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Patented July 3, 1900.

S. N. POND.

CARRIER FOR PNEUMATIC DESPATCH TUBES.

(Application filed May 4, 1899.)

(No Model.)

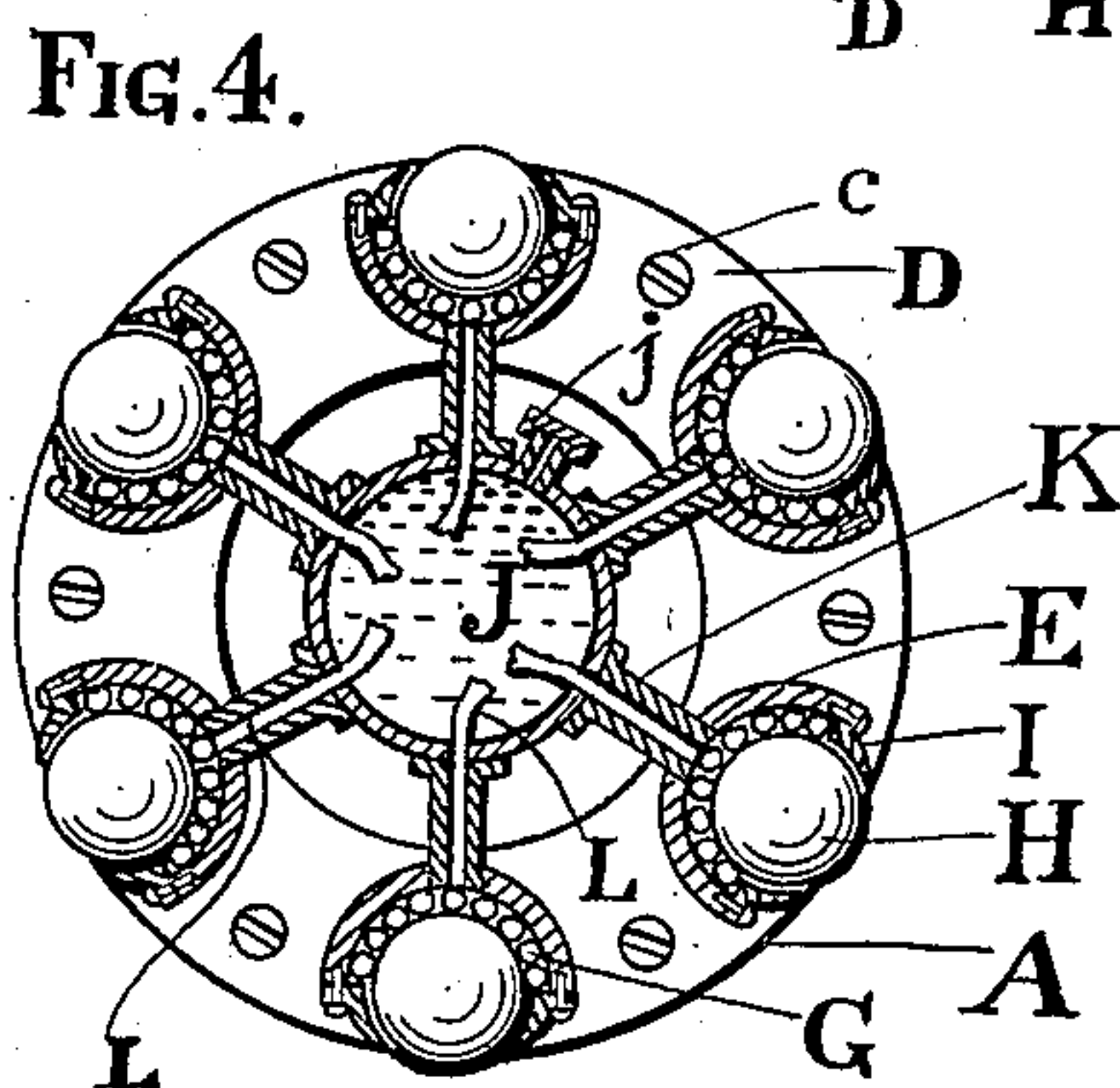
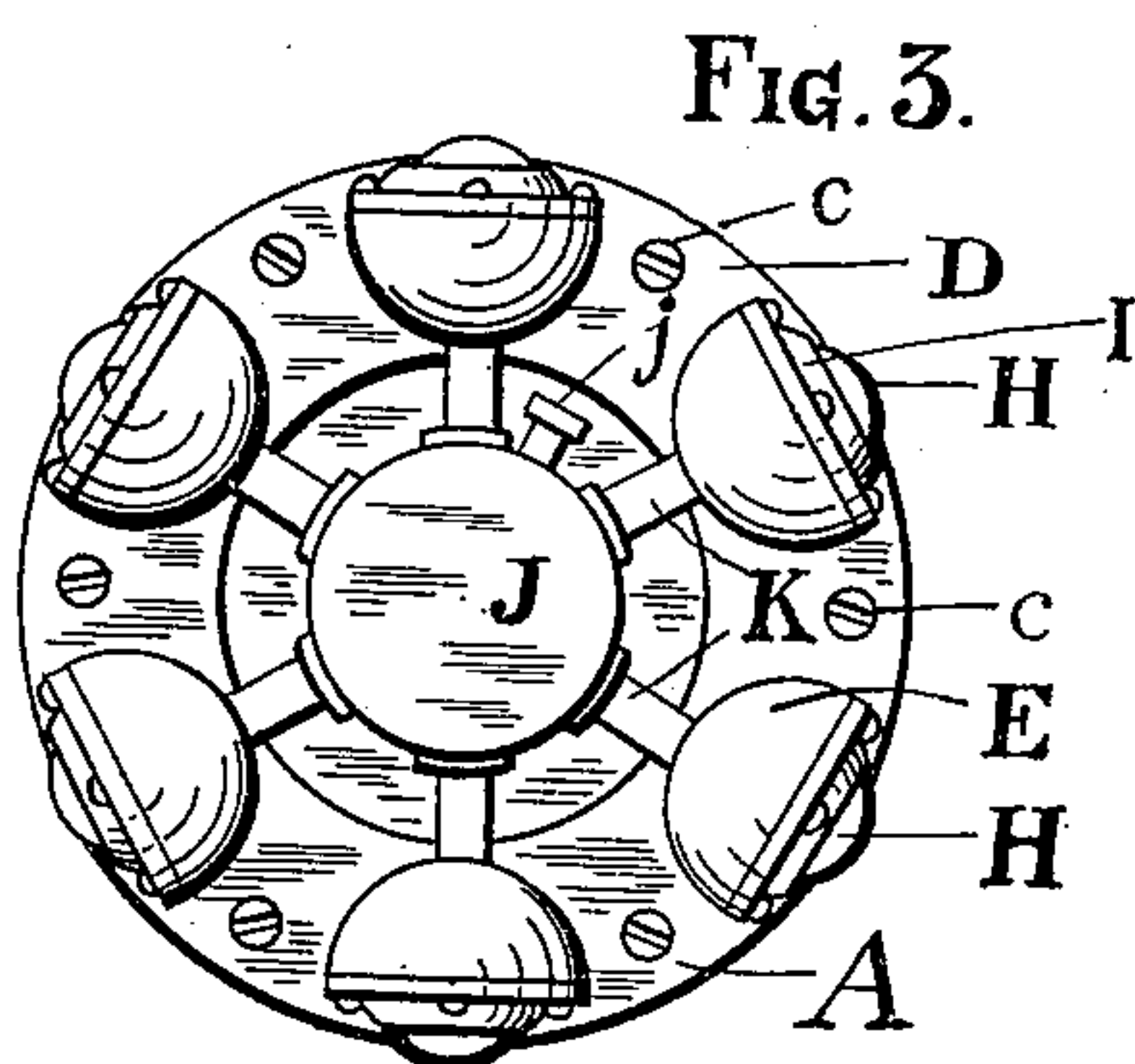
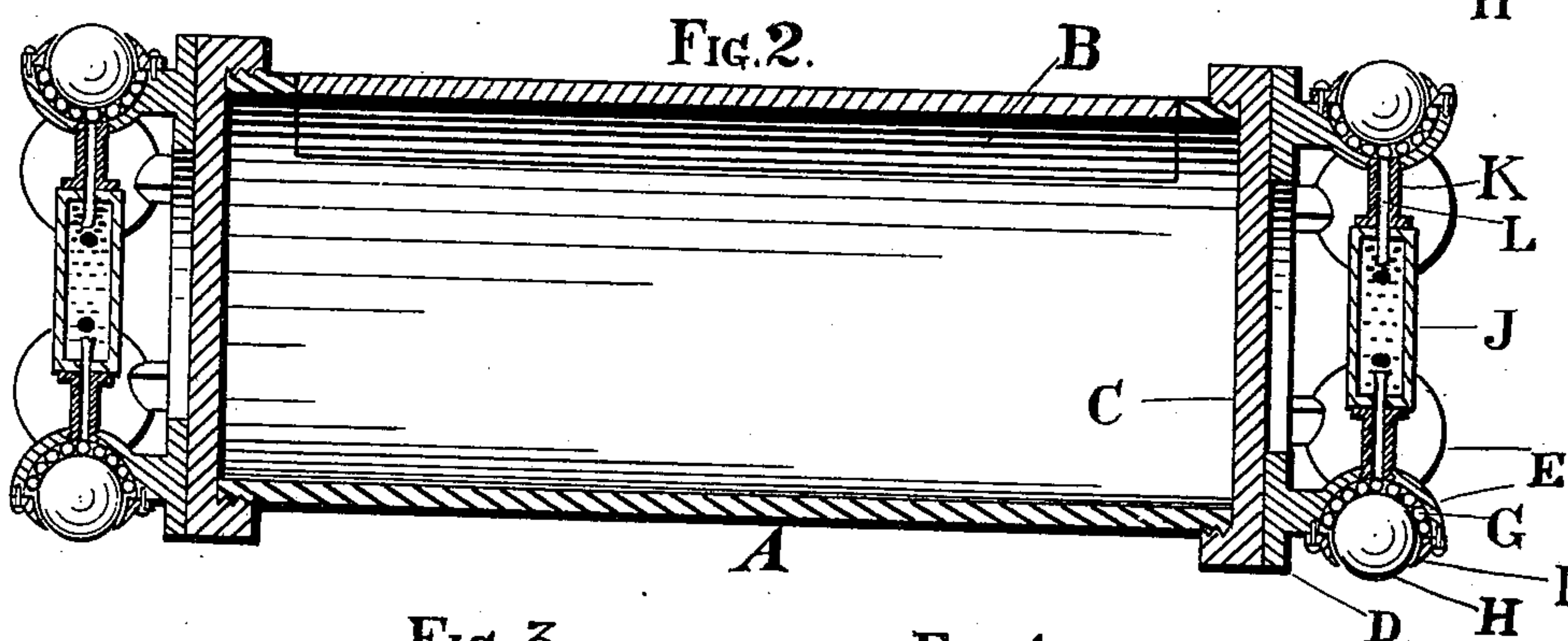
