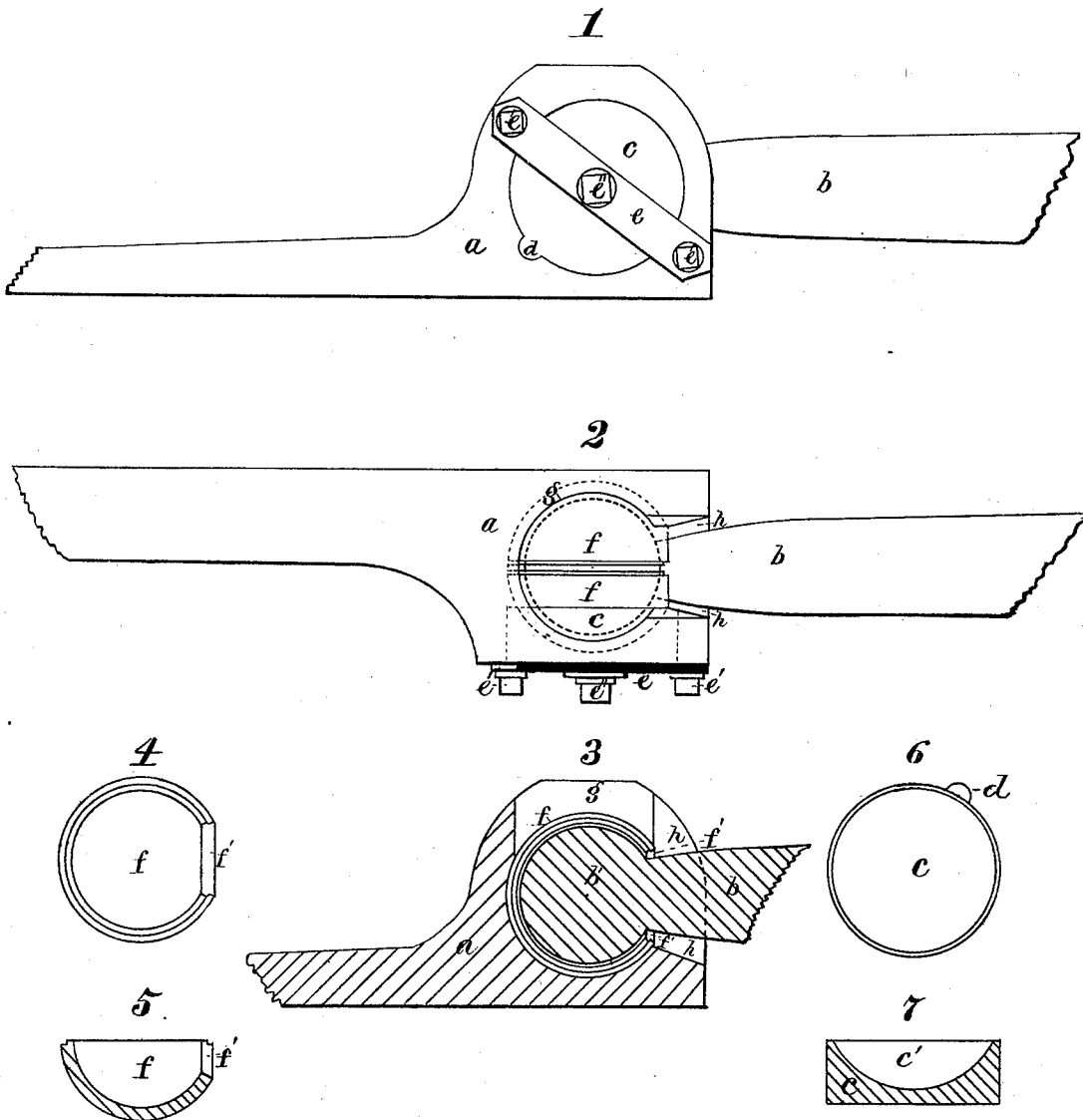


G. H. EARNEST.
PITMAN-CONNECTION.

No. 170,666.

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Witnesses.

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IMPROVEMENT IN PITMAN-CONNECTIONS.

Specification forming part of Letters Patent No. **170,666**, dated December 7, 1875; application filed January 4, 1875.

To all whom it may concern:

Be it known that I, GEORGE H. EARNEST, of the city of Springfield, county of Clarke and State of Ohio, have invented certain Improvements in Pitman-Connections for Harvesters, of which the following is a specification:

My invention relates to improvements in pitman-connections for harvesters, the object being to allow of perfect freedom of motion in the parts in whatever position the sickle or knife may be placed, to relieve the connections from excessive friction and wear; to make the sickle-connection in direct line through the end of its head, instead of on one side, as is usual in pitman-connections, thus making the wear equal on each edge of the knife-bar, the head of the pitman-rod acting as a pivot on which the sickle-head can partially rotate in raising and lowering the points of the guards.

Figure 1 is a side elevation of the sickle-head connection. Fig. 2 is a plan view of the same. Fig. 3 is a vertical section, in elevation, of the connecting parts shown in Figs. 1 and 2. Fig. 4 is an inside view of one of the shells, *f*, shown in Figs. 2 and 3. Fig. 5 is a cross-section of the same. Fig. 6 is a side elevation of the plug-shell *c*. Fig. 7 is a cross-section of the same.

