(No Model.)

R. SHETTLER.

CLUTCH.

No. 481,205. Patented Aug. 23, 1892.

Fig. 1.

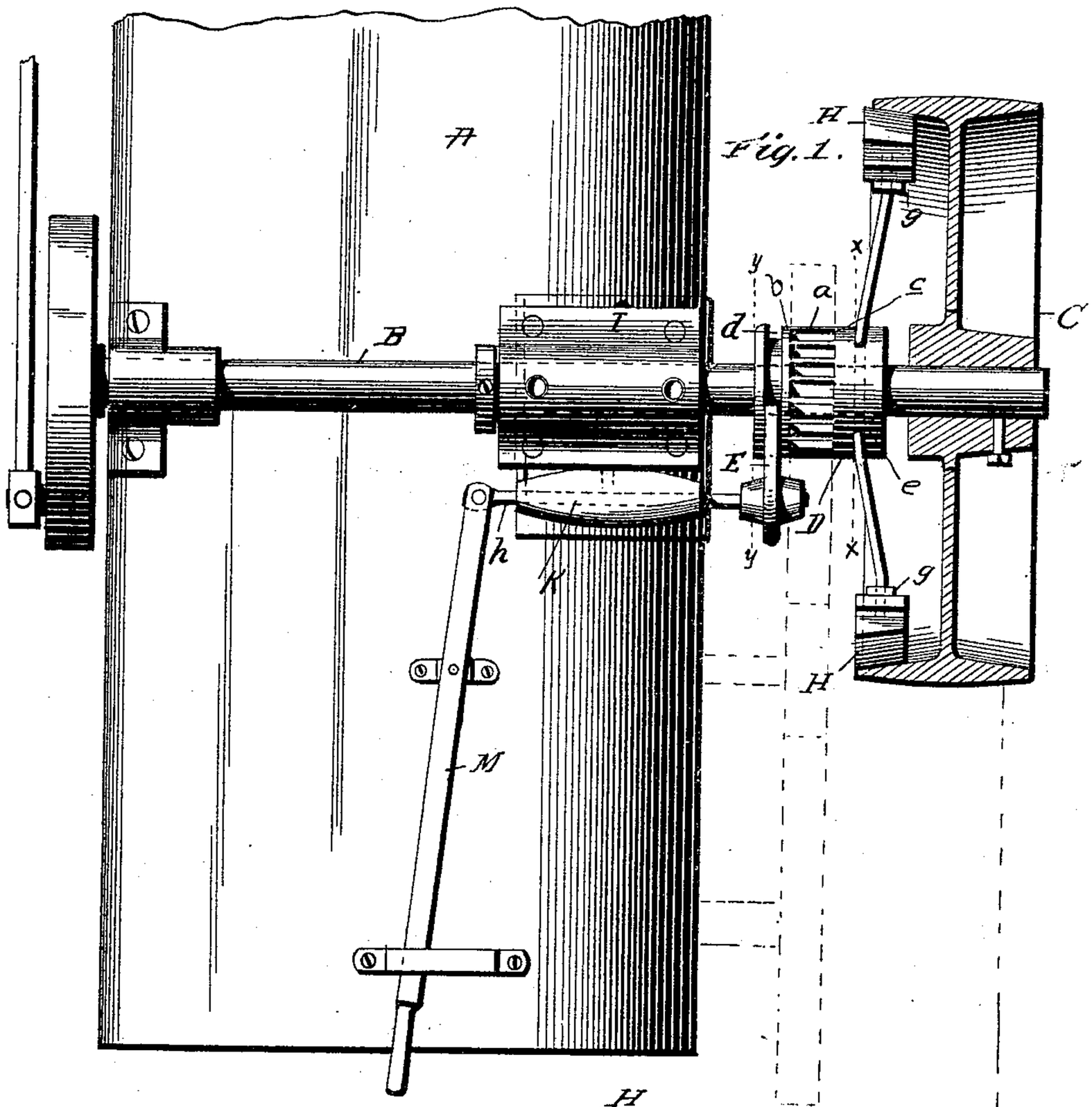


Fig. 2.