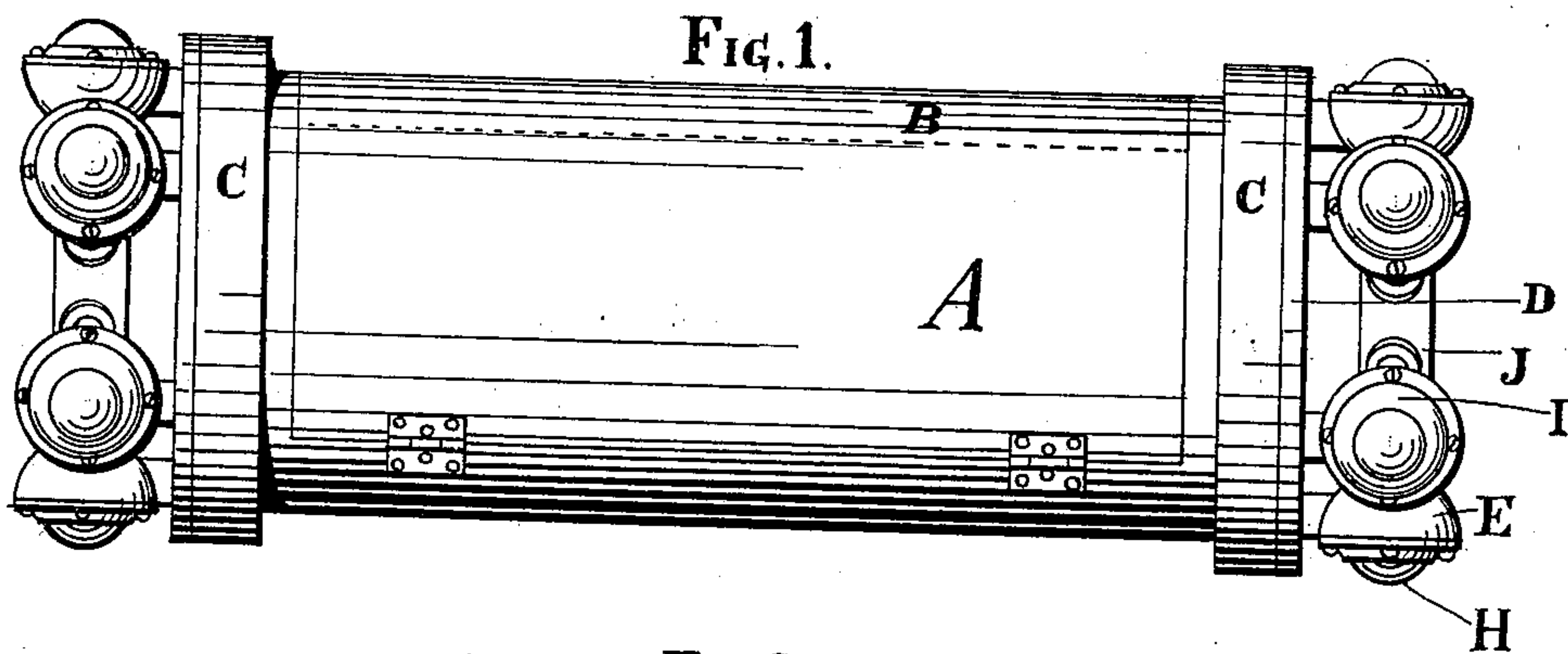
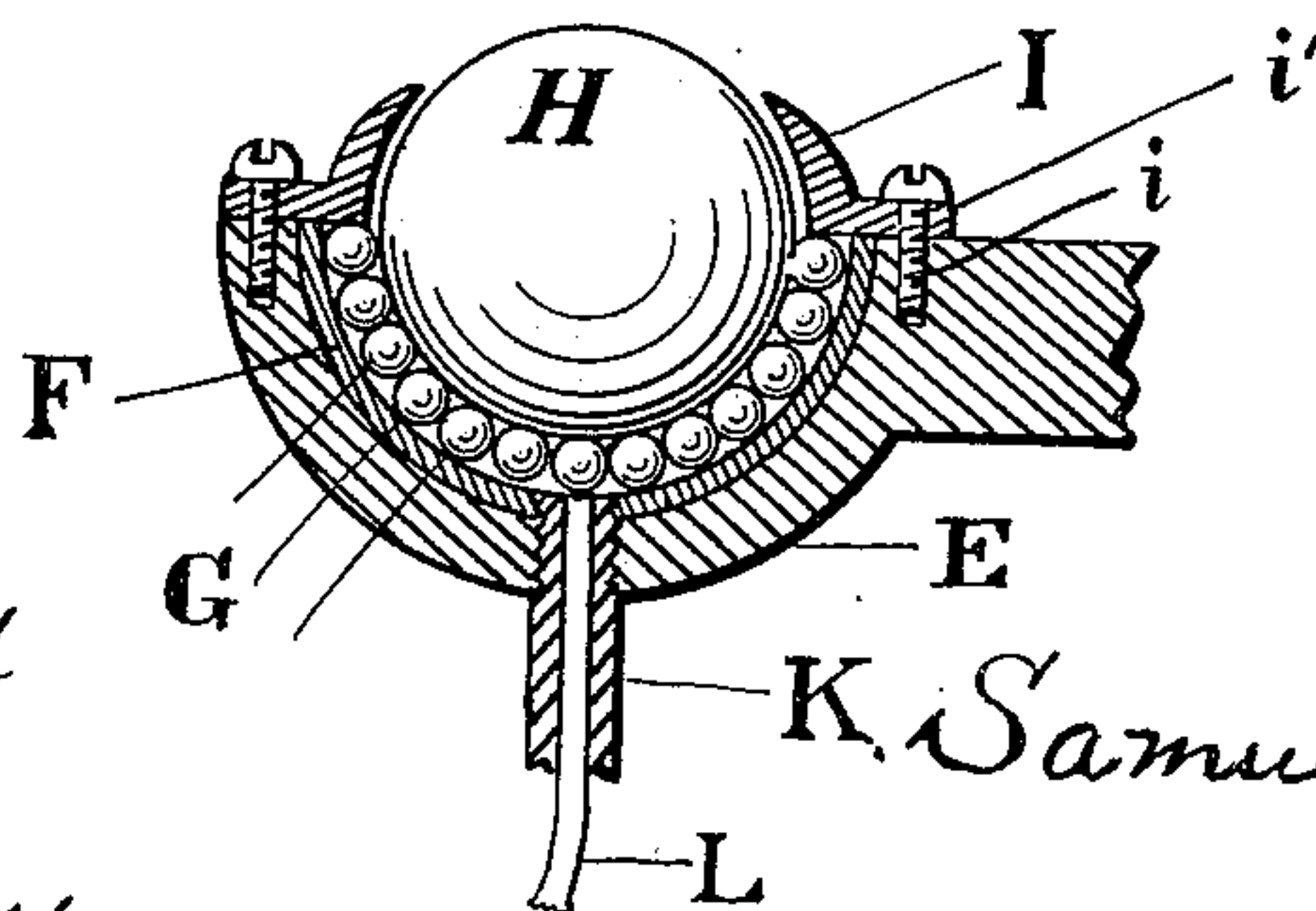


