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H. PAULING.
APPARATUS FOR TREATING GASES.
APPLICATION FILED APR. 2, 1902.

NO MODEL.

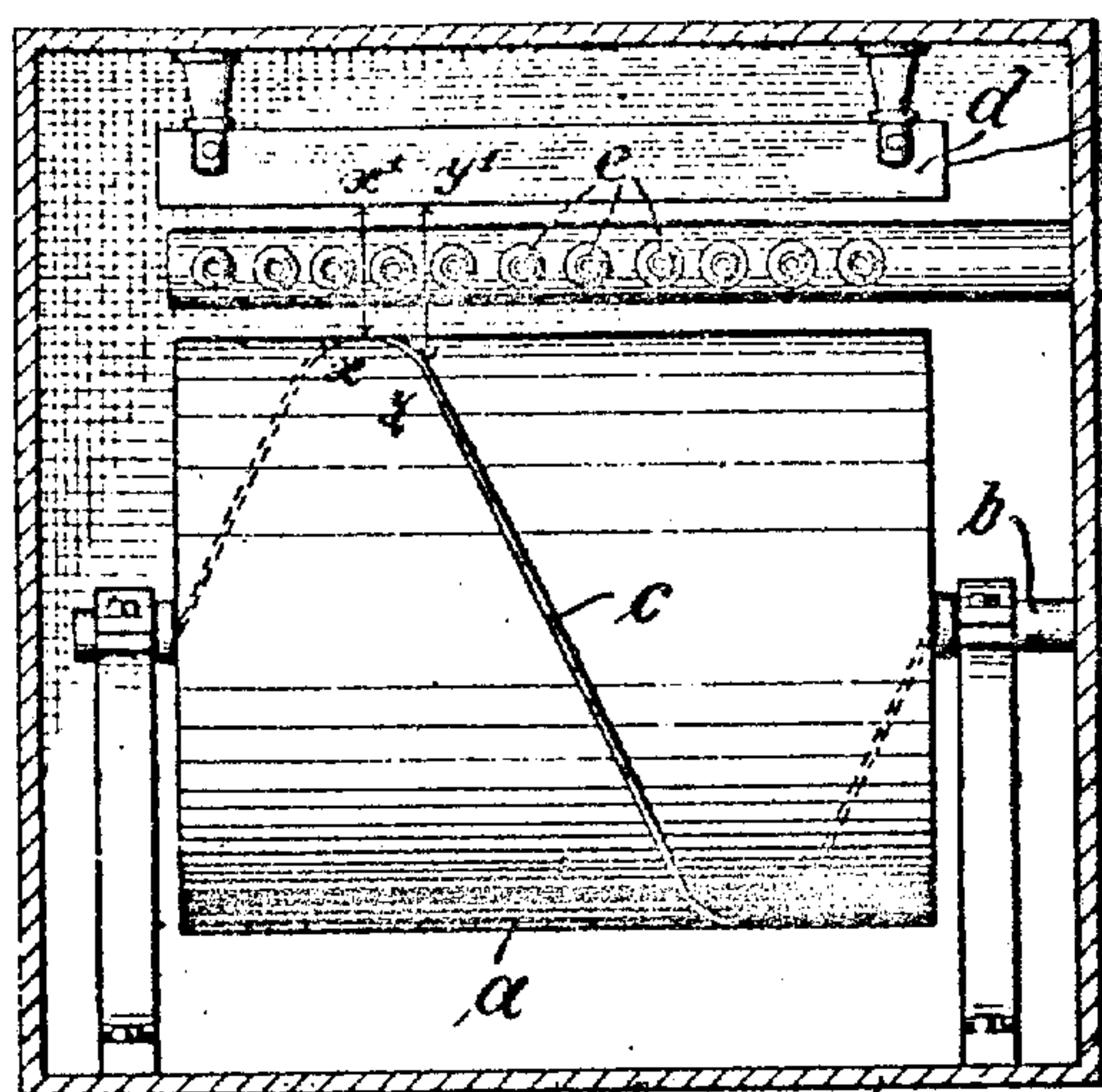


Fig. 1.

