(No Model.)

G. FRANCIS.

APPARATUS FOR HANDLING GRAIN IN BAGS.

No. 360,578. Patented Apr. 5, 1887.

Fig. 1.

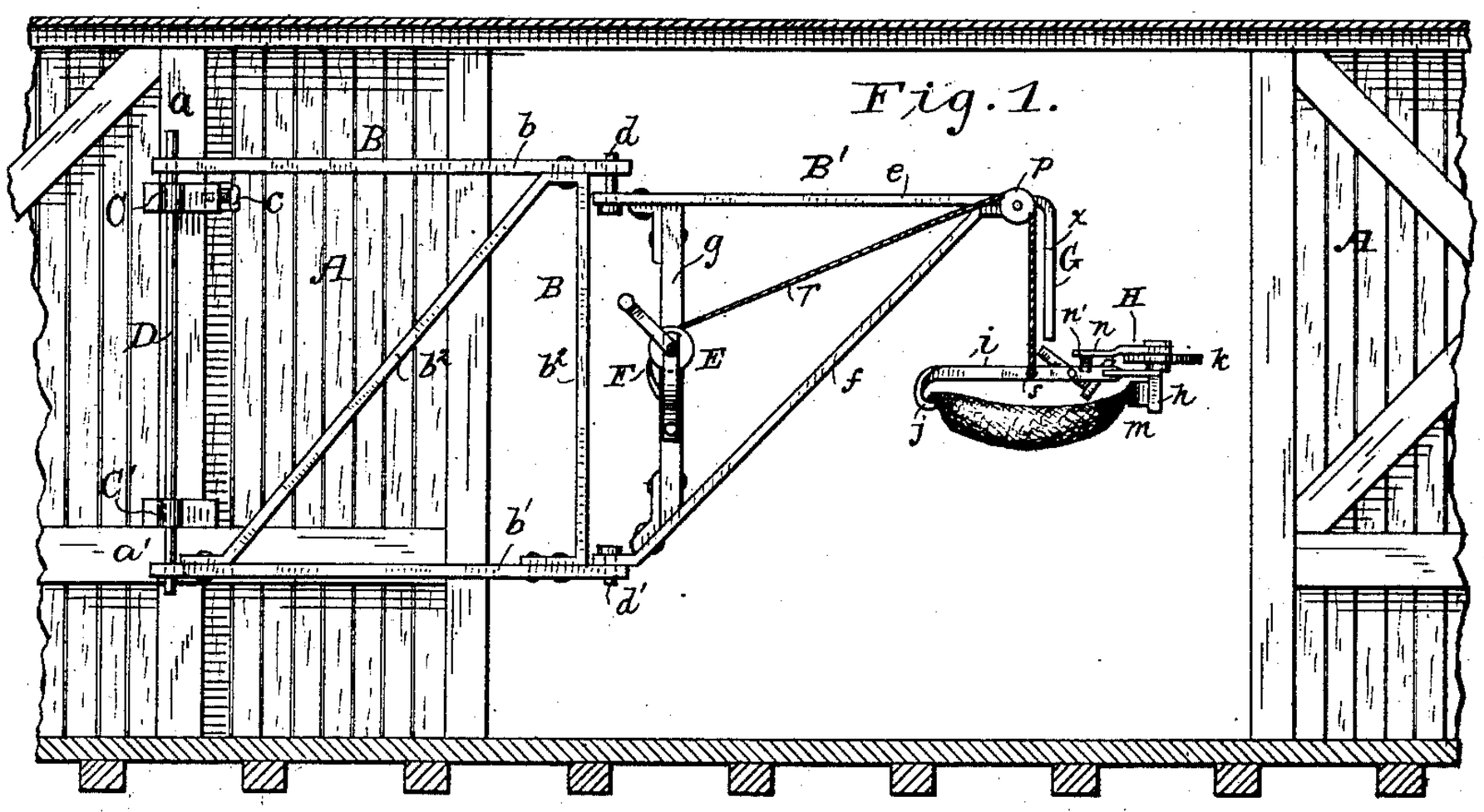


Fig. 2.

