(No Model.) 2 Sheets—Sheet 1.

W. N. WHITELEY.

GRAIN BINDING HARVESTER.

No. 378,817. Patented Feb. 28, 1888.

Fig. 1.

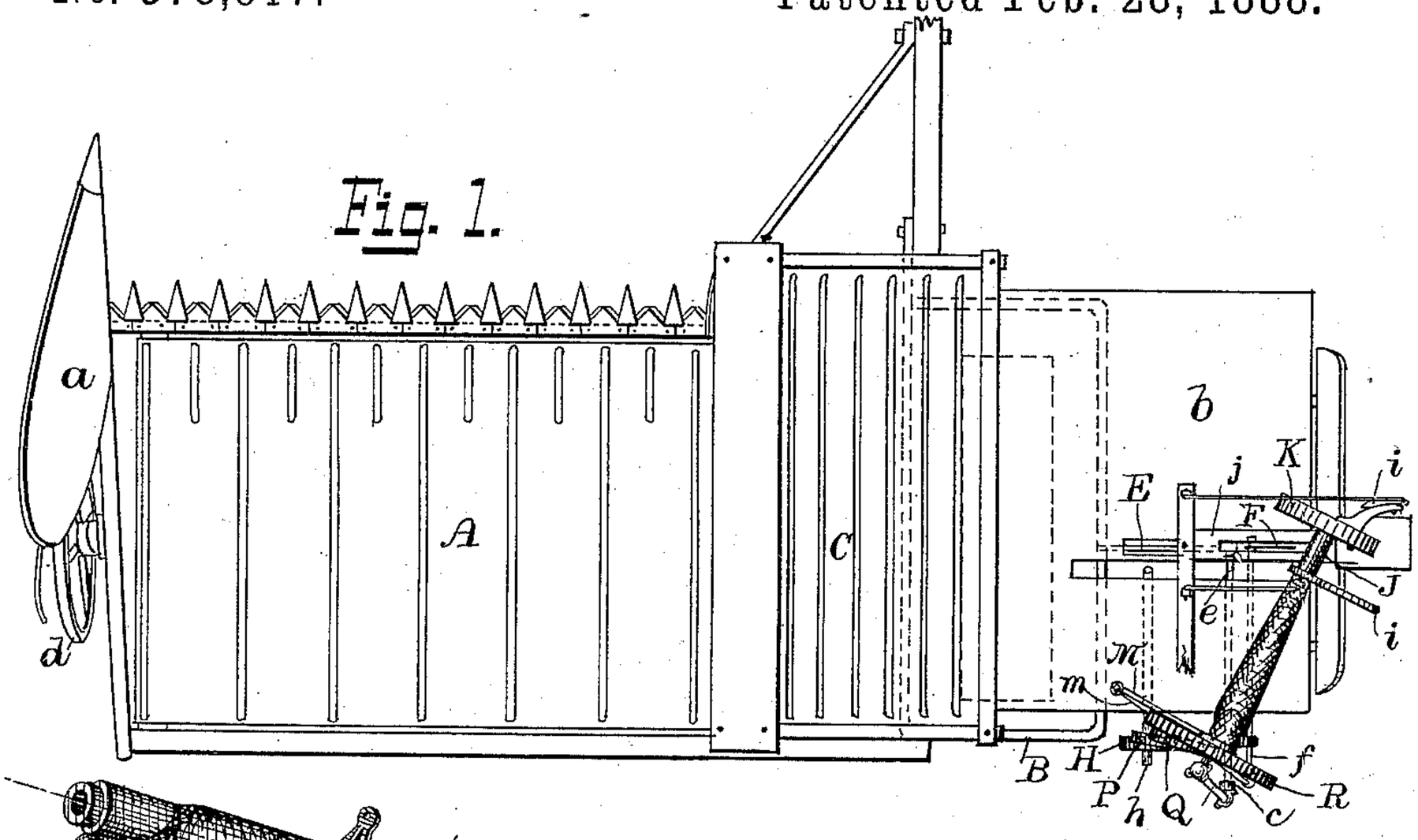


Fig. 3.

