

(No Model.)

B. A. KENNEDY.
DIE FOR SWAGING SCREWS.

No. 338,276.

Patented Mar. 23, 1886.

Fig. 2.

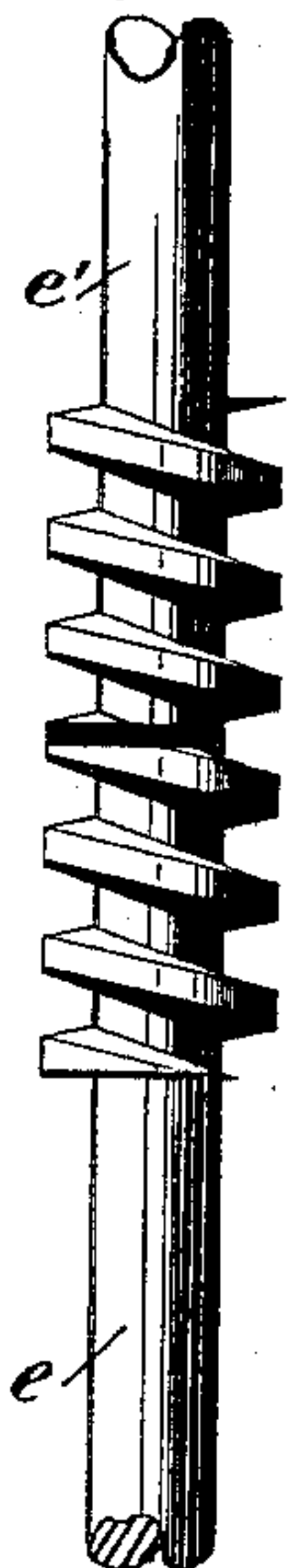


Fig. 3.

