R. SAFELY.

Turning Machine.

No. 60,259. Patented Dec. 4, 1866.

Fig. 1

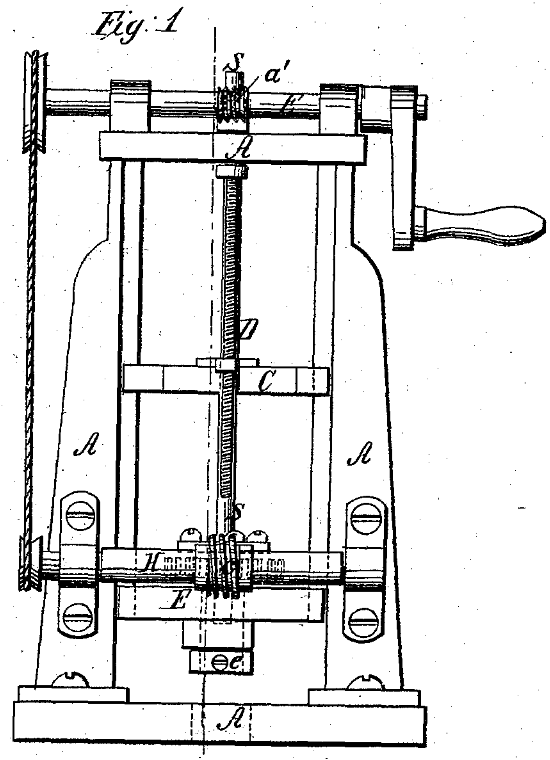


Fig. 2.

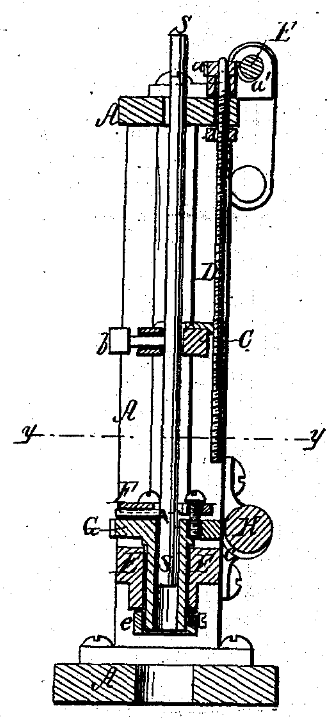
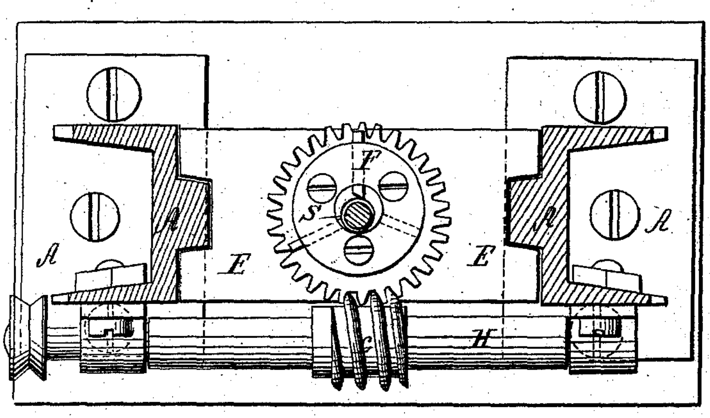


Fig. 3.



Witnesses;
R. S. Campbell
Henry Sylvester

Inventor;
Robt Safely
by his atty
Mason Fenwick & Lawrence

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

United States Patent Office.

IMPROVEMENTS IN MACHINES FOR TURNING SHAFTING.

ROBERT SAFELY, OF COHOES, NEW YORK.

Letters Patent No. 60,259, *dated December* 4, 1866.

SPECIFICATION.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, ROBERT SAFELY, of Cohoes, Albany county, State of New York, have invented a new and improved Machine for Turning and Finishing Shafting; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, making a part of this specification, in which—

Figure 1 is a front elevation of the improved machine.

Figure 2 is a section taken through fig. 1, at the point indicated by red lines *x x*.

Figure 3 is a horizontal section through the machine, taken above the cutters.

Similar letters of reference indicate corresponding parts in the several figures.

The object of this invention is to obtain a machine which will turn and finish shafting in a much better and more expeditious manner, and with less labor to the attendant, than hitherto. It consists in so constructing such machine that there will be no liability nor tendency of the shaft sagging during the operation of turning and finishing, the shaft being arranged in the machine in an upright or vertical position, instead of a horizontal position as heretofore, as will be hereinafter described.

To enable others skilled in the art to understand my invention, I will describe its construction and operation.

In the accompanying drawings, A represents the frame of the machine, which consists of two strong uprights which are securely held by means of a horizontal base plate and a top plate, through the centre of which are vertical holes for the passage of the shafts through the machine. The lower central hole through the base plate is of such size as to admit of the passage through it of the shaft chips, or "turnings," and water. C represents a horizontal support, which receives a vertical movement from the feed-screw D, which screw carries on its upper end a tangent-wheel, *a*, that is rotated by means of the worm *a'* on the upper horizontal shaft, E. The screw, D, communicates a slow downward movement to the cross-bar or support, C, to which latter the shaft, S, to be turned is clamped by means of a screw, *b*, fig. 2. The ends of the shaft support, C, are guided by means of tenons on the inside surfaces of the frame standards, as shown in figs. 1 and 3. E represents a horizontal support for the tool-chuck, F, which latter is fastened by means of screws to the tangent-wheel, G, that engages with and receives a rotary motion from the worm, *c*, on the horizontal shaft, H. The chuck, F, is composed of a top plate, having a central vertical hole through it, the screws of which serve to confine the tools that are used to finish the shaft. These cutters, three in number, radiate from the centre of the chuck, and their cutting ends are made concave or concentric to the axis of the shaft which they are employed to turn and finish. The cutting ends of these tools take off the superfluous metal from the shaft, at the same time finishing it with a water polish. The tangent-wheel, to which the cutters are secured, has a long hub or collar formed on its lower surface, which has a hole through it of sufficient size to allow of the escape of chips and water from the cutters. This tubular collar has its bearings in the supporting cross-plate, E, and is provided on its lower end with a collar, *e*, by the removal of which the tangent-wheel and its attachment can be detached from the machines.

In turning and finishing shafting, the shaft, after it is straightened, is put into a common horizontal engine lathe and centred true, then a "cut" is taken from it with a diamond-point tool, to make it perfectly cylindrical; the shaft is then "doctored," to make it uniform in size. The shaft being in a horizontal position sags by its own weight, and springs away from the tool by its elasticity and resistance to the tool. To partially correct this tendency the "follower rest" is used, as is also the "centre rest," but these attachments involve a loss of time, and are otherwise very objectionable. By my machine I completely obviate all difficulties, and am enabled to turn and finish shafting with much greater speed and accuracy. The shaft in my machine is not, and does not require to be centered, but is placed vertically, and thus obviates the necessity of a centre rest. The operation of turning and "doctoring" is performed by the same tools and at the same time, thus effecting a great saving in time and material. Instead of holding the shaft stationary by the support, C, and having the chuck to rotate, the same result might be accomplished by having the chuck stationary and rotating the shaft during the turning and finishing of it.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. An improved machine which is adapted for turning and finishing shafts when they are supported in an upright position, said machine being constructed and operating substantially as herein specified.

2. The combination of the horizontal chuck support E, and sliding shaft holder C, with devices for feeding, turning, and finishing shafts that are arranged in an upright or vertical position, substantially as described.

ROBERT SAFELY.

Witnesses:

E. W. FULLER,

GEO. P. STEENBERGH.