

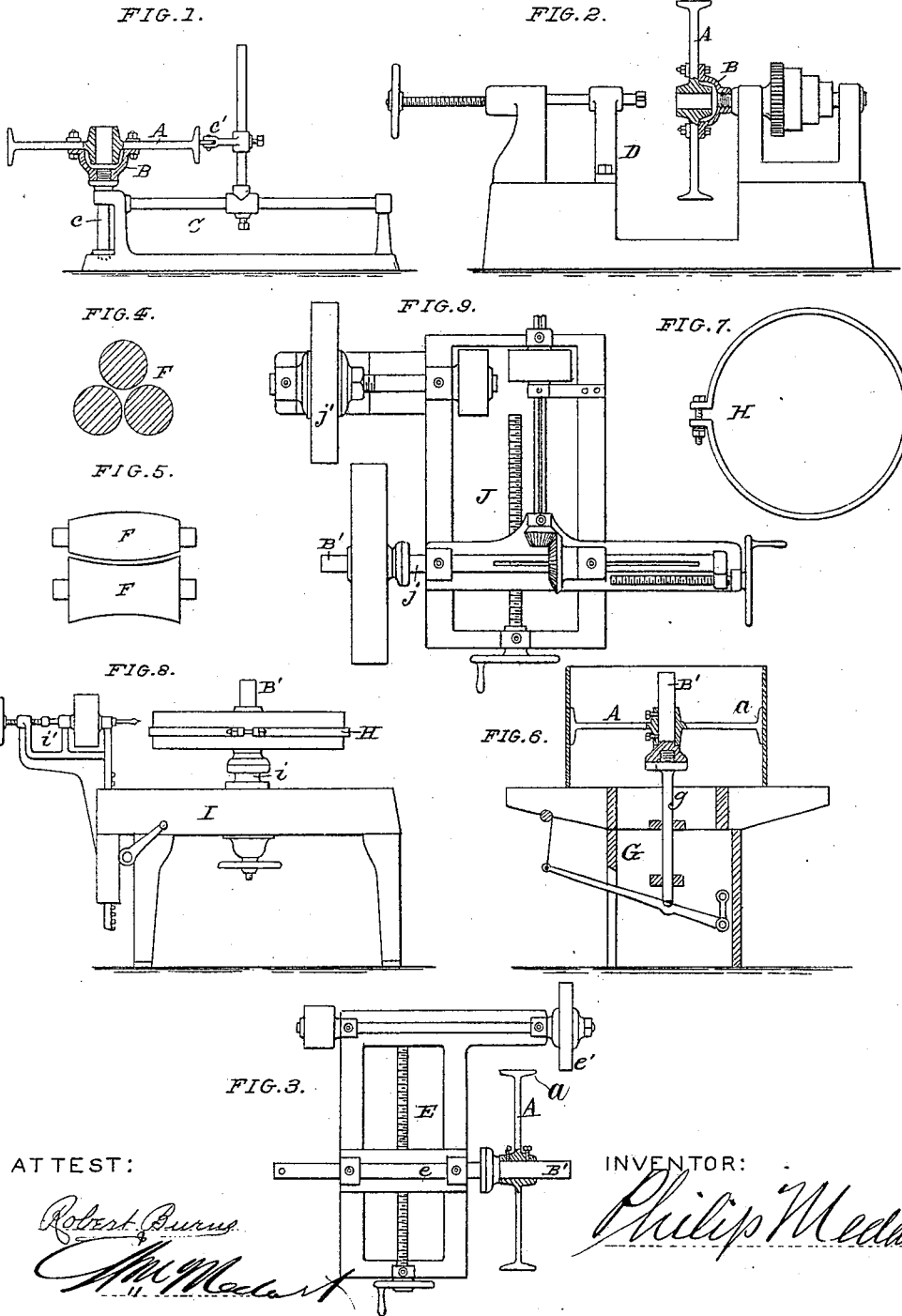
(No Model.)

P. MEDART.

MANUFACTURE OF BELT PULLEYS.

No. 248,599.

Patented Oct. 25, 1881.



ATTEST:

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# UNITED STATES PATENT OFFICE.

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## MANUFACTURE OF BELT-PULLEYS.

SPECIFICATION forming part of Letters Patent No. 248,599, dated October 25, 1881.

Application filed March 15, 1881. (No model.)

*To all whom it may concern :*

Be it known that I, PHILIP MEDART, of St. Louis, in the county of St. Louis and State of Missouri, have invented certain new and useful Improvements in the Manufacture of Belt-Pulleys, of which the following is a specification.

My invention relates to that class of belt-pulleys formed of a wrought-metal rim and a separate center, usually a spider, and usually made of cast metal.

Heretofore considerable difficulty has been encountered in the manufacture of such pulleys, much time, skilled labor, and large and elaborate machinery have been required, and their production has been correspondingly expensive.

The object of my invention is to cheapen and simplify their construction, overcome the objections above mentioned, and produce strong and perfect pulleys in a quick and efficient manner.

My invention therefore consists in an improved process of manufacture, whereby the above results are obtained, as will hereinafter fully be set forth.

In the accompanying drawings, which represent the machinery for carrying out my invention, and the pulley at various stages of its manufacture, Figure 1 is a view of the spider-centering machine with the spider thereon; Fig. 2, a view of the lathe for boring the central bearing of the pulley; Fig. 3, a view of the spider-grinding machine. Figs. 4 and 5 are views of the rim bending and crowning rolls; Fig. 6, a view of the table for fitting the spider to the rim; Fig. 7, a view of the clamping-rim; Fig. 8, a view of the machine for drilling the rivet-holes through the rim and the bracket-lugs on the spider-arms, and Fig. 9 a view of the grinding-machine for truing up the faces and edges of the pulley.

The manner in which I carry out my invention is as follows: The spider or center A of the pulley is secured to a chuck, B, and properly centered thereon by means of the centering-machine C, which for this purpose is provided with a vertical arbor, *c*, on which the chuck screws, and an adjustable indicator arm, *e'*, to show the workman, as he turns the spi-

der, which parts are out of center and what adjustment is required. When the spider has been properly centered it is securely clamped or bolted to the chuck. The chuck and spider may now be secured to the arbor of the boring-lathe D and the hub bored out to the required diameter, as is well understood. I prefer to use a centering-machine, as above set forth; but it may be dispensed with, if desired, and the centering done on the lathe or mill D. The usual screw-holes can now be bored in the hub for the reception of the set-screws to secure the pulley to the shaft on which it is to be used. At this stage the spider may be removed from the chuck B and secured on the mandrel B', which has a screw-threaded socket for screwing on the arbors of the different machines, hereinafter referred to, used in my improved process; but the arbors of these machines may be adapted to receive the chuck B; and, obviously, the boring of the hub, above described, may be deferred until the pulley is otherwise completed, or it may be done at any stage of the operation, as may be desirable and expedient. I prefer, however, to use the mandrel B', as with it there is no danger of the spider or pulley being accidentally forced out of center during the several operations undergone in the process of manufacture. The spider is now secured to the rotatable arbor *e* of the grinding-machine E, and the ends of its arms are ground off concentric with its axis by the grinder *e'*. The rim for the pulley is bent to the required circle in suitable bending-rolls, and may be straight or crowned, as is well understood. Rolls F are shown in the drawings, Figs. 4 and 5, for giving a crown to the rim. The rim, as it comes from the rolls, is of sufficient length to allow a slight overlap in applying it to the spider, and has one end filed or finished up square, for the purpose hereinafter set forth. The spider is now transferred from the grinding-machine E to the vertically-adjustable arbor *g* of the rim-fitting table G. This arbor is vertical to the table, and being adjustable holds the spider at any required height, with the horizontal central plane of the spider parallel with the face of the fitting-table, on which the rim rests, as shown, and consequently insures an accurate fit of the rim to the spider.

In the drawings the rim is shown as rolled straight, and the bracket-lugs *a* on the spider-arms correspondingly ground; but when the rim is crowned the bracket-lugs are ground to fit it.

5 The rim is applied to the spider in the following manner: It is placed around the spider on the fitting-table G, and firmly drawn or clamped thereon by the band H. The amount  
10 of overlap necessary to be cut off is then accurately marked on the unfinished end of the rim, the rim removed, and the overlap cut off, after which it is again placed around the spider and the band applied so as to firmly clamp the  
15 two together, the butt-joint of the rim being formed on one of the bracket-lugs. The pulley is now mounted on the rotatable arbor *i* of a drilling-machine, I, and the rivet-holes drilled through the rim and bracket-lugs. The drill-  
20 head *i'* of the drilling-machine is adjustable vertically, to drill the rivet-holes at different heights. When the drilling is completed the partly-finished pulley is removed from the machine and the rim riveted to the spider-arms.  
25 The band H is then removed, and the pulley is secured on the rotatable arbor *j* of the finishing grinding-machine J. This arbor has also an endwise and a sidewise movement, (the gears of the machine being secured to their shafts  
30 by a groove and feather to permit of these movements, as will be understood by those familiar with this class of machinery,) which are regulated and adjusted by the screw-shafts, as shown. The face of the rim is ground off  
35 smoothly by the grinder *j'*, concentric with the axis of the pulley, and from the same center that the spider-arms were ground. The edges of the rim are now squared or trued up against the sides of the grinder, and the pulley is com-  
40 pleted.

Pulleys thus manufactured are perfectly balanced, faultless in shape, strong and durable, and can be produced more rapidly and at less

expense than the imperfect pulleys heretofore made.

The machinery herein shown and referred to has not been described more in detail, as its operation will be clear to those skilled in such matters; and no claim to it is herein made, it being my purpose to secure protection for such apparatus by other applications hereafter to be made.

I claim as my invention—

1. The herein-described improvement in the art of manufacturing belt-pulley spiders for  
55 composite belt-pulleys, which consists in centering the pulley center or spider and then grinding the same concentrically with the axis of the pulley, substantially as set forth.

2. The herein-described improvement in the  
60 art of manufacturing belt-pulleys, which consists in centering the pulley center or spider, boring it, grinding it concentrically with the axis of the pulley, and then securing the rim thereto, substantially as described.

3. The herein-described improvement in the art of manufacturing belt-pulleys, which consists in centering the pulley center or spider, boring the hub thereof, grinding the center or spider concentric with the axis of the pulley,  
70 securing the rim thereto, grinding the face of the rim concentric with the axis of the pulley, and then grinding or squaring the edges of the rim, substantially as set forth.

4. The improvement in the art of manufac-  
75 turing belt-pulleys which consists in centering the pulley center or spider upon a chuck or mandrel, as herein described, and then subjecting it to the various operations in the process of manufacture without removing it there-  
80 from, whereby all the work is done from a common center and absolute accuracy insured.

PHILIP MEDART.

Witnesses:

WM. MEDART,  
ROBT. BURNS.