

(No Model.)

E. L. POST.

MACHINE FOR TESTING THE FRICTION OF METALS.

No. 358,164.

Patented Feb. 22, 1887.

Fig. 1.

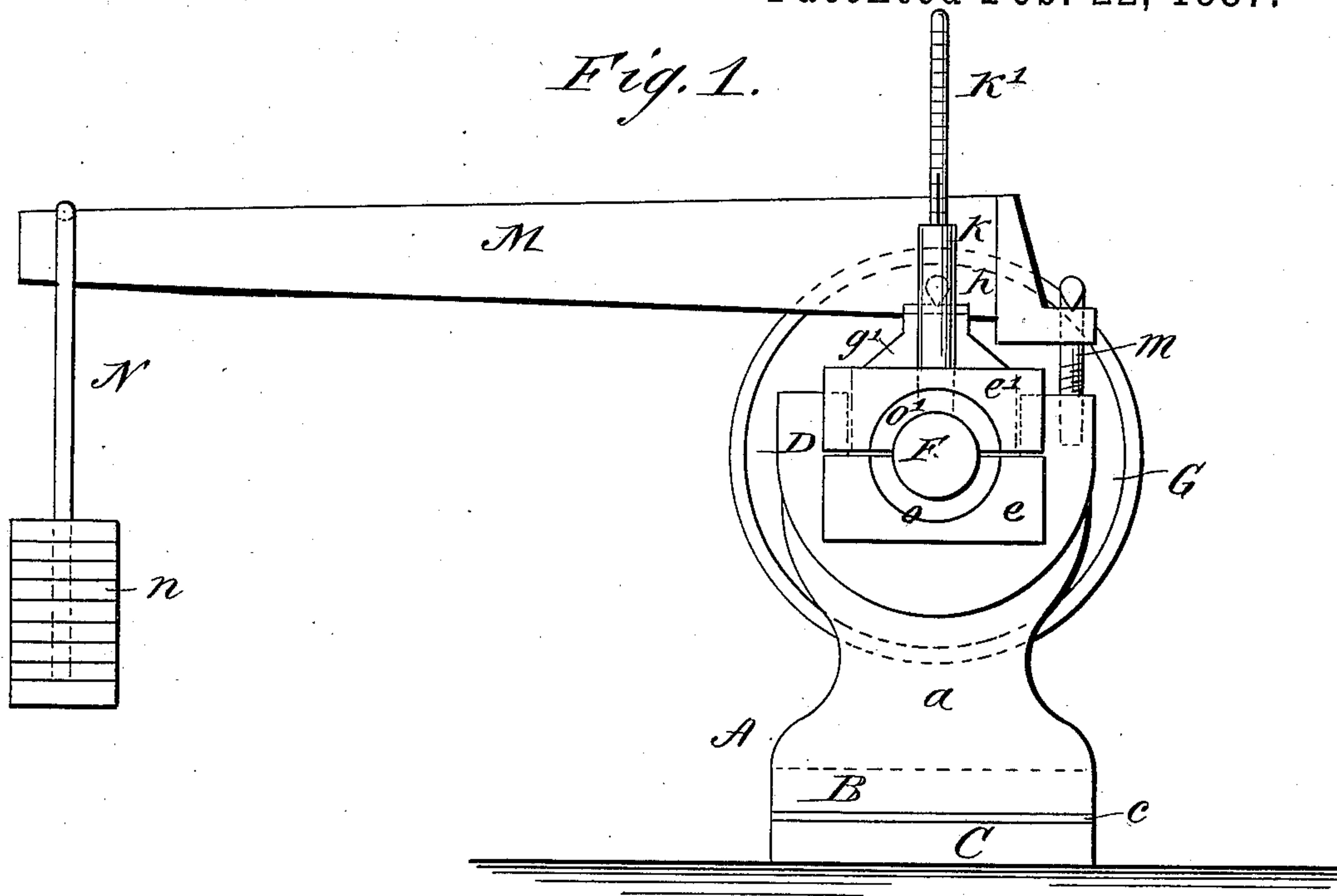
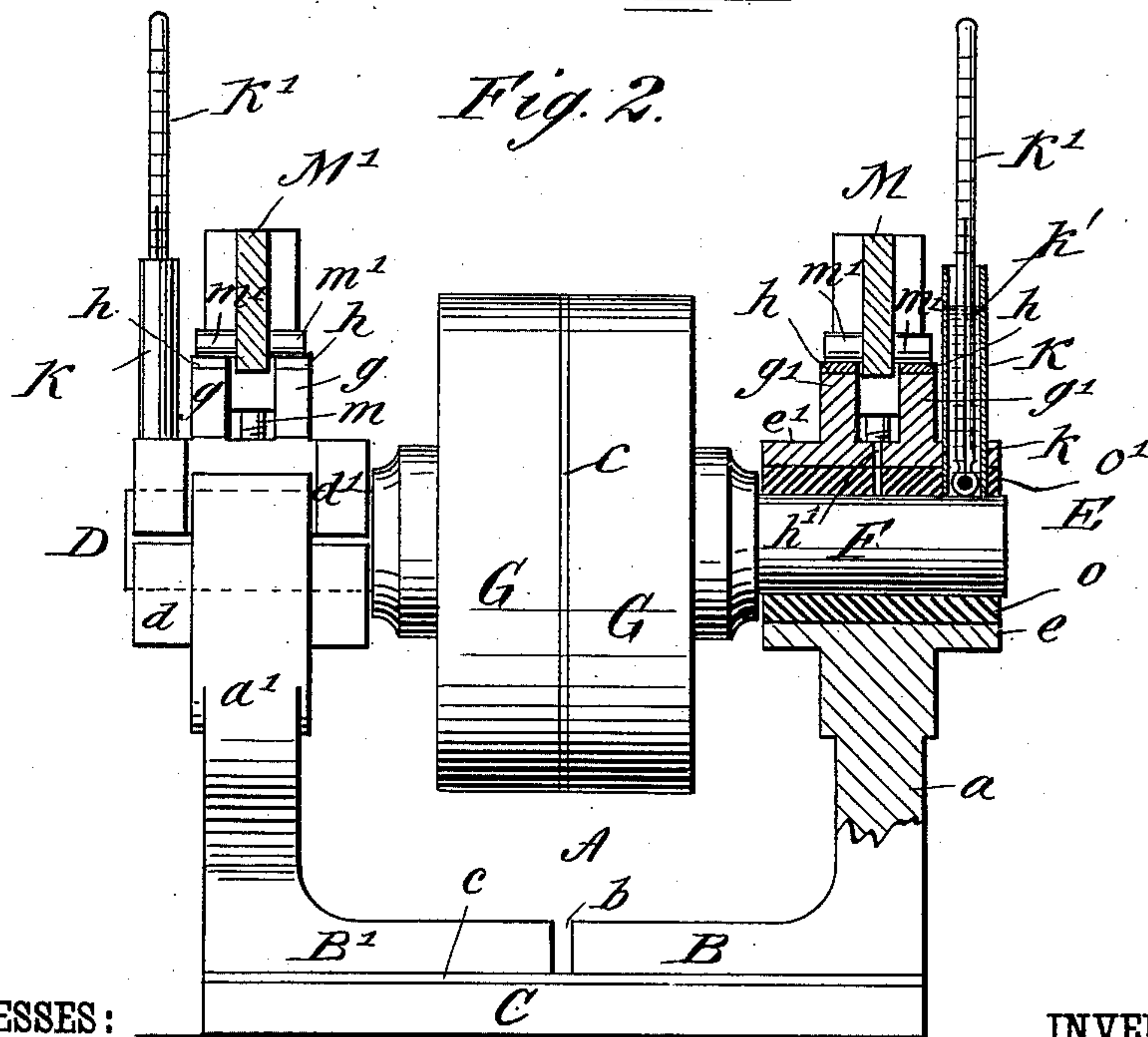


Fig. 2.



WITNESSES:

Donn Twitchell.
W. Sedgwick

INVENTOR:

E. L. Post

BY

Munn & Co.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

EZRA L. POST, OF NEW YORK, N. Y.

MACHINE FOR TESTING THE FRICTION OF METALS.

SPECIFICATION forming part of Letters Patent No. 358,164, dated February 22, 1887.

Application filed November 2, 1886. Serial No. 217,804. (No model.)

To all whom it may concern:

Be it known that I, EZRA L. POST, of the city, county, and State of New York, have invented a new and Improved Machine for Testing the Friction of Metals, of which the following is a full, clear, and exact description.

My invention relates to an apparatus for testing the friction of metals, and has for its object to produce a portable machine of simple construction, through the use of which the relative frictional resistance of metals may be ascertained and the percentage of one over the other accurately computed.

The invention consists in the construction and combination of the several parts, as will be hereinafter fully set forth, and pointed out in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in both the figures.

Figure 1 is a side elevation of my machine; and Fig. 2 a front elevation thereof, partly sectional.

The frame A is constructed of two vertical end standards, *a a'*, having their upper surfaces recessed centrally, so as to impart to the same somewhat the shape of the letter U, and their under surfaces provided with integral horizontal inward projections, B B', forming the base for said standards. The two projections B B', thus extended horizontally in the same direction, are made to approach each other at the center and form a narrow transverse space, *b*. Between the bases of the standards *a a'* and the solid base C of the machine a layer or layers, *c*, of paper or other non-conductive material, is interposed, the purpose of the aforesaid space *b* and the layer *c* being to prevent the passage of heat from one side of the machine to the other, as will be hereinafter set forth.

Within the recessed top of the standards *a a'* the lower half, *d* and *e*, of the journal-boxes D and E are detachably placed, adapted to receive a shaft, F, having centrally keyed thereon a pulley, G. The said shaft and pulley are, however, divided centrally and provided with an interposing packing, *c*, of non-conductive material, similar to the aforesaid packing in the base C, as a further precaution against the transmitting of heat, the said shaft and pulley

being again united to revolve in unison by clamps, bolts, or in any customary or well-known manner. The upper sections, *d'* and *e'*, of the said journal-boxes D and E are provided upon each side of the center with integral vertical projections *g g'*, having a steel plate, *h*, attached to the top face thereof. Centrally between said projections in the said upper sections a lubricating-aperture, *h'*, is formed, and near each outer end a larger aperture, *k*, is made centrally the upper surface to admit a tubular casing, K, to a bearing upon the shaft F, purposed to shield a thermometer, K', the bulb of which is also made to rest upon the shaft to prevent friction and keep the said thermometer in an upright position. The said casing K is partially filled with oil *k'*.

In the rear arm of each standard *a* and *a'*, in alignment with the space between the projections *g g'* of the journal-boxes D and E, I fasten, by screw-thread or otherwise, a T-shaped rod, *m*, having its arms formed with a knife-edge. I now employ two levers, M M', of a suitable length, provided upon each side, near their rear ends, with horizontal knife-edged arms *m'*, and having their extreme rear ends reduced and recessed centrally, each lever M and M' being adapted when in position to engage the T-shaped vertical rods *m*, with their recessed rear ends, in such manner as that the arms of said rods will bear upon the reduced portion of said levers, as shown in Fig. 1, thus bringing the knife-edged arms *m'* of the levers to a bearing upon the steel plates *h* of the box projections *g* and *g'*. The levers thus positioned are provided with a carrier, N, at their free ends, adapted to receive weights *n*, the length of the levers being so calculated as that one pound placed upon the said carrier N will exert a pressure of three pounds to the square inch upon the boxes D and E.

In operation I cast the standard metal and the metal to be tested against said standard in two parts, the said metals partaking of a shape similar to the inner contour of the journal-boxes. The metals are then placed one part, *o*, in the lower box-section, *d* and *e*, and the shaft F entered thereon. The remaining portion, *o'*, of the metals, having previously been drilled in line with the apertures *h'* and *k* in the upper box-sections, *d'* and *e'*, are

placed upon the shaft and the said box-sections upon the metals. The thermometer and casing are now entered to a bearing upon the shaft, and the levers M M' placed in position
5 and weighted equally until the required pressure is obtained. Thus we have one kind of metal in the box E and another in the box D, with no possibility of the heat of one bearing being communicated to the other, due to the
10 divisions above referred to and the interposed packing of non-conductive material. The power is applied and the shaft revolved in its metal beds. In making tests the temperature of each metal is taken about every fifteen min-
15 utes during the period of work, and the temperatures of each metal, when the machine has been stopped, are added separately to obtain a total. From each total the temperature of the room at the time of starting is deducted.
20 Then deducting one from the other to find the difference, I divide the difference by the lesser amount, whereupon the percentage of friction that one box runs over the other is obtained.

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

1. A machine for testing the friction of metals, provided with a frame supporting independent boxes carrying separate metals, and

a non-conductive shaft-journal in said boxes 30 on said metals having keyed thereto a non-conductive pulley, substantially as shown and described, for the purpose herein set forth.

2. A machine for testing the friction of metals, provided with a frame supporting independent boxes carrying separate metals, a non-
35 conductive shaft journaled in said metals, having keyed thereto a non-conductive pulley, means for imparting pressure to said boxes, and means for taking the temperature from
40 the shaft, substantially as shown and described, and for the purpose herein set forth.

3. A machine for testing the friction of metals, provided with a non-conductive frame supporting independent divided and detachable
45 boxes carrying separate metals, a shaft having keyed centrally thereto a pulley journaled in said metals, the said shaft and pulley packed transversely with non-conductive material, independent weighted levers pivoted upon each
50 box, and an incased thermometer entered through said boxes and metals to a bearing on the shaft, substantially as shown and described, and for the purpose herein set forth.

EZRA L. POST.

Witnesses:

J. F. ACKER, Jr.,

E. M. CLARK.