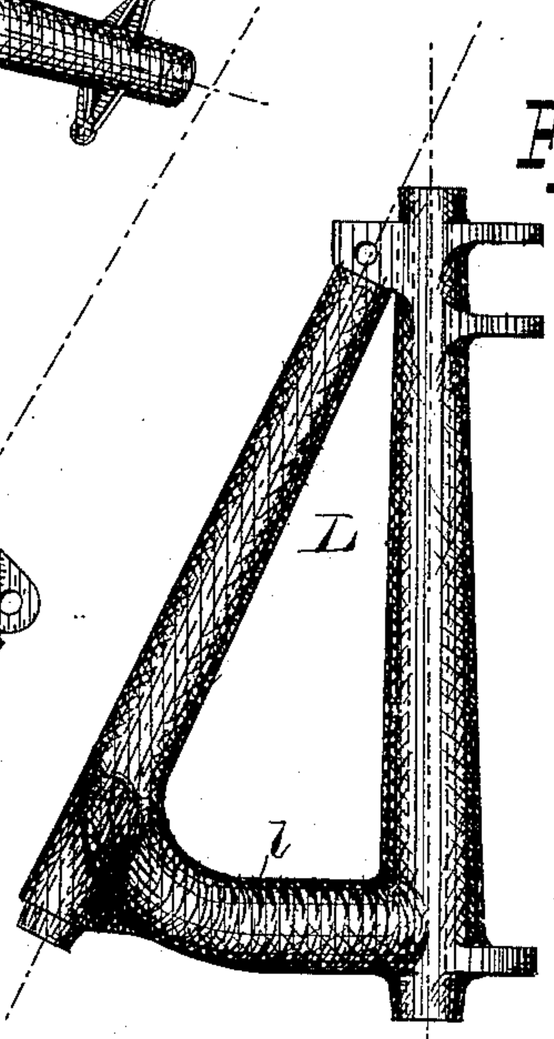


Fig. 4.

