

(No Model.)

2 Sheets—Sheet 2.

W. M. HOLMES.
GRAIN BINDING HARVESTER.

No. 596,594.

Patented Jan. 4, 1898.

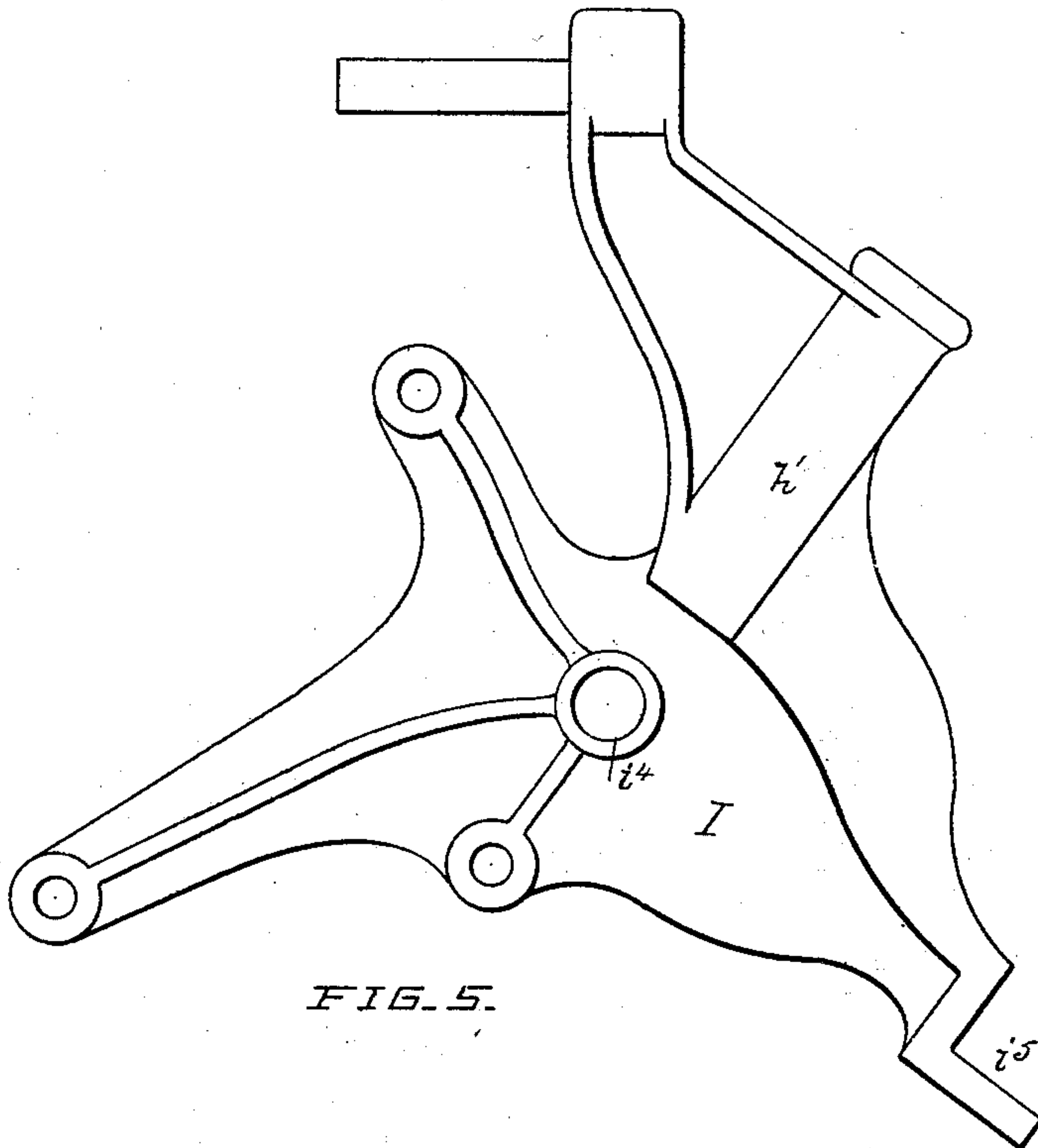


FIG. 5.

