



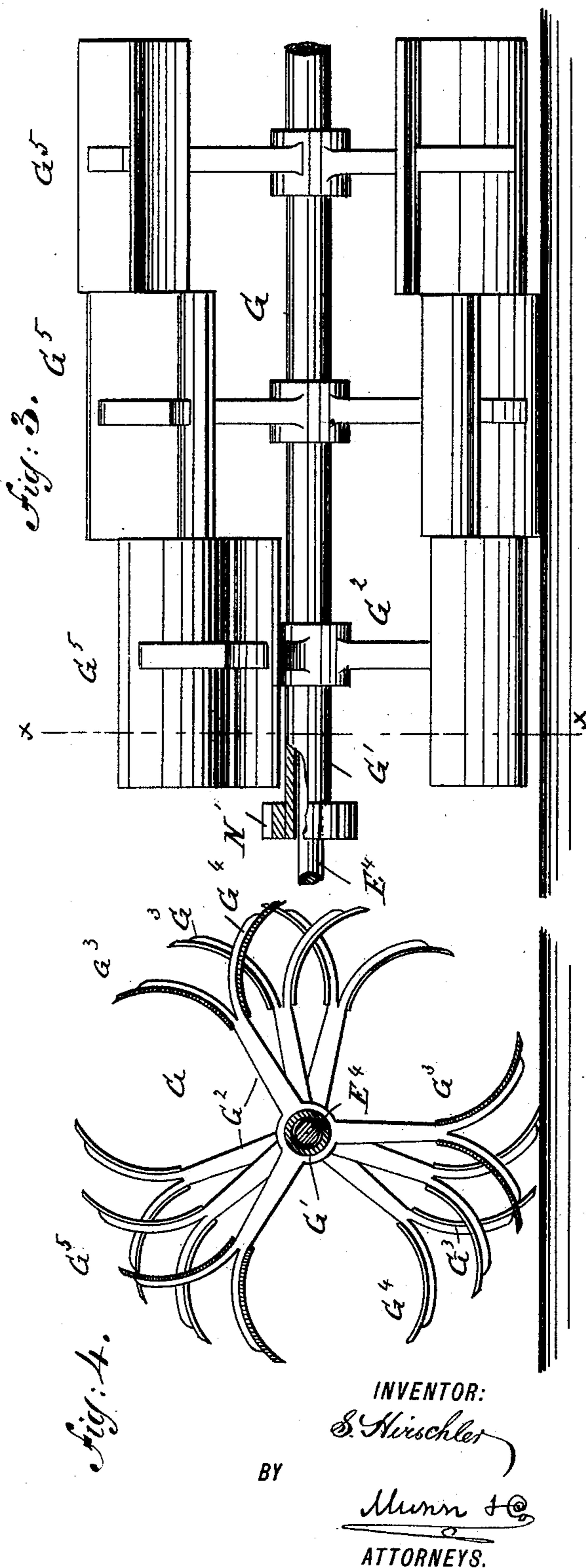
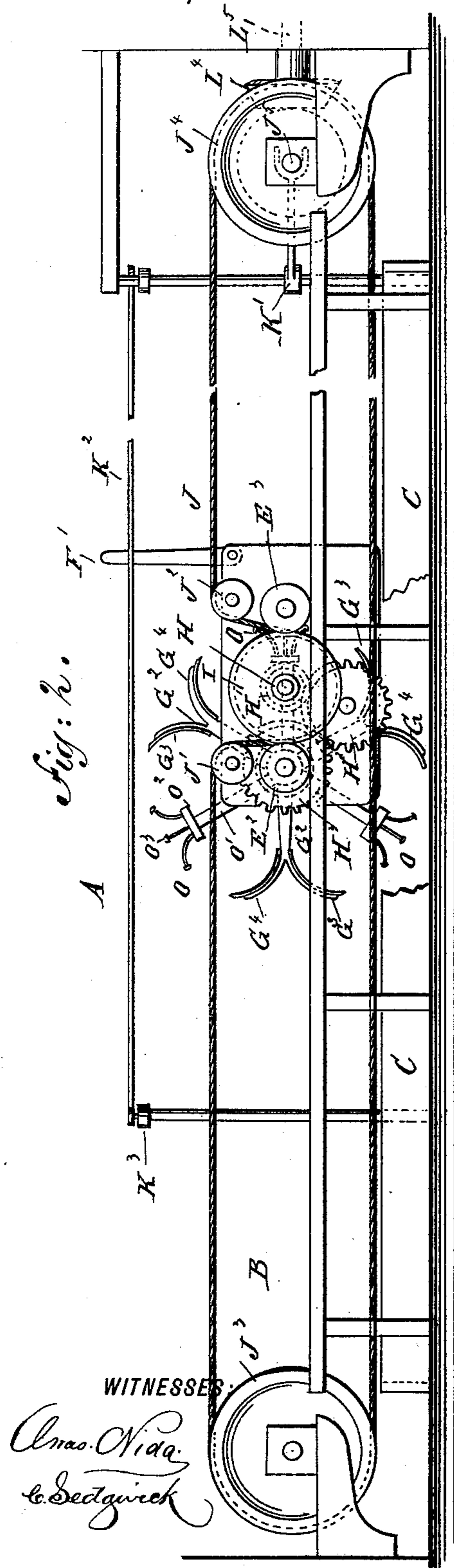
(No Model.)

