No. 609,973. Patented Aug. 30, 1898.

G. S. NEELEY.

MEANS FOR THROWING SEWING MACHINES INTO OR OUT OF GEAR.

(Application filed Nov. 18, 1897.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

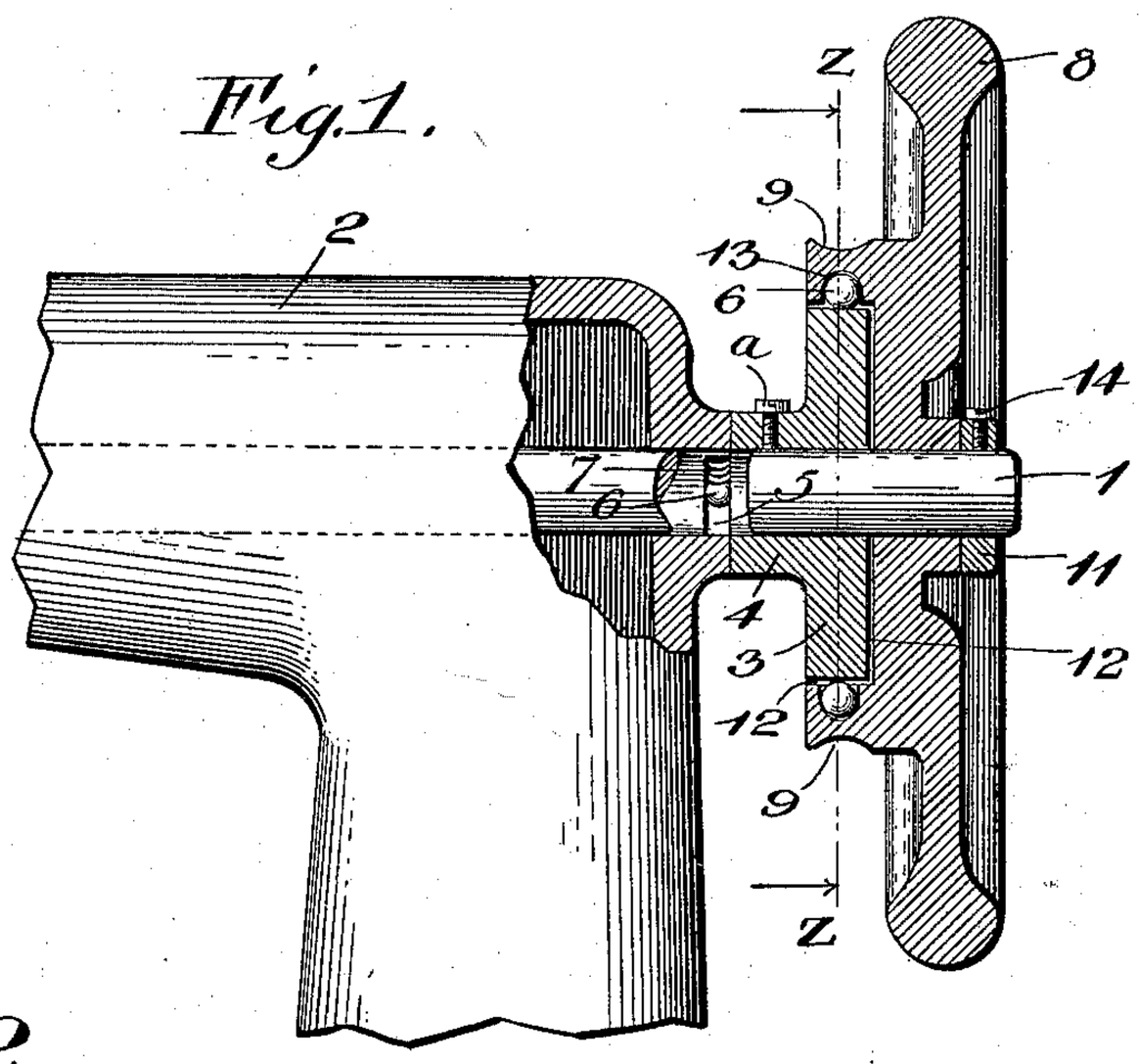


Fig. 2.

