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O. A. BUTTERFIELD.

BAND CUTTER FOR THRESHING MACHINES.

APPLICATION FILED JAN. 22, 1904.

NO MODEL.

Fig. 1.

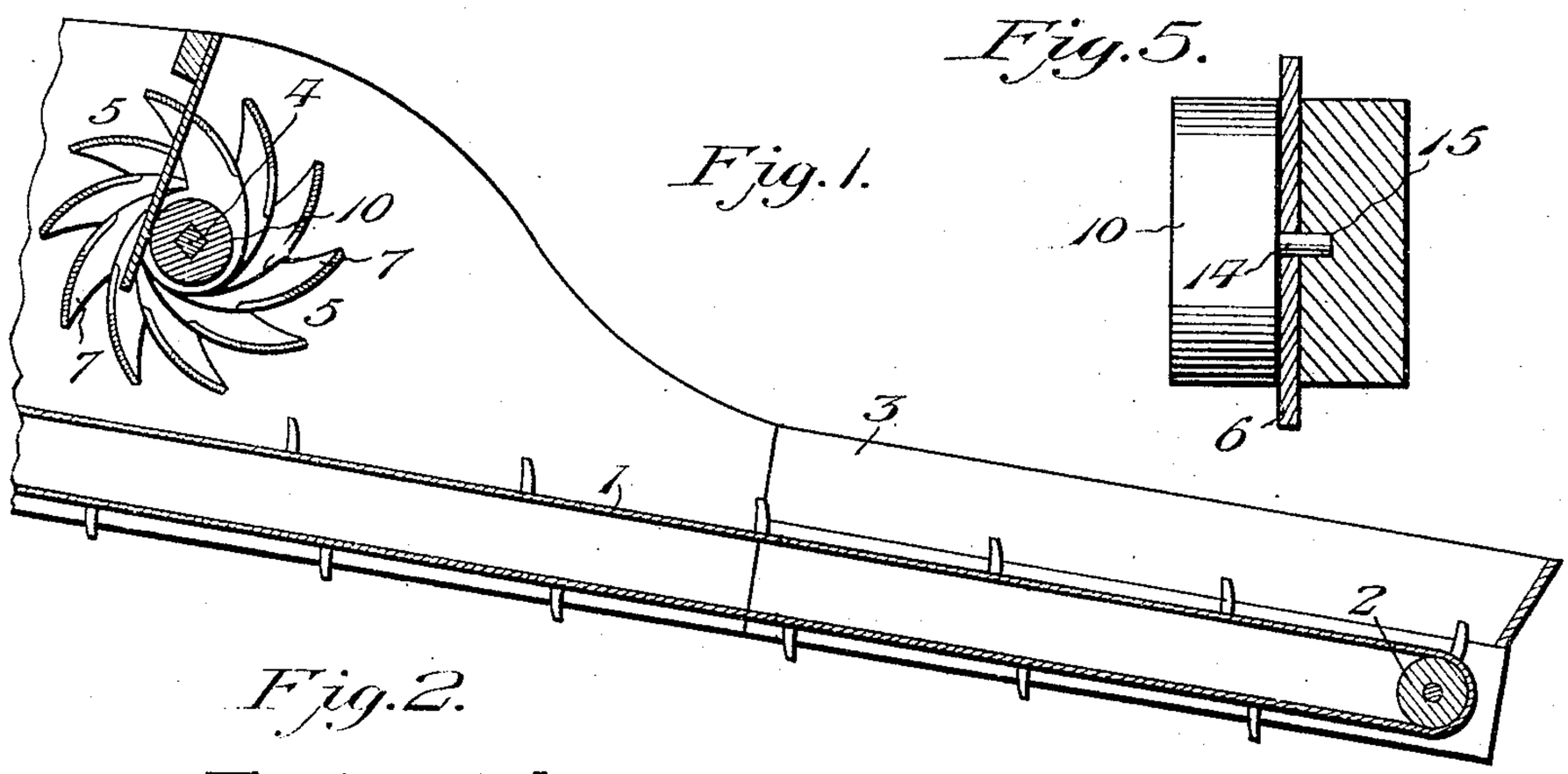


Fig. 5.

Fig. 2.

