

J. D. HUSBANDS, Jr.
Stone Dressing-Machines.

No. 153,568.

Patented July 28, 1874.

Fig. 1.

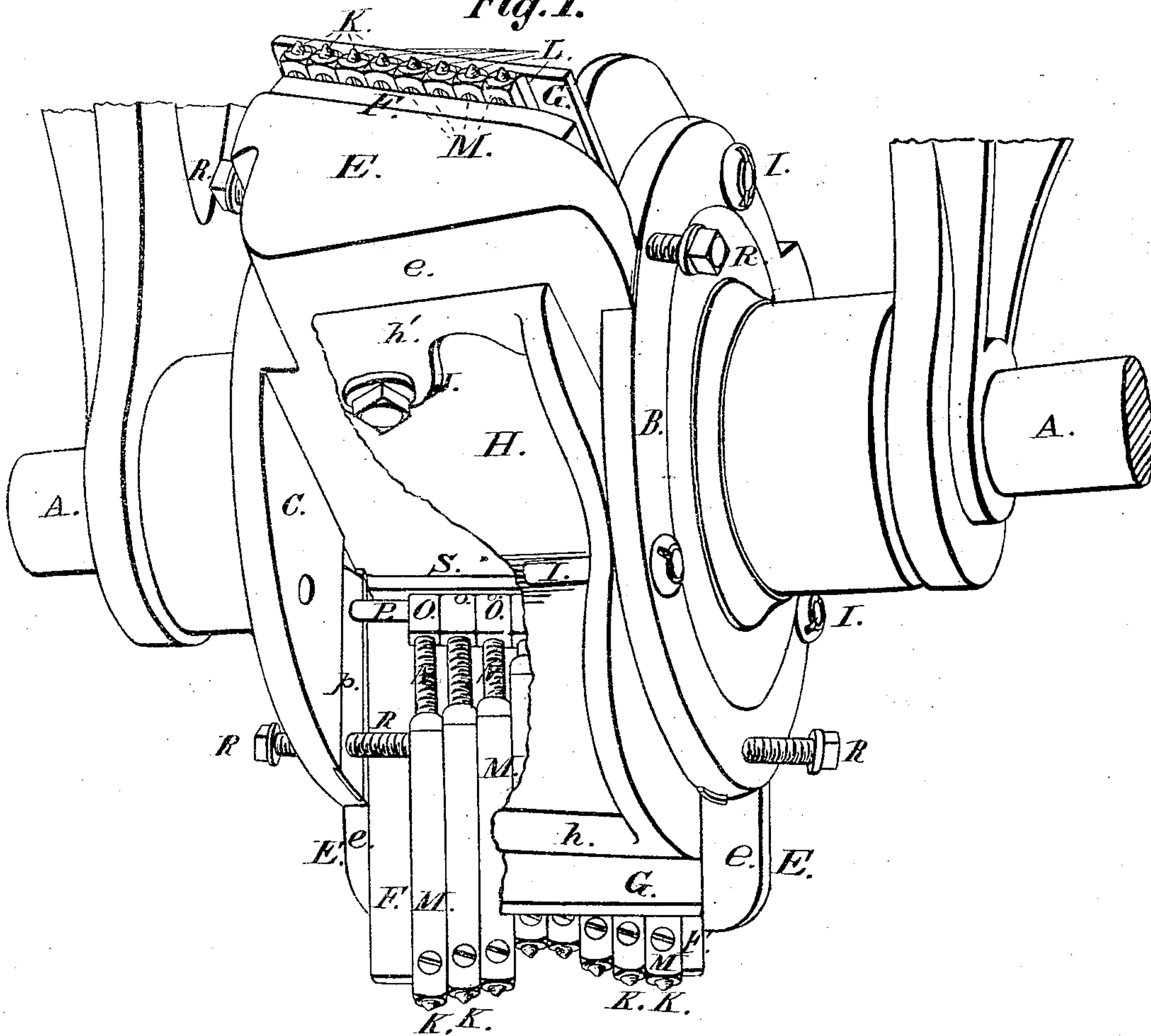
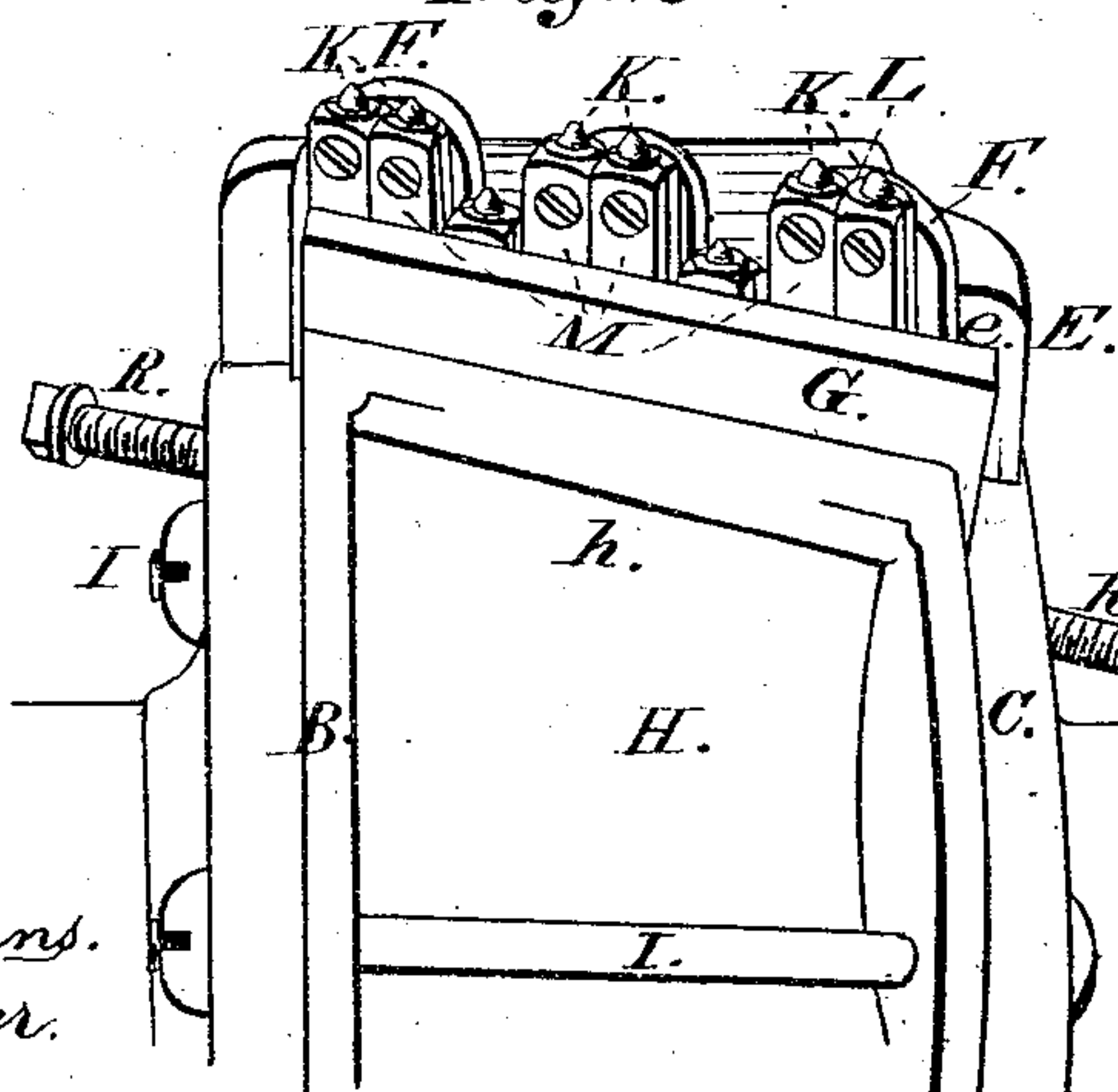


Fig. 2.



ATTEST:

Robert Burns.
H. P. Tanner.

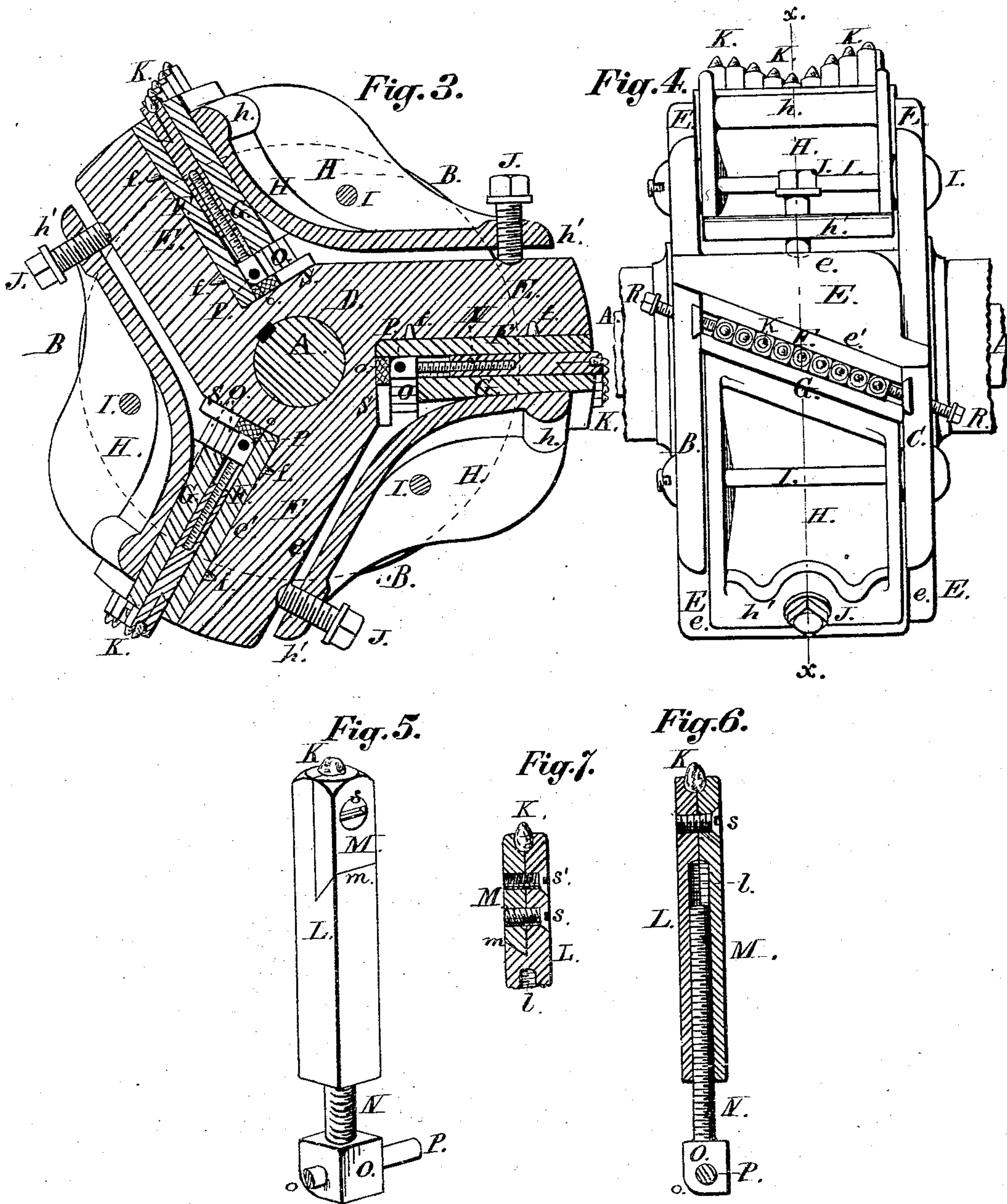
INVENTOR:

Joseph D. Husbands Jr.
By Wright Bros.
Atty.

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UNITED STATES PATENT OFFICE.

JOSEPH D. HUSBANDS, JR., OF ST. LOUIS, MISSOURI.

IMPROVEMENT IN STONE-DRESSING MACHINES.

Specification forming part of Letters Patent No. **153,568**, dated July 28, 1874; application filed April 28, 1874.

To all whom it may concern:

Be it known that I, JOSEPH D. HUSBANDS, Jr., of the city and county of St. Louis, and State of Missouri, have invented a certain new and useful Improvement in Machines for Dressing Stone, of which the following is a specification:

My improvement relates to a rotary cutter-head for cutting moldings, &c., in stone. Working and dressing stone by machinery have heretofore been laboriously accomplished in various ways, but principally by means of cylinders having steel cutters, by cutters themselves, either revolving or stationary, and by cutter-heads, disks, or pieces of metal studded with diamonds and shaped in a manner complimentary to the thing to be made. These have been reciprocated or rotated over the stone while the stone remained stationary, or while the stone has been rotated or reciprocated under or at the side of the cutters mentioned. Where cutters of metal have been used the chisels are secured as in common iron-planing machines, and have not been capable of cutting different patterns with the same tool or tools. When diamond points have been inserted or brazed in the metal of a plane or irregular surface which it is intended to cut, no attention has been paid to the manner of holding the points beyond the resistance of the metal. By such processes a separate cutter-head, or form studded with diamonds, is required for each pattern or design made.

The object of my invention is to produce a cutter-head or machine whereby any given device may be cut with the same cutter as well as a plane surface, or any number of different styles of molding, simply by adjusting the diamond-holders or cutting-points within the cutter-head.

The first part of my invention consists in the combination with the rotary head of diamond-holders, having independent adjustment to and from the axis of the head. The second part of my invention consists in making the said holders adjustable lengthwise of the cutter-head, so as to cause the diamonds in one series to be in circumferential lines diverse from those of the other series. The third part of my invention consists in the con-

struction of the head with a number of oblique shoulders or abutments for the support of the diamond-holders in series oblique to the cutter-head, so that no two diamonds of the series will be in the deepest part of their cut at the same time. The fourth part of my invention consists in the combination with the cutter-head and holders, as set forth, of a spring or springs inserted beneath the ends of the holders to allow their temporary retraction or retreat under extreme pressure, and to return them to their prominent position when said extreme pressure is past. The fifth part of my improvement consists in the manner of holding the diamonds in the holders. Said holders consist of two parts held together by solder, rivet or rivets, or other means, among which I use two screws, one of which has a right and the other a left hand thread, and being both entered from one side any shake tending to unscrew the one would tend to screw up the other. The sixth part of my improvement consists in the combination of the diamond-holder proper with a pivot-bar running through the heads of the temper-screws of the series, as shown, so that either holder can be bent down out of line, to allow the upper part to be turned on the adjusting-screw to regulate the radial distance of the cutting-point from the axis of the head. After adjustment the holders are restored to their radial position, when their square form prevents them from turning, and holds them to their adjustment.

Figure 1 is a perspective view of the cutter-head. Fig. 2 is a similar view of a portion of the same. Fig. 3 is a section at *x x*, Fig. 4. Fig. 4 is a side view of the cutter-head. Fig. 5 is a perspective view of a diamond-holder. Fig. 6 is an axial section of one of the holders. Fig. 7 is an axial section of part of one of the holders, showing a right and a left hand screw for holding the parts together.

A is the shaft, upon which the cutter-head may be secured by a key or otherwise. The cutter-head has two ends, B C, connected together at the center D, and also connected by angular cross-pieces E, extending from the central part to the periphery of the ends. Three of these cross-pieces are shown; but they may be more or less in number, if desired.

The rear side *e* of the cross-piece E is straight across the cutter-head, but the side *e'* is oblique and forms an abutment for the diamond-holders. Between the holders and the face *e'* is preferably interposed a plate, F, that may, if desired, have its outer edge rudely fashioned like the molding to be produced, so as to give a support to the diamond-holders near their outer ends. This plate may have lugs *f* resting in suitable cavities in the face *e'*, so as to hold it in place. The plates F are made removable, so that one may be used having the proper marginal outline, as before stated.

I will now describe the diamond-holders and their manner of adjustment. There may be any desired number of diamonds in each holder, and such diamonds may project from the top and sides, either or both. K is the diamond inserted between the two parts L M, forming the shanks or outer part of the holder. In inserting the diamond these parts L M are preferably heated and pressed together upon the diamond, so as to embed the diamond in them, as described in a former application for patent made by me. After the parts are pressed together they may be attached by brazing, riveting, or by screw *s*, or by screws *s s'*, the screw *s* being a right-hand screw, and the screw *s'* being a left-hand one, so that any jar tending to unscrew the one would tend to tighten the other. The same end would be accomplished by making both screws either right-handed or left-handed and screwing them in from opposite sides of the holder. The parts L M may be fitted together in any preferred manner; for instance, they may each constitute one-half of the stem or shank, as seen in Fig. 6, or the part M may be fitted into a recess at the side of the part L, as shown in Figs. 5 and 7—in the latter case the inner end of the part M by lock-joint, as seen at *m*.

The inner end of the shank L M has an axial screw-threaded socket, *l*, to receive a screw, N. The head O of the screw N has a transverse hole to allow the passage of a pivot-rod, P. The rod P may have bearings at the ends in plates *p*, occupying radial grooves or recesses in the inner faces of the ends B C. Thus all of the holders in each series are strung on the rod P, and clamping devices being removed either of the holders may be turned down out of rank for adjustment, (so as to regulate the radial distance of the cutting-point from the axis of the cutter-head,) the outer corner *o* of the head being rounded off to admit of the holder being turned down. This radial adjustment of the holders is accomplished by turning the shank L M upon the screw N so as to lengthen or shorten the holder. When the holders are in the cutting position, as shown, the square sides bear one against another, and against the clamping devices, so that no change of adjustment can take place when the holders are in this position. The front side of the holders is clamped by the fol-

lowing devices: G is a plate, preferably of a wedge shape, with the thin side outward, and whose inner and thicker edge bears on the outer side of the heads O, to hold the holders from being driven too far out by the centrifugal force imparted to them from the rotation of the cutter-head. This plate is made of the described wedge form, to prevent its working outward. H is a lever-shoe, fulcrumed on a bolt or bolts, I, passing through the ends B C. The toe *h* of this shoe has an obliquity similar to that of the face *e'*, and bears upon the plate G with sufficient force to keep the diamond-holders in place. The toe *h* is forced against the plate G by a set-screw, J, passing through the other end, *h'*, of the shoe, and bearing against the face *e* of the cross-piece E.

Although the holders cannot be changed in their adjustment when in the position for use, yet they are preferably allowed the freedom to retreat a small distance, in case an extreme pressure is exerted on either of the diamonds. To allow of this retreating motion, I have interposed between the head O and the part D a strip of caoutchouc or other spring, S, which allows this retraction, and yet has sufficient resistance (with the help of the centrifugal force) to again project the holder when the cause for retraction is past.

It will be seen that the series of holders stand in lines oblique to the cutter-head, so that when the diamonds are equidistant from the axis, as seen in the upper series in Fig. 1, they will no two of them come in contact with nor leave the stone at the same time, and even when arranged for cutting other than a flat surface, as seen in Fig. 2, and the lower series in Fig. 1, no two diamonds will be in the deepest part of their cut at the same time.

The lateral adjustment of the diamond-holders is accomplished by means of set-screws R at each end of the series, and which screw through the ends B C. The points of these set-screws have bearing against the outside holders of the series, so that the whole series can be moved either toward the end B or that C. The diamond-holders may be adjusted in distance from each other in the series by interposing plates of metal between them. The set-screws R pass through the sliding plates *p* and help to hold them in place, (especially when the plate G and shoe H are removed for adjustment.)

It will be seen that the diamonds are some distance apart in the series, so that not all of the stone-surface would be cut over by one series, and that small ridges would be left between the diamonds. To leave a smooth surface, devoid of ridges, the diamonds in one series are arranged laterally in respect to those of the other series, as to remove the ridges left upon the face of the stone by them, so that the stone may be left with the proper degree of evenness.

In Fig. 1 the upper series of holders is shown with the diamonds in a line parallel with the axis of the cutter-head, so as to form

a flat surface on the stone. The lower series in this figure is shown as arranged for cutting an uneven surface. In actual use the series would all, of course, have to be arranged alike.

The cutter-head may have reciprocating motion in the direction of the length of the shaft, in combination with its described rotary motion. The said reciprocating motion may be imparted to the shaft A, or it may be imparted directly to the cutter-head, which may, in this case, be made to slide endwise on the shaft, and to be rotated with said shaft by means of a spline upon the latter.

The positions of the screw N and socket-screw l of the holders may be reversed, if preferred, the screw being upon the outer part, L M, and the socket in the inner part, O.

The stone may be moved before or beneath the cutter-head, or the feed may be in the cutter-head and the stone be stationary.

I claim as new and of my invention—

1. The rotary cutter-head provided with a series of diamond-holders radially adjustable therein.

2. The rotary cutter-head provided with a series of diamond-holders laterally adjustable therein in a plane oblique to the axis.

3. The diamond-holders L M N O, spring S, and pivot-rod P, all combined substantially as set forth.

4. The diamond-holders L M N O, rod P, wedge-formed plate G, and shoe H with heel-screw J, all combined in the cutter-head, substantially as set forth.

JOSEPH D. HUSBANDS, JR.

Witnesses:

SAML. KNIGHT,
ROBERT BURNS.