(No Model.)

D. J. AMES.

TRANSMITTING RECIPROCAL TO ROTARY MOTION.

No. 285,943. Patented Oct. 2, 1883.

FIG. 1

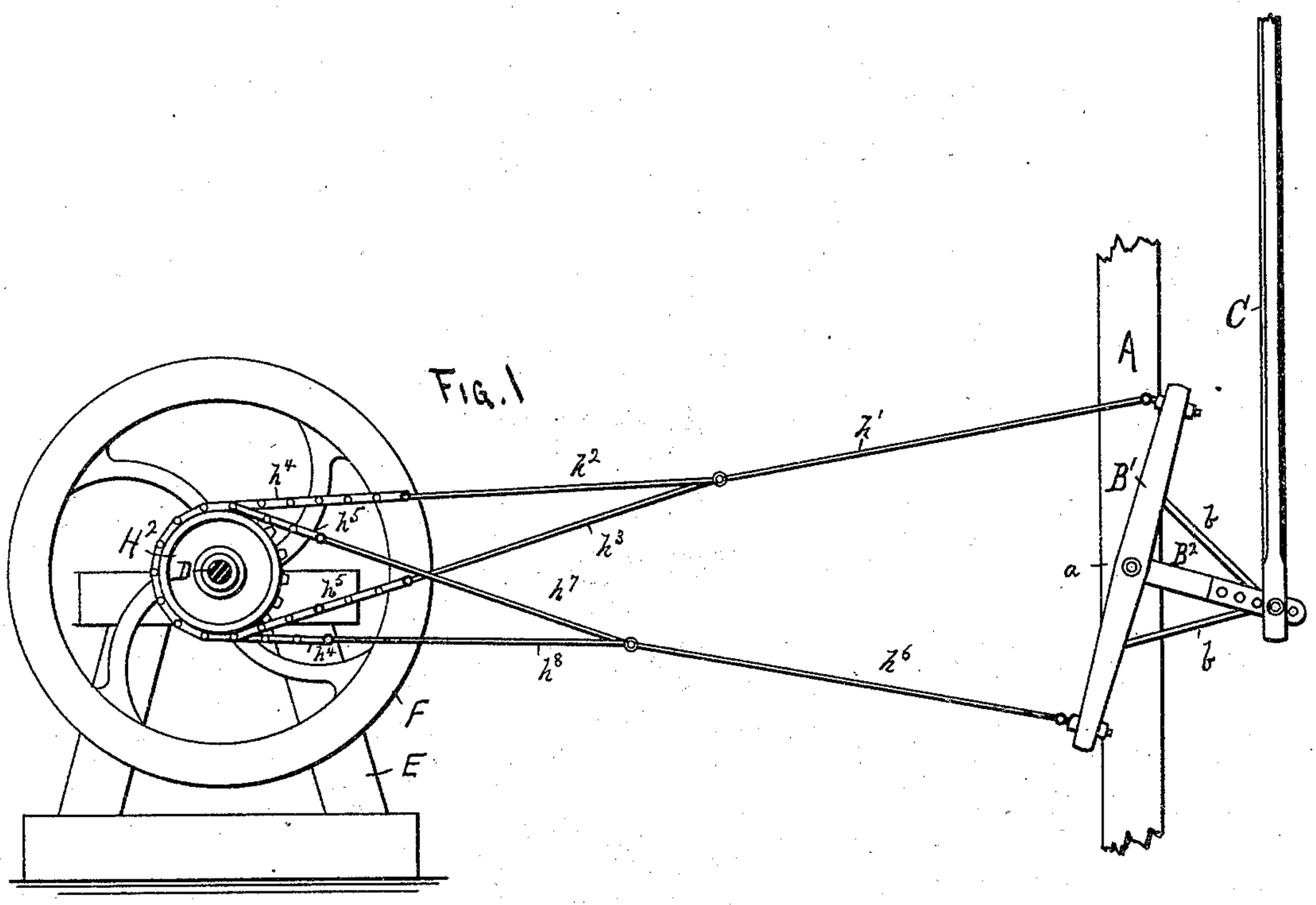


FIG. 2

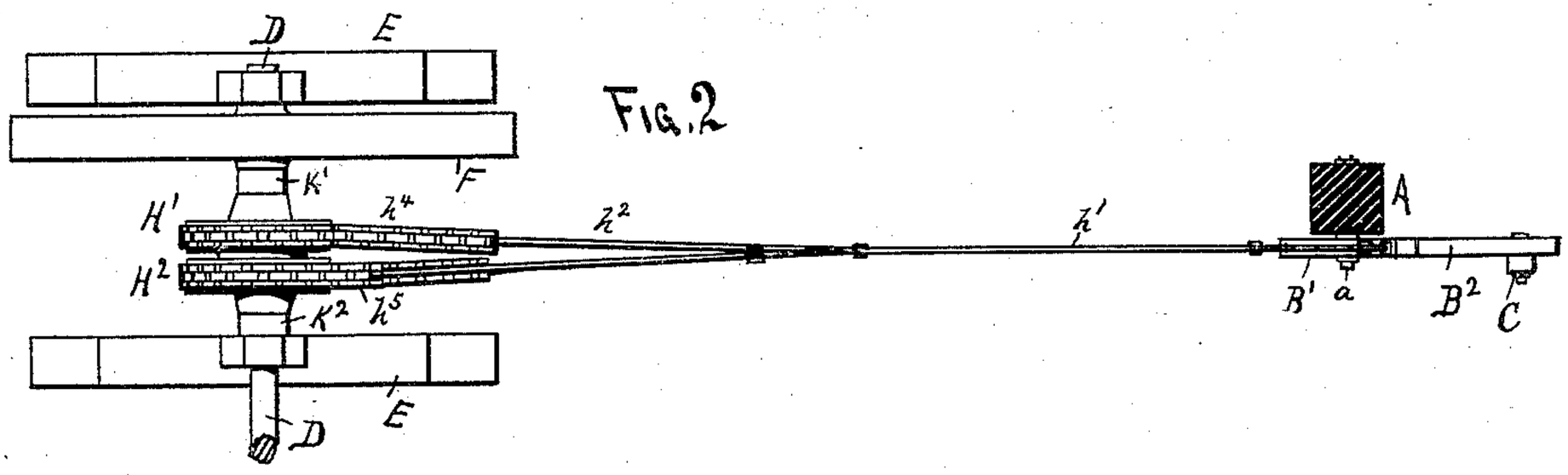


FIG. 3

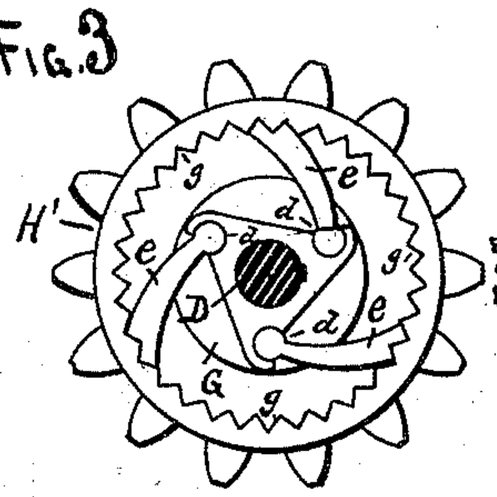


FIG. 4

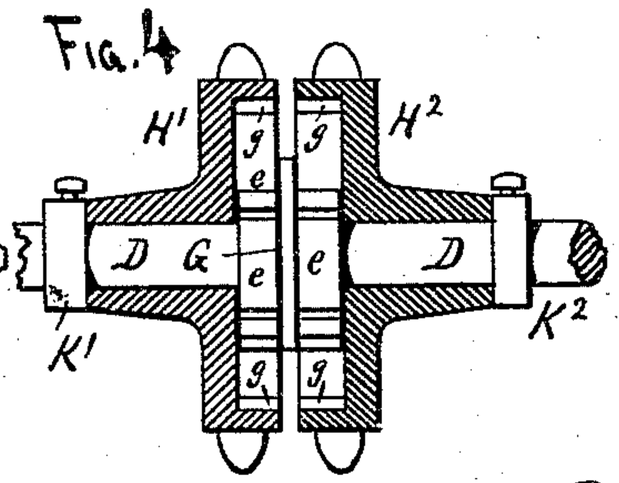
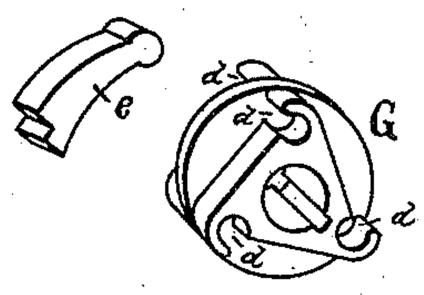


FIG. 5



WITNESSES.
J. Reynolds.
A. L. Roe

David J. Ames
INVENTOR, BY
John B. Sanborn
Atty.

UNITED STATES PATENT OFFICE.

DAVID J. AMES, OF AUSTIN, ASSIGNOR OF ONE-HALF TO McLAUGHLIN, SHELDON & CO., OF OWATONNA, MINNESOTA.

TRANSMITTING RECIPROCAL TO ROTARY MOTION.

SPECIFICATION forming part of Letters Patent No. 285,943, dated October 2, 188?.

Application filed August 3, 1883. (No model.)