2 Sheets—Sheet 2.

S. HIRSCHLER.  
GRAIN TURNER.

No. 415,460.

Patented Nov. 19, 1889.



# UNITED STATES PATENT OFFICE.

SIEGFRIED HIRSCHLER, OF WORMS, GERMANY.

## GRAIN-TURNER.

SPECIFICATION forming part of Letters Patent No. 415,460, dated November 19, 1889.

Application filed August 6, 1889. Serial No. 319,892. (No model.)

*To all whom it may concern.*

Be it known that I, SIEGFRIED HIRSCHLER, a subject of the Emperor of Germany, residing at Worms, Germany, have invented new and useful Improvements in Grain-Turners, of which the following is a specification.

The object of the invention is to provide a new and improved machine for conveniently and rapidly turning barley or other grain while undergoing germination during the manufacture of malt.

The invention consists in certain parts and details and combinations of the same, as will be fully described hereinafter, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a plan view of the improvement. Fig. 2 is a side elevation of the same. Fig. 3 is an enlarged side elevation of a modified form of the turning-shovel wheel, and Fig. 4 is a sectional end elevation of the same on the line *xx* of Fig. 3.

The improved grain-turner A is placed in a room B over the floor or box C, containing the germinating barley or other grain to be occasionally turned to facilitate germination. On the sides of the floor or box C are arranged the longitudinal rails D and D', on which are mounted to travel the rollers E E' and E<sup>2</sup> E<sup>3</sup>, respectively, supporting a carriage F, in which is mounted to turn the shovel-wheel G, extending across the entire width of the box or floor C, and serving to turn the grain on the forward and on the backward motion. For this purpose the shovel-wheel G has double shovels—that is, shovels branching in opposite directions, as is plainly shown in Figs. 2 and 4.

On one side of the carriage F is mounted to turn in suitable bearings a shaft H, carrying a grooved pulley I, over which passes an endless rope J, also passing over the grooved rollers J' and J<sup>2</sup>, mounted to turn on suitable studs held on one side of the carriage F. The endless rope J also passes over the grooved wheels J<sup>3</sup> and J<sup>4</sup>, located opposite each other at the end walls of the room B. The shaft J<sup>5</sup> of the grooved wheel J<sup>4</sup> carries a double clutch K, adapted to engage alternately the