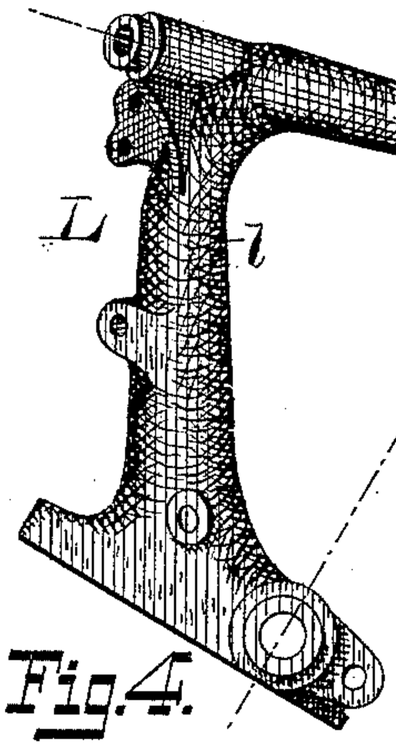
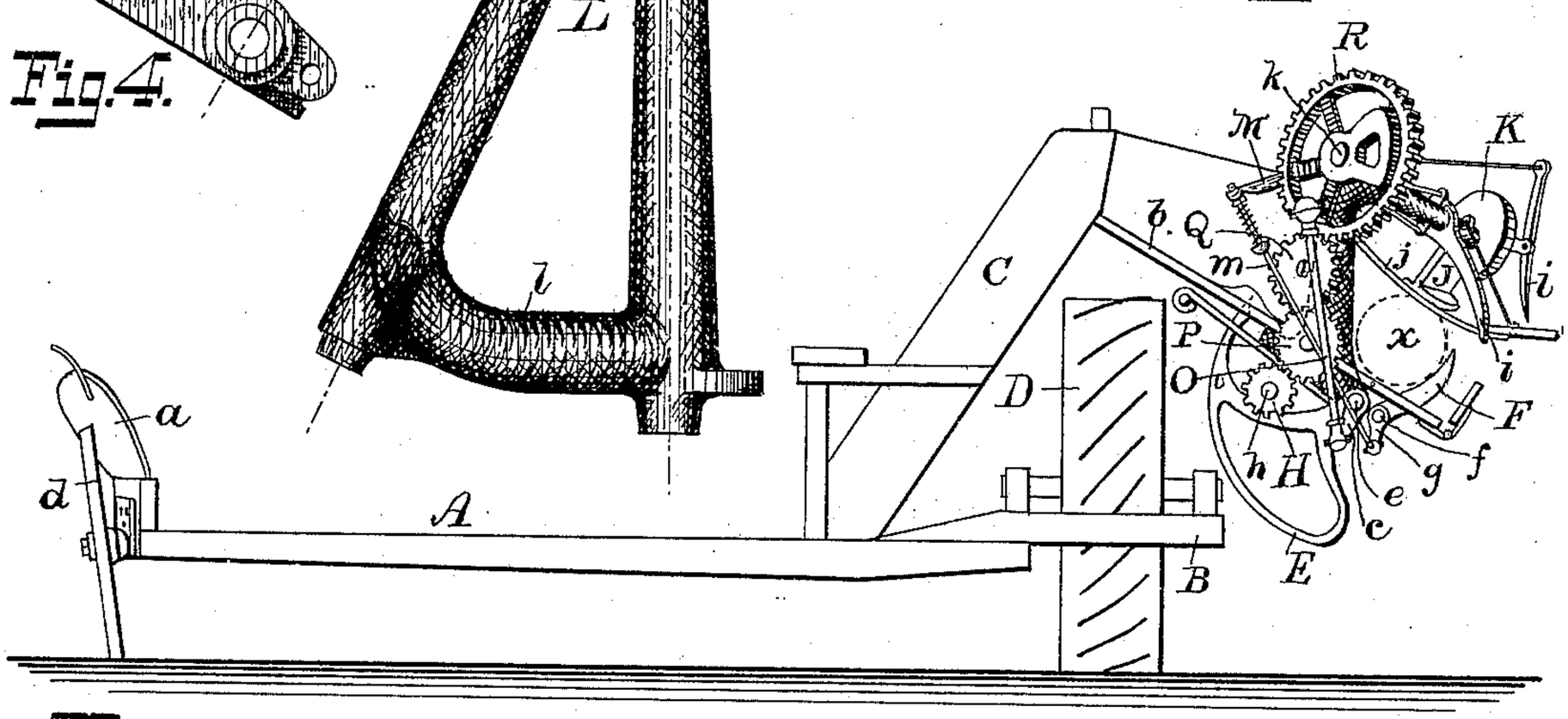


Fig. 2.



Witnesses:

Oscar E. Perrigo.

A. L. Perrigo.

Inventor:

William N. Whiteley.

(No Model.) 2 Sheets—Sheet 2.

W. N. WHITELEY.

GRAIN BINDING HARVESTER.

No. 378,817. Patented Feb. 28, 1888.

Fig. 5.

