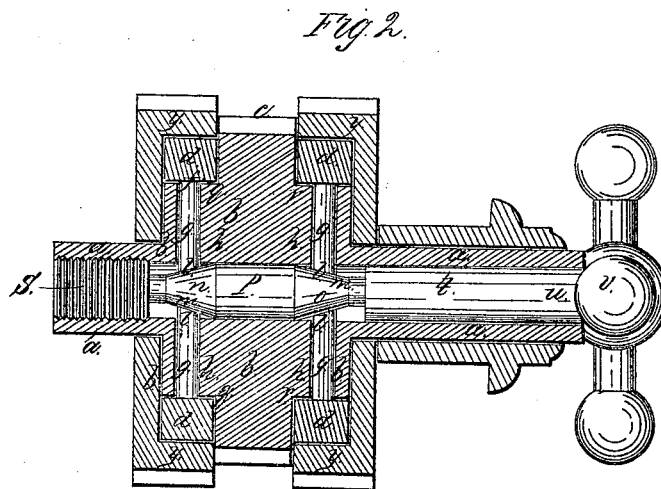
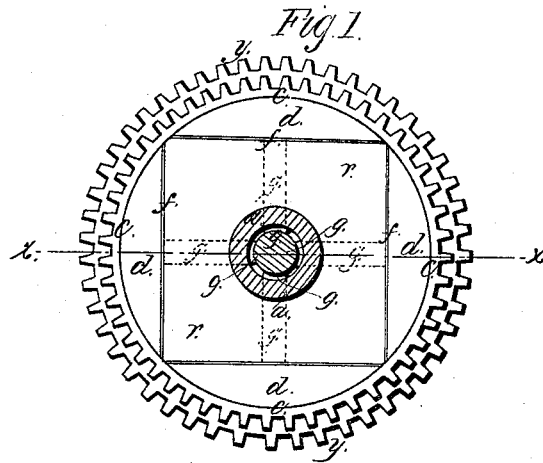


H. K. Smith,

Friction Clutch.

No 51,360.

Patented Dec. 5. 1865.



Witnesses:
Wm. J. Sperry,
M. C. Cingro

Inventor;
H. K. Smith.
Per my attys.

UNITED STATES PATENT OFFICE.

H. K. SMITH, OF NORWICH, CONNECTICUT.

IMPROVEMENT IN FRICTION-CLUTCHES.

Specification forming part of Letters Patent No. **51,360**, dated December 5, 1865; antedated November 18, 1865.

To all whom it may concern:

Be it known that I, H. K. SMITH, of Norwich, New London county, State of Connecticut, have invented a new and useful Improvement in Friction-Clutches; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is an end view of a shaft, showing its divisions and sectional pieces; Fig. 2, a horizontal section in plane of line *x x*, Fig. 1.

Similar letters of reference indicate like parts.

The present invention consists in forming the periphery of a shaft in separate section or parts, to each of which sections and in the center thereof a rod is secured of sufficient length to extend nearly to the center of the shaft, passing through suitable apertures therein, which rods there rest upon the inclined surface of a conical-shaped plug placed within the axis of the shaft and revolving with the same, but susceptible of being moved back and forth therein, whereby the sectional pieces of the shaft can be either raised or lowered, and thus brought either to bear against or released from the gear-wheel or other device placed in proper position therefor upon the shaft, causing it to revolve with the same or not, according as may be desired.

a a represent a shaft made hollow in its central portion, to which is securely attached, or forming a part thereof, a cylindrical drum, *b*. Around the central portion of the drum a toothed gear-wheel, *c*, is formed, the periphery of the drum each side of said gear *c* being divided into four separate and distinct sections or parts, *d d d*, &c., the inner faces of which form an inscribed square within the circumference of the drum.

To the straight side *f* of each section, and at the center thereof, and at right angles thereto, a rod, *g*, is attached, of sufficient length to extend nearly to the center of the shaft, suitable radiating apertures *h h*, &c., being made in the proper places of the drum and shaft for the same.

The inner ends, *l l*, &c., of the rods *g g*, &c.,

rest and bear upon the inclined sides *m m*, of the two conical-shaped ends *n* and *o* of the plug *p*, placed within the hollow shaft *a*, the four within the part *q* of the drum *b*, upon the cone *n*, and the four of the other part, *r*, upon the cone *o*.

To the conical end *n* of the plug is attached, or forming a part thereof, a screw-shaft, *s*, having bearings in proper-shaped female screw-threads on the interior of the hollow shaft *a*, and to the opposite conical end, *o*, of the plug, is attached a cylindrical shaft, *t*, of a diameter equal, or nearly so, to the internal diameter of its covering-shaft *a*, and extending the entire length of the same, to the outer end, *u*, of which is secured a handle, *v*, made of any desired and suitable shape and size.

Over and upon each sectional portion of the drum, constructed as described, gear-wheels *y y* are placed, being of sufficient internal diameter to freely turn thereon.

By turning the handle *v* to the right or left the double conical-shaped plug before referred to is made to either move back and forth within the axis of the shaft, raising or lowering the sectional pieces of its drum, bearing on the respective inclined surfaces of the plug, thereby causing them either to bear against the inner surfaces of the gear-wheels placed upon the drum or be relieved therefrom, whereby the said gears can be either so held to and upon the drum as to be made to revolve with the same or not, according as may be desired.

With the respective gears arranged upon the shaft, as described, any desired mechanical devices may be connected, proper intermediate gearing being used, and as the two outer gears can be either thrown in or out of connection with their shaft by the simple movement of the conical plug forward and backward within the shaft, as described, the machinery respectively connected therewith is thus made either to revolve or not at pleasure.

From the above description of the construction and arrangement of the loose gear-wheels and the double conical plug, it is evident that when the sectional pieces of one portion of the drum are moved outward therefrom, the sectional pieces of the other portion are operated in the opposite direction.

Although I have described in the above

specification my improvement applied in a two-fold manner and as operating upon two gear-wheels by one and the same movement of the conical plug, it is manifestly apparent that only one gear-wheel, or more, may be thus arranged without departing from the principles of the present invention.

There are many and various modes in which the conical plug may be moved back and forth within the shaft, and the drum of the same can be divided into more or less sections or parts, as may be desired, and can also be connected, by various means, with the conical plug used other than those described, and therefore I do not intend to limit myself to any one mode of moving the plug, or to any particular number of sectional friction-pieces into which the drum or its shaft is to be divided; and it is also evident that my improved arrangement of a friction-clutch is adaptable to all the purposes for which they are ordinarily used as well as to a gear-wheel, as has been herein particularly described.

I claim as new and desire to secure by Letters Patent—

1. Forming the exterior of a shaft in one or more sectional pieces or parts, in combination with a conical or other suitable-shaped plug placed and moving within the interior of the said shaft, the said sections and plug being so connected together that, by moving the plug either forward or backward within the shaft the said sectional pieces are either brought to bear against or released from the gear or other device properly arranged therefor upon the shaft, substantially as herein described, and for the purposes specified.

2. The peculiar arrangement herein described, the same consisting of the conical-shaped plug or shaft *p*, and sectional pieces *d*, *d*, &c., arranged with regard to and bearing upon the same, substantially as and for the purposes specified.

Witnesses:

H. K. SMITH.

A. E. BEACH,

ALBERT W. BROWN.