

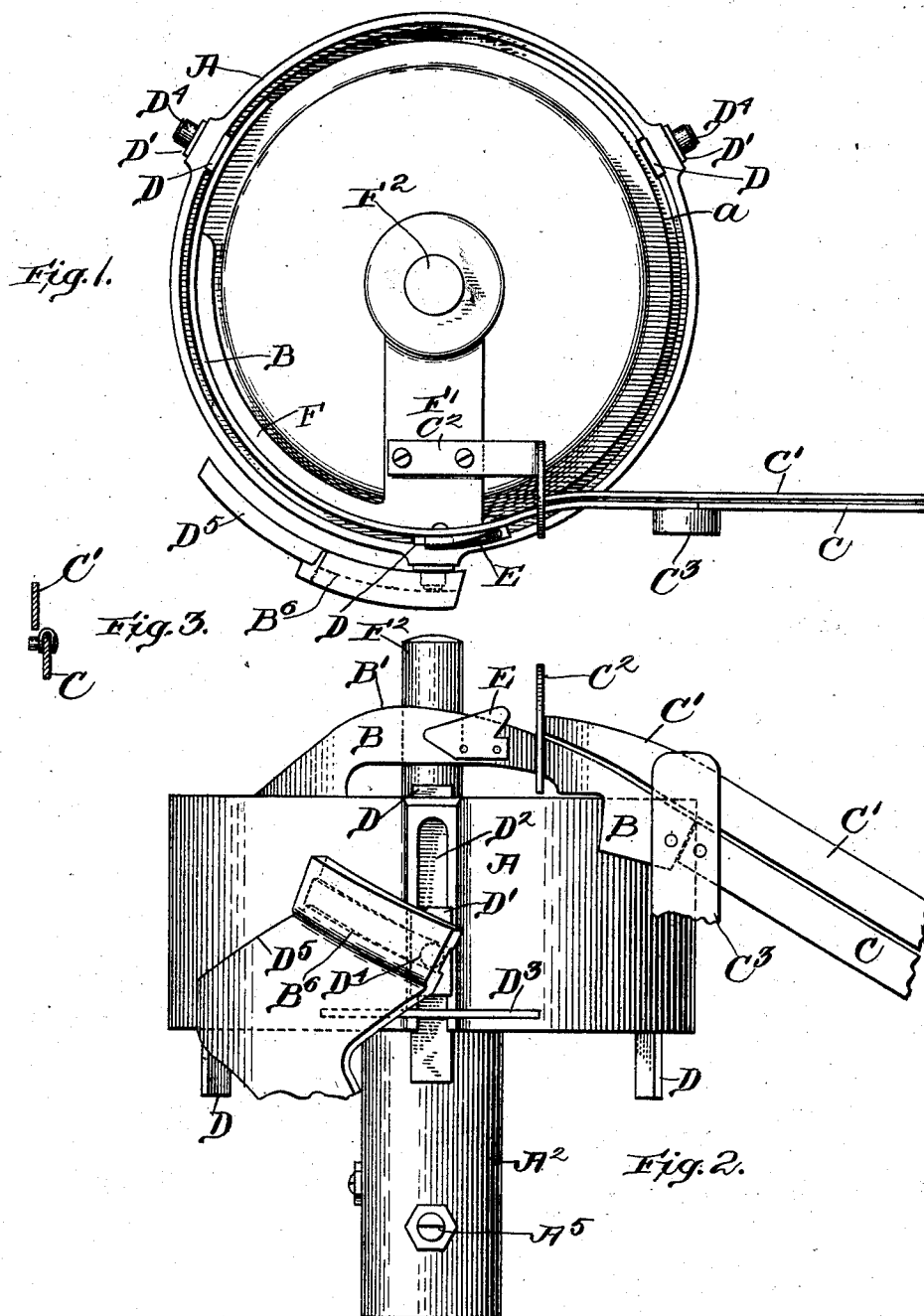
No. 859,481.

PATENTED JULY 9, 1907.

M. N. BRAY & W. J. COOMBS.
HOPPER FOR LACING HOOKS OR STUDS.

APPLICATION FILED AUG. 10, 1904.