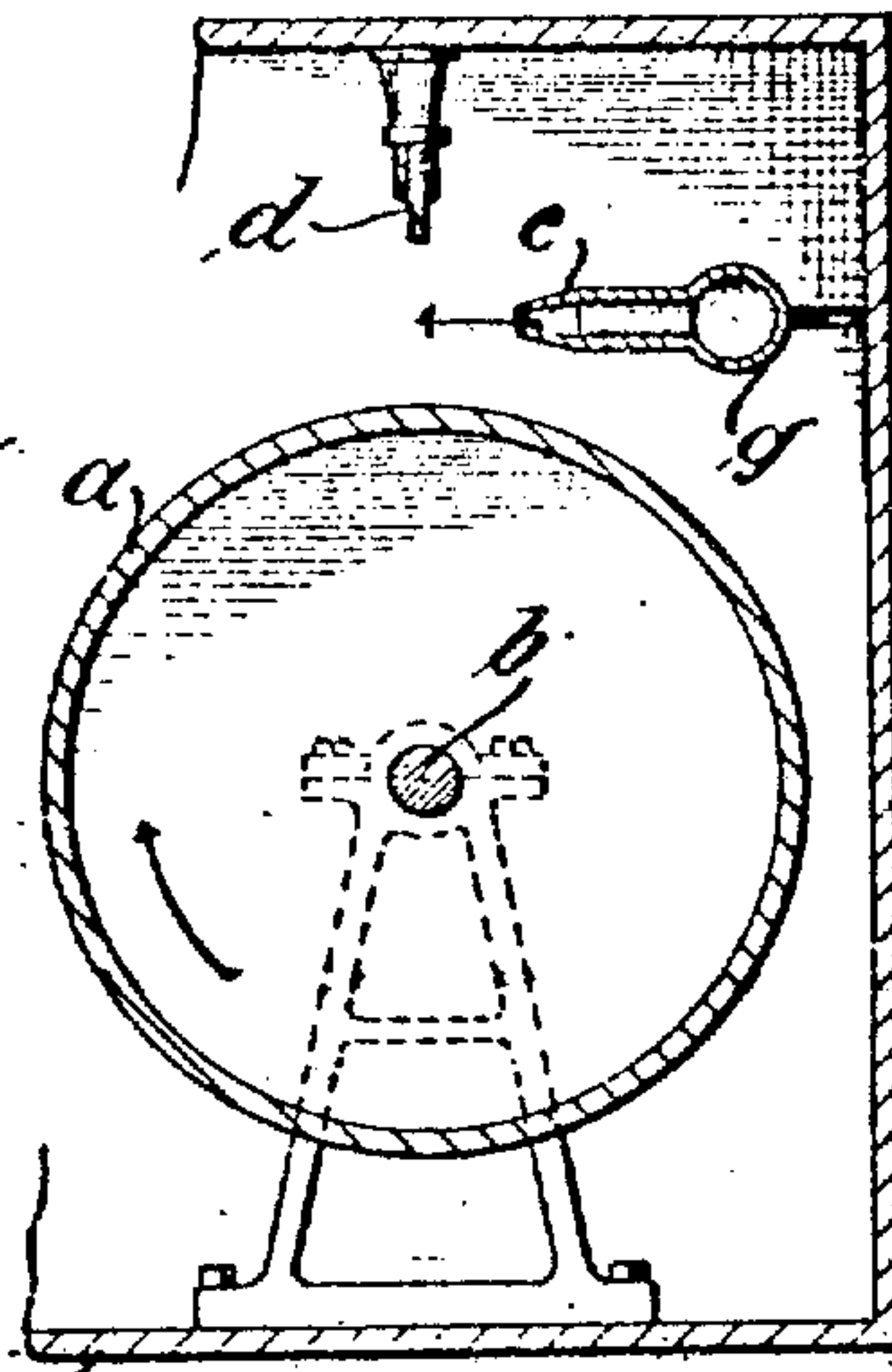


Fig. 2.

Witnesses.

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APPARATUS FOR TREATING GASES.

SPECIFICATION forming part of Letters Patent No. 739,921, dated September 29, 1903.

Application filed April 2, 1902. Serial No. 101,083. (No model.)