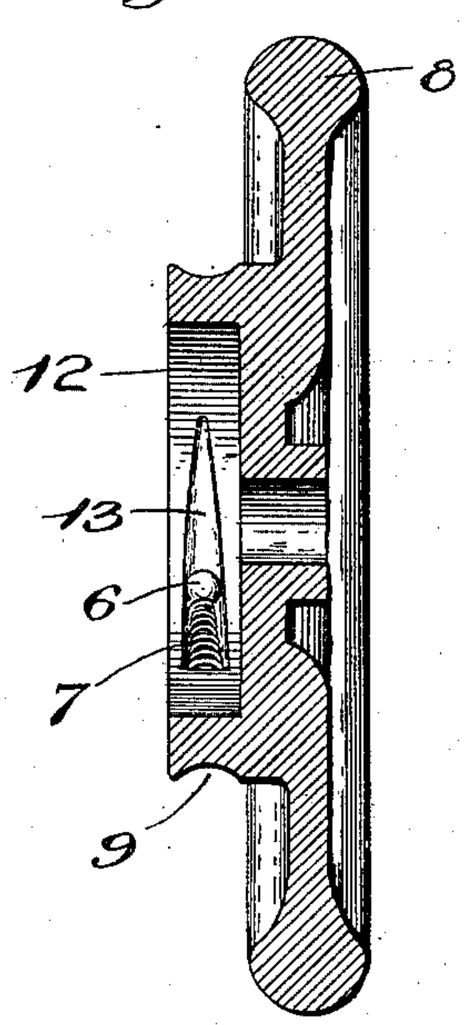
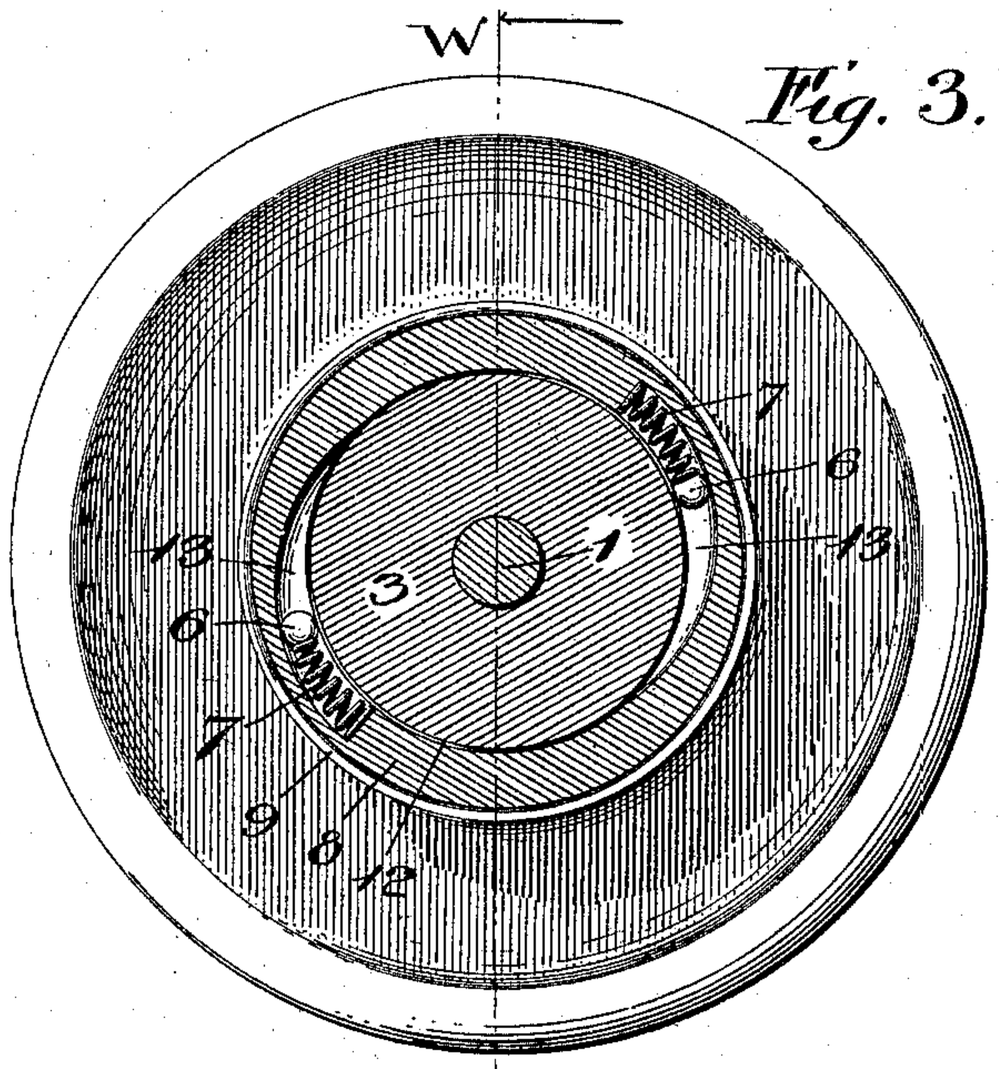