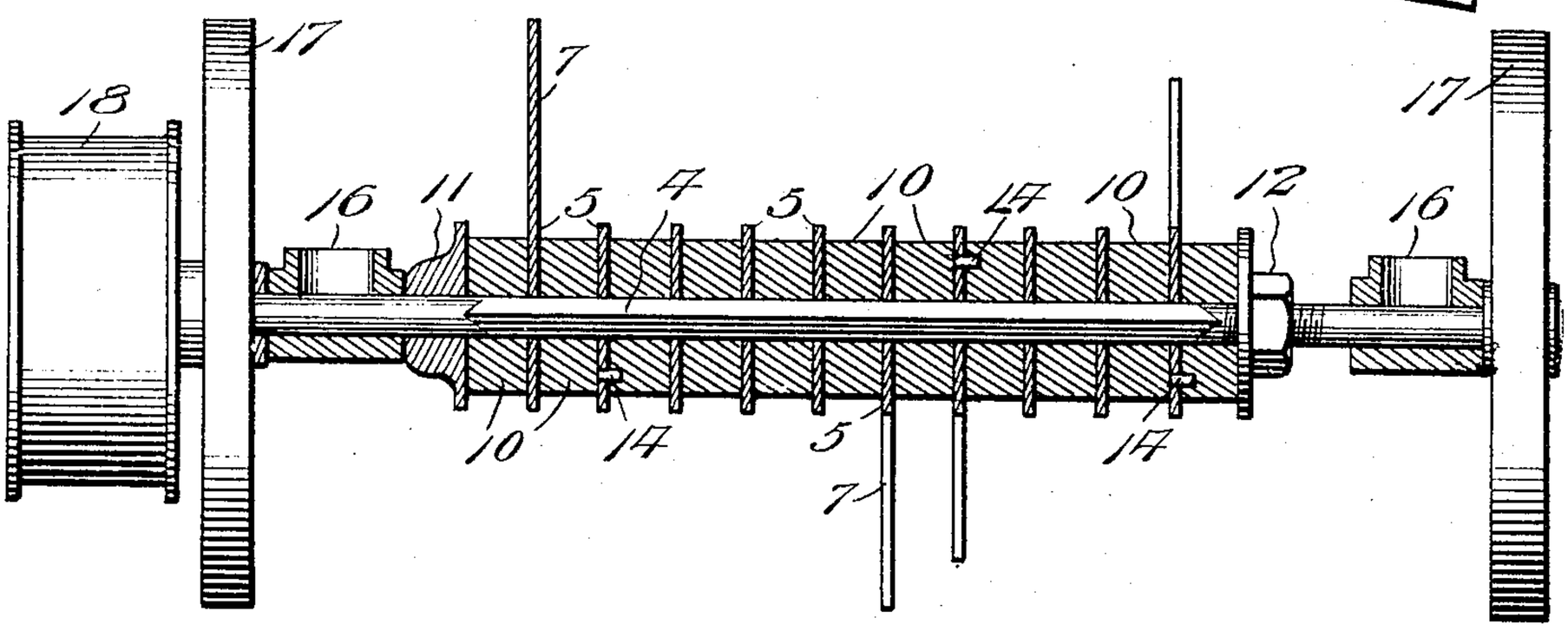
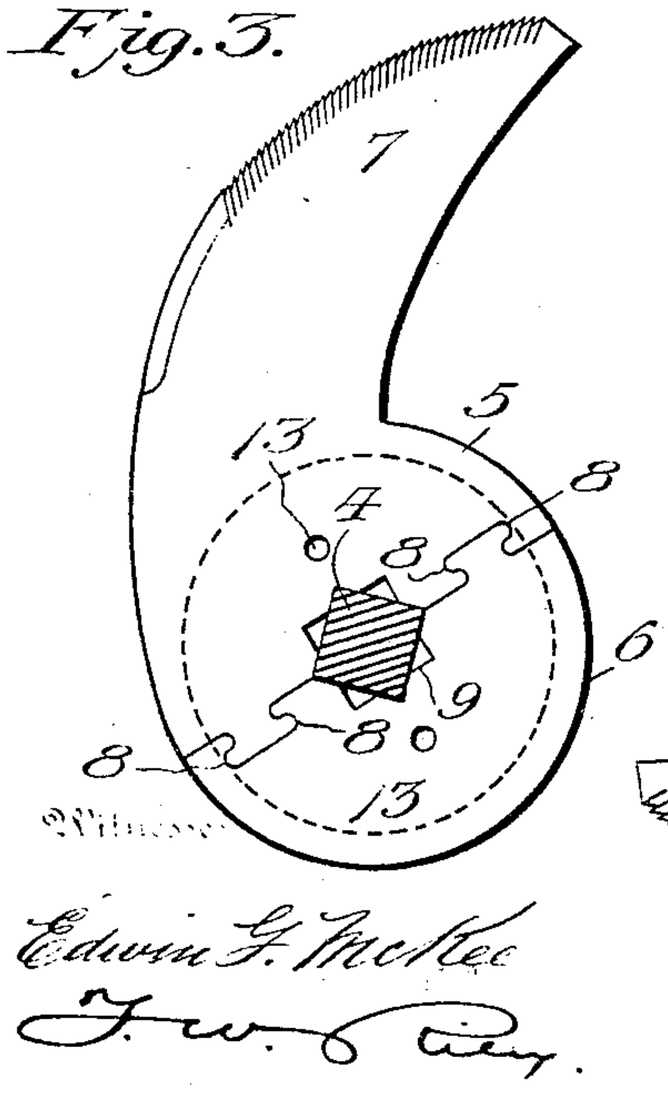


Fig. 3.