clutches L and L', formed on the bevel gear-wheels L<sup>2</sup> and L<sup>3</sup>, respectively, on the shaft J<sup>5</sup>. Both bevel gear-wheels L<sup>2</sup> and L<sup>3</sup> are in mesh with a bevel-pinion L<sup>4</sup>, secured on a shaft L<sup>5</sup>, connected with suitable machinery imparting a rotary motion to the said shaft L<sup>5</sup>. The clutch K is thrown in contact with either of the clutches L or L' by the hand-lever K' engaging said clutch K. The double clutch K is automatically thrown out of contact with either of the said clutches by the carriage F whenever the latter arrives at one end of the box or floor C. For this purpose the lever K' is connected by a rod K<sup>2</sup> with a lever K<sup>3</sup>, located opposite the lever K' at the other end of the box or floor C.

An arm F' is held on the carriage F, and is adapted to engage alternately the levers K' and K<sup>3</sup>, according to the direction in which the said carriage travels over the floor C. When the arm F' strikes either of the said levers K' or K<sup>3</sup>, the double clutch K is thrown out of contact with the clutch L or L', respectively. On the shaft H is held a pinion H', meshing into an intermediate gear-wheel H<sup>2</sup>, in mesh with the gear-wheel H<sup>3</sup>, secured on the axle E<sup>4</sup>, carrying the rollers E and E<sup>2</sup>.

When the clutch K is in contact with either of the clutches L or L', the respective gear-wheel L<sup>2</sup> or L<sup>3</sup> turns said double clutch K, thereby turning the shaft J<sup>5</sup> and imparting a rotary motion to the grooved wheel J<sup>4</sup>. The endless rope J, passing over the said grooved wheel J<sup>4</sup>, imparts a rotary motion to the grooved pulley I, so that the shaft H is rotated, and the latter, by means of the gear-wheels H', H<sup>2</sup>, and H<sup>3</sup>, turns the axle E<sup>4</sup>, thereby turning the rollers E and E<sup>2</sup>, whereby the carriage F is forced to travel forward or backward over the box C on the rails D and D'. On the shaft H is also secured a gear-wheel N, which meshes into a gear-wheel N', secured on one end of a hub G', mounted to turn in suitable bearings in the sides of the carriage F, and through which passes the axle E<sup>4</sup>, previously mentioned. The hub G' is part of the shovel-wheel G, and supports the radial arms G<sup>2</sup>, which carry, at their upper ends, the transversely-extending shovel-blades G<sup>3</sup> and G<sup>4</sup>, arranged to extend in opposite directions, so as to turn the grain during the forward and backward motion of the

carriage F. When the latter moves forward and backward, as previously described, the shaft H turns and consequently imparts, by the gear-wheels N and N', a revolving motion to the shovel-wheel G, whereby the respective shovel-blades G<sup>3</sup> and G<sup>4</sup> dip into the grain in the box C to lift the same and turn it over.

In order to agitate the germinating grain, forks O are arranged between the double-shovel blades G<sup>3</sup> and G<sup>4</sup>, as is plainly shown in Fig. 2. Each of the forks comprises radial arms O', set into the hub G' and carrying at their outer ends transversely-extending boards O<sup>2</sup>, in which are secured outwardly-projecting nails or spikes O<sup>3</sup>, as is plainly shown in Figs. 1 and 2.

It is understood that the shovel-blades G<sup>3</sup> and G<sup>4</sup>, when in their lowermost position, reach to within a short distance of the bottom of the box C, as is plainly shown in Fig. 2, so that all the grain resting on the said box is turned over.

Instead of arranging the shovel-wheel G as previously described, it may be made as shown in Figs. 3 and 4, in which the shovel-blades do not extend the entire length of the shovel, but are made shorter, and a series G<sup>5</sup> of such shovel-blades is employed, set one behind the other across the box C, so that the shovels do not pass simultaneously into the grain, but one after the other, thus relieving the machine of any undue strain.

