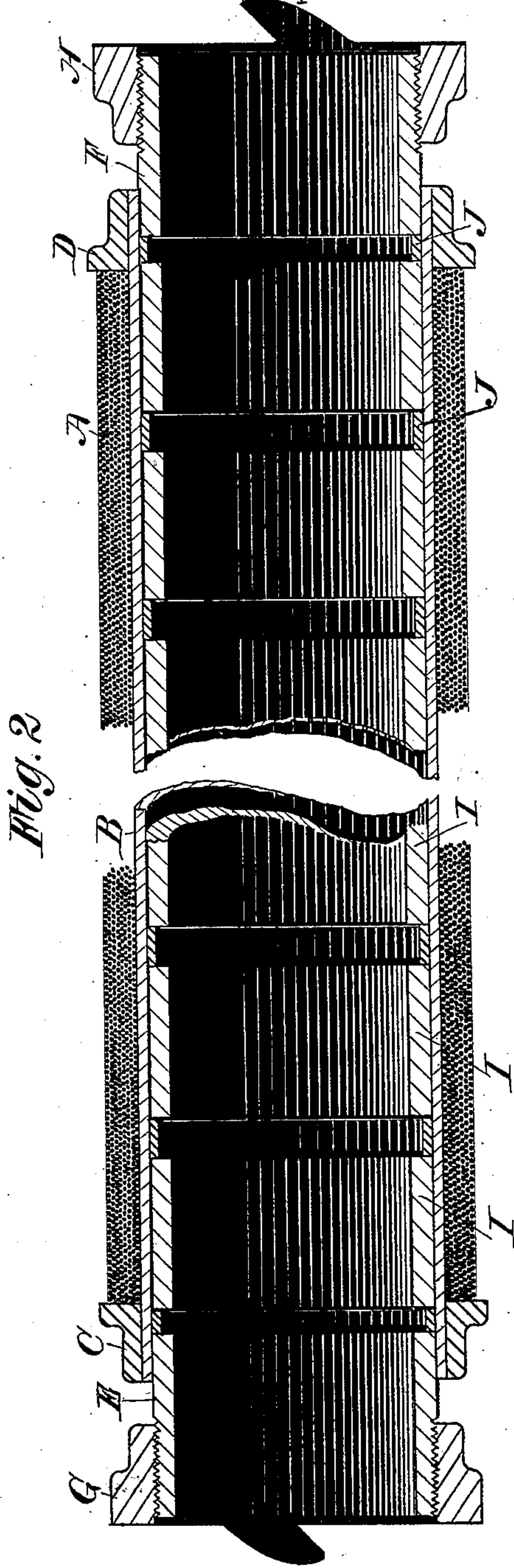
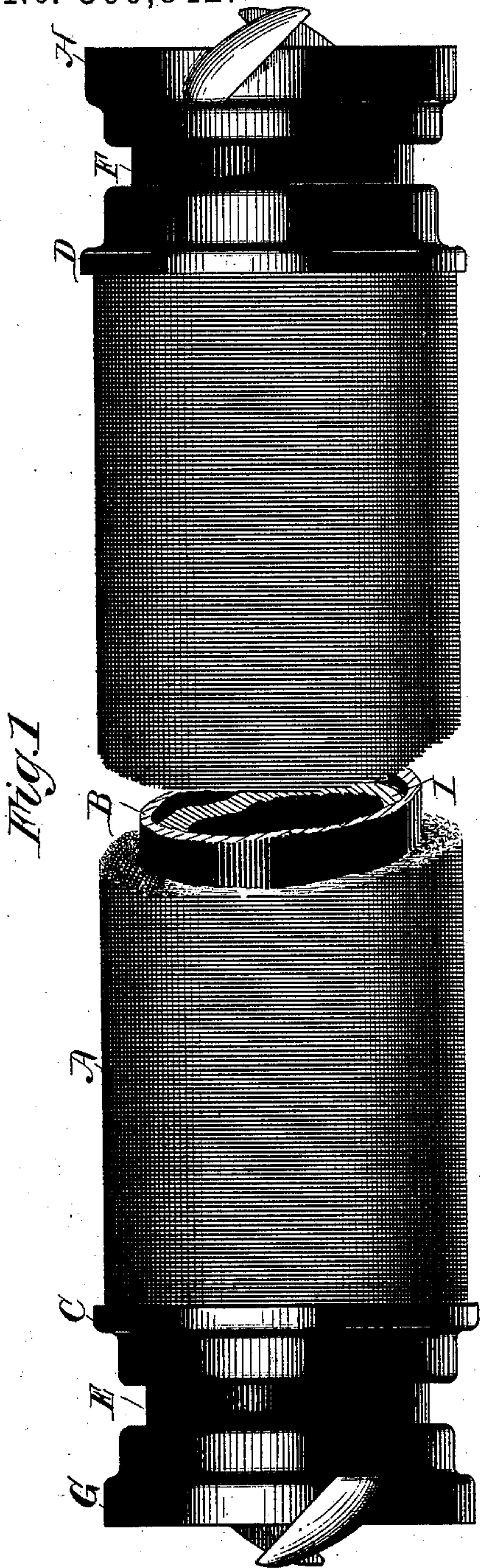
(No Model.)

