

No. 641,636.

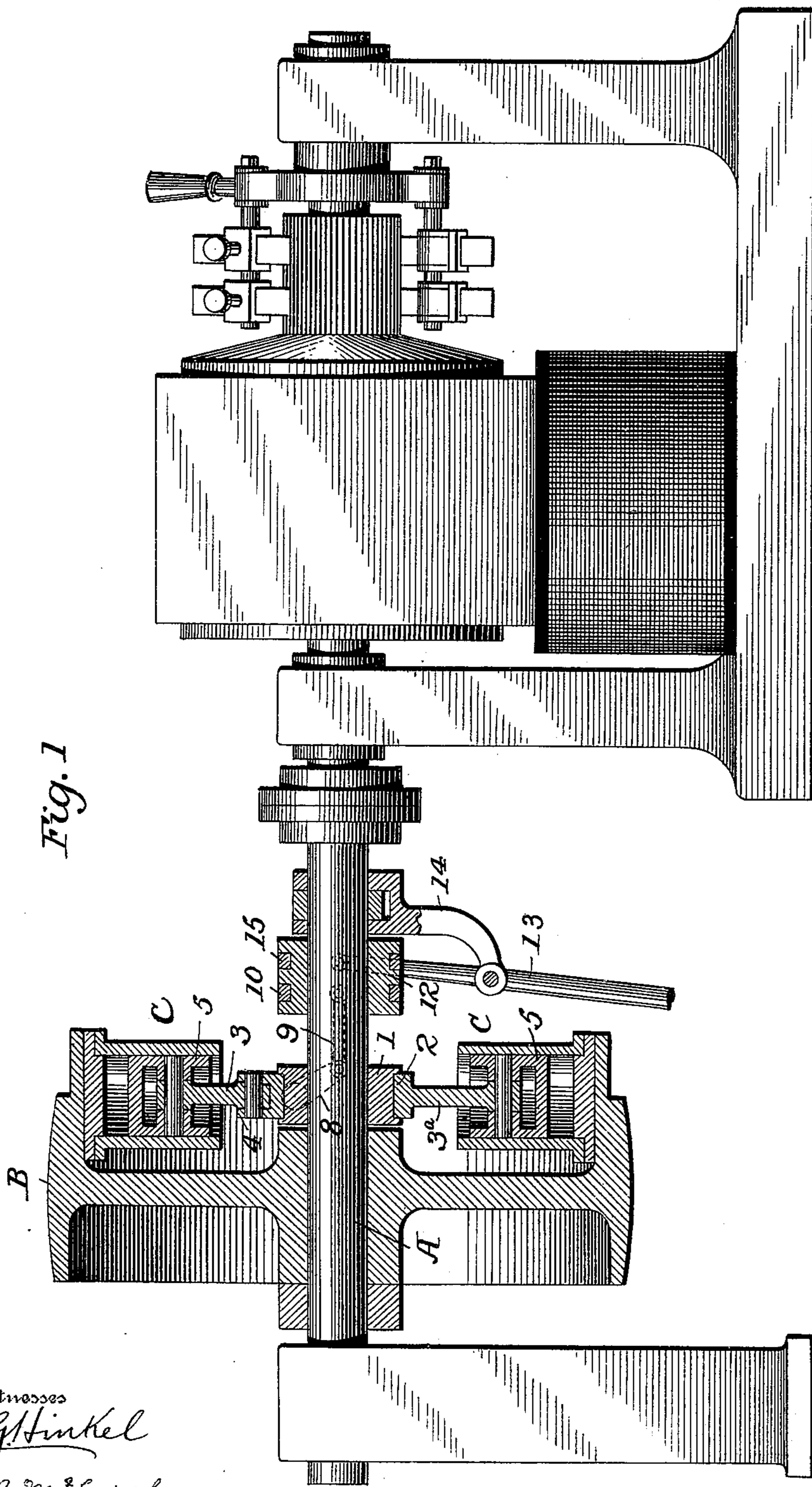
Patented Jan. 16, 1900.

F. BURGER.
FLUID CLUTCH.

(Application filed Nov. 23, 1898.)

(No Model.)

2 Sheets—Sheet 1.



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Fig. 2.