Fig. 3.



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George S. Neeley.

Witnesses
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U. B. Hillyard.

By Mr's Attorneys,
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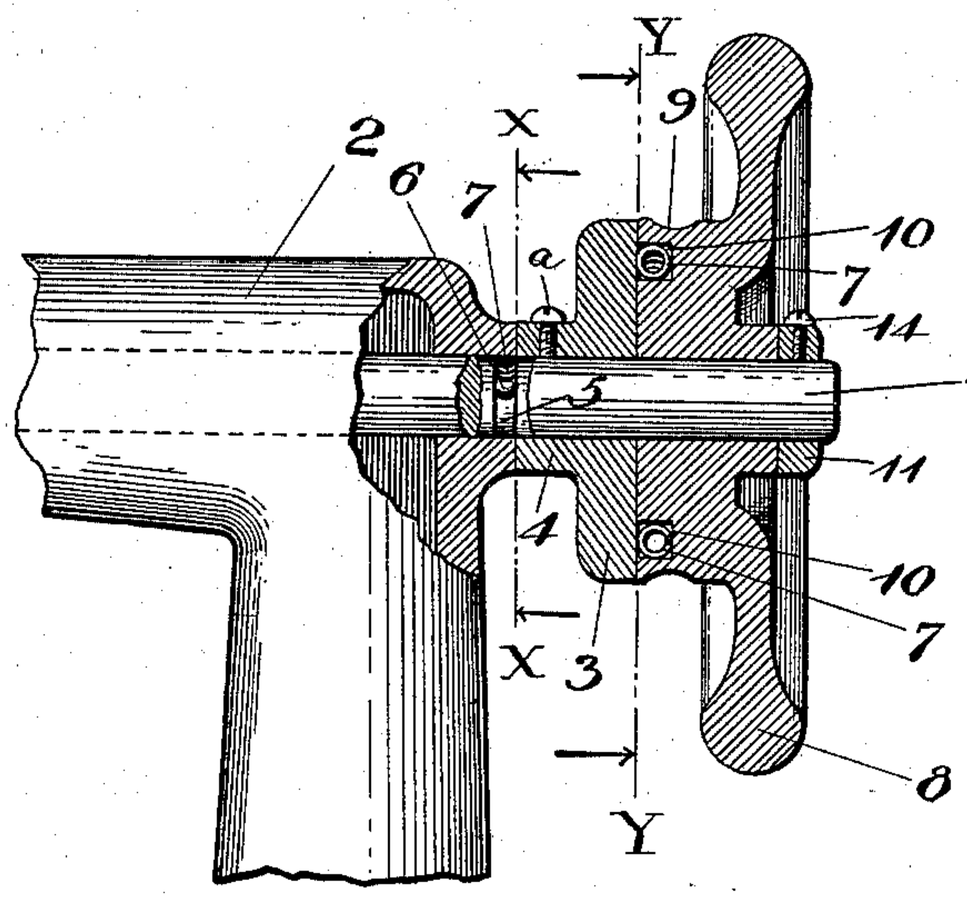