2 SHEETS—SHEET 1.



Witnesses:
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M. F. Frederick

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Mellin N. Bray
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by
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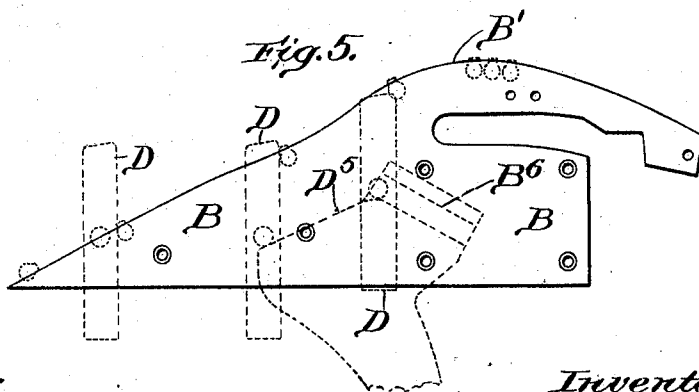
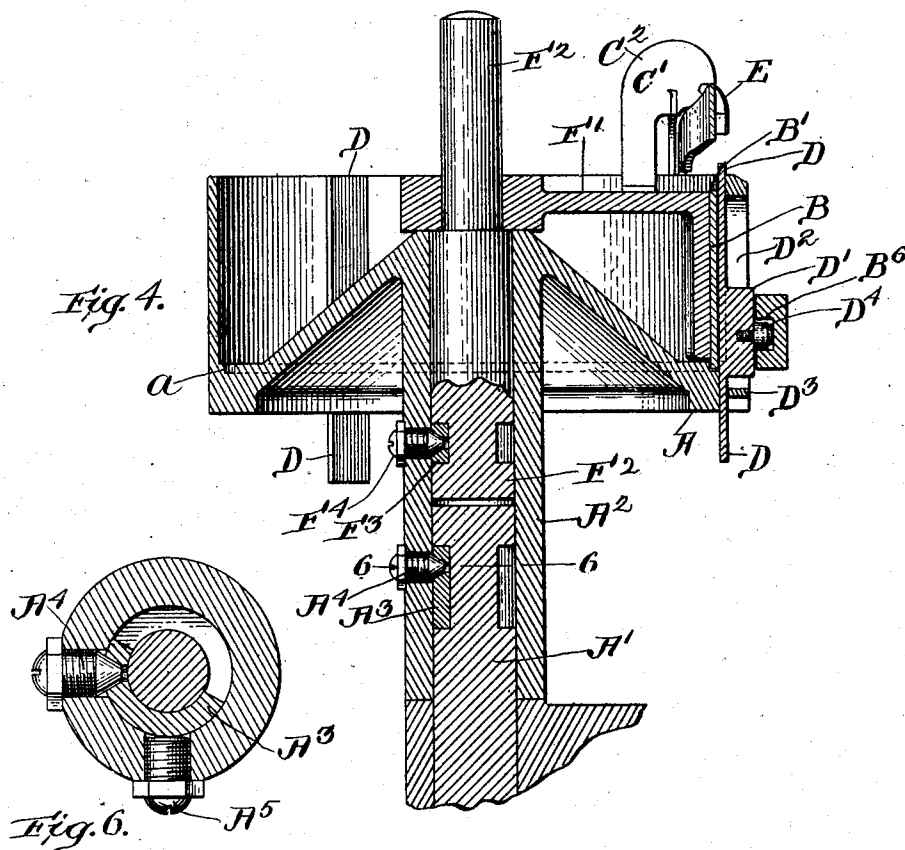
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UNITED STATES PATENT OFFICE.

MELLEN N. BRAY, OF BOSTON, AND WALTER J. COOMBS, OF QUINCY, MASSACHUSETTS,
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HOPPER FOR LACING HOOKS OR STUDS.

No. 859,481.

Specification of Letters Patent.

Patented July 9, 1907.

Application filed August 10, 1904. Serial No. 220,190.

To all whom it may concern:

Be it known that we, MELLEN N. BRAY and WALTER J. COOMBS, of Boston, in the county of Suffolk and State of Massachusetts, and of Quincy, in the county of Norfolk, and State of Massachusetts, have invented certain new and useful Improvements in Hoppers for Lacing Hooks or Studs, of which the following is a specification.

The invention relates to hoppers for separating lacing hooks or studs from a mass of hooks and supplying them to a raceway leading to the setting devices, and more especially to that class of hoppers in which the separation is done by an inclined hopper blade extending upward above the edge of the hopper and forming an extension of the supporting plate of the raceway.

In this class of hoppers those hooks which pass onto the blade as the hopper revolves are pushed up the blade by a series of pushers formed on the inner surface of the hopper. These pushers engage the hooks only while they are below the upper edge of the hopper and a retaining catch and plate have been employed for retaining a series of hooks on the inclined blade against which the hook engaged by the pusher may act to carry the hooks over the highest part of the hopper blade. The pushers must act to push the hooks under the catch and retaining plate which are arranged over the blade within the hopper and it has been found that the hooks are likely to become jammed at this point thus interfering with the feed of hooks to the plate and also injuring the hooks. This defect has been so serious as to preclude the use of this type of hopper for separating many forms of hooks and studs and has been a serious objection to its use for any style of hook.