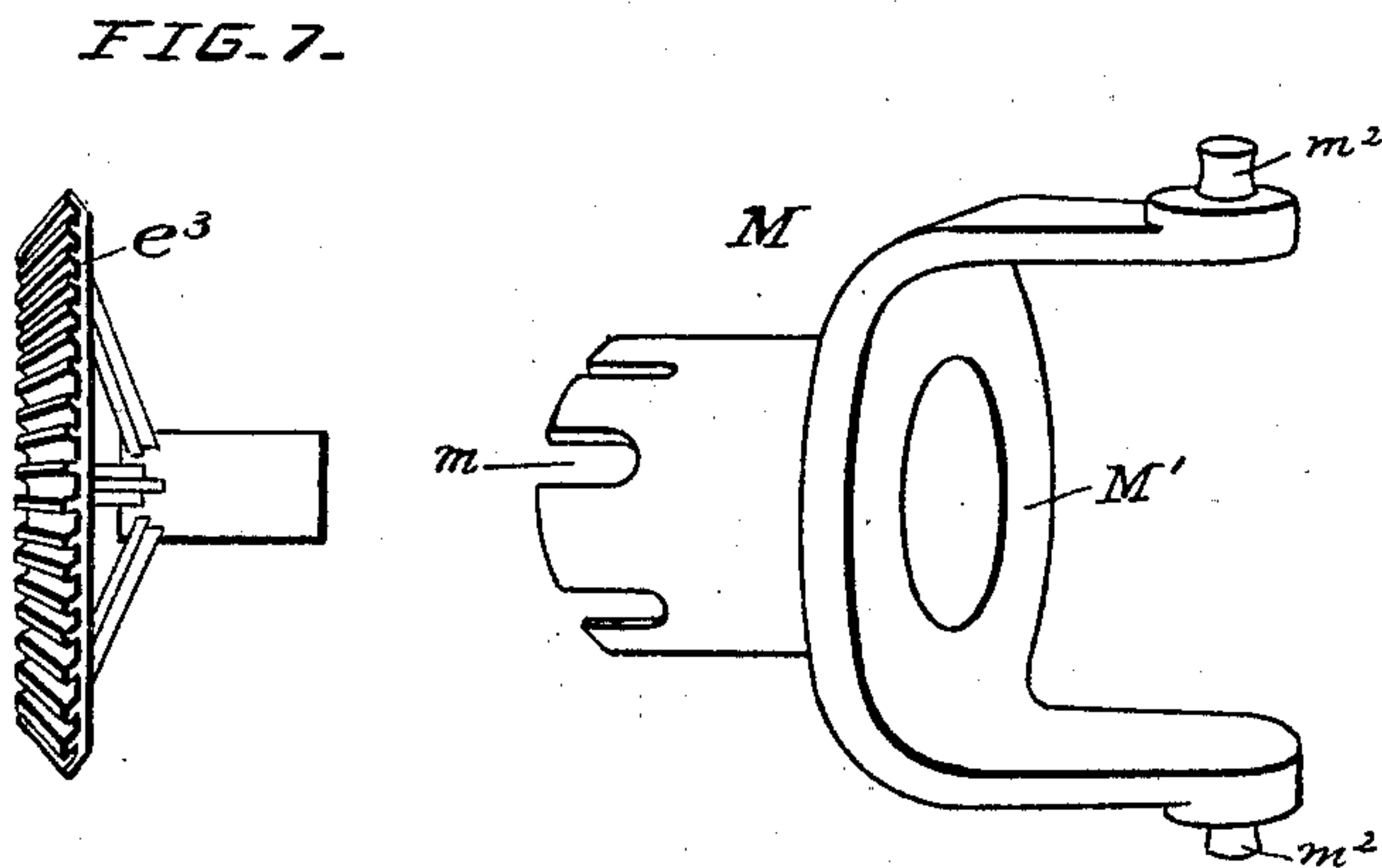


FIG. 6.

WITNESSES:

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GRAIN-BINDING HARVESTER.

SPECIFICATION forming part of Letters Patent No. 596,594, dated January 4, 1898.

Application filed October 4, 1893. Serial No. 487,195. (No model.)

To all whom it may concern:

Be it known that I, WATSON M. HOLMES, a citizen of the United States, residing at Hoosick Falls, Rensselaer county, New York, have invented certain new and useful Improvements in Grain-Binding Harvesters, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates more particularly to the reel-driving devices used on grain-binding harvesters and also to the butter-driving device.

It has for its object simplicity of construction and durability.

It consists of the combination with the pinion on the end of the upper or lower elevator-roller of a gear driven thereby and articulating directly with the horizontal reel-shaft.

It also consists in certain other details of construction and combination of parts, as will be more fully hereinafter described, and pointed out in the claims.

Figure 1 is a front perspective view of a machine embodying my invention, only so much thereof being shown as is necessary for the purpose of illustration. Fig. 2 is a view, partly in elevation and partly in longitudinal vertical section, of the joint and sliding connection between the reel-shaft and the driving mechanism. Fig. 3 is a view in elevation of the two parts of the ring forming part of this connection. Fig. 4 is a detail view of a part of the reel-supporting standard. Fig. 5 is a view in elevation of a casting secured to elevator side and carrying the driving mechanism. Fig. 6 is a perspective of a casting forming part of the reel-driving mechanism. Fig. 7 is a side view of the dished gear-wheel of the mechanism.

In the accompanying drawings, A represents the front elevator side of a harvester of any well-known construction; B, the seat-plank; C, the grain-board; E, the elevator cap or hood; F, the upper roller of the lower elevator. The roller F is driven positively. Its gudgeon projects beyond the front elevator side and carries a pinion e , which meshes with and drives a bevel-gear e' , with which is cast integral a second gear e^2 , which meshes with and drives the gear e^3 , which is articu-

lated directly with the reel-shaft H. The gear e' is threaded internally to receive the lower end of a shaft h , which projects upwardly beyond the box h' on casting I, and at its upper end is formed into a crank i^2 , into the end of which is secured a stud i^3 , on which is pivoted a casting K, to the lower end of which is fastened the butter L. The lower end of the butter L is controlled by a swinging pivoted link, as is usual with reciprocating butters. The upper end of the casting I is provided with a stud secured therein, on which stud the gear e^3 is mounted and revolves.

It will be noticed from the drawings that the gear e^3 is dished or bell-shaped to provide sufficient room for the reciprocation of the crank which drives the butter, the throw of which crank or the radius of its crank-pin being about three and one-fourth inches. The casting I is formed with the bearing i^4 for the pinion e of the elevator-roller, and against this casting the shoulder of the pinion abuts. The operative parts being mounted in the same casting their relative positions are always properly maintained. The casting I also forms a support at i^5 for the grain-board, in proximity to and above which the butter reciprocates. The speed of the roller F to the butter-crank and to the reel-shaft is 11:20::7:46. These ratios are, of course, somewhat dependent upon the diameter of the roller F by which the canvas is driven. With a larger roller than the one shown the diameters of the gears e' e^2 e^3 could be decreased. The casting I projects forwardly of the elevator a sufficient distance to permit the revolution of the gear e^3 .

The malleable casting M is mounted on the stud of gear-wheel e^3 and is provided with scallops or indentations m , which fit over the ribs of the spokes in the gear e^3 . The casting is held on the stud and against endwise play by means of a spring-key and washer.

It is evident that the casting is thus caused to revolve with gear-wheel M. The casting M is also provided with a bifurcated end M, in which are two pintles or studs m^2 . N is a malleable casting cored with a square or rectangular hole and provided also with two pintles n .

O and O' are two rings adapted to be held

together by bolts $o\ o$ and provided with bearings for the pintles m^2 and n , half the bearing being in each ring. In the casting N slides the square or rectangular shaft P, to
 5 the lower end of which is fastened a bifurcated malleable casting p , provided with two pintles. The reel-shaft H is also provided with two pintles, both of these sets of pintles being held or pivoted between two rings similar to O O'. On the reel-shaft is of course
 10 fastened the reel. The reel-shaft is mounted in the end of an arm R, pivoted at r to an upright R', held in an upright position by the notched brace R², by which the arm R' may be adjusted back and forth. The arm
 15 R is adjustable in relation to the arm R' by means of a lever P', connected to the arm R by link p' and pivoted to arm R'. The reel is held in any desired position by means of
 20 detent p^2 and lock p^3 , secured to standard R'. The arm R' is cast hollow to receive a spring P², through which passes a rod P³, the upper end of which is hooked over a cross-piece P⁴ of arm R. The upper end of spring P² is
 25 confined against the end of a chamber secured in arm R', and the lower end is confined against an adjusting-nut on the end of spring-rod P³. The purpose of the spring is to assist the operator in raising the arm R
 30 and the reel carried thereby. The arm R' is pivoted on a pipe p^4 , which is fastened to the seat-plank and serves as a pivot for the arm R' and also as a brace to the elevator side A.
 It is evident that the reel can be adjusted
 35 up and down and back and forth. It is also evident that this motion of the reel is permitted by the universal-joint connection between the reel-shaft and the driving-gear e^3 and the sliding shaft P.
 40 I am aware that the reels have been heretofore driven by means of a worm-gear driven from the upper elevator-roller and articulating by means of a sliding shaft and universal joints with the reel-shaft. The difficulty
 45 with this device is that the motion of the screw is not uniform, and the consequent motion of the reel is uneven. The screw also is

largely disposed to wear. I am also aware that gears have been employed in lieu of the worm and a system of differential reducing-
 50 gears used on the reel-shaft. This latter device is complicated, expensive to manufacture, and has never come generally into use.

It is evident that there must be an intermediate between the gears $e' e^3$ both in order
 55 to impart the requisite direction to the revolutions of the reel and to reduce the speed of the reel.

I claim—

1. The combination with the gear on the upper elevator-roller, of the butter crank-shaft, a gear thereon meshing with the elevator-roller gear, the reel-driving gear, bell-shaped to permit the revolution of the crank carrying the butter and a second gear on the crank-
 65 shaft of the butter to drive the reel-gear as and for the purpose specified.

2. The combination of the reel-shaft, the reel-driving gear having its axis of motion parallel thereto, a universal joint and a sliding connection between the reel-driving gear and the reel-shaft, the elevator-roller, a gear thereon, the butter-driving crank-shaft, and the butter mounted thereon, a second gear on the crank-shaft of the butter meshing with
 75 the reel-driving gear as specified.

3. The casting I having formed centrally therein the bearing for the gudgeon of the elevator upper roller and at right angles thereto the tubular bearing for the butter
 80 crank-shaft and a stud at an angle of about forty-five degrees with said tubular bearing, in combination with a bell-shaped gear-wheel upon said stud, said gear-wheel having its spokes in engagement with a scalloped hub
 85 constituting a part of a universal joint substantially as described.

In witness whereof I have hereunto set my hand this 28th day of September, 1893.

WATSON M. HOLMES.

Attest:

P. MCKEARIN,
 A. H. BRADY.