Witnesses:

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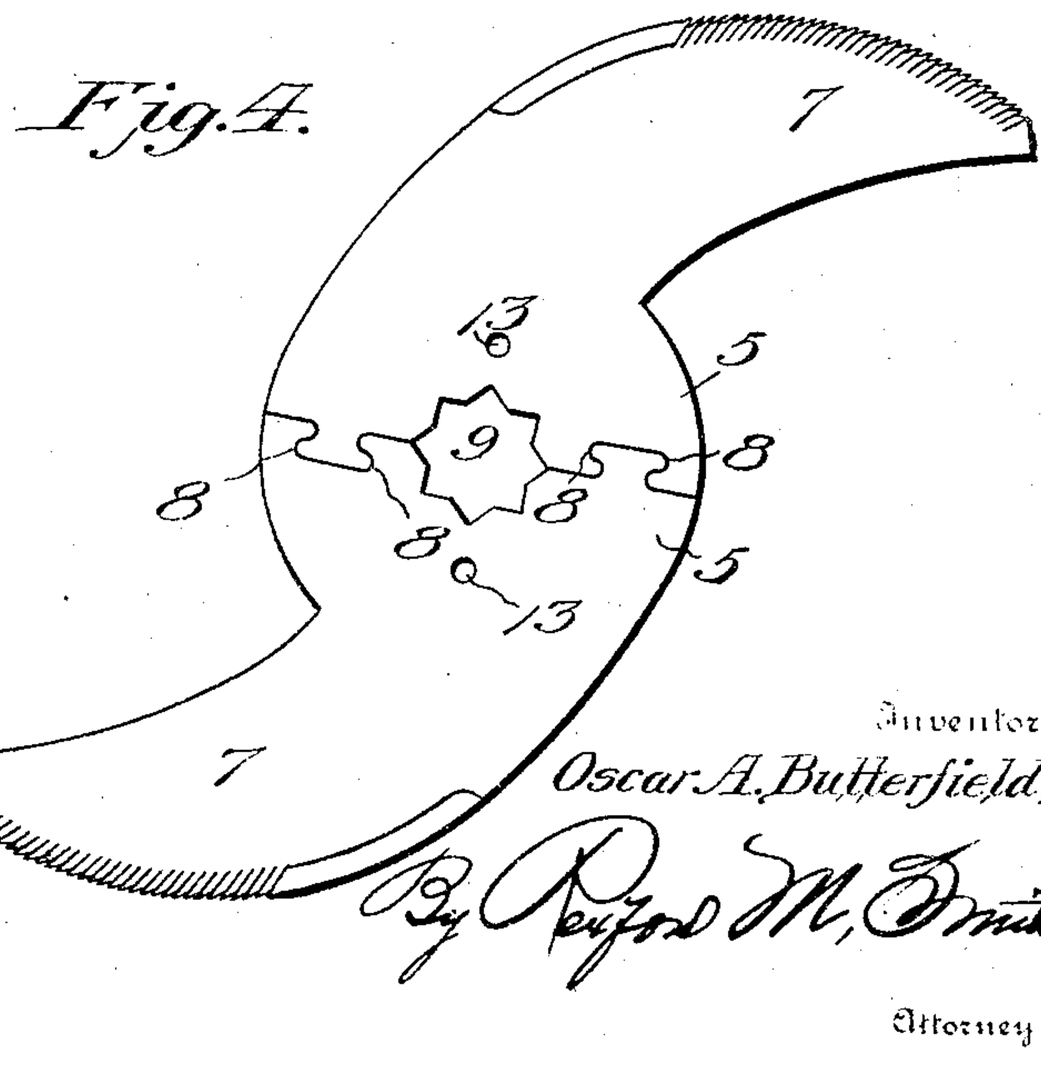
Fig. 4.



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UNITED STATES PATENT OFFICE.

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BAND-CUTTER FOR THRESHING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 774,155, dated November 8, 1904.