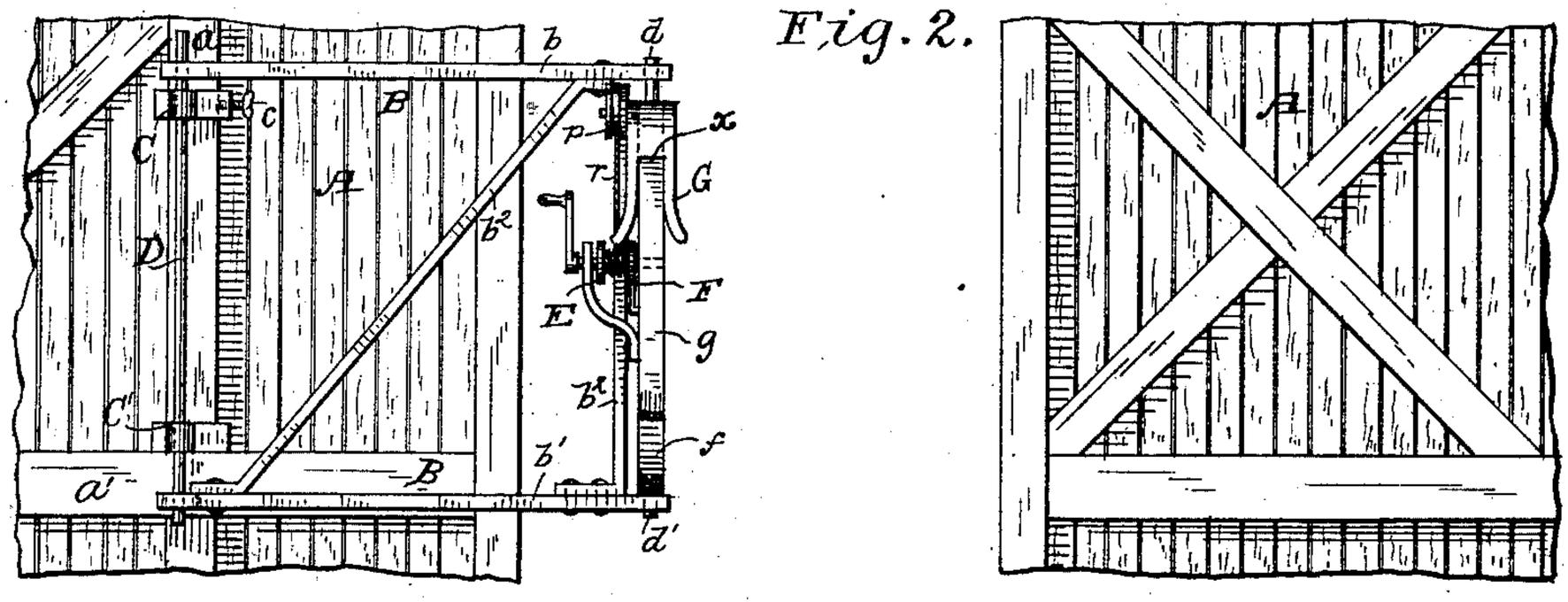


Fig. 3.

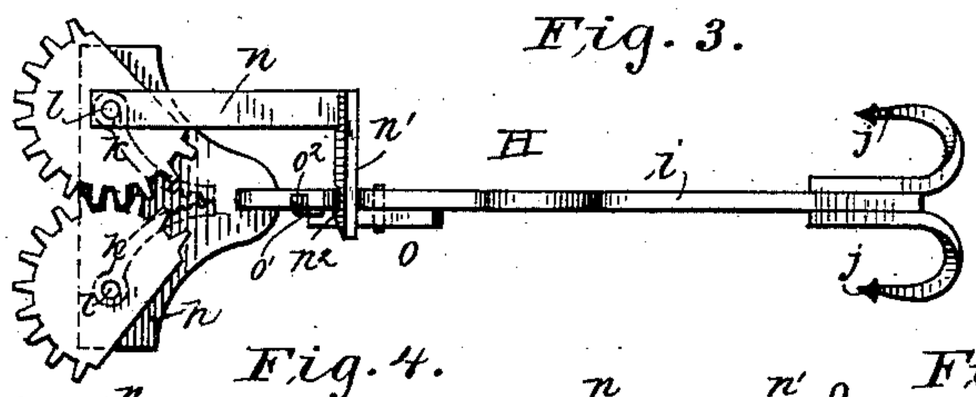


Fig. 4.

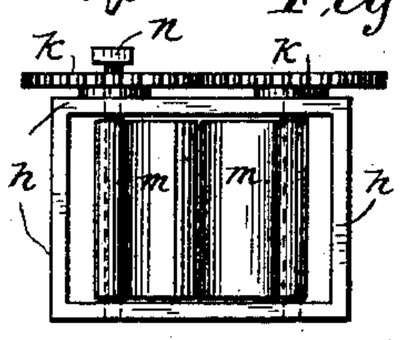


Fig. 5.