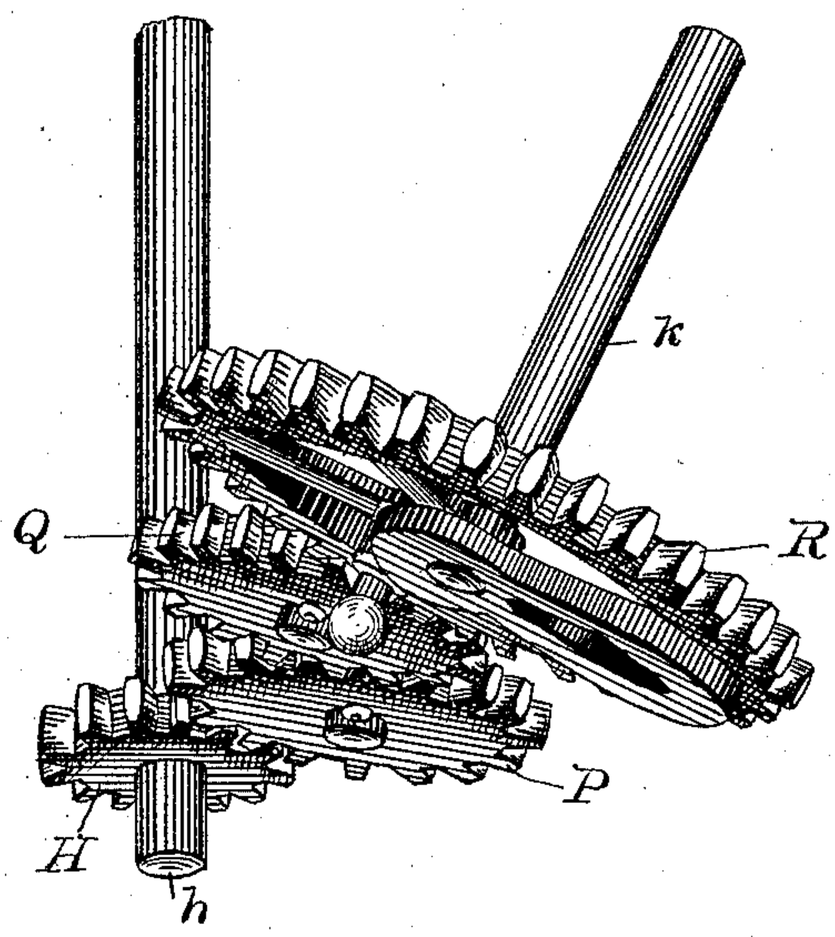
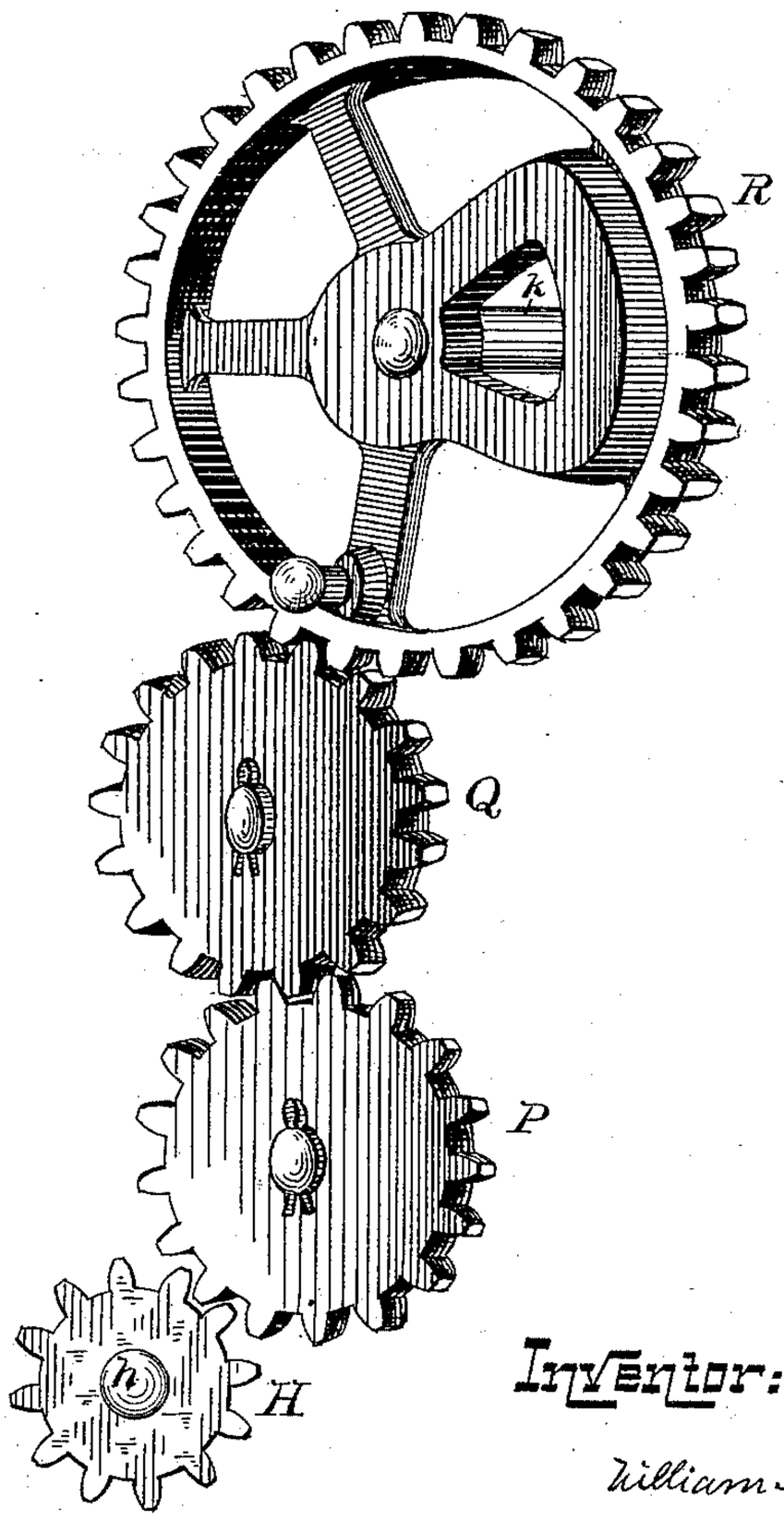