To all whom it may concern:

Be it known that I, DAVID J. AMES, a citizen of the United States, residing at Austin, in the county of Mower and State of Minnesota, have made certain new and useful Improvements in Transmitting Reciprocal to Rotary Motion, of which the following is a full, clear, and exact description, reference being also had to the accompanying drawings, in which—

Figure 1 is a side elevation, and Fig. 2 is a plan view, of the apparatus. Fig. 3 is an enlarged sectional side view, and Fig. 4 is an enlarged cross-sectional view, of the double-acting ratchet and pawl, actuated chain-pulleys, and the operating-shaft. Fig. 5 is an enlarged detached perspective view of the pawl-supporting drum and one of the pawls.

This device may be used in many different kinds of mechanical appliances, but is more especially adapted to the transmission of the reciprocal motion of the operating-bar of windmills to the rotary motion of feed-mills and similar machines.

A represents an upright post, either set up for the purpose or forming part of the windmill-frame. Pivoted by its center at *a* to this post A is a bar or lever, B′, having an arm, B², secured to it at right angles, and to the outer end of this arm is secured the lower end of the main operating rising-and-falling bar C of the windmill. The arm B² and lever B′ are suitably stengthened by braces *b*, so that they will retain their same relative positions.

D is a shaft mounted in a suitable frame, E, at any distance away from the post A, as shown. This shaft may be the main driving-shaft of any kind of machine it is desired to operate; or if applied to feed-mills the shaft D will be the spindle of the mill. Fixed upon this shaft D is a balance-wheel, F, and a sleeve or hub, G, the latter being provided with two independent sets of sockets, *d*, (see Fig. 5,) in which two independent sets of pawls, *e*, are set and held by their inner enlarged ends, so that while free to oscillate slightly in the sockets they cannot be removed therefrom except endwise of the sockets.

H′ H² are two sprocket or chain pulleys having hollow interiors provided with teeth *g*, upon which the pawls *e* catch, as shown in Figs. 3 and 4. These chain-pulleys are loose upon the shaft D, but are held in close proximity to the hub G by collars K′ K², fixed to the shaft D. By this means either or both of the chain-pulleys, being revolved in one direction, will engage the pawls with their teeth *g* and revolve the hub G and shaft D, but will slip over the pawls and not affect the shaft or hub when revolved in the opposite direction, so that if the chain-pulleys be alternately oscillated upon the shaft D the latter will be constantly revolved, as one of the chain-pulleys will be revolving the shaft forward during the backward movement of the other one.

h′ is a small rod connected loosely by one end to the upper end of the lever B′, and jointed at its other end to two similar rods, h^2 h^3, one leading to a chain, h^4, running over the chain-pulley H′, and the other leading to a chain, h^5, running underneath the chain-pulley H², as shown.

h^6 is another small rod, connected loosely to the lower end of the lever B′, and jointed at its other end to two small rods, h^7 h^8, leading to the opposite ends of the chains h^4 h^5 from the rods h^2 h^3.

When the bar C is forced downward, the upper end of the bar B′ will be moved outward and the lower end inward, in the position shown in the drawings. This will cause the rod *h′* to draw the chain h^4, by means of the rod h^2, over the pulley H′ and revolve the shaft D a short distance. At the same time the rod h^3 will draw the chain h^5 around the pulley H² from the opposite direction and revolve the pulley backward, but not affecting the shaft D, as the pawls slip over the teeth *g*. Then, when the bar C moves upward the upper end of the lever B′ is moved inward and the lower end outward, thereby causing the rod h^6, by means of the rod h^7, to draw the chain h^5 forward over the chain-pulley H² and revolve the latter and the shaft D a short distance, while at the same time the rod h^8 will draw the chain h^4 backward beneath the pulley H′, and thereby reverse the motion of the latter, so as to be ready for the next stroke. By this means the vibrating motion of the lever B′ will, by means of the rods *h′*, h^2, h^3, h^6, h^7, and h^8 and the chains h^4 h^5, alternately oscillate the pulleys H′ H² upon the

shaft D and revolve the latter constantly, as the small amount of lost motion caused by the change of stroke of the lever B′ will be overcome by the balance-wheel F.

What I claim as new is—

1. A shaft carrying a fixed collar having two independent sets of pawls pivoted thereon, two independent chain-pulleys loose upon said shaft and provided with ratchet-teeth upon their interiors, chains h^4 h^5, centrally-pivoted oscillating bar B′, and a series of rods connecting the free ends of said bar with said chains, substantially as and for the purpose set forth.

2. The combination of the shaft D, hub or collar G, pawls *e*, chain-pulleys H′ H², having teeth *g* on their interiors, chains h^4 h^5, coupling-rods h^2 h^3 h^7 h^8, main rods h' h^6, centrally-pivoted bar B′, having right-angled arm B², and vibrating arm C, substantially as and for the purpose set forth.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

DAVID J. AMES.

Witnesses:
J. M. GREENMAN,
C. H. WILBOUR.