C. H. ATKINS.

ELECTRICAL APPARATUS FOR SEPARATING METALLIC PARTICLES
FROM PAPER PULP.

No. 360,842.

Patented Apr. 12, 1887.



Witnesses

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UNITED STATES PATENT OFFICE.

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ELECTRICAL APPARATUS FOR SEPARATING METALLIC PARTICLES FROM PAPER-PULP.

SPECIFICATION forming part of Letters Patent No. 360,842, dated April 12, 1887.

Application filed December 11, 1886. Serial No. 221,248. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. ATKINS, of Boston, Massachusetts, have invented a new and useful Apparatus for Separating Metallic
5 Particles from Paper-Pulp, of which the following description and claims constitute the specification, and which is illustrated by the accompanying sheet of drawings.

This invention is for the purpose of separating
10 particles of iron or other paramagnetic metals from paper-pulp; and it consists of annular electro-magnets, which form part of a tube through which the pulp passes on the way from the stuff-chest to the machine.

15 Figure 1 is an exterior view of the apparatus, but broken at the middle to show an irregular cross section thereof. Fig. 2 is a longitudinal diametric section of what is shown in Fig. 1.

20 A is a coil of insulated wire, wound upon the tube B, which tube is brass or other diamagnetic metal, as also are the collars C and D, which are fixed to the ends of the tube B. The short tubes E and F are permanently fixed
25 within the respective ends of tube B, and are respectively provided with the coupling-collars G and H, for attachment to the tubes which extend from the apparatus toward the stuff-chest and toward the machine, respectively.

30 A series of short tubes, I, are placed within the tube B, and are separated from each other and from the tubes E and F by a series of rings, J. The tubes I are of iron or other paramagnetic metal, while the rings J are of brass or other
35 diamagnetic metal, and are shorter in axial length and larger in interior diameter than the tubes I. The coil A forms a part of an electric circuit, worked by a battery or other generator. (Not shown in the drawings.) When a cur-

40 rent of electricity is passing through the coil A, and a current of paper-pulp is passing through the interior of the apparatus, the tubes I are separate electro-magnets, and op-

erate to draw to themselves whatever particles of iron or other paramagnetic metal may be
45 mingled in the mass of pulp which is passing through them. These particles adhere to the tubes I, and, as far as they are dislocated by the passing pulp, are forced into the annular spaces within the rings J, and are kept in
50 those spaces by the strong magnetism of the ends of the tubes I, which ends constitute the poles of those tubes, respectively.

Whenever it becomes necessary or convenient to do so, the electric current may be broken
55 and the apparatus removed from the tubes between which it is interposed, when the accumulated metallic particles will fall away from the tubes I, and may readily be removed from the interior of the apparatus; or the ap-
60 paratus may be cleaned out at proper intervals by merely breaking the electric current and directing a stream of water through the conduit of which the apparatus forms a part.

This invention may also be used for separating
65 metallic particles from oil, grain, or other liquid or granular substances.

I claim as my invention—

1. A tubular electro-magnet consisting of the coil A and a paramagnetic tube within
70 that coil, and of mechanism, substantially as described, for coupling that tube to other tubes extending from the respective ends thereof, all substantially as described.

2. A tubular electro-magnet consisting of
75 the coil A and a series of paramagnetic tubes, I, within that coil, and separated from each other, substantially as described, the whole being connected at the ends thereof with other inclosed conduits extending therefrom, for the
80 purpose set forth.

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Witnesses:

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