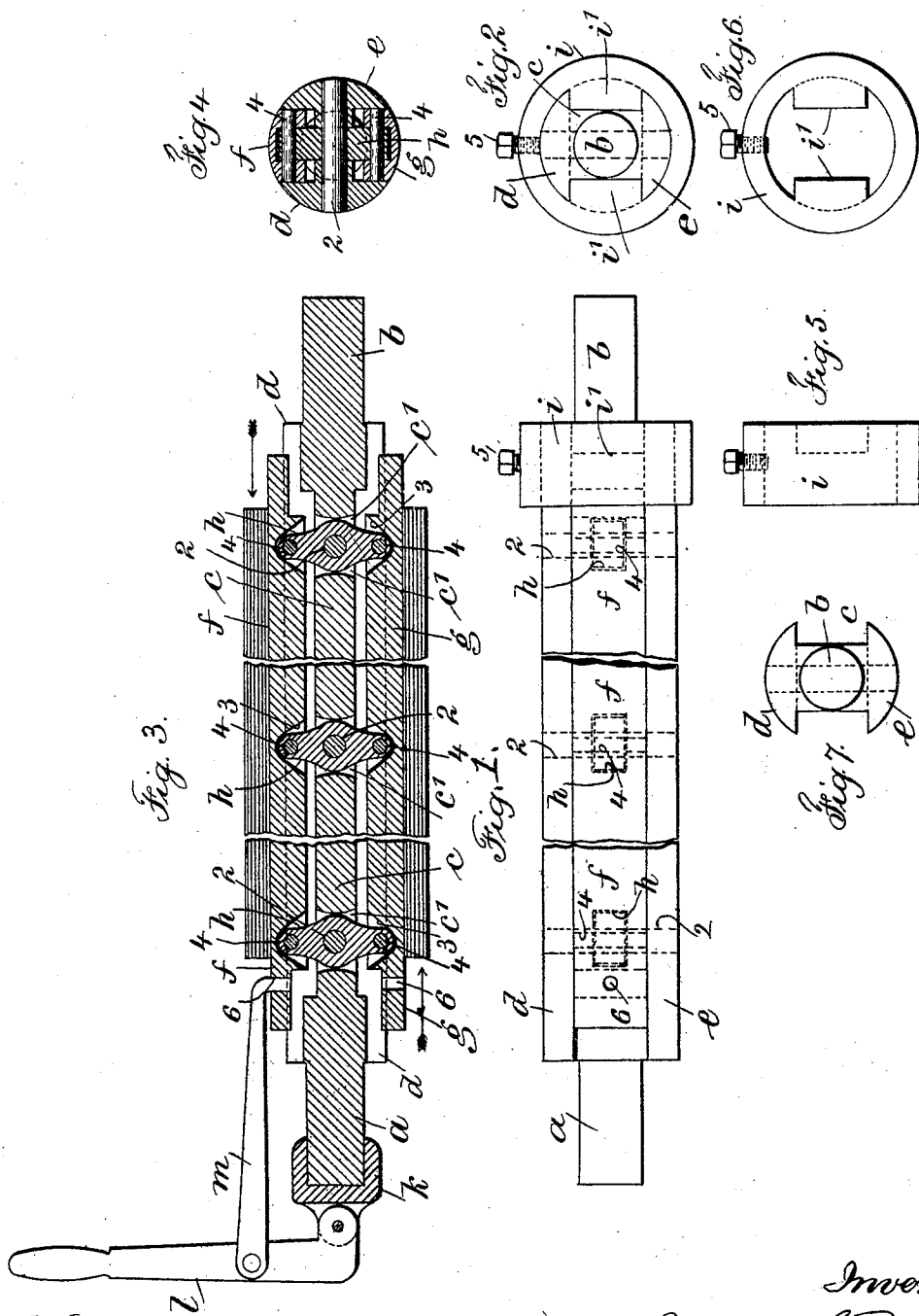


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SHAFT FOR WINDING PAPER ROLLS AND CORES.

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SHAFT FOR WINDING PAPER ROLLS AND CORES.

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To all whom it may concern:

Be it known that I, JAMES H. BAKER, a citizen of the United States, residing at Saratoga Springs, in the county of Saratoga and State of New York, have invented an Improvement in Shafts for Winding Paper Rolls and Cores, of which the following is a specification.

