

No. 744,012.

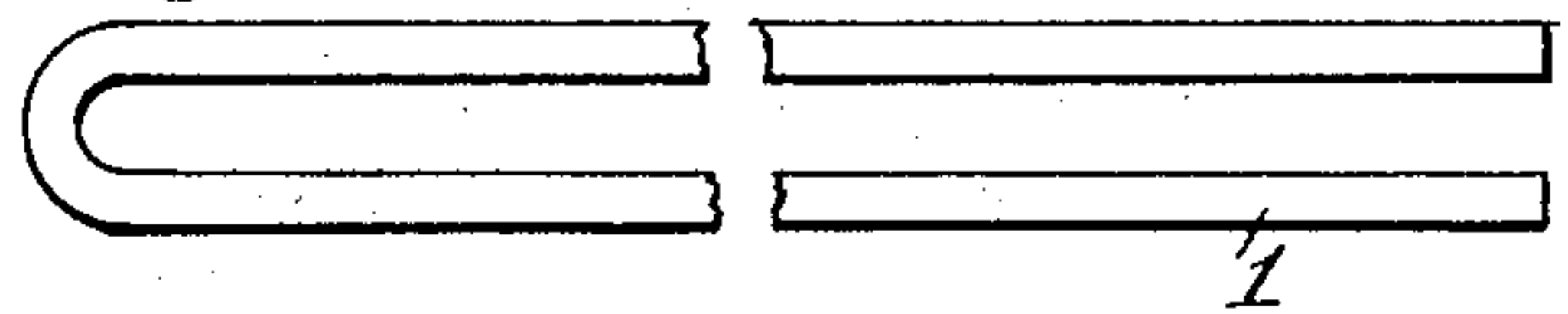
PATENTED NOV. 10, 1903.

C. KNAPE.  
ARMATURE COIL.

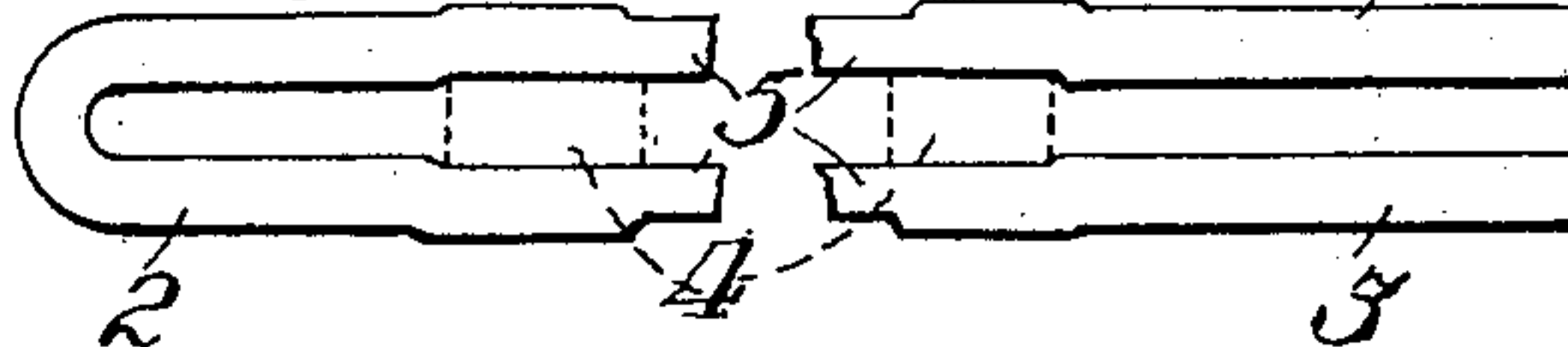
APPLICATION FILED JULY 9, 1903.

NO MODEL.

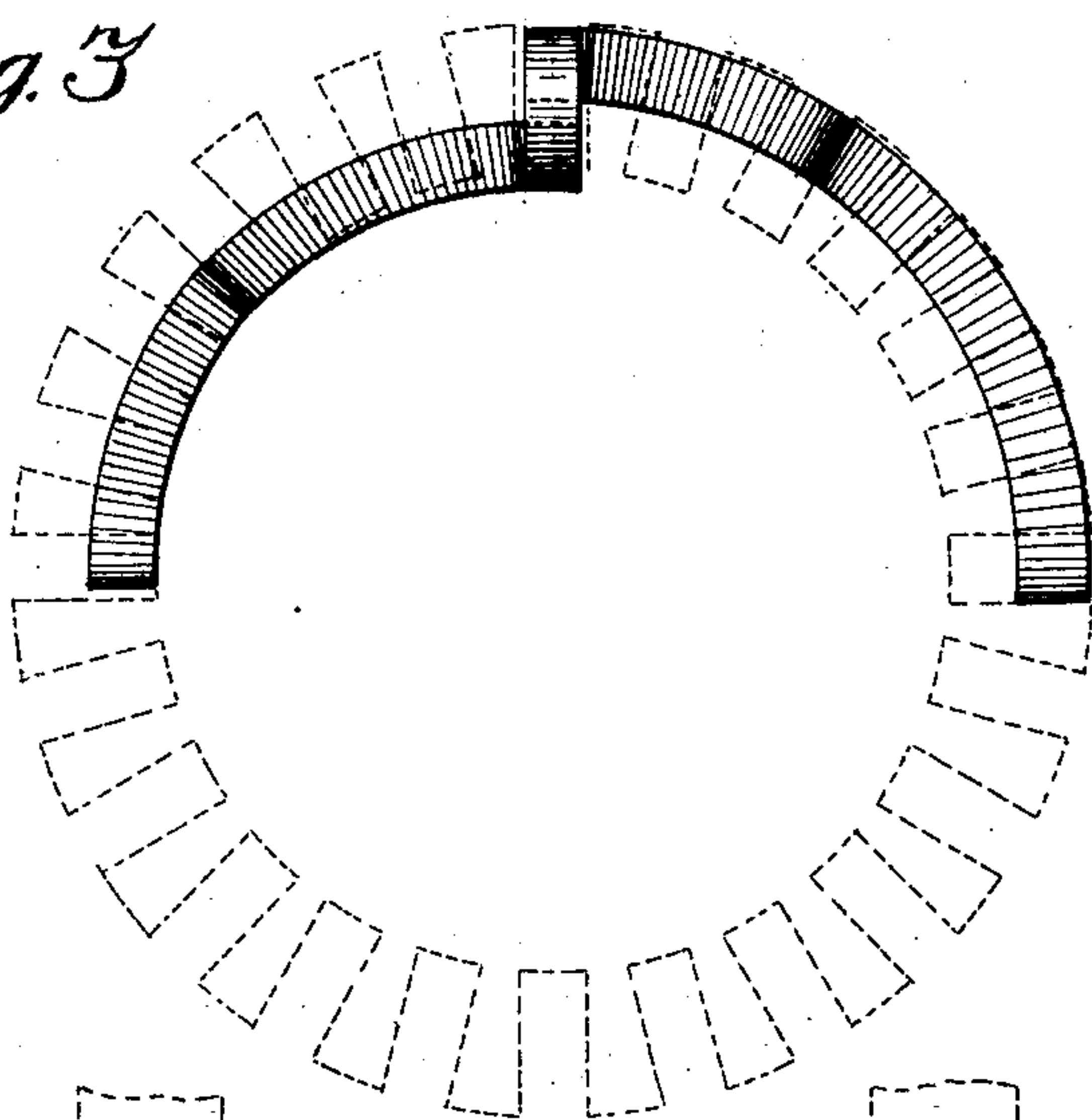
*Fig. 1*



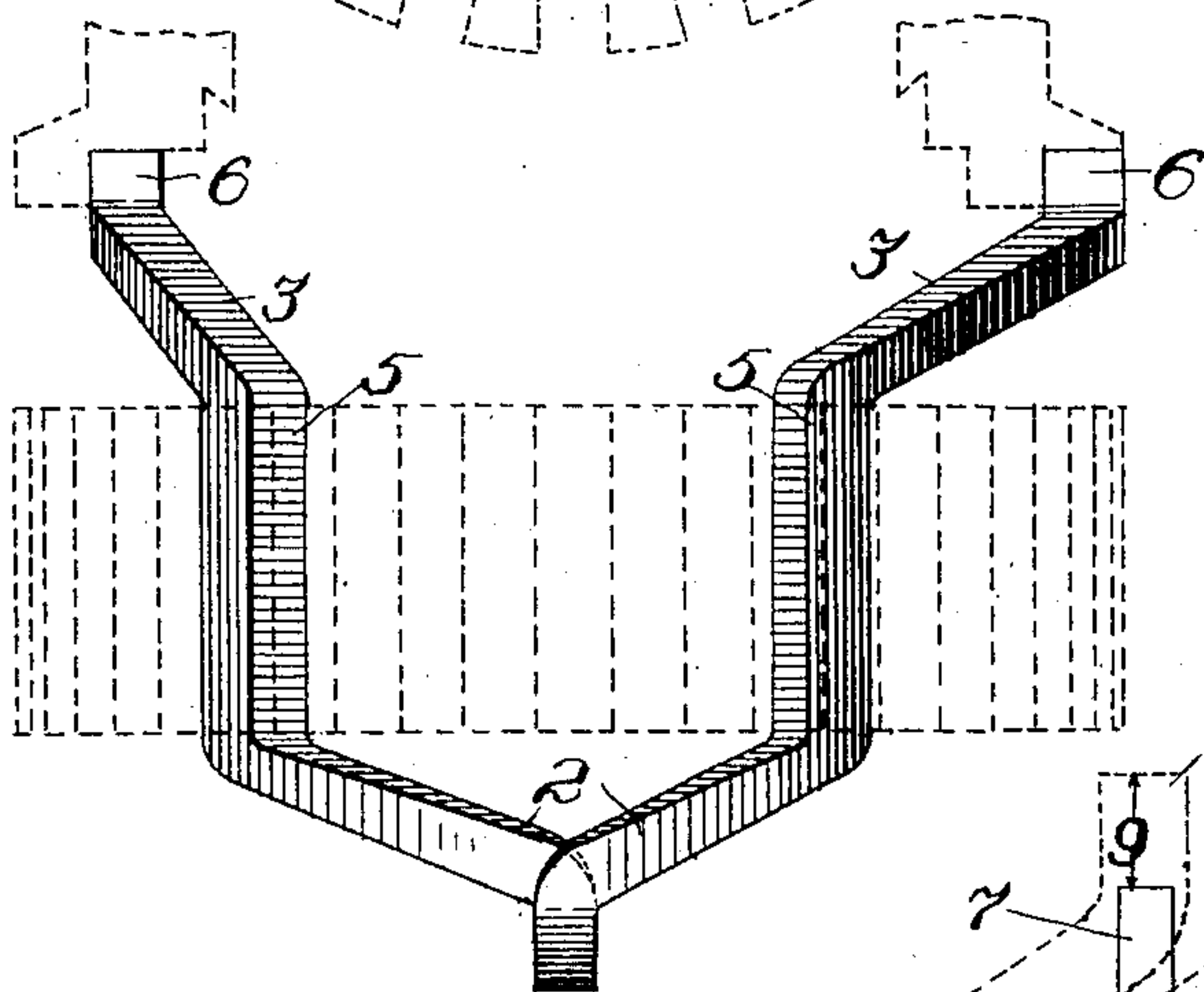
*Fig. 2*



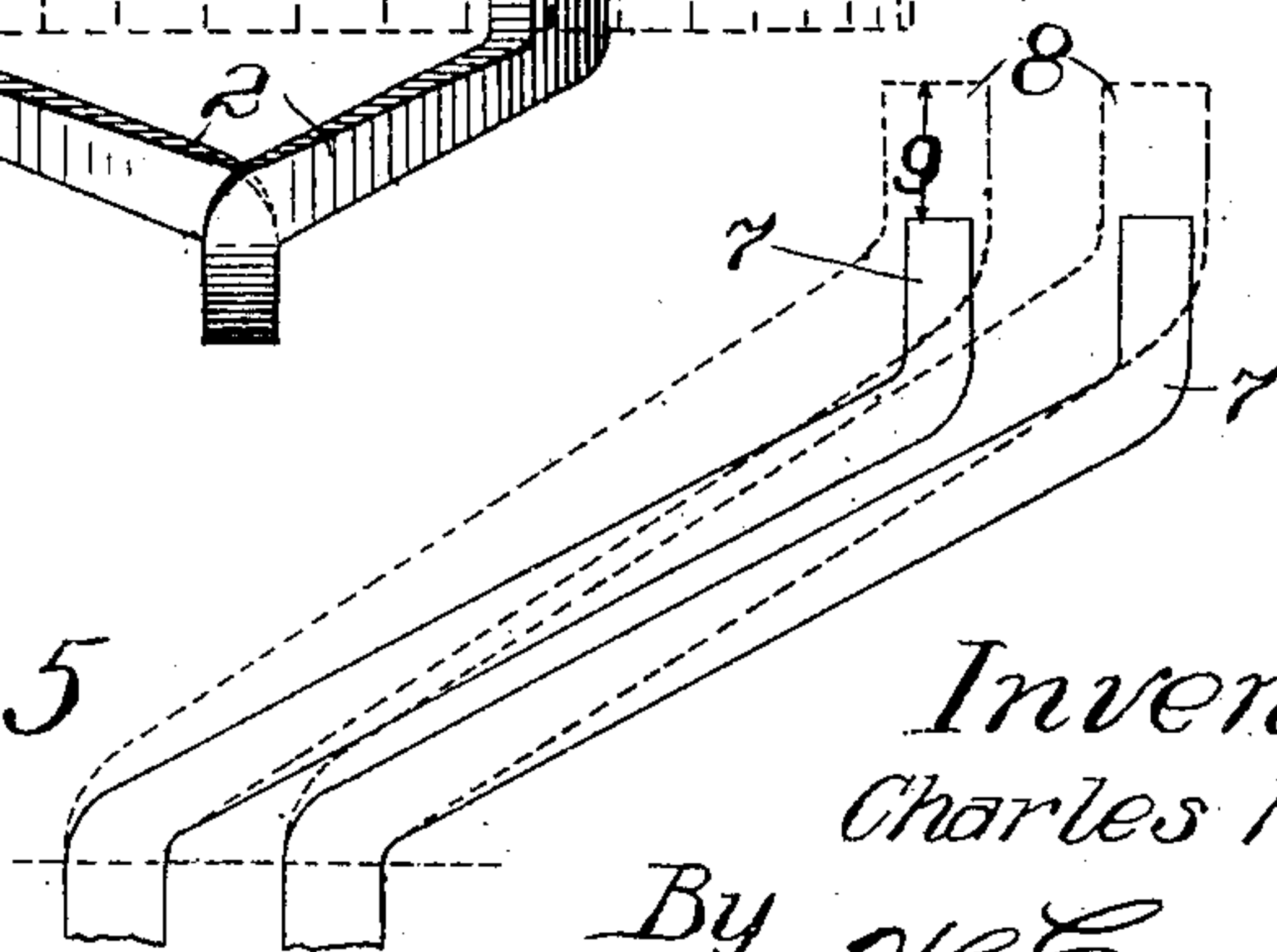
*Fig. 3*



*Fig. 4*



*Fig. 5*



Witnesses:  
Geo. B. Rowley  
E. E. Potter,

Inventor:  
Charles Knape.  
By *H. C. Everett & Co.*  
Attorneys.



# UNITED STATES PATENT OFFICE.

CHARLES KNAPE, OF PITTSBURG, PENNSYLVANIA; ASSIGNOR OF ONE-HALF  
TO CHARLES A. PSILANDER, OF PITTSBURG, PENNSYLVANIA.

## ARMATURE-COIL.

SPECIFICATION forming part of Letters Patent No. 744,012, dated November 10, 1903.

Application filed July 9, 1903. Serial No. 164,918. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES KNAPE, a citizen of the United States of America, residing at Pittsburg, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Armature-Coils, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to certain new and useful improvements in armature-coils, and more particularly to the straps which are used in forming the same.

The object of this invention is to so construct the strap which forms the armature-coil that the same may be more compactly formed on either side of the armature-core and to accomplish this result without decreasing the conducting area of said strap.

A further object of this invention is to so construct the straps that they will be in one piece, and also to provide means whereby material will be saved or increased insulation may be made possible without increasing the space occupied by the armature.

A still further object of this invention is to so construct the coil that a motor of increased power may be secured within a given space or that the air-space around the said armature may be materially increased without increasing the size of said motor.

Briefly described, my invention consists in flattening and widening the opposite sides of the portion of the straps which form the armature-coil that extends beyond the ends of the armature-core, thereby permitting the said extending portions of the coil to be much more compactly formed, whereby much space will be saved, and this space which is saved may be utilized either for air-space, insulation, or increased length of armature, which would permit of a greater horse-power, and whichever of these results is utilized the outside dimensions of the motor will remain the same as has been heretofore used.

In describing the invention in detail reference is had to the accompanying drawings, forming a part of this specification, and wherein like numerals of reference indicate like parts throughout the several views, in which—

Figure 1 is a plan view of the strap which forms the armature-coil as the same is first formed. Fig. 2 is a similar view showing the strap after the ends thereof have been flattened. Fig. 3 is a side elevation of my improved strap, the same being shown in the position which it would occupy on the armature-core, said core being indicated in dotted lines. Fig. 4 is a plan view showing the strap in position on an armature-core, the said core and commutator being indicated in dotted lines. Fig. 5 is a diagram showing the space saved by forming the strap in accordance with my invention.

In the accompanying drawings a coil consisting of a single strap only has been illustrated, but it will be obvious that the invention could be carried out with a coil consisting of any number or form of straps. Thereference-numeral 1 indicates a metal strap, the first operation of forming which consists in bending the strap upon itself, as shown in Fig. 1. The strap is then suitably flattened and widened at the portions 2 and 3 3, as indicated in Fig. 2, the temporary block 4 4, which is indicated in dotted lines in Fig. 2, being inserted between the portions of said strap during this flattening process for the purpose of maintaining a predetermined distance between the two portions of the strap at the point adjacent to the central portion 5 5 of said strap. The strap being flattened, as just described, the same is bent over any suitable former into any desired shape, which as indicated in Figs. 3 and 4 is of the type which is very commonly used. The ends 3 3 of the strap have their outside ends 6 6 bent in such a manner that they are adapted to be connected with any suitable commutator-bars. It will be noted that this flattening and widening process does not decrease the sectional area of the strap at the point where this has taken place, but that the uniform sectional area is maintained throughout the length of the strap.

Referring to Fig. 5, (wherein 9 represents the room saved,) the utility of forming the portions of the strap which are not within the armature-core, as described, will be readily seen as the flattened portions 7 of two straps which are in position they might occupy, while were the same not flattened, as described, they



would necessarily occupy the space indicated by dotted lines 8. It will be obvious that by forming the straps as described the same would run more directly from the slot in the armature-core to the commutator-bar, thereby saving much material; but should the same be run at an angle, which was heretofore necessary, a much increased insulation or air-space would be permitted. Should the distance between the rear end wall of motor and the commutator remain the same as heretofore used and the straps running to the commutator-bars be run at an angle, as indicated by 7 in Fig. 5, it will be obvious that the length of the armature-core would be materially increased, whereby a motor of increased horse-power could be obtained. In other words, with my construction of coil if the distance between the commutator-bars and the rear end wall of the motor as heretofore used is to be maintained it will be evident that by extending the armature-straps at a more acute angle I shorten the overhanging part of the coil, thus permitting me to utilize the room thus obtained for the lengthening of the armature-core, whereby a greater horse-power can be obtained without materially increasing the diameter.

While I have herein shown and described one form of strap, it will be obvious that my improvements could be applied to any form of strap and that various means might be employed for forming said strap without departing from the general spirit of my invention.

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

1. An armature-coil consisting of a continuous strap forming the same and having flattened portions on the outer ends thereof and a flattened portion intermediate the length of said strap, substantially as described. 40

2. An armature-winding comprising a strap having the same sectional area with different shape of section, substantially as described. 45

3. An armature-winding comprising a one-piece strap having the same sectional area with different shape of section, substantially as described. 50

4. An armature-winding consisting of a continuous strap having the same sectional area and provided with flattened ends, substantially as described.

5. An armature-winding consisting of a continuous strap having the same sectional area and different shape of section, the ends of said strap being flattened, substantially as described. 55

6. An armature-winding comprising a one-piece strap having flattened portions intermediate its ends, the sectional area of the strap being the same and the shape of the section being different, substantially as described. 65

7. In an armature-winding, a one-piece strap having flattened ends and flattened portions intermediate the ends, the said strap having the same sectional area and different shape of section, substantially as described. 70

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

CHARLES KNAPE.

Witnesses:

A. M. WILSON,  
E. E. POTTER.