Application filed January 22, 1904. Serial No. 190,119. (No model.)

To all whom it may concern:

Be it known that I, OSCAR A. BUTTERFIELD, a citizen of the United States, residing at Battlecreek, in the county of Calhoun and State of Michigan, have invented a certain new and useful Band-Cutter for Threshing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to band-cutters and feeders for threshing-machines, and particularly to the band-cutter proper, which operates to sever the bands of the bundles as they are carried by the feeding mechanism toward the threshing-cylinder.

The object of the present invention is to provide a cutter embodying separable parts so combined and arranged that the cutters may be removed laterally from the cutter-shaft for the purpose of sharpening and replacing the same or substituting new cutters for broken ones, thus obviating the necessity of unmounting the shaft and the contiguous parts, and thereby effecting a great saving in time, labor, and trouble. In the common construction of the knives as they are made and used to-day such knives are made in one piece with a hole or eye which fits upon the squared cutter-shaft, and the said knives are assembled by being placed one by one upon the shaft over the end thereof and held in place and separated from each other by means of interposed washers or clamping-disks. Now in the daily use of these knives it is necessary to sharpen the same, and in order to get at them it is necessary to take out the cutter-shaft and at least one box and remove one of the balance or fly wheels, unscrew the collar which holds the parts together, and then remove the knives and washers or clamping-disks one at a time until access is had to the desired knife. The present invention aims to overcome this fatal defect and objection by constructing each of the cutters or knives in two interlocking parts or members, so that each knife may be associated laterally with and disassociated laterally from the cutter-shaft by simply loosening the screw collar or nut which clamps all of the knives and clamping-disks together upon the shaft.

Another object of the invention is to so construct and arrange the parts of the cutter that the knife portion of each cutter may be detached without disconnecting the complemental member of such knife from the cutter-shaft. By the means hereinafter described it is also practical to place either a double or a single cutter at any desired point on the cutter-shaft and readily remove the same at any time without disturbing any other parts of the cutter as a whole.

With the above and other objects in view, the nature of which will more fully appear as the description proceeds, the invention consists in the novel construction, combination, and arrangement of parts, as hereinafter fully described, illustrated, and claimed.

In the accompanying drawings, Figure 1 is a vertical longitudinal section through the feeder of a threshing-machine, showing the feeder-apron or belt and the band-cutter arranged thereover. Fig. 2 is a section taken longitudinally through the cutter in line with the cutter-shaft, the latter being shown in elevation. Fig. 3 is a plan view of a single cutter embodying the present invention. Fig. 4 is a similar view of a double cutter embodying the same principle; and Fig. 5 is a detail section showing a pair of clamping-disks with an interposed knife and the dowel-pins or retainers, which hold the knives in place.

Like reference-numerals designate corresponding parts in all the figures of the drawings.

In band-cutters and feeders at present in use resort is usually had to a traveling feeder apron or belt 1, which is mounted at its opposite ends upon suitable rollers 2, supported in a feeder-frame 3, the said apron being arranged to carry the bundles inward to the threshing mechanism, while above the feeder-apron is arranged a rotary cutter mounted upon a cutter-shaft 4 and comprising a series of blades or knives 5, arranged in a circular or spiral series around the same. Ordinarily

the blades or knives are simply provided with holes to receive the shaft 4 and are threaded one by one upon the shaft in connection with alternately-arranged clamping-disks which serve to space the knives at a suitable distance apart, as shown in Fig. 2, the holes or eyes of the blades being ordinarily square, so as to fit the squared portion of the cutter-shaft and enable the knives to derive their power therefrom.

In carrying out the present invention each blade or knife is composed of two interlocking members 5 and 6, 5 designating that member which carries the knife or blade 7 proper, while the member 6 corresponds in its formation with the hub portion of the knife-bearing member. The members 5 and 6 are divided on a line substantially diametrical to the cutter-shaft, as shown in Figs. 3 and 4, and are made male and female, or, in other words, provided along their meeting edges with interlocking projections and recesses and, by preference, the said projections and recesses are arranged to extend in reverse directions at opposite sides of the cutter-shaft, as clearly shown in Figs. 3 and 4, for a purpose which will hereinafter appear. Each projection may be said to be of dovetailed shape or provided with oppositely-projecting shoulders 8, which fit into the corresponding notches or extensions of the main recesses, which receive the projections as a whole, so that abutting and interlocking shoulders are provided in connection with each projection or recess, which serves to prevent the two members 5 and 6 from being drawn apart while they are in alinement with each other or while they lie in the same plane. By moving the said members laterally with respect to each other, however, the members 5 and 6 may be disconnected from each other, which will allow one or both of said members to be removed from the cutter-shaft without disturbing any other knives or clamping-disks. Each knife or blade is also provided with a squared or octagonal hole or eye 9 to receive the squared shaft 4 of the cutter as a whole, so that each knife is made fast on the shaft and caused to rotate therewith and derive its power therefrom. The knives thus formed are placed laterally upon the shaft, and each knife is interposed between a pair of clamping-disks or spacing-sleeves 10, which have previously been threaded upon one end of the shaft. Adjacent to one end the shaft is provided with a fixed abutment-collar 11, while at the opposite end the shaft is threaded to receive a clamping nut or collar 12, by means of which all of the knives and clamping-disks are firmly pressed together and are held while the cutter is in operation.