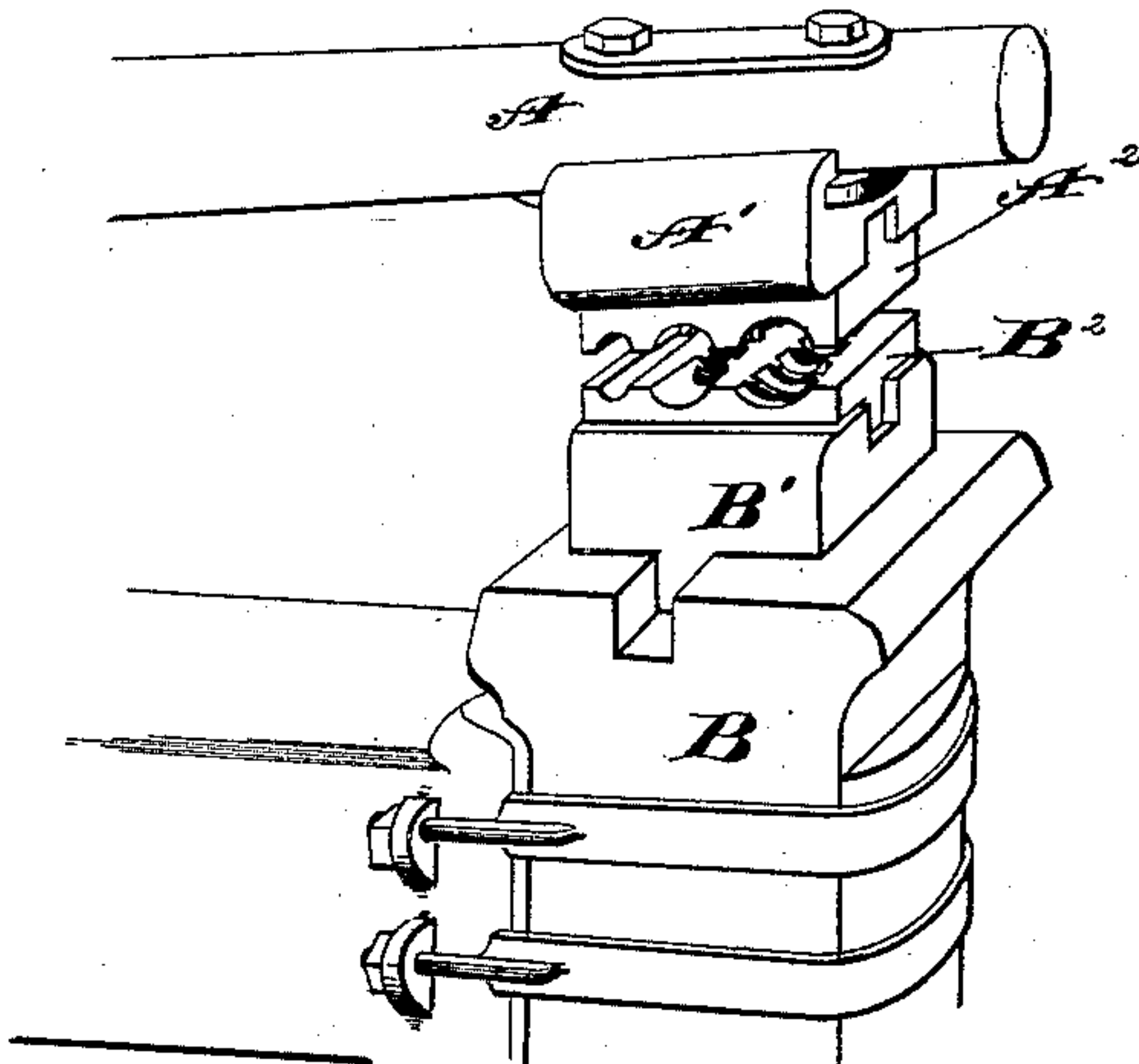


Fig. 1.



Fig. 7.