Fig. 5.



Witnesses.

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# UNITED STATES PATENT OFFICE.

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## CARRIER FOR PNEUMATIC-DESPATCH TUBES.

SPECIFICATION forming part of Letters Patent No. 652,979, dated July 3, 1900.

Application filed May 4, 1899. Serial No. 715,510. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL N. POND, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Carriers for Pneumatic-Despatch Tubes, of which the following is a specification.

My invention relates to a new and improved carrier for use in pneumatic-despatch-tube systems, and resides more particularly in a novel construction and arrangement of anti-friction devices on the heads of the carrier, whereby the latter may be propelled by air-pressure through a tube with a minimum of frictional resistance.

My invention is more especially designed for use upon the heavy carriers employed in large tubes for transporting mail and freight matter of considerable bulk and weight.

It is well known that in positive-pressure despatch-tube systems in which a continuous air-current is maintained, especially in large-tube systems, the air-current tends naturally to assume a gyratory or spiral motion in its passage through the tube, and this action of the air-current on the carrier tends to impart to the latter a rotary movement on its longitudinal axis in addition to its direct longitudinal movement through the tube, and in order that the carrier may travel through the tube with the least possible resistance to the action of the air-current upon it it is essential that the carrier be provided with anti-friction devices of such a character as will enable it to readily conform itself to the particular direction of movement of the propelling-current at every point of its travel. In that class of despatch-tubes in which a series of wheels on the carrier-heads engage grooves or rails formed in or on the inner surface of the tube it is obviously impossible for the carrier to partake of the spiral movement of the propelling-current, while in that class in which a series of wheels on the carrier-heads engage only the smooth inner surface of the tube, but are journaled so as to revolve only in planes parallel with the planes of the longitudinal axis of the carrier, if the carrier while in transit tends to rotate on its longitudinal axis in conformity with the spiral movement of the

current considerable friction results, due to the lateral sliding of the peripheries of the wheels on the inner surface of the tube, the latter action being similar to the slurring or lateral sliding of the wheels of a carriage when drawn at a high speed around a sharp turn in the road. In neither of the above cases therefore has the carrier entire freedom to adjust its position and movement conformably to the particular action upon it of the propelling-current at all points of its travel.