Fig. 6.



Witnesses:

Oscar E. Perrigo

A. L. Perrigo

Inventor:

William N. Whiteley

UNITED STATES PATENT OFFICE.

WILLIAM N. WHITELEY, OF SPRINGFIELD, OHIO.

GRAIN-BINDING HARVESTER.

SPECIFICATION forming part of Letters Patent No. 378,817, dated February 28, 1888.

Application filed March 25, 1887. Serial No. 232,376. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM N. WHITELEY, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Grain-Binding Harvesters, of which the following is a full, clear, and exact description thereof, reference being made to the accompanying drawings, forming a part of this specification.

My invention relates to grain-harvesters in general, and particularly to that class in which the grain is received from the cutting apparatus by elevators and carried up and delivered to a binding-machine, which forms it into gavels, binds it, and discharges the bound bundles to the ground.

It consists in a peculiar construction of the rear geared binder, whereby the binder-shaft and overhanging arm of the binder-frame are set at an acute angle with the line of the packer-shaft and needle-arm shaft and extend forward and outward for the purpose of permitting the free escape of the bound bundle from such a binder.

In grain-binders of this class which have their driving-gearing and the usual connections for operating the compressors, needle-arm, stop device, &c., on the rear end of the binder, as heretofore constructed, these parts and a frame of proper form to support them occupy the end of the binding-receptacle, nearly or quite down to the lower edge thereof, thus forming an obstruction with which the heads of the grain, especially when long or tangled, frequently come in contact as the bundle is ejected. This difficulty has been obviated by placing the gearing and appendages upon the front end of the binder, so as to come next to the butts of the grain, which arrangement, also, I am aware has been accompanied in some cases by an inclination of the binder-shaft relative to the line of advance of the machine, and I do not claim, broadly, a binder-shaft so inclined; but when this is done a still worse difficulty is encountered—namely, the front end of the binder becomes too heavy and overbalances that part, thereby throwing a burdensome weight upon the horses' necks.

To avoid these serious defects is the object of this invention. I accomplish this result by locating the gearing at the rear of the binder, as usual, and extending the tyer-wheel shaft and the overhanging arm of the binder from said gearing forward and outward obliquely across or over the binding-deck—*i. e.*, at an acute angle to the line of the forward movement of the machine and at an obtuse angle to the grain-delivery thereof—and also obliquely to the needle-arm shaft and packer-shaft. Of course the needle-arm shaft and its appendages may also be located obliquely, or the whole binder may be located obliquely, to the line of motion of the harvester as it is drawn forward, as well as to only change the usual plane of the tyer-wheel shaft and the gearing which is connected with it; but I prefer to construct the machine as herein shown and described, as being the most practical mode of construction and operation. When constructed in this manner, it will be observed that the free escape of the bound bundles is insured whether they be discharged by the ejecting device or not, as the binding-gearing, although at the rear of the binder, offers no obstruction to the grain, and will pass away from the bundle in its forward movement and allow the bound bundle to slide off the binding-deck both sidewise and endwise to the ground, the gavel having been previously formed by means of the packers and needle-arm at a point outside of and below the upright portion of the binder-frame and its gearing and appendages.