My invention relates to a shaft structure adapted for use in paper-mills and upon which a roll of paper may be wound or paper-cores be made and upon which paper-cores the paper-roll may be wound for shipment. Heretofore difficulties have been experienced in removing from the roll of paper or its core the shaft upon which the same is wound; and the object of my invention is to construct a shaft whose circumference and bearing-surface can be reduced, so that the shaft can be readily removed and the shaft then expanded to an initial condition preparatory to winding thereon another roll.

In carrying out my invention the body of the shaft is longitudinally and oppositely grooved to receive two oppositely-placed movable segments pivotally connected to the body by rocker-arms that in their initial position hold the said segments, so that the round contour of the shaft is complete. This position is maintained by a removable collar held to the shaft only while the roll of paper is being formed. After the roll of paper is complete and it becomes desirable to remove the shaft the movable segments are actuated in opposite directions and closed down into the grooves to contract the circumference of the shaft, so that it may be readily removed. I prefer to employ a cap fitting the end of one journal and a lever and link device to operate the movable segments. The details of the construction are hereinafter more particularly set forth.

In the drawings, Figure 1 is a plan representing my improvement with the collar in position holding the parts as distended and as ready for paper to be rolled thereon. Fig. 2 is an end view of the parts, Fig. 1. Fig. 3 is a vertical longitudinal section of my improvement with the collar removed and showing some layers of paper on the shaft and the lever device in position to contract the parts, so that the shaft may be removed; and Fig. 4 is a cross-section of these parts without the

paper around the shaft. Fig. 5 is an edge elevation of the collar; and Fig. 6 a front elevation of the same, while Fig. 7 is an end view of the body of the shaft without the movable segments. The parts shown in Figs. 1 and 3 are broken across to compact the illustration.

The body portion is composed of the journal ends *a b*, adapted to be set into bearings in which the shaft may be revolved. Between these journal ends there is an intermediate web, which for the main part is of less thickness than the journal ends, and at opposite sides there are fixed segments *d e*, between which segments at opposite sides of the web there are channels or grooves. The journal ends, intermediate web, and the fixed segments *d e* are integral. The intermediate web *c* of the body portion is provided with mortises *c'*, the same being made longitudinally and centrally of the shaft, and the body portion is transversely perforated for the pins 2, which come at the central parts of said mortises, the pins in length agreeing with the extreme diameter of the shaft or body portion.

f and *g* are movable segments placed intermediate of the fixed segments *d e* and occupying a position in the grooves between the fixed segments, and the under sides of these movable segments at the ends are shouldered, as shown in Fig. 3. The under sides of the movable segments are also provided at spaced-apart intervals with recesses 3, and said recesses are in line with the said mortises *c'*, and I employ rocker-bars *h*, which pass through the mortises and are pivoted on the pins 2, the ends of said rocker-bars being received in the recesses 3 and pivotally connected to the movable segments *f g* by pins 4. Adjacent ends of the movable segments are provided with apertures 6. In the position of the parts shown in Figs. 3 and 4 the said rocker-bars are at right angles to the axial line of the shaft and the movable segments are held at their point of greatest distention, and at this point the shaft is circumferentially round and true, and in this position the parts of the shaft are to be held while paper is rolled thereon or while a core for paper-rolls is being made thereon, and for the purpose of holding these parts in position I prefer to employ the collar *i*, (shown in Figs. 5 and 6,) and

which collar is shown in position in Figs. 1 and 2 as slipped over the end of the shaft and surrounding the journal end, the ends of the fixed segments *d e*, and in part surrounding the adjacent ends of the movable segments *f g*, with the internal lugs *i'* of the collar coming up against the adjacent ends of the movable segments *f g* and the collar held in position by a set-screw 5, so as to clamp the same to the shaft and prevent any movement of the movable segments. In this position of the shaft and collar the same may be placed in suitable bearings and paper wound thereon or a paper-roll formed thereon, after which the collar *i* is to be removed.

I have shown and prefer to employ a cap *k*, adapted to fit over one journal end, as *a*, and to this cap a lever *l* is pivotally connected. A link *m* is at one end pivotally connected to the lever, as shown in Fig. 3, and the free end of the link is bent over approximately at right angles to the main portion and made of a size adapted to pass into one aperture 6 of one of the movable segments. These parts are shown in position in Fig. 3, and upon the outward swinging movement of the lever *l* with the thrust against the journal end *a*, to which the cap is connected, the link *m* is pulled upon and actuates the movable segments, pulling one and pushing the other in the direction of the arrows, Fig. 3, so as to close both movable segments down into the grooves of the body, and thus contract the circumference of the shaft, so as to free the grip of the same upon the paper and create a looseness, so that the shaft may be withdrawn from the paper or from the core upon which the paper is wound. After the shaft is withdrawn the lever device is actuated to return the movable segments to their distended position. The collar *i* is then replaced on the shaft, as hereinbefore described, and the lever device may be removed, the shaft then being in condition for repeating the operations of winding paper or of making a core upon which the paper may be wound.

I claim as my invention—

1. A shaft for winding paper rolls or cores, comprising a body longitudinally and oppositely grooved and having journal ends and oppositely-placed movable segments in said grooves pivotally connected to the body.

2. A shaft for winding paper rolls or cores, comprising a body longitudinally and oppositely grooved and having journal ends and oppositely-placed movable segments in said grooves pivotally connected to the body, and means for holding the movable segments in a distended position while the roll of paper is being formed.

3. A shaft for winding paper rolls or cores, comprising a body longitudinally and oppositely grooved and having journal ends and oppositely-placed movable segments in said

grooves pivotally connected to the body, and means for moving said segments to close the same down into the grooves for removing the shaft from the roll of paper or core.

4. A shaft for winding paper rolls or cores, comprising a body longitudinally and oppositely grooved and having journal ends and oppositely-placed movable segments in said grooves pivotally connected to the body, and means for moving said segments in opposite directions to close the same down into grooves for removing the shaft from the roll of paper or core.

5. A shaft for winding paper rolls and cores, comprising a body composed of journal ends, an intermediate web and opposite fixed segments between which at opposite sides of the web there are journals or grooves, movable segments fitting said grooves, and means for pivotally connecting said movable segments to the web of the body portion, whereby the said movable segments may be closed down into the grooves to contract the circumferential area of the shaft.

6. A shaft for winding paper rolls and cores, comprising a body portion composed of journal ends, opposite fixed segments and an intermediate connecting-web, which web is of less thickness than the journal ends so that there are shoulders at their points of intersection, and a web extending centrally across the shaft with mortises in the web at spaced-apart intervals and movable segments adapted to fit in grooves formed between the fixed segments of the body and at opposite sides of the web, said movable segments having recesses in their under surfaces in line with the mortises in the web and their under sides at the ends shouldered, rocker-bars and pins for pivotally connecting the same to the web of the body, and other pins for pivotally connecting the rocker-bars at their ends to the movable segments, whereby, when the rocker-bars are at right angles to the line of the shaft the movable segments are fully distended and the circumference of the shaft is true and round, said movable segments fitting down into the grooves upon the rocking of the rocker-bars, the one moving in one direction and the other in the opposite direction, and their under shouldered ends lapping upon the shouldered portions of the web.

7. A shaft for winding paper rolls and cores, comprising a body portion composed of journal ends, opposite fixed segments and an intermediate connecting-web, which web is of less thickness than the journal ends, so that there are shoulders at their points of intersection, and a web extending centrally across the shaft with mortises in the web at spaced-apart intervals and movable segments adapted to fit in grooves formed between the fixed segments of the body and at opposite sides of the web, said movable segments having re-

cesses in their under surfaces in line with the mortises in the web and their under sides at the ends shouldered, rocker-bars and pins for pivotally connecting the same to the web of the body and other pins for pivotally connecting the rocker-bars at their ends to the movable segments, whereby when the rocker-bars are at right angles to the line of the shaft the movable segments are fully distended and the circumference of the shaft is true and round, said movable segments fitting down into the grooves upon the rocking of the rocker-bars, the one moving in one direction and the other in the opposite direction, and their under shouldered ends lapping upon the shouldered portions of the web, and a collar having a set-screw and internal lugs for about one-half the width of the collar, adapted to fit over the end of the shaft to receive the adjacent ends of the fixed segments and extend over the adjacent ends of the movable segments and hold the movable segments in position while paper is

being wound upon the shaft or a core being made.

8. The combination with a body portion having journal ends and opposite longitudinal grooves and oppositely-placed movable segments in said grooves, and means for pivotally connecting the same to the body portion, of a cap adapted to fit over one journal end, a lever pivotally connected to said cap, a link at one end pivotally connected to said lever and the other free end reduced and bent approximately at a right angle to the main portion of the link and adapted to be received in an aperture of one of the movable segments, whereby with the operation of said lever device the movable segments are closed down into the grooves of the shaft.

Signed by me this 21st day of April, 1905.
JAMES H. BAKER.

Witnesses:

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