It is the object of the present invention to provide a construction which is not open to the objections incident to the constructions previously employed and which will enable various forms and styles of hooks or studs to be separated and fed up the hopper plate without danger of injury to the hooks or of interruption in the operation of the hopper in separating and feeding hooks to the hopper blade and raceway.

In practicing our invention we employ a hopper blade which extends above the upper edge of the hopper and provide one or more pushing devices which travel along the side of the blade above the top of the hopper and carry the hooks above the upper edge of the hopper and nearly to the top of the hopper blade. The hooks as they pass up to the highest part of the hopper blade are at all times freely supported so that they may rise up off of the blade should there be any obstruction to their upward movement. For instance, if the raceway and blade should be full of hooks back

to the highest part of the blade the succeeding hooks pushed up the blade would lift off the blade as they engaged the end of the series on the blade and fall back into the hopper without injury to the hooks and without interfering with the movement of succeeding hooks up the blade.

The pusher which carries the hook up the blade above the upper edge of the hopper may be the same pusher which carries it up the blade within the hopper or we may employ an auxiliary pusher for this purpose. For the sake of simplicity and efficiency we prefer to employ the same pusher and to reciprocate the pusher so that it may continue to act on the hook after it passes the upper edge of the hopper and may quickly disengage the hook as it reaches the high part of the hopper blade or just previous to this point. We believe it is desirable that the pusher should cease its action on the hook shortly before the hook passes onto the high part of the blade as with this construction the hooks lift off the blade more readily when the blade and raceway are full, and for the further reason that the line of thrust on the hooks is necessarily always in an upward direction and all danger of applying an injurious force to the line of hooks before they lift off the blade is avoided.

The various features of the invention will be understood from the following detailed description of the hopper shown in the accompanying drawings which embodies these features in the forms in which I prefer to use them.

In these drawings Figure 1 is a plan view of the hopper and a part of the raceway to which the hooks or studs are delivered. Fig. 2 is a side elevation of the same. Fig. 3 is a vertical sectional view through the raceway showing the hook in position upon the supporting blade. Fig. 4 is a vertical sectional view through the axis of the hopper Fig. 2. Fig. 5 is a detail showing a development of the hopper blade, and Fig. 6 is a horizontal sectional view on line 6-6 Fig. 4.

In the construction shown in the drawings the hooks are introduced into a revolving hopper A provided with an annular groove *a* within which the stationary hopper blade B is arranged. This blade extends from the bottom of the hopper upwardly in an inclined direction and the high part B' of the blade is some distance above the upper edge of the hopper. From the high part B' the blade extends downwardly over the edge of the hopper and joins on to the upper end of the supporting plate C of the raceway down which the hooks pass so that the outer end of the blade forms in effect a continuation of the supporting plate C of the raceway.

The hooks which pass onto the upper edge of the hopper blade as they are carried around by the rotation of the hopper are pushed up the blade by means of a se-

ries of pushers D projecting from the inner surface of the hopper so that they pass along and close to the outer surface of the hopper blade. These pushers consist of slides arranged on the inner surface of the hopper and provided with lugs D' engaging vertical slots D² in the hopper. The lugs D' normally rest upon the plates D³ extending across the grooves D² in position to support the slides D with their upper ends below or flush with the upper edge of the hopper. As these slides travel along the outer surface of the hopper blade B they engage any hook which may be upon the hopper blade and push this hook and any hooks in front of it upward along the inclined edge of the hopper blade. Before the hook engaged by the pusher passes the outer edge of the hopper a roll D⁴ on the pusher rides up a stationary cam D⁵ so that the pusher moves vertically as it travels forward and continues to act upon the hook and continues to carry it up the hopper blade until the hook has nearly reached the high part B' of the hopper blade. The roll D⁴ then passes into the cam groove B⁶ so that the pusher moves downward and disengages the hook.

If there are two or more hooks in front of the pusher as it travels along the hopper blade, the hooks in advance of the one engaged by the pusher will be carried up onto the high part B' of the hopper blade and the hook engaged by the pusher may receive sufficient impetus from the pusher to also pass up onto the high part of the blade. This last hook in the series may however slide down the blade when released by the pusher and be carried up by the succeeding pusher.

There is no obstruction to the free movement of the hooks by the inclined edge of the hopper blade and the hooks are unconfined by guard rails or other devices, being retained upon the hopper blade merely by the force of gravity. There is no danger therefore of injury to the hooks by the action of the pushers upon them, nor is there any danger of interrupting the proper feed of the hooks up the inclined hopper blade.