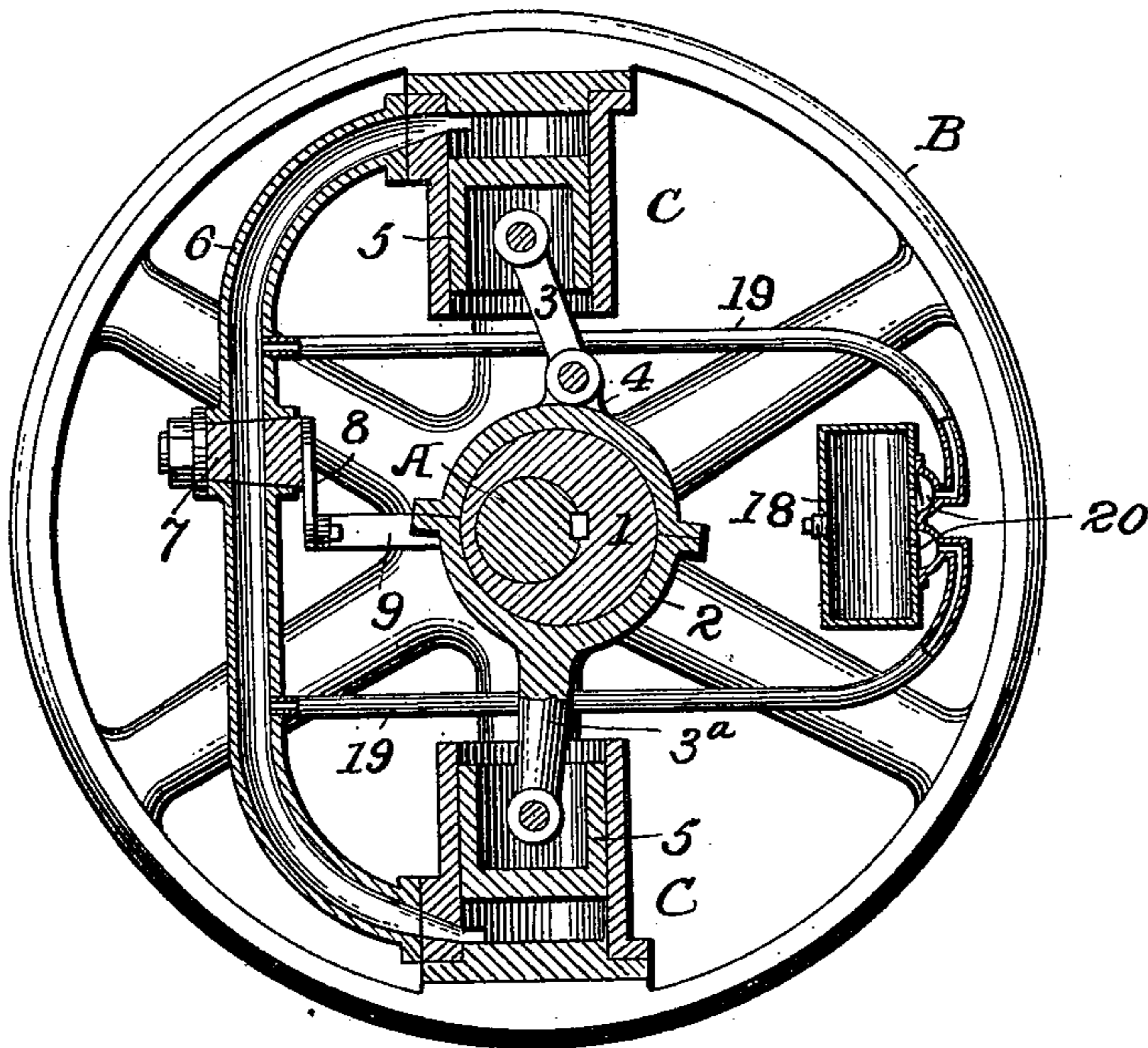
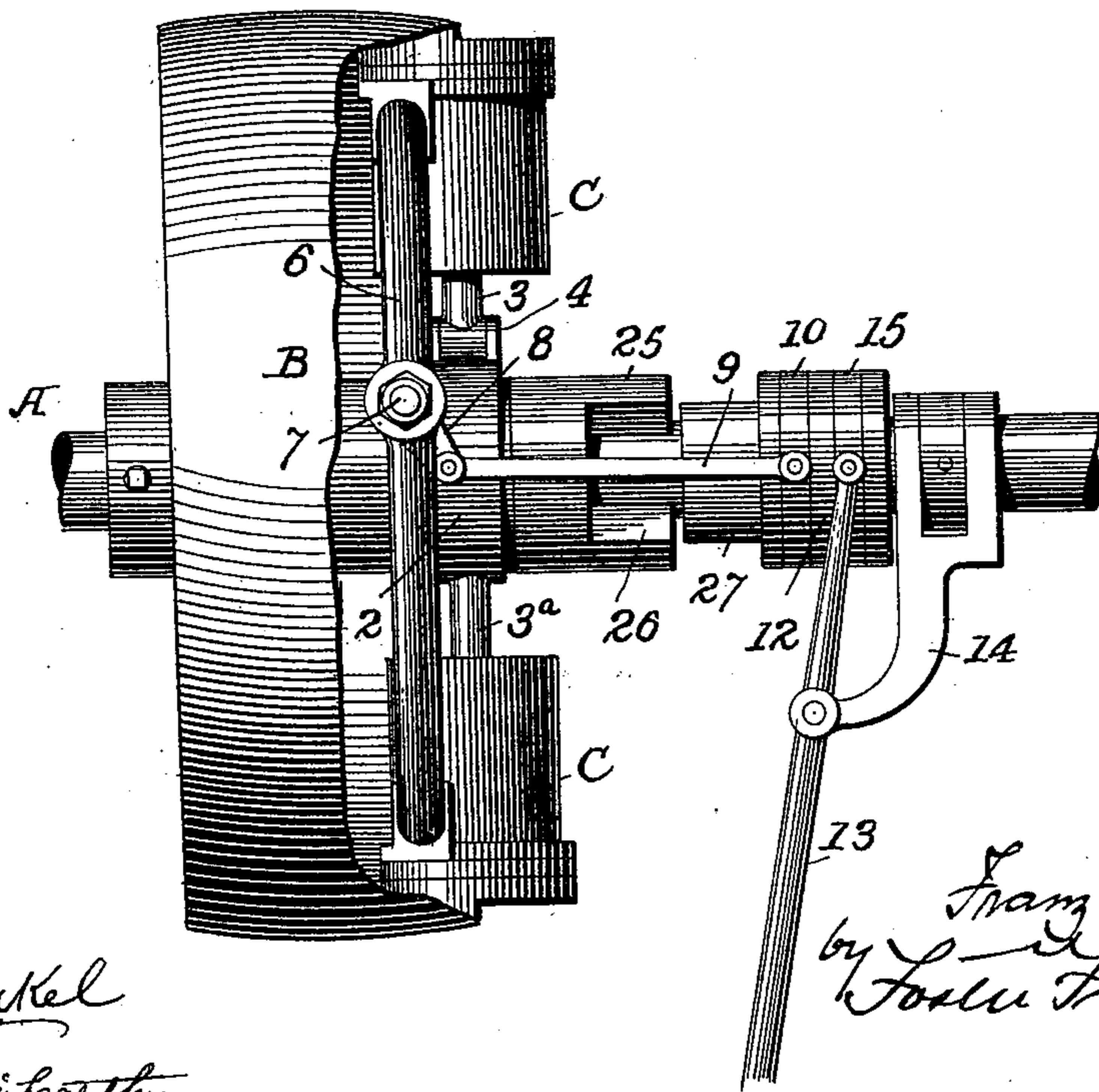