In the drawings, Figure 1 is a plan view showing the essential parts of a grain-binding harvester embodying my improvements. Fig. 2 is a rear view showing the binder-gearing. Fig. 3 is a plan view of the binder-frame, showing the angle of the tyer-wheel shaft to the needle-arm shaft. Fig. 4 is a rear elevation of said frame. Fig. 5 is a plan view, on an enlarged scale, of the gears communicating motion from the packer-shaft to the tyer-wheel shaft; and Fig. 6 is a rear elevation of the same.

Similar letters refer to like parts in the several views.

A is the grain-platform, B is the main frame, C is the elevators, D is the main wheel, *d* is the grain-wheel, *a* is the divider, *b* is the binder-deck, E is the needle-arm, *e* is the needle-arm shaft, *c* is the needle-arm crank, F is the com-

pressor, *f* is the compressor-shaft, *g* is the compressor-crank, H is the driving-pinion on the packer-shaft, *h* is the packer-shaft, *i i* are the ejectors, J is the knotter, K is the tyer-wheel, and *j* is the breast-plate, all constructed and arranged substantially in the usual manner.

The binder-frame L has the needle-arm shaft *e* journaled in the long pipe-box, which forms its lower portion in the usual manner. The overhanging arm in which the tyer-wheel shaft *k* is journaled is set at an angle of about twenty-five degrees when viewed from the top, as seen in Figs. 1 and 3, for which purpose the upright part *l* is inclined at an angle with the binding-deck *b*, as shown in Figs. 2 and 4. By thus constructing the binder-frame it will be observed, by reference to Figs. 1 and 2, that the gavel *x* is bound at a point outside of and below the line of the upright part *l*, and that, consequently, whether forced out by the ejectors *i i* or not, it is quite impossible for the heads of the bundle to be obstructed by the binder-frame, and it may, therefore, fall to the ground, either sidewise, endwise, or obliquely, without being obstructed in any manner. There is, therefore, no danger of the frequent difficulty of a bundle going out, partly, butt first, the butt striking the ground and the heads coming in contact with some part of the binder, and so shelling out the grain if it is at all dry or slightly overripe. To facilitate the same ends, the compressor-operating rod *m* and the lever M, by which it is actuated, are located toward the inside of the binder-frame, and the binder-wheel R and tyer-wheel shaft *k* being located in a different plane from the compressor-shaft *f* and crank *g*, the rod *m* is provided with ball-and-socket joints at each end. The same provision is made for the needle-arm connecting-rod O. The tyer-wheel shaft *k* being in a different plane from the packer-shaft *h*, necessitates the locating of the intermediate gears, P and Q, on planes intermediate to the inclination of the two former planes to each other, as shown in Figs. 1 and 5. By constructing the teeth of these gears with slightly-rounded faces there is no difficulty, in practice, of transmitting the power from the packer-shaft *h*, by means of the pinion H, intermediate gears, P Q, and binder-wheel R, to the tyer-wheel shaft *k*, as shown in Figs. 1 and 2, and on an enlarged scale in Figs. 5 and 6, in which latter figures the form of the teeth necessary in this construction is shown as clearly as possible on the small scale necessary to be used.

The operation of the machine is identical with the well-known form of "Appleby binders," commonly so called, and shown and described in Letters Patent No. 212,420, dated February 19, 1878, and need not, therefore, be particularly described.

Having thus described my invention and pointed out its application, novelty, and usefulness, what I claim, and desire to secure by Letters Patent, is—

In a grain harvesting and binding machine, the combination, with the binder-frame mounted at the rear of the binder-deck, of the binder-gearing mounted on said frame in the rear of the axle of the main wheel on the vertical post of the binder-frame and nearer the wheel than the bundle holding and compressing devices, the latter and the knotter being situated farther from the wheel than the binder-gearing, and the tyer-wheel shaft extending obliquely forward and outward from said gearing to the knotter.

WILLIAM N. WHITELEY.

Witnesses:

OSCAR E. PERRIGO,

A. S. PERRIGO.