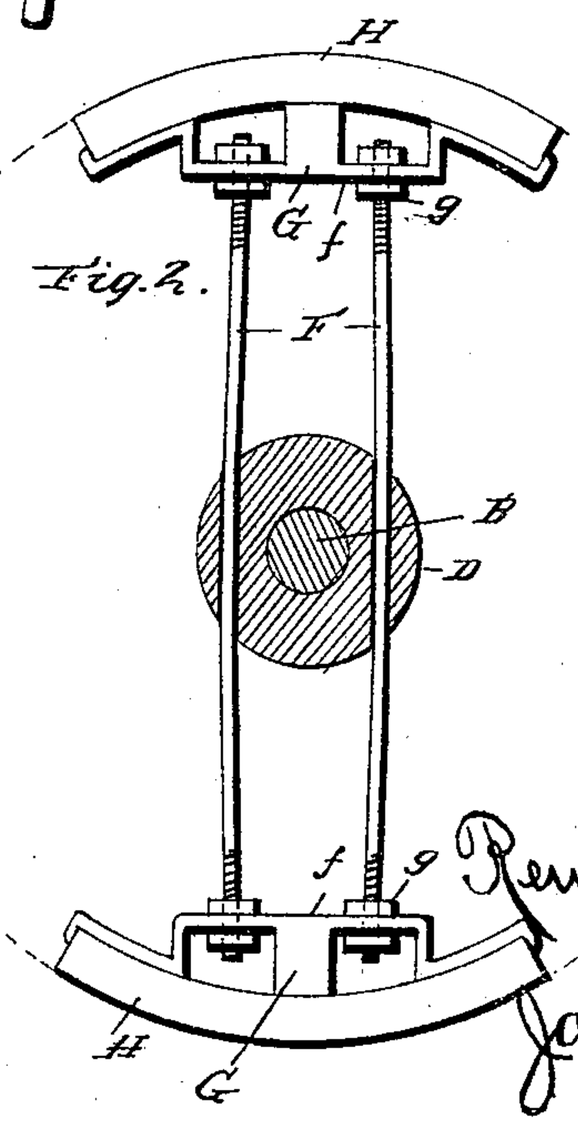
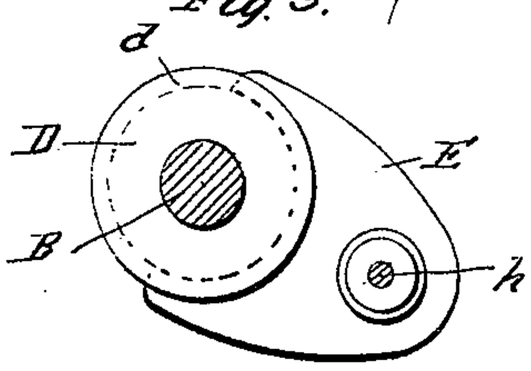


Fig. 3.



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REUBEN SHETTLER, OF PORT HURON, MICHIGAN.

CLUTCH.

SPECIFICATION forming part of Letters Patent No. 481,205, dated August 23, 1892.

Application filed October 13, 1890. Serial No. 367,980. (No model.)

To all whom it may concern:

Be it known that I, REUBEN SHETTLER, a citizen of the United States, residing at Port Huron, in the county of St. Clair and State of Michigan, have invented certain new and useful Improvements in Friction-Clutches; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention has relation to friction-clutches for traction-engines and other machines in which similar clutches are used, and the novelty will be fully understood from the following description and claims, when taken in connection with the annexed drawings, in which—

Figure 1 is a plan view of a portion of a boiler of an engine, showing the fly-wheel in section and my improvements applied. Fig. 2 is a sectional view taken in the plane indicated by the dotted lines *x x* on Fig. 1, and Fig. 3 is a sectional view taken in the plane indicated by the dotted line *y y* on Fig. 1.

Referring by letter to said drawings, A indicates the boiler, which may be that of any traction-engine.

B indicates the crank or drive shaft, and C the fly-wheel secured to one end of said shaft.

The fly-wheel C may be of the usual construction, and the inner flange or rim of the wheel is preferably flared or beveled on its under side, so as to serve more effectually in the frictional contact with the shoes, which are of a corresponding shape on their outer sides.

D indicates a sliding sleeve, which is arranged on the crank-shaft adjacent to the fly-wheel and carries the hub bearing the rods of the friction-shoes, and also the pinion, which engages a gear-wheel designed to connect with the traction mechanism. This sleeve also has an annular groove formed near one end to receive the clutch-arm. By special reference to this sleeve D it will be seen that the teeth of the pinion do not project, but are formed by recesses *a*, and the ends of the teeth are not free, which would necessarily render them weak, but are walled up, as shown at *b* and *c*, thereby giving great strength and rendering them strong and durable. The teeth of the pinion are of greater length than the teeth of the gear with which it meshes, so that said pinion will always hold mesh with the engaging gear.

The annular groove *d*, formed on the inner end of the sleeve, is designed to receive the forked lever or clutch-arm E, and the hub *e* for the rods carrying the friction-shoes is formed integral with the toothed pinion, although it is obvious that these parts may be made separately and fixed together by any suitable devices, as it is necessary that they should all move together.

F indicates the rods or spokes carrying the friction-shoes. These rods are preferably of steel, and it is necessary that they should be of some metal which will be elastic and yield or give somewhat under the action of the clutch-lever, so that the shoes may firmly bind against the band or periphery of the fly-wheel and quickly release therefrom when said lever has been shifted in an opposite direction. The sleeve may be made of cast metal, and in practice I usually cast the same on the rods F, so that the latter will be prevented from moving in the hub.

G indicate the shoe-irons. These irons are of a form substantially as shown to receive the shoes or friction-blocks H, which may be of wood or other suitable material, and said irons have holes in their offset portions *f* to receive the outer threaded ends of the rods F. Jam-nuts *g* are employed on the inner and outer sides of the shoe-irons to adjustably secure the threaded ends of the rods thereto. By this means it will be seen that the clutch is adapted to be adjusted to the flange of the wheel and compensate for the wear on the blocks or shoes.

I do not confine myself to any particular form of iron or block nor the exact manner in which such parts are connected and adjusted; but I do attach importance to the yielding and threaded rods in connection with friction-shoes of any suitable form. By making these rods of spring-steel or the like and bending them slightly, as shown, it will be seen that when the sleeve has been moved in the direction of the fly-wheel by the shifting-lever said rods will straighten out, according to the force employed and the friction required at the shoes, and when force has been

removed from the lever it will require but little power to release the shoes from the wheel, as the resiliency of the rods will assist in taking them off.

Fixed to the bearing I, which forms the main support for the crank-shaft B, is a supplemental bearing K, which supports a transversely-movable rod *h*, carrying at its outer ends the forked lever or clutch-arm E, and its opposite end is pivotally connected with the hand-lever M. The forked lever or arm E enters the groove *d* of the sleeve, so as to slide the same to and fro on the shaft B. The hand-lever, which is pivoted at a suitable point on the boiler, may be held in position by a rack or a set-screw, according to the fancy of the mechanic. By having the rods carrying the friction-shoes bent or dished toward the fly-wheel it is obvious that the distance from shoe to shoe is much less than if such rods were straight. Consequently when force is applied to the hand-lever to throw the shoes into the fly-wheel the rods straighten out, according to the force employed, and the force given to the lever added to the expansible force which naturally arises by the tendency of the rods to straighten gives an increase of leverage, and therefore requires much less power to throw the clutch and forcibly hold the same in the wheel. Similar beneficial results are obtained in releasing the clutch from the fly-wheel, as the moment the hand-lever has been started to move in the desired direction the elasticity of the rods will again come into action, and the spring, as it were, is thereby used to assist in throwing off the shoe. I therefore attach great importance to the employment of these dished or bowed rods, to the fact that they are capable of longitudinally adjusting the shoe, and to the particular manner in which the pinion-teeth are formed in the sleeve.

In practice I have found that a clutch thus constructed can be thrown into the wheel with all the force that a man can give it, and yet the springs of the rods will release the shoes with the greatest ease and convenience. The clutch will throw the traction mechanism into and out of gear regardless of the speed at which the engine is running and without effecting any stoppage of the engine itself.

Having described my invention, what I claim is—

1. In a friction-clutch, the combination of a clutched wheel flared or coned interiorly, a hub sliding on the same shaft therewith, sectional brake-shoes, and elastic spokes connecting said hub to said sectional shoe, said spokes being connected to the hub at an angle oblique to the axis of the shaft, whereby the perimeter of the sectional brake-shoe is increased as the angle between the spoke and the hub approaches a right angle.

2. In a friction-clutch, the combination, with a sliding pinion and a fly-wheel, of rods fixed to the pinion and curved outwardly therefrom and carrying on their outer ends friction-shoes adapted to engage the fly-wheel, whereby when said pinion has been moved toward the fly-wheel the rods carrying the friction-shoes will be somewhat straightened, so as to increase the frictional contact between the shoes and their connection with the fly-wheel.

3. In a friction-clutch, the combination, with a sliding sleeve, of a rod or rods secured about midway of their length thereto and curved therefrom and carrying friction-shoes at their ends, substantially as specified.

4. In a friction-clutch, the combination, with a sliding sleeve, of rods secured thereto about midway of their length and curved therefrom and also having their ends threaded, the shoe-irons perforated to receive the threaded ends of the rods, and jam-nuts for adjustably securing the irons to the rod, substantially as specified.

5. The sliding sleeve having the pinion-teeth formed therein and a wall or flange at the opposite end of said teeth, said sleeve also having an annular groove to receive the arm of the shifting lever and the rods carrying the shoes, which rods are curved or inclined outwardly, so that when their outer ends are met with resistance and their inner portions moved outwardly they will be somewhat straightened out, substantially as specified.

6. A friction-clutch having a sliding toothed sleeve adapted to mesh with a gear-wheel, in combination with yielding rods or bars carrying friction-shoes and having their ends bent outwardly and their inner portions fixed to the sleeve, substantially as specified.

7. The combination, with a power-shaft and fly-wheel thereon, of a sliding sleeve having a pinion and an annular groove formed therein, rods secured to said sleeve and curved therefrom, friction-shoes adjustably secured to said rods, the transversely-movable rod, the forked arm secured to one end of said shaft, and the hand-lever secured to the opposite end of the shaft, substantially as specified.

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

REUBEN SHETTLER.

Witnesses:
ELMER D. SMITH,
EDWARD F. PEER.