Fig. 3.



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UNITED STATES PATENT OFFICE.

FRANZ BURGER, OF FORT WAYNE, INDIANA, ASSIGNOR OF THREE-FOURTHS
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FLUID-CLUTCH.

SPECIFICATION forming part of Letters Patent No. 641,636, dated January 16, 1900.

Application filed November 23, 1898. Serial No. 697,256. (No model.)

To all whom it may concern:

Be it known that I, FRANZ BURGER, a citizen of the United States, residing at Fort Wayne, in the county of Allen and State of Indiana, have invented certain new and useful Improvements in Fluid-Controlled Clutch Devices, of which the following is a specification.

This invention relates to certain new and useful improvements in fluid-controlled clutch devices, having for its object to provide a simple and efficient construction whereby a part to be driven may be readily and quickly coupled to a driving part and rotated at different speeds with relation to the driving part.

With this object in view the invention consists in the novel construction, combination, and arrangement of the parts hereinafter more particularly described.

In the accompanying drawings, forming a part of this specification, and in which like letters and numerals of reference designate corresponding parts, Figure 1 is a vertical sectional view of one form of mechanism embodying the invention. Fig. 2 is a transverse sectional view thereof; and Fig. 3 is a side elevation of a modification of the invention, parts being broken away.

Referring more particularly to the drawings, A designates the driving member of the clutch, which in the present instance is a shaft adapted to be rotated directly or indirectly from any suitable engine. Mounted loosely upon the shaft A is the driven member of the clutch, which is shown in the form of a band-wheel B, and likewise mounted fixedly upon the shaft is an eccentric 1, surrounded by a strap 2, from which extend at diametrically opposite points two connecting-rods 3 and 3^a, the former being pivotally connected to the strap between separated lugs 4 thereon and the latter being rigidly connected thereto.

Fixedly supported upon the band-wheel B, opposite to and in alignment with each other, are two single-acting cylinders C, each containing a piston 5, which are pivotally connected, respectively, to the ends of the connecting-rods 3 3 in such manner as to be reciprocated simultaneously in opposite directions during the rotation of the eccentric 1.