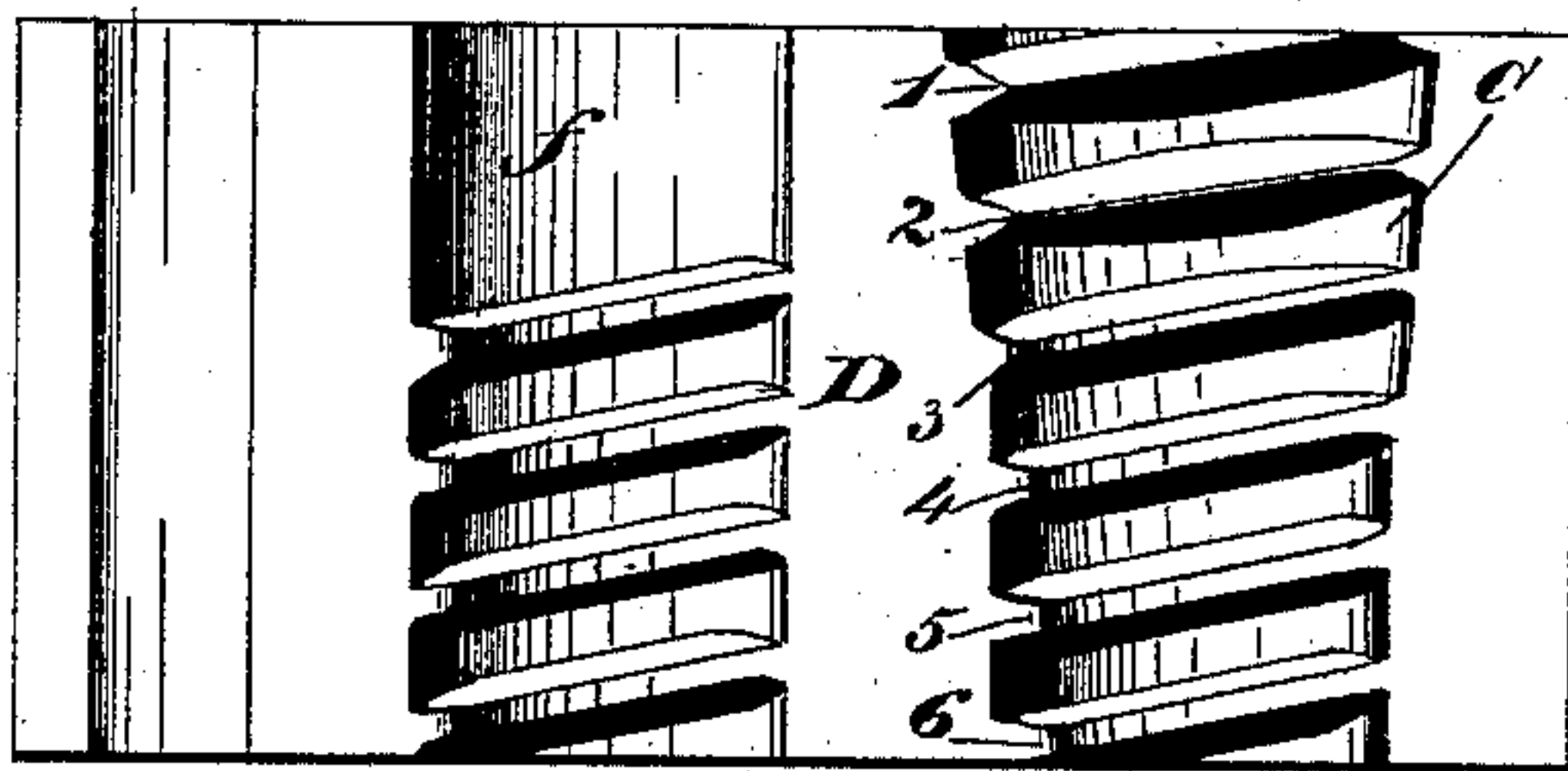
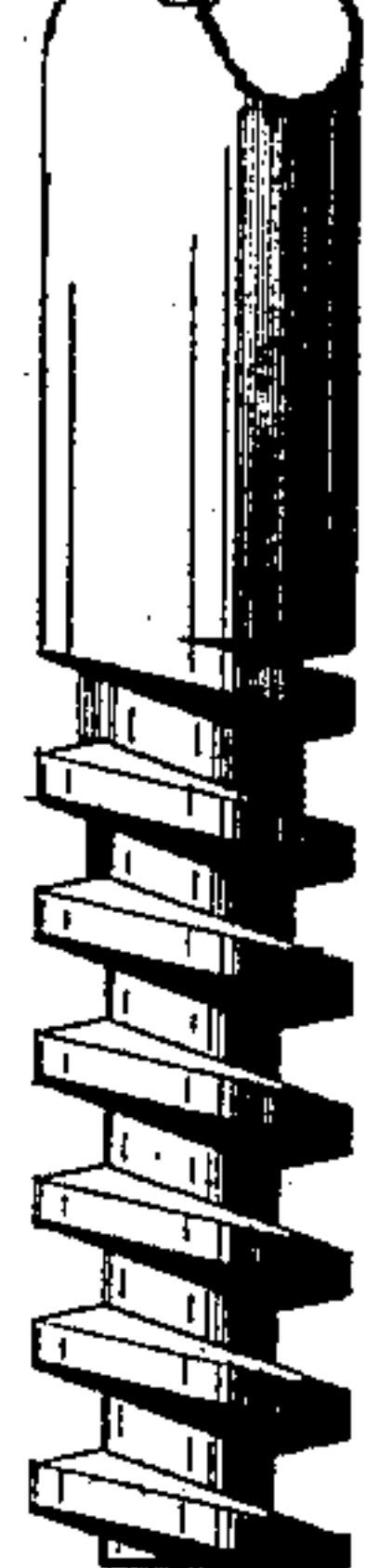


Fig. 4.

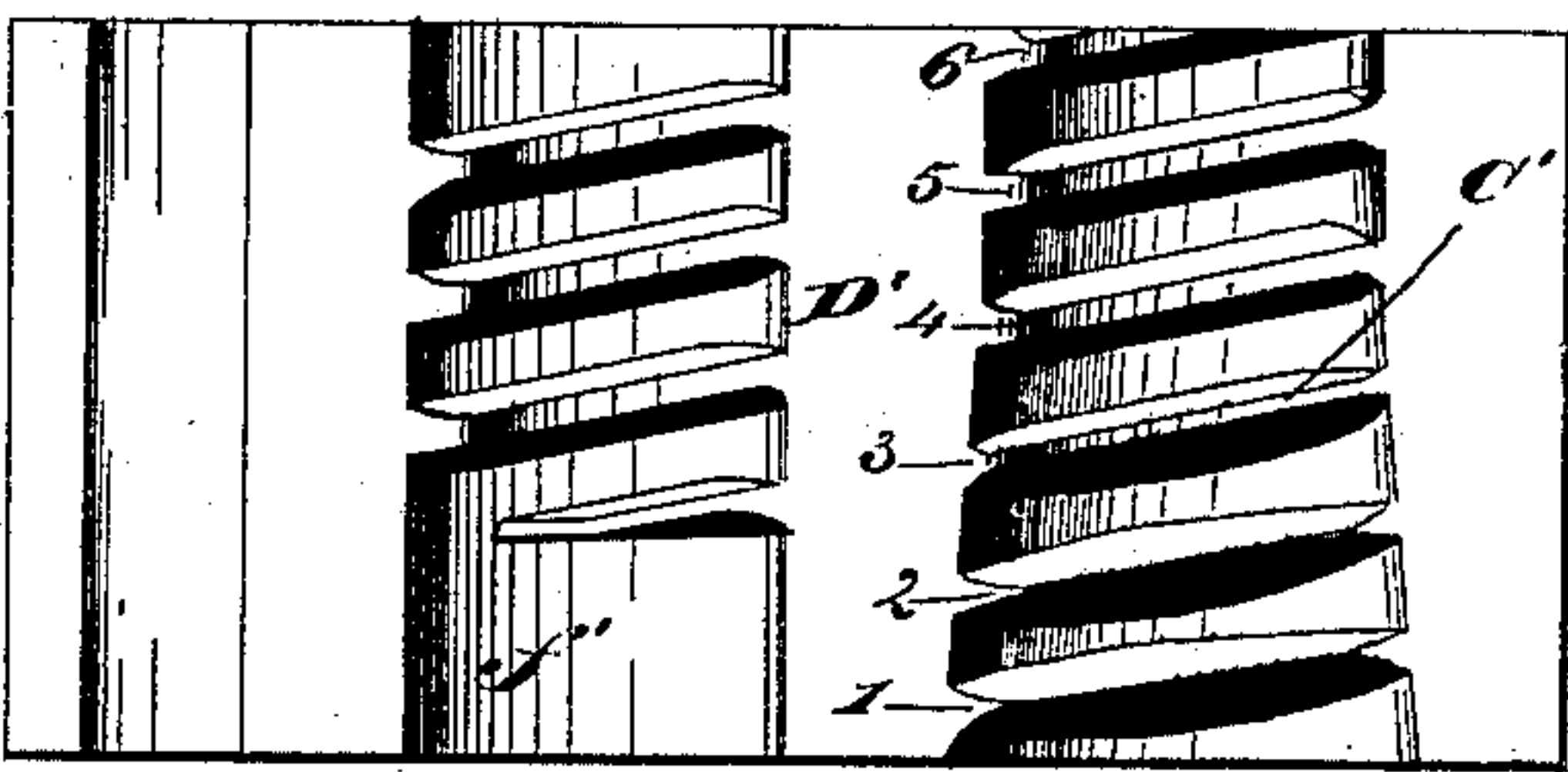


Fig. 5.