After the hooks pass the high part or crest B' of the hopper blade they slide down the blade onto the supporting plate C of the raceway. The hooks are retained upon the raceway by a guard rail C' which extends part way up the downwardly inclined portion of the hopper blade as indicated in Fig. 2. The rear end of this guard rail is beyond the crest of the hopper blade so that the hooks are free to lift off of the blade at the high point or crest without any danger of becoming jammed or injured.

In case any of the hooks are misplaced upon the hopper plate so that the shanks project outward from the plate, they are removed from the plate by means of a guard cam E so arranged that the shanks of the misplaced hooks will ride up the cam and be lifted off of the hopper plate.

After the pusher slides D have moved down out of engagement with the hooks, they pass under the forward end of the hopper plate where it extends over the edge of the hopper. The cam D⁵ which raises the pushing plates so that they will carry the hooks up the hopper blade, may be arranged to lift the slides at any time after they have passed beneath the hopper plate but we prefer to arrange the cam as shown in the drawings. The weight of the slides or their weight assisted by a spring, may be depended upon to lower the slides so that they may pass under the hopper plate

but we prefer to provide the cam groove B⁶ so that the slides will be positively moved downward in case they do not move downward by reason of their own weight.

The hopper is continuously revolved by means of a rotating shaft A' with which the sleeve A² depending from the hopper is frictionally connected by means of a friction block A³ engaging a groove in the end of the shaft and connected with the sleeve A² by a screw A⁴. The friction between the block and shaft may be regulated by an adjusting screw A⁵ by which the block may be forced against the shaft with a greater or less pressure.

The hopper blade B is secured to a segmental plate F on the outer end of an arm F' which is supported on a stud F². The stud F² is supported in the upper end of the sleeve A² of the hopper by means of a segmental block F³ similar to the block A³ which engages a groove in the stud and is secured to the hopper sleeve by a screw F⁴. The block F³ is loose in the groove so that the hopper sleeve revolves freely about the stud while the block prevents vertical movement of the stud. The arm F' also supports a bracket C² to which the upper end of the guard rail C' is secured. The outer end of the hopper blade B and the upper end of the supporting rail C are secured to a bracket C³ supported from a stationary part of the machine frame.

While we prefer to employ the particular construction and arrangement of parts shown in the drawings and specifically described, it will be understood that the construction and arrangement of the parts may be varied without departing from our invention. For instance, as has been heretofore indicated, other forms of pushing devices for carrying the hooks onto the crest of the hopper blade may be employed or in case vertically moving pushers are employed other means than those shown may be employed for raising and lowering the pushers.

It will also be found desirable in most instances to provide a cover for the hopper and this cover may be provided with walls which register with and form stationary continuations of the walls of the revolving hopper as is customary in the use of hoppers of the general type shown in the drawings.

What we claim and desire to secure by Letters Patent is:

1. The combination with a hopper, of a hopper blade, one or more pushers mounted to move between the blade and the inner surface of the hopper about an axis parallel with the blade, and means for raising the pushers as they act on the hooks and lowering them to pass under the upper edge of the blade.

2. The combination with a cylindrical hopper, of a hopper blade extending along the cylindrical inner surface of the hopper, and one or more vertically moving pushers mounted to travel along the blade between the plate and inner surface of the hopper and means for operating the pushers.

3. The combination with a moving hopper, of a hopper blade extending above the upper edge of the hopper, and one or more vertically moving pushers moving with the hopper and means for operating the pushers.

4. The combination with a hopper, of a hopper blade extending above the edge of the hopper, one or more pushers mounted on the hopper, and a cam for raising the pushers above the edge of the hopper.

5. The combination with a hopper, of a hopper blade, one or more pushers mounted on the hopper, means for raising said pushers above the edge of the hopper and lowering said pushers before the hook engaged thereby reaches the crest of the blade.

6. The combination with a hopper, of a hopper blade, one or more slides D mounted on the hopper, and a cam D⁵ for raising said slides.

5 7. The combination with a hopper, of a hopper blade, one or more slides D mounted on the hopper, means for raising said slides and lowering them to pass under the upper edge of the blade, and a guard rail the rear end of which is beyond the crest of the blade.

10 8. The combination with a cylindrical hopper, of a hopper blade, extending along the cylindrical inner surface of the hopper and one or more traveling and vertically moving pushers for carrying hooks up the hopper blade.

9. The combination with a hopper, of a hopper blade, one or more pushers for carrying hooks up the hopper blade, and a guard cam arranged to engage the shank of a misplaced hook and lift it from the blade. 15

In testimony whereof we have affixed our signatures, in presence of two witnesses.

MELLEN N. BRAY.
WALTER J. COOMBS.

Witnesses:

ALBERT H. TABER,
F. A. HOWE.