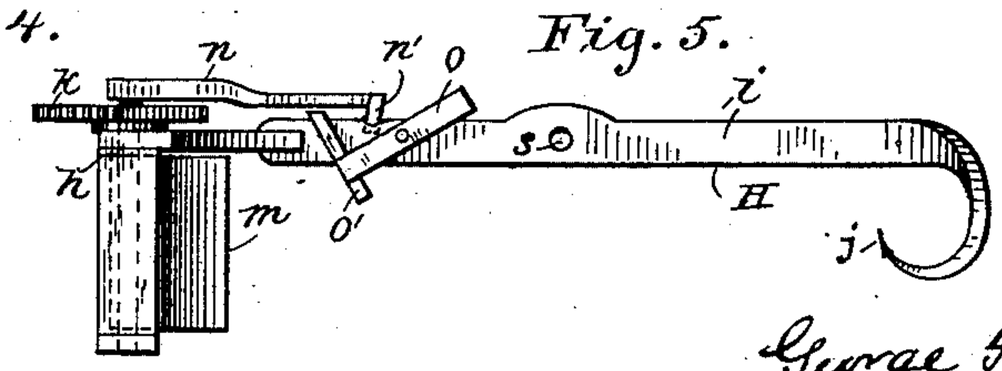
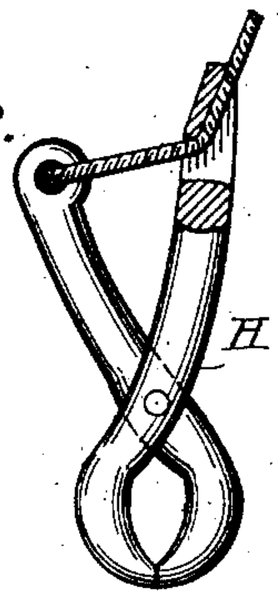


Fig. 6.



Witnesses
Jos. S. Lahmer
D. B. Gallatin

George Francis
Inventor
By Wm. Hunter Myers
attorney

UNITED STATES PATENT OFFICE.

GEORGE FRANCIS, OF ANSONIA, OHIO.

APPARATUS FOR HANDLING GRAIN IN BAGS.

SPECIFICATION forming part of Letters Patent No. 360,578, dated April 5, 1887.

Application filed July 3, 1886. Serial No. 207,108. (No model.)

To all whom it may concern:

Be it known that I, GEORGE FRANCIS, a citizen of the United States, residing at Ansonia, in the county of Darke and State of Ohio, have invented certain new and useful Improvements in Apparatus for Handling Grain in Bags; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an apparatus for handling grain in bags; and it has for its object the provision of cheap, simple, and effective mechanism for lifting bags of grain from a wagon into a car or warehouse, and, if desired, emptying the bags.

The invention consists in a crane of novel construction, with which is combined a windlass, a rope, and a bag holder or grapple attached to the rope, all as hereinafter described, and fully set forth in the claims.

In the accompanying drawings, Figure 1 is a longitudinal section of so much of a car as is necessary to exhibit the application of my invention, and a side elevation of the crane, the bag holder or grapple, and a bag of grain. Fig. 2 is a front view of the outer section of the crane swung at a right angle to the inner section, the bag-holder being removed and the inclined brace broken away. Fig. 3 is a plan view of my improved bag holder or grapple with the jaws closed. Fig. 4 is an end view of the same. Fig. 5 is a side elevation of the same with the jaws open. Fig. 6 is a side elevation, partly in section, of an ordinary grapple.

Referring to the annexed drawings, A represents a freight-car, the open space indicating the doorway.

B B′ represent my improved crane, which is made in two sections.

The inner section, B, of the crane consists simply of two horizontal arms, *b b′*, and vertical and diagonal braces b^2. This section is to be attached to the first rib of the car, inside the door, as *a*, and this attachment is effected by means of two brackets, C C′, and a hinge-rod, D. The brackets are adapted to embrace the sides of rib *a*, and the upper one, C, is secured to said rib by means of a thumb-screw, *c*, while the lower one, C′, is free to slide on the rib, so that it may rest on the nail-tie *a′*, whether the latter is high or low in the car. Rod D passes through these brackets, the upper end extending above bracket C far enough to receive the end of arm *b* of the crane, which arm is perforated for the purpose of slipping loosely over the rod. The hinge-rod is tightly fitted into the upper bracket, but is loose in the lower one, so that the latter may be moved to a suitable position to rest on the nail-tie. The lower arm, *b′*, of the crane is not perforated, but is forked, so that it may slip astride the hinge-rod and rest against it. It will be seen that by this arrangement the crane can be put up and taken down in a very short time, and also that it can be attached to either side of the car.

The outer section, B′, of the crane consists of a horizontal arm, *e*, an inclined brace, *f*, and a vertical post, *g*, the upper end of said post being riveted to arm *e*, and its lower end likewise secured to the inclined brace, all as clearly shown in Fig. 1. This section of the crane is hinged to section B by two pins, *d d′*, one of which, *d*, is fixed in arm *e* and passes through a hole in the outer end of arm *b* of section B, the other pin, *d′*, being fixed in brace *f*, and passing through a hole in the outer end of arm *b′*. The hinged end of section B′ is not so wide as the other section, and therefore pin *d* should be somewhat longer than pin *d′*. By this construction section B′ can be readily detached from section B by simply lifting it until pin *d′* is raised out of the hole in arm *b′*, and then lowering it until pin *d* is withdrawn from arm *b*.