Fig. 4.

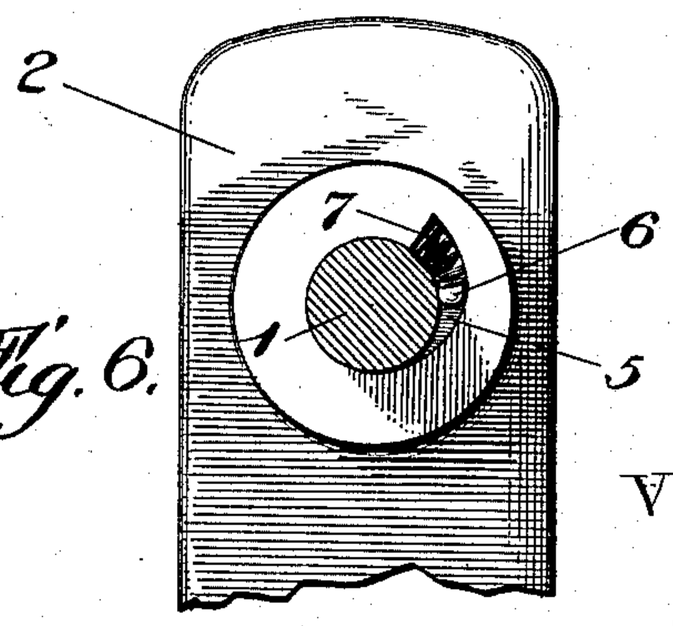

Fig. 6.