The closed ends of the cylinders C are connected by means of a passage or pipe 6, intermediate the ends of which is located a valve 7, the valve shown being rotary and provided upon the exterior of the pipe 6 with an arm 8, to the end of which is connected one end of a rod 9, the opposite end of which is pivoted to a ring 10, loosely mounted to turn in an annular recess of a sliding sleeve 12. The sleeve 12 is keyed to the shaft A and is adapted to rotate therewith and slide longitudinally thereon, and as a convenient means of manipulating the said sleeve a lever 13 is provided. This lever is pivoted intermediate its ends to a bracket 14, loosely supported upon the shaft A, and at one end it is pivoted to a ring 13, loosely mounted in a second annular peripheral groove of the sleeve 12.

In operation, assuming the cylinders C and pipe 6 to be filled with suitable fluid—say, for instance, glycerin—and the parts to be in the positions shown in Fig. 2, when the shaft A is rotated the eccentric 1 will turn therewith and through the strap 2 will reciprocate the connecting-rods 3 3 and pistons 5 simultaneously in opposite directions, and the valve 7 being fully open the fluid from one of the cylinders will freely flow from one cylinder to the other, the pulley B remaining stationary. If, however, the valve is partially closed through the sleeve 12 and rod 9 to partially restrict the flow of fluid through the pipe 6, resistance will be offered to the movement of the pistons toward the closed ends of their cylinders, resulting in increased frictional contact between the strap 2 and eccentric 1, and thereby causing the strap and, through the intermediate connections, the pulley B to turn with the shaft A just in proportion to the rapidity with which the fluid is permitted by the valve 7 to flow from one cylinder to another. Thus it will be seen that the speed at which the pulley B is driven depends upon the position to which the valve 7 is shifted and that if said valve is wholly closed the pulley will be rotated at the same speed as the shaft A. It will be apparent also that when the shaft A is driven from an electric motor the motor may be set in motion and by gradually shifting the valve 7 the pulley B may be rotated slowly at first,

and its speed increased, thereby precluding all possibility of the armature of the motor being burned out, as often happens where it is subjected suddenly to excessive strains.

5 It is apparent that during the continued running of the clutch a certain loss of the fluid in the cylinders and pipe 6 will occur through leakage and other causes, and in order that this loss may be automatically compensated for a reservoir 18 for liquid is supported upon the pulley B and communicates with the pipe 6 upon opposite sides of the valve 7 through supply-pipes 19, interposed between each of which and the reservoir are
10 outwardly-opening suction-valves 20. Thus it will be seen that whenever a deficiency of fluid occurs in either of the cylinders one or the other of the suction-valves 20 will be opened and a sufficient quantity of fluid will
15 be drawn from the reservoir 18 to supply the deficiency.

In the modified form of clutch shown in Fig. 3 the parts are identically constructed and arranged with those of the preceding figures, except that the eccentric 1 is loosely
25 mounted upon the shaft A and is provided with an extension-piece 25, having segmental recesses 26, into which are adapted to fit correspondingly-shaped projections 27 of the
30 sliding sleeve 12. In this construction the valve-operating rod 9 is preferably connected to the sliding sleeve 12 and moves with it. By operating the lever the sleeve 12 may be moved toward the eccentric, and the projections 27 will partially enter the recesses 26
35 before the valve is closed to any material extent, and the eccentric will begin to move with the sliding sleeve without moving the driven member B at the same speed, and it is
40 not until the projections have moved entirely into the recesses 26 that the valve 7 will be entirely closed, and then all the parts will move uniformly.

Without limiting myself to the precise construction and arrangement of the parts shown

and described, since it will be obvious that various changes in such construction and arrangement may be made without departing from the spirit or scope of the invention,

What I claim is—

1. In a clutch, the combination with normally-disconnected driving and driven members, of two cylinders carried by the driven member, a pipe connecting the cylinders, an eccentric carried by the driving member and
55 movable therewith, a strap surrounding the eccentric, pistons in the cylinders, rods connecting the pistons to the strap, a valve in the pipe connecting the cylinders, means to operate the valve, a reservoir for containing
60 fluid, two pipes leading from said reservoir to the connecting-pipe, one on each side of the valve, and suction-valves between the connecting-pipe and reservoir, substantially
65 as and for the purpose specified.

2. In a clutch, the combination with normally-disconnected driving and driven members, of an eccentric loosely mounted on the driving member, and provided with an extension having a clutch member, a sliding
70 sleeve mounted on the driving member to turn therewith and provided with a clutch member to engage the member on the eccentric, means to move the sliding sleeve, cylinders
75 carried by the driven member and communicating with each other, pistons in the cylinders, a strap on the eccentric, connecting-rods between the strap and the pistons, a valve controlling the communication between the
80 cylinders, and a connection between the sliding sleeve and the valve to operate the latter on the movement of the former, substantially
as and for the purpose specified.

In testimony whereof I have signed my name to this specification in the presence of
85 two subscribing witnesses.

FRANZ BURGER.

Witnesses:

GEO. K. TORRENCE,
JOHN P. AUSPACH.