E represents a windlass mounted in brackets on post *g*. To the windlass is attached one end of a rope, *r*, the other end of which passes over a pulley, *p*, journaled at the outer end of arm *e*, and is attached to a bag holder or grapple.

F represents a pawl-and-ratchet mechanism for operation in connection with the windlass.

G represents what I term a "trip," the purpose of which will hereinafter appear. This trip, as will be seen in Fig. 2, is bifurcated and hangs in the path of the bag-holder as it is being elevated, the trip being either formed integral with arm *e* of section B or attached to the end thereof.

H represents a bag holder or grapple, de-

signed for use when it is desired to empty the grain from the bag. This device is constructed as follows: *h* is a rectangular frame, the top plate of which extends considerably to the rear of the other portion of the frame, as seen in Figs. 3 and 5, and to the rear end of this top plate is secured one end of a bar, *i*, which bar is provided at its other end with barbed hooks *j*. Near the center of the bar is a hole, *s*, in which to secure the elevating-rope *r*. *k k* are two segmental gear-wheels mounted outside of frame *h* on shafts *l*, which pass through and are journaled in said frame in such relation to each other that the segments *k k* will mesh. To shafts *l* inside frame *h* are rigidly secured two jaws, *m*, serrated on the inside at their outer ends, as seen in Fig. 4. To the shaft *l* of one of the segments *k* is rigidly attached an arm, *n*, carrying at its outer end a finger, *n'*, notched at n^2, for the purpose of engaging with bar *i* to hold the jaws *m* in a closed condition.

O represents a lever pivoted to the side of bar *i* in such position that its forward end will underlie finger *n'*. This lever is provided at its extreme forward end with a cross-strip, *o'*, whose ends are bent at a right angle, as at o^2, for engaging with bar *i*, and thereby limiting the movements of the lever.

It is to be understood that my improved grain-handling apparatus is as well adapted for use in a warehouse as in a car.

The operation of my invention is as follows: Assuming that bags of grain are to be lifted from a wagon into a car or a warehouse and that the grain is to be discharged from the bags, the grapple shown in Figs. 1, 3, 4, and 5 is to be secured to the elevating-rope. Section B' of the crane is then swung out over the wagon, the grapple is lowered, and its hooks fastened in the bottom of the bag, after which the bag is untied and its mouth placed in the jaws at the other end of the holder or grapple, when arm *n* is drawn around until the notch n^2 in finger *n'* engages with bar *i*, which serves to hold the jaws firmly clamped together. The windlass is then turned and the bag elevated until it reaches the lower end of the trip, when the crane is swung into the car or warehouse, after which the bag is further elevated until the grapple-lever *o* strikes the trip G at *x*, when the former is depressed, thus disengaging finger *n'* from bar *i*, when the weight of the bag will draw the jaws apart and allow the open end of the bag to drop.

When it is desired not to empty the grain, but to simply deposit the filled bags in the car or warehouse, I employ any ordinary grapple—such a one, for instance, as is shown in Fig. 6—in place of the one above described. When this ordinary grapple is used, the operation of the apparatus will be apparent without description.

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

1. The combination, with a two-part crane, the inner section of which is hinged to a fixed support, and the outer section hinged to the inner section, of a windlass, an elevating-rope, and a bag-holding device, substantially as described, and for the purpose set forth.

2. The combination, with a crane constructed as herein described and a fixed support, of two brackets adjustable on said support, and a hinged rod, the said rod being rigidly secured in one of the brackets and loose in the other, substantially as shown and described.

3. A two-part crane in which the outer section is narrower than the inner section, and is provided at top and bottom with fixed hinge-pins for taking into perforations in the outer ends of the upper and lower arms of the inner section, the pin at the top being longer than the pin at the bottom, for the purpose set forth.

4. The combination, with a two-part crane, the inner section of which is hinged to a fixed support and the outer section hinged to the inner section, of a windlass, an elevating-rope, a trip, and a bag-holding device so constructed that its jaws will be opened on contact of the holder with the trip, substantially as set forth.

5. The combination, with a crane, a windlass, a pulley, and a rope, and a trip, all constructed and arranged substantially in the manner above set forth, of a bag-holding device consisting of frame *h*, in which are journaled shafts *l*, carrying inside the frame the jaws *m*, and outside the frame the segments *k*, arm *n*, provided with notched finger *n'*, bar *i*, provided at its outer end with hooks *j*, and lever *o*, pivoted to the side of bar *i*, as shown and described, and for the purpose stated.

In testimony whereof I affix my signature in presence of two witnesses.

GEO. FRANCIS.

Witnesses:
A. C. ROBESON,
E. A. GRUBBS.