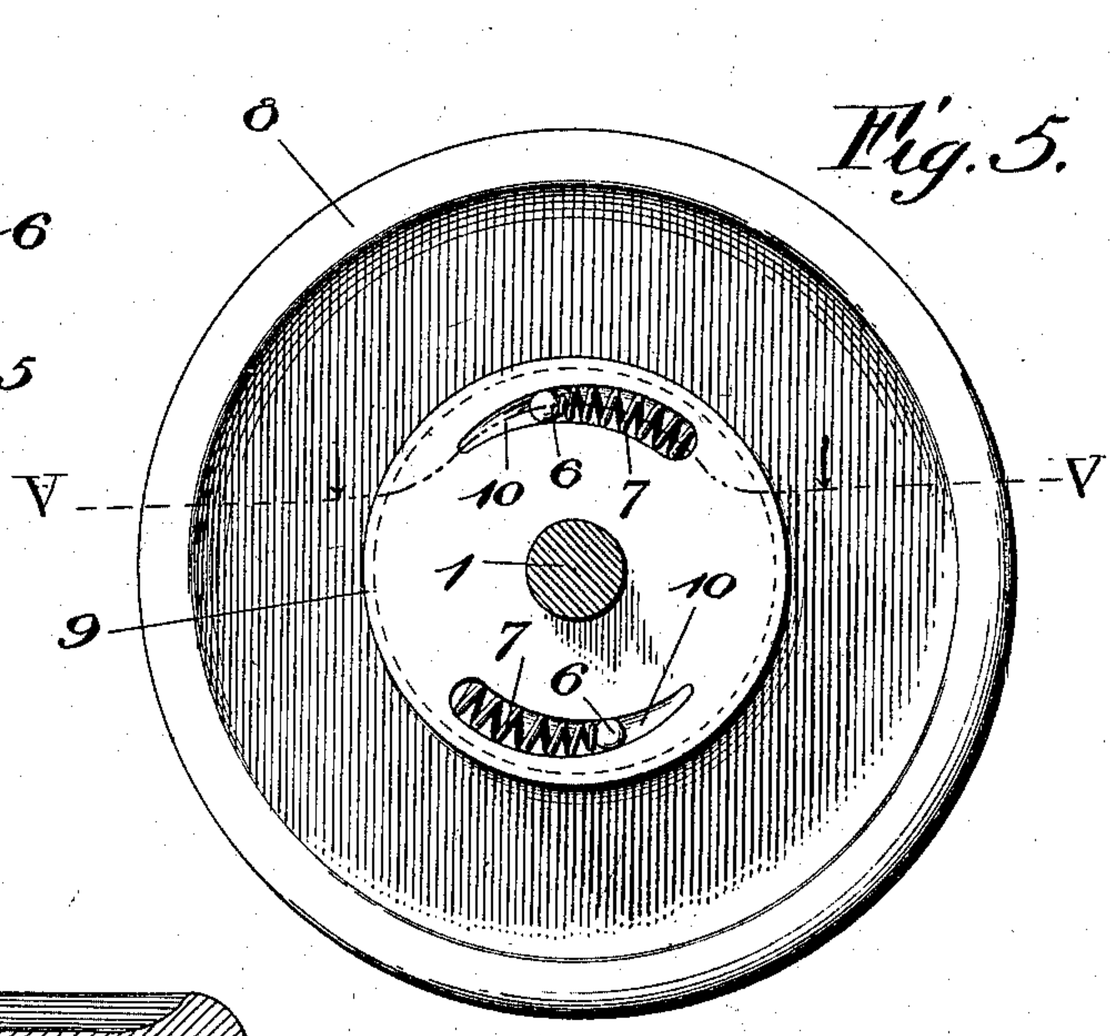

Fig. 5.

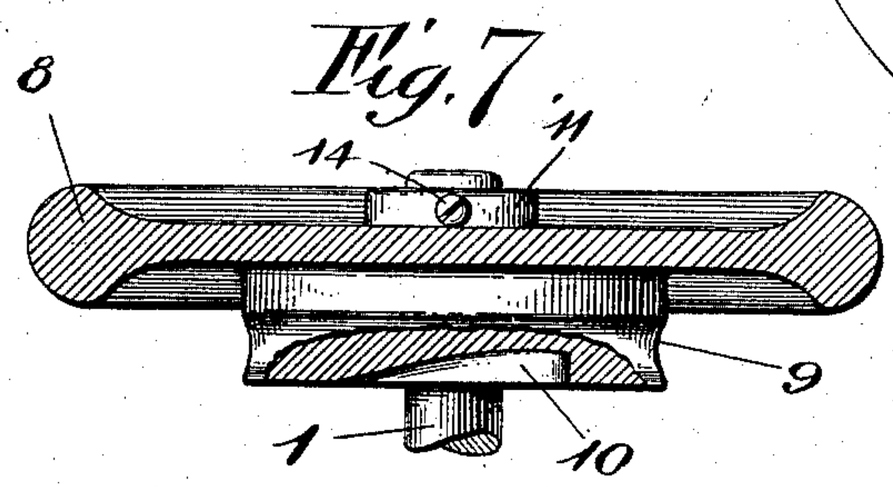

Fig. 7.

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UNITED STATES PATENT OFFICE.

GEORGE S. NEELEY, OF PACIFIC, MISSOURI, ASSIGNOR OF TWO-THIRDS TO ALEXANDER MAITLAND AND GEORGE E. BIRKICHT, OF SAME PLACE.

MEANS FOR THROWING SEWING-MACHINES INTO OR OUT OF GEAR.

SPECIFICATION forming part of Letters Patent No. 609,973, dated August 30, 1898.

Application filed November 18, 1897. Serial No. 658,979. (No model.)