To all whom it may concern:

Be it known that I, HARRY PAULING, engineer of mines, a citizen of the Empire of Austria-Hungary, and a resident of Brandau, Bohemia, Austria-Hungary, (whose post-office address is House No. 200,) have invented certain new and useful Improvements in Apparatus Serving for Treating Gases, &c., of which the following is a specification.

This invention relates to an improved apparatus for the treatment of gases, vapors, and the like by electric-spark discharges.

For certain purposes—for example, the ozonizing of oxygen for converting the nitrogen of the atmosphere into nitrous acid and the like—it is necessary to expose air, gases, gas mixtures, or mixtures of gas and air, or vapors of all kinds and the like which may contain liquids in a finely-divided condition separately or several simultaneously to the effect of electric-spark discharges. The method hitherto in use consisted in producing the electric spark in a space or chamber filled with the particular gas or in a current of gas between two ordinary electrodes. It will be obvious that in this case the spark could only act upon a small quantity of gas at a time, and it is impossible to subject all parts of a given volume of gas uniformly to the action of the electric spark.

The apparatus forming the object of the present invention is based upon a process which enables the continuous treatment of gases and the like by means of spark discharges in such a manner that every particle of the gas is compelled to come into contact with the spark. The said process consists, essentially, in the fact that by a suitable form of the electrodes between which the spark is produced or by a suitable movement of the electrodes toward one another the sparking surface is drawn out in band shape and the gases are blown or sucked through the spark-gap so formed. A band-shaped sparking surface can be produced, for instance, by allowing the points between which the spark has to pass to make a rapid lateral displacement.

The apparatus suitable for carrying out the above-described process and forming the object of this invention is shown in the annexed drawings in elevation, Figure 1, and in a cross-section, Fig. 2.

a represents a cylinder made of insulating material and fixed to a shaft *b*, which is rotarily mounted and can be driven in any convenient manner. Around the cylinder *a* a wire *c*, of conductive material, is wound in the form of a helix. The ends of this wire have conductive connection with the shaft *b*. At a suitable distance from the cylinder *a* a metal strip *d* is arranged parallel to the shaft *b* and corresponding in length to the cylinder *a*. The strip *d* is connected with one of the poles of an induction-coil, while the other pole is connected to the shaft *b* by means of brushes *p*. *e* represents a set of nozzles parallel to the strip *d* at a short distance therefrom and adapted to be supplied by a pipe *g*, common to all. The whole is suitably inclosed in a casing *f*.

The operation of the apparatus is as follows: The cylinder *a* and wire *c* are connected with the poles of the induction-coil, and at that part where the distance between wire *c* and strip *d* is the least (between *x* and *x'*) the spark will pass or jump and will thus pass through the current of gas emitted from the opposite nozzle. On rotating the cylinder *a* in the direction of the arrow the distance between *x* and *x'* becomes greater, while the point *y* approaches the point *y'*, so that a further spark can pass, and so on. If the speed of rotation of the cylinder *a* is sufficiently great, the passage of the sparking from the wire *c* to strip *d* will take place in such rapid succession that between the cylinder *a* and strip *d* a continuous spark-band is produced, so that every part of the gas passing from the nozzle *e* must necessarily come into contact with the electric sparks.

In the apparatus described above the gases, gas mixtures, or vapors can be subjected to the treatment in a more or less cooled or heated state and under normal, increased, or reduced pressure. They can also be saturated with finely-divided liquids, such as water.

The temperature of the gases or vapors to be treated in this apparatus, as well as their pressure, changes according to the nature of the gases or vapors and the nature of the products to be obtained.

Having thus described the nature of my invention, what I claim is—

An apparatus for treating gases, vapors, and the like by electric-spark discharges, comprising a cylinder of insulating material fastened upon a rotarily-mounted shaft, a
5 conductive wire wound around the cylinder in the form of a helix, the ends of said wire being connected with the shaft, a metal strip arranged parallel to the shaft and at some distance from the cylinder, a set of nozzles
10 arranged parallel to said strip at a short distance therefrom and half-way between the

strip and the cylinder, means for rotating the cylinder, means for blowing air through the nozzles and electric connections between the strip, the shaft and a source of electricity, is substantially as shown and described.

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

HARRY PAULING.

Witnesses:

WOLDEMAR HAUPT;
HENRY HASPER.