In Fig. 1, *a* is the sickle-head, which is made large enough to give sufficient size to the working parts of the pitman-connection within it. It may be forged in one piece with the knife-bar, or it may be made separately, of malleable iron, and riveted or bolted to it. An opening is made in the front of the head, and another in the top. The latter is made for the introduction of the ball end *b'* of the pitman-rod *b*. The bottom and rear side of the head are intact. The inner part or end of the front hole, in connection with the inside cavity *c'* of the plug-shell *c*, Figs. 1, 2, 6, 7, forms a spherical cavity for the reception of the shell-sections *ff*, (shown in Figs. 2, 4, 5.) Within these is the ball end *b'* of the pitman-rod *b*, Fig. 3. The part *f'* is cut out so as to form a hole when the sections *ff* are placed together for the reception of the neck of the ball. It is made a little larger than that part of the rod which forms the neck, to give sufficient play when operated. It is flared outward correspondingly

with the slot *h*, which is cut down in the middle of the heel end of *a*, from the top hole *g* to near the bottom of the inner cavity, its sides and bottom part being flared or beveled outward, to give room for the movements of this end of the pitman-rod.

It will be noticed that the opening *f'* in the united shell-sections *ff* is not quite so large as the slot, so that the radial movement given to the rod in operating is communicated first to them, they performing almost the same function as the inside ball *b'*, making the connection that of a double ball-joint. A bar, *e*, extends diagonally across the front of the sickle-head *a*, over the plug-shell *c*, Figs. 1 and 2, its ends being screwed down to the head-piece by screws *e'*. It is tapped in the center for the set-screw *e''*, with which it is provided for adjustment of the pressure upon *c*, and taking up lost motion from wear.

In Fig. 2 the position of the plug-shell or cup *c* is shown from the top, and the distance it extends over the half-shell *f* on that side. The exterior of *ff* is shown in the outside circular dotted line. It also shows the spherical shape of the cavity in the back part of the sickle-head, and that of *c'* in the plug-shell *c*. A space is left between the edges of the two shells *f*, for wear. (See Fig. 2.) The inside circular dotted line in this figure represents the ball *b'*. The inside line of shell *f* is more readily seen in the sectional view, Fig. 3, a minute space being seen between them. Slot *h*, which extends from the top hole *g* down to a point below the center of the head *a*, being beveled or flared outward all around, allows the pitman-rod to operate below the level of the cutter-bar, and at less than a right angle when the latter is folded.

The piece which forms the plug-shell *c* may be either of wrought or malleable iron, the key or gib *d*, in either case, being formed on it. It fits into a groove in the side of the hole (in which *c* is inserted) formed to receive it. The object of *d* is to prevent the plug-shell *c* from turning during the operation of connection.

In attaching this end of the pitman-rod to the sickle-head *a*, one of the shells *f* is first inserted into the head from the front through the hole in which plug *c* is shown, Figs. 1 and 2, its openings *f'* toward the heel or right end,

as shown in drawings, Sheet 1, and partially rotated, so as to lie on the bottom of the cavity with its hollow side up. The head of the pitman *b'* is next inserted from the top through hole *g*, allowing the neck to fall down in slot *h*, and the half-opening *f'* in the shell-section *f*, which latter is again partially rotated to its place against the cavity in the back of the head, and the other half-shell, *f*, inserted from the front with its cavity inward over the exposed half of ball-head *b'*, after which the shell-plug *c* is introduced and secured, as before stated.

This form of connection with the sickle-head—having two ball-heads, one within the other, with sufficient space to allow of the easy partial rotation of both in accommodating the movements of the sickle—presents the advantage of large and equable bearing-surface with least amount of friction, working smoothly and easily in any of the varied positions to which the sickle may be subjected, allows the latter to be worked (either forward or backward) out of a right line, and also to be raised to less than a right angle while the machine is in motion.

This construction is applicable to any connection in which there is a reciprocatory movement deviating from a right line.

I am aware that the ball-joint is an old and well-known device, and that many modifications of it have been made; but the improvements shown in my device, and its application to pitman connections and other mechanisms

having like movements in the specific forms and constructions specified, I believe to be new.

I therefore claim as my improvement—

1. In a pitman-connection, a double ball-joint, in which the outer ball consists of the two hemispherical shells *f f*, (divided vertically,) in combination with ball *b'* of pitman-rod *b*, plug-shell *c*, with its key *d* and sickle-head *a*, as shown and specified, as and for the purpose set forth.

2. The combination of sickle-head *a*, hole *g*, with slot *h*, shell-plug *c* with its key *d*, bar *e*, screws *e'*, and set-screws *e''*, as shown and specified, for the purpose hereinbefore set forth.

3. Parts *f'* of shells *f*, in combination with neck of ball *b'*, and slot *h* of sickle-head *a*, as and for the purpose set forth.

4. In combination, pitman-rod *b* with ball-head *b'* and shell-sections *f f*, sickle-head *a* with hole *g*, slot *h*, shell-plug *c*, and the securing and adjusting devices specified, arranged substantially as described.

5. In combination with sickle-head *a*, ball *b'*, shells *f f*, shell-plug *c*, bar *e*, screws *e'*, set-screw *e''*, and rod *b*, with ball *j*, cups *i* and *i'*, wheel *A*, bolt *l*, pin *r*, and nuts *k k' k'*, as shown and specified, as and for the purpose hereinbefore set forth.

GEORGE H. EARNEST.

Attest:

B. C. CONVERSE,
F. POOL.