The object of my present invention, therefore, is to provide a pneumatic-despatch-tube carrier with anti-friction devices of such a character as will enable the carrier to move with equal facility and freedom from friction in any direction in the tube, and in the carrying out of such object I employ a series of what may be termed "universal bearings" on each head of the carrier, the preferred embodiment of my invention comprising a series of large steel balls or spheres, themselves supported in ball-bearings and provided with an automatic oiling device for effecting their thorough lubrication, all as hereinafter described, and illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a pneumatic-despatch carrier constructed in accordance with my invention. Fig. 2 is a central vertical longitudinal section of the same. Fig. 3 is an end view. Fig. 4 is a central vertical transverse section through the anti-friction-bearings and the oiling device; and Fig. 5 is a detail in section, drawn to an enlarged scale, of one of the spheres and its anti-friction-bearing.

A represents the shell of the carrier, provided with a suitable door B and having its ends closed by the heads C. To each head is secured, as by screws or bolts c, a metal ring D. Integral with or secured in any suitable manner to this ring D is a series of brackets E, preferably six in number, and equidistantly spaced, as shown, around the ring D. These brackets are cup-shaped at their outer ends, as shown, and where they are made of cast or untempered metal, as will ordinarily be the case, each bracket is provided with a hardened-steel lining F on its inner or concave face, as shown in Fig. 5.



Within each of these cup-shaped hemispherical steel linings F is placed a second lining of small hardened-steel balls G, the latter forming an antifriction-bearing for a large  
 5 hardened-steel sphere H, the spheres H being designed to contact with and roll upon the inner surface of the despatch-tube when the carrier is in transit. In order to keep the spheres H and their ball-bearings G in place, a retaining-ring I surrounds the outer portion of  
 10 each sphere and is secured, as by screws *i*, passing through its flange *i'*, to the circular rim or edge of the bracket E, as best shown in Fig. 5.

15 In order that the carrier may travel with a minimum of friction, it is essential that the bearings should be kept well and uniformly lubricated. To this end I have devised a self-oiling device, which will now be described.

20 J represents a circular metallic oil-receptacle located centrally of the group of brackets on each head and connected therewith by a series of short pipes K. These pipes K may be screwed into and through the cup-shaped  
 25 bottoms of the brackets E and at their other ends may be soldered, riveted, or otherwise secured to the circular casing of the oil-receptacle J. Within and completely filling the pipes K are snugly-fitting wicks L, of suitable absorbent material, the inner ends of  
 30 which are constantly immersed in the lubricating fluid carried in the receptacle J. By this means a constant and uniform supply of lubricating fluid may be furnished to the  
 35 antifriction-bearings of the spheres H, the receptacle J being replenished with oil whenever necessary through its nozzle *j*.

The diameter of a circle drawn around and just touching the outermost edges of the  
 40 spheres H will be very slightly less than the internal diameter of the tube, so that when the carrier is in transit not more than two of the spheres on each end will be in contact at the same time with the inner surface of the  
 45 tube.

From the above description the operation of my improved carrier will be obvious. When the carrier is inserted in a despatch-tube and subjected to the action of the air-  
 50 current flowing therethrough, it will be carried along on its spherical bearings with a minimum of friction and at practically the speed of the propelling-current, and by reason of the fact that the ball-bearing spheres  
 55 H constitute, in effect, a universal roller-bearing the carrier will be just as free to partake of the rotary or spiral movement of the current as of its direct longitudinal movement and will conform to the combined lon-  
 60 gitudinal and rotary movement of the propelling-current without friction against the inner walls of the tube. In this respect I believe my improved carrier differs from all other carriers now in use, and, as is obvious,  
 65 the more freely and perfectly the carrier can be made to conform to the movements of the

propelling-current the less will be its frictional resistance and the greater will be the speed obtainable with a current of a given pressure.