Instead of forming the knife as shown in Fig. 3 it may be made in the double form shown in Fig. 4. In other words, instead of combining a member 6 with a member 5 two members 5 may be combined with each other to provide a greater number of cutting edges, which arrangement is sometimes found desirable.

In order to prevent the members 6 from falling away from the cutter-shaft upon the removal of a member 5, it is desirable to provide each of the members 5 and 6 with a hole 13, and also provide each clamping-disk 10 with a laterally-projecting retainer or dowel-pin 14 at one side which passes through the opening 13 in the cutter member and preferably enters a corresponding recess or socket 15 in an adjacent clamping-disk, as best illustrated in Fig. 5. Now in removing one of the knife-bearing members 5 it is only necessary to loosen the clamping collar or nut 12 and back the same off a distance a little greater than the thickness of the cutter-blade. Thereupon the blade-carrying member may be removed laterally from the shaft, while the complemental member 6 is left upon the dowel-pin or retainer 15 until the knife-bearing member is replaced in its original position and the parts tightened up and clamped together. Under the ordinary arrangement of the rotary cutter the same is supported at or near its opposite ends in suitable bearings 16, and also provided with suitable balance or fly wheels 17 and a driving-pulley 18, as shown in Fig. 2.

From the foregoing description it will be understood that each knife is composed of two interlocking pieces or members, each of which partially surrounds the shaft and obtains its driving power therefrom, the eye of the cutter-knife being made to conform to the cross-sectional shape of the shaft for that purpose. It will be further seen that any knife or number of knives may be removed from the shaft laterally by simply loosening the clamping collar or nut at one end, this being done without disturbing any of the other knives or clamping-disks and without unmounting the cutter-shaft from the machine. Further, the non-knife-bearing members are retained in position during the operation of removing and replacing the knife-bearing members. It will also be seen that double knives may be substituted for single knives whenever found necessary.

Having thus described the invention, what is claimed as new is—

1. The combination with the shaft of a rotary band-cutter, of a cutting-blade consisting of two members located on opposite sides of the shaft and having an interlocked connection directly with each other and means on each member whereby the members are adapted to be disconnected from each other and the shaft by relative lateral movement only.

2. The combination with the shaft of a rotary band-cutter, of a cutting-blade consisting of two members of uniform thickness lo-

cated on opposite sides of the shaft and having integral means effective to interlock when the members are in line with each other and ineffective when the members are moved out of line with each other.

3. A knife for band-cutters consisting of two members divided substantially in line with their axis of movement and having interlocking means at their meeting edges and also provided with an eye formed partly in each meeting edge, said eye being angular in shape.

4. A rotary cutter comprising a shaft, a series of clamping-disks thereon, and a series of knives interposed between the clamping-disks and each consisting of interlocking members adapted to be moved laterally into and out of engagement with each other, and means for clamping the knives and disks and preventing such lateral movement.

5. A rotary cutter embodying a shaft, a sectional knife mounted on the shaft and consisting of interlocking members which lie in a common plane and on opposite sides of said shaft, and one of which is provided with a hole, and clamping-disks at opposite sides of the knife, one of the disks being provided with a pin or retainer which enters the hole in the knife member.

6. A rotary cutter comprising a shaft, a series of clamping-disks provided with oppositely-located dowel-pins, and sockets for the same, and a series of knives held between the disks and each consisting of interlocking members which lie in a common plane and are laterally removable from the shaft, one of said members being provided with an opening to receive one of the said dowel-pins or retainers.

7. A rotary cutter comprising a shaft, a series of clamping-disks thereon provided with laterally-projecting dowel-pins or retainers and sockets therefor, and a series of knives each consisting of two members lying in a common plane and having an interlocked engagement with each other, one of said members being provided with an opening to receive one of the said dowel-pins or retainers.

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

OSCAR A. BUTTERFIELD.

Witnesses:
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FRANK O. SMITH.