To all whom it may concern:

Be it known that I, GEORGE S. NEELEY, a citizen of the United States, residing at Pacific, in the county of Franklin and State of Missouri, have invented a new and useful Means for Throwing Sewing-Machines Into or Out of Gear, of which the following is a specification.

When winding the bobbins of sewing-machines, it is desirable to throw the sewing mechanism out of gear, thereby saving the machine and preventing the breaking of the upper thread and the withdrawing of the same from the needle, and resulting, further, in a lighter-running action and enabling the hand or balance wheel to be run at a higher speed than is safe when sewing.

The object of this invention is to provide an improved mechanism for attaining the ends aforesaid which will be of simple and effective construction and prevent at all times and under all conditions the backward rotation of the shaft by means of which power is transmitted to the shuttle and needle-bar operating mechanism, whether operated by hand or treadle power, thereby preventing the breaking of the upper thread and the unthreading of the needle.

For a full understanding of the merits and advantages of the invention reference is to be had to the accompanying drawings and the following description.

The improvement is susceptible of various changes in the form, proportion, and the minor details of construction without departing from the principle or sacrificing any of the advantages thereof, and to a full disclosure of the invention an adaptation thereof is shown in the accompanying drawings, in which—

Figure 1 is a sectional detail of the rear portion of the arm of a sewing-machine head, showing the application of the invention. Fig. 2 is a transverse section of the hand-wheel on the line W W of Fig. 3, showing the tapering depression and ball-clutch in elevation. Fig. 3 is a section on the line Z Z of Fig. 1, looking to the right. Fig. 4 shows a different arrangement of the ball-clutch between the hand-wheel and the disk. Fig. 5 is a vertical section on the line Y Y of Fig. 4 looking to the right, as indicated by the arrow. Fig. 6 is a similar section on the line X X of Fig. 4 looking to the left. Fig. 7 is a detail section of the hand or balance wheel on the line V V of Fig. 5, showing the decreasing depth of the depression which receives the ball-clutch and its spring.

Corresponding and like parts are referred to in the following description and indicated in the several views of the accompanying drawings by the same reference characters.

All sewing-machines are not constructed to operate upon rotating the hand or balance wheel in the same direction, and some perform work upon turning the hand-wheel to the right and others when the hand-wheel is rotated to the left, and in the following description the term "backward rotation" must be interpreted as meaning turning the shaft in an opposite direction from that in which it is designed to be rotated for operating the sewing mechanism, whether it be to the right or to the left. The main object is to prevent this backward rotation of the shaft either by hand or treadle power.

The shaft 1 is journaled in the arm 2 in the ordinary manner and is the means for transmitting motion to the sewing mechanism. Upon the outer or rear end of this shaft is secured a disk 3, having an inwardly-extending hub portion 4, the latter receiving the binding-screw *a*, by means of which the disk is held in place, although other means may be employed for fastening the disk to the shaft so it will revolve therewith. A recess 5 is formed in the outer face of the arm 2 and extends from the opening therein in which the shaft 1 is journaled, and this recess is of tapering form or gradually decreases in depth throughout its circumferential length and receives a ball-clutch 6 and a spring 7, the latter being located in the larger end of the recess and normally holding the ball-clutch toward the smaller end of the said recess, whereby upon turning the shaft 1 backward the ball-clutch will be crowded into the smaller end of the recess and secure the shaft against backward rotation by a wedging action, as will be readily understood. The spring 7 in-

sures a positive and responsive action on the part of the ball-clutch, so that the instant the shaft 1 receives a backward tendency the ball-clutch comes into play and holds the shaft, and thereby prevents the breaking of the thread and the unthreading of the needle, which are the chief sources of annoyance and inconvenience to the operator.

The hand or balance wheel 8 is loosely mounted upon the outer end of the shaft 1 and is provided on its inner face with a grooved pulley 9, which receives the belt, (not shown,) by means of which motion is imparted thereto from the drive-wheel and treadle in the usual manner. The disk 3 is smaller than the pulley 9 and fits snugly within a recess 12, formed therein. A tapering depression 13 is provided in the wall of the recess 12 and curves in the direction of its length and decreases in depth toward one end. A ball-clutch 6 and spring 7 are located in the depression 13 and operate in the manner previously described, the spring 7 moving the ball-clutch toward the smaller end of the depression, so as to be wedged between the depression and the edge of the disk 3 upon rotating the hand-wheel forwardly or in a direction to impart movement to the shaft 1 and sewing mechanism. There may be any number of these depressions 13 and ball-clutches, two being shown, and the number will depend upon the nature of the work and the size of the machine to be driven. The parts coöperating with the ball-clutches will be case-hardened or made of steel and tempered, so as to resist the wearing action incident to the wedging of the ball-clutches between the parts gripped thereby.

It will be observed that the hub of the disk 3 serves to close the open side of the recess 5 and retains the ball-clutch and spring in place, and the disk enters the recess 12 and closes the open sides of the depressions 13, and its edge receives the thrust of the ball-clutches located in the said depressions 13. When the hand-wheel is rotated backwardly by hand, treadle, or by other means, the ball-clutch between it and the disk 3 is thrown out of action, and the ball-clutch between the arm and shaft instantly comes into play and prevents any backward rotation of the shaft, and upon turning the hand-wheel forwardly the ball-clutch between it and the disk 3 comes into action and causes a corresponding movement of the shaft 1, and the ball-clutch between the arm 2 and shaft 1 is thrown out of action, as will be readily understood. The hand-wheel is held in place by a collar 11, secured upon the end of the shaft 1 by means of a binding-screw 14.

As shown in Fig. 4, the disk 3 and pulley 9 are of like diameter, and the pulley 9 has depressions 10 in its face of tapering form and receiving ball-clutches 6 and springs 7, said depressions being closed by the disk 3, against which the ball-clutches act laterally. This construction can be readily adapted to the present patterns of machines at a small cost, but is not preferred because dirt and foreign matter can enter the space between the parts 3 and 9 and because the collar 11 must sustain the lateral stress of the ball-clutch between the parts 3 and 9 when in action.

The construction shown in Fig. 1 is preferred, as it relieves the collar 11 of outward strain when the machine is running and enables the attachment to be fitted to shorter shafts and the middle portion of the hand-wheel to be made thinner.

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

1. In combination, an arm or bearing provided in its outer side with a circumferential recess of tapering form, a shaft journaled in the said bearing, a clutch-ball and spring located in the said tapering recess, a disk secured to the shaft and having a hub portion coming against the outer face of the bearing and closing the aforesaid recess formed therein and holding the ball-clutch and spring in place, a hand-wheel loosely mounted upon the shaft and having a tapering depression in its inner face, and a ball-clutch and spring located in the said tapering depression and adapted to operate against the aforementioned disk by a wedging action and in an opposite direction to the first-mentioned ball-clutch, whereby upon turning the hand-wheel backwardly the shaft will be clutched to the bearing, and upon turning the hand-wheel forward will be released and clutched so as to turn with the hand-wheel, substantially as and for the purpose set forth.

2. In combination, a bearing having a circumferential tapering recess, a shaft journaled in the said bearing, a clutch-ball and spring placed in the said tapering recess, a disk secured to the shaft and closing the open side of the aforesaid tapering recess, a hand-wheel loosely mounted upon the shaft and having a grooved pulley on its inner side recessed to snugly receive the disk, and having a tapering recess in the wall encircling the said disk and closed by the latter, and a ball-clutch and spring located in the said recess of the pulley to act against the periphery of the disk, the tapering recesses of the bearing and grooved pulley extending in opposite directions with respect to each other to cause the parts to operate substantially in the manner specified.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

GEO. S. NEELEY.

Witnesses:
JNO. A. LANDRIGAN,
LUCY F. BOOTH.