I do not wish to be understood as limiting my invention to the precise details and arrangement of parts shown and described. It is obvious, for instance, that both the anti-  
 70 friction and the lubricating devices might be formed directly in the heads of the carrier, if preferred, and numerous other modifications may be made within the field of mechanical skill without departing from the spirit of my invention.

Having thus described my invention and illustrated the preferred means for carrying the same into effect, what I claim as new, and desire to secure by Letters Patent, is—

1. In a carrier adapted for transit in a despatch-tube, the combination with the body of the carrier of a series of balls or spheres grouped around and carried by the carrier, and journaled in relation thereto so as to be capable of a universal rolling movement, whereby the carrier is capable of conforming to the combined longitudinal and rotary movement of the propelling-current without friction against the inner walls of the tube, substantially as described.

2. In a carrier adapted for transit in a despatch-tube, the combination with the shell of the carrier and the heads closing the ends of the same of a series of balls or spheres grouped around and carried by the heads of the carrier, and journaled in relation thereto so as to be capable of a universal rolling movement, whereby the carrier is capable of conforming to the combined longitudinal and rotary movement of the propelling-current without friction against the inner walls of the tube, substantially as described.

3. In a carrier adapted for transit in a despatch-tube, the combination with the shell of the carrier and the heads closing the ends of the same of a series of balls or spheres grouped around and carried by the heads of the carrier, and antifriction-bearings in which said balls or spheres are journaled so as to be capable of a universal rolling movement, whereby the carrier is capable of conforming to the combined longitudinal and rotary movement of the propelling-current without friction against the inner walls of the tube, substantially as described.

4. In a carrier adapted for transit in a despatch-tube, the combination with the shell of the carrier and the heads closing the ends of the same of a series of balls or spheres grouped around and carried by the heads of the carrier, antifriction-bearings in which said balls or spheres are journaled so as to be capable of a universal rolling movement, and an automatic oiling device carried by and supplying lubricant to said antifriction-bearings, whereby the carrier is capable of conforming to the combined longitudinal and rotary move-



ment of the propelling-current without friction against the inner walls of the tube, substantially as described.

5 In a carrier adapted for transit in a despatch-tube, the combination with the shell of the carrier and the heads closing the ends of the same of a series of brackets secured to each head, antifriction-bearings formed in said brackets, and balls or spheres journaled  
10 in said antifriction-bearings so as to be capable of a universal rolling movement, whereby the carrier is capable of conforming to the combined longitudinal and rotary movement of the propelling-current without friction  
15 against the inner walls of the tube, substantially as described.

6. In a carrier adapted for transit in a despatch-tube, the combination with the shell of the carrier and the heads closing the ends of  
20 the same of a series of brackets secured to each head, antifriction-bearings formed in said brackets, balls or spheres journaled in said antifriction-bearings so as to be capable of a universal rolling movement, and an automatic oiling device arranged centrally of  
25 the series of brackets and connected with and

supplying lubricant to the antifriction-bearings, substantially as described.

7. In a carrier adapted for transit in a despatch-tube, the combination with the shell of  
30 the carrier and the heads closing the ends of the same of a ring secured to each head, a series of brackets equidistantly spaced around said ring and projecting from the outer face thereof, antifriction-bearings formed in the  
35 outer ends of said brackets, balls or spheres journaled in said antifriction-bearings so as to be capable of a universal rolling movement, an oil-receptacle arranged centrally of the series of brackets, short pipes connecting said  
40 oil-receptacle with the antifriction-bearings, and means in said pipes and receptacle for automatically effecting a uniform supply of lubricant to said antifriction-bearings, substantially as described. 45

In testimony that I claim the foregoing as my invention I affix my signature, in the presence of two witnesses, this 2d day of May, 1899.

SAMUEL N. POND.

Witnesses:

EDW. B. WITWER,  
ROBERT N. HOLT.