In order to hold the carriage F on the rails D and D', one side of the carriage F is provided with an arm P, carrying the rollers P' and P<sup>2</sup>, traveling on the side of the rail D, as is plainly shown in Fig. 1.

The operation is as follows: The carriage F when at rest always stands at one end of the floor or box C, the double clutch K then being out of mesh with both clutches L and L'. When the operator desires to turn the grain, he shifts the lever K', so that the double clutch K is shifted and engages either of the clutches L or L', according to the direction in which the carriage F is to travel. The shaft J<sup>5</sup> is thus rotated, whereby the rope J imparts a traveling motion to the said carriage F by the means previously described. The carriage F moves slowly forward, and the shovel-wheel G is rotated at the same time in the direction opposite to the forward movement of the carriage F. The respective shovel-blades G<sup>3</sup> or G<sup>4</sup> pass into the grain, lift the same up, and throw it down again, thereby turning it over. As soon as the carriage F reaches the respective end of the floor or box C, the arm F' comes in contact with either lever K' or K<sup>3</sup>, thus forcing the lever K' to move the double clutch K out of contact with the respective clutch L or L'. The carriage F thus comes to a standstill, and at the same time the rotary motion of the shovel-wheel G ceases. The apparatus is then at rest usually for several hours, and when the operator again de-

sires to start the machine on its return movement he has to shift the lever K', so that the double clutch K engages the clutch L or L', respectively. The above-described operation is then repeated.

It is understood that as the shovel-blades G<sup>3</sup> and G<sup>4</sup> are curved the grain falls out of the respective blade at about a quarter-revolution of the wheel G after the grain is packed up.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The combination, with the parallel longitudinal guide-rails, of a grain-turning wheel having a hollow hub G', journaled in the sides of the carriage and provided at one projecting end with a pinion N', the axle E<sup>4</sup>, passing through said hub and provided at its ends with rollers E E<sup>2</sup>, traveling on said rails, and with a gear-wheel H<sup>3</sup> between roller E<sup>2</sup> and pinion N', the short shaft H, provided with a gear N, meshing into pinion N', and with a pinion H', a pinion H<sup>2</sup>, meshing into gear H<sup>3</sup> and pinion H', means for rotating the shaft H and reciprocating the carriage, and rollers E' E<sup>3</sup> on opposite sides of the carriage traveling on the rails, substantially as set forth.

2. The combination, with the parallel longitudinal rails D D' and the pulleys J<sup>3</sup> J<sup>4</sup> at the ends thereof, of a reciprocating carriage provided at its opposite sides with rollers E' E<sup>3</sup>, traveling on said rails, a short shaft H at the center of one side and provided with gear-wheel N, pinion H', and pulley I, the grain-turning wheel having a hollow hub journaled at its ends in the sides of the frame and provided with a pinion N', meshing into the gear-wheel N, the axle E<sup>4</sup>, extending through the said hub and provided beyond the ends of the hub with rollers E E<sup>2</sup>, traveling on the said rails, and with a gear-wheel H<sup>3</sup>, the gear H<sup>2</sup>, meshing with pinion H', gear H<sup>3</sup>, the pulleys J' J<sup>2</sup> above and at opposite sides of the pulley I, the endless driving-strand J, passing at its upper side under pulley I and over pulleys J' J<sup>2</sup>, and a reversing mechanism, substantially as set forth.

3. In a grain-turner, the wheel G, provided with arms G<sup>2</sup>, having oppositely-projecting double shovels G<sup>3</sup> G<sup>4</sup> at their outer ends, and the forks O, arranged between the pairs of shovels and each comprising radial arms O', having transversely-extending bars O<sup>2</sup> at their outer ends provided with central and outer oppositely-projecting nails or spikes O<sup>3</sup>, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

SIEGFRIED HIRSCHLER.

Witnesses:

FRANZ HASSLACHER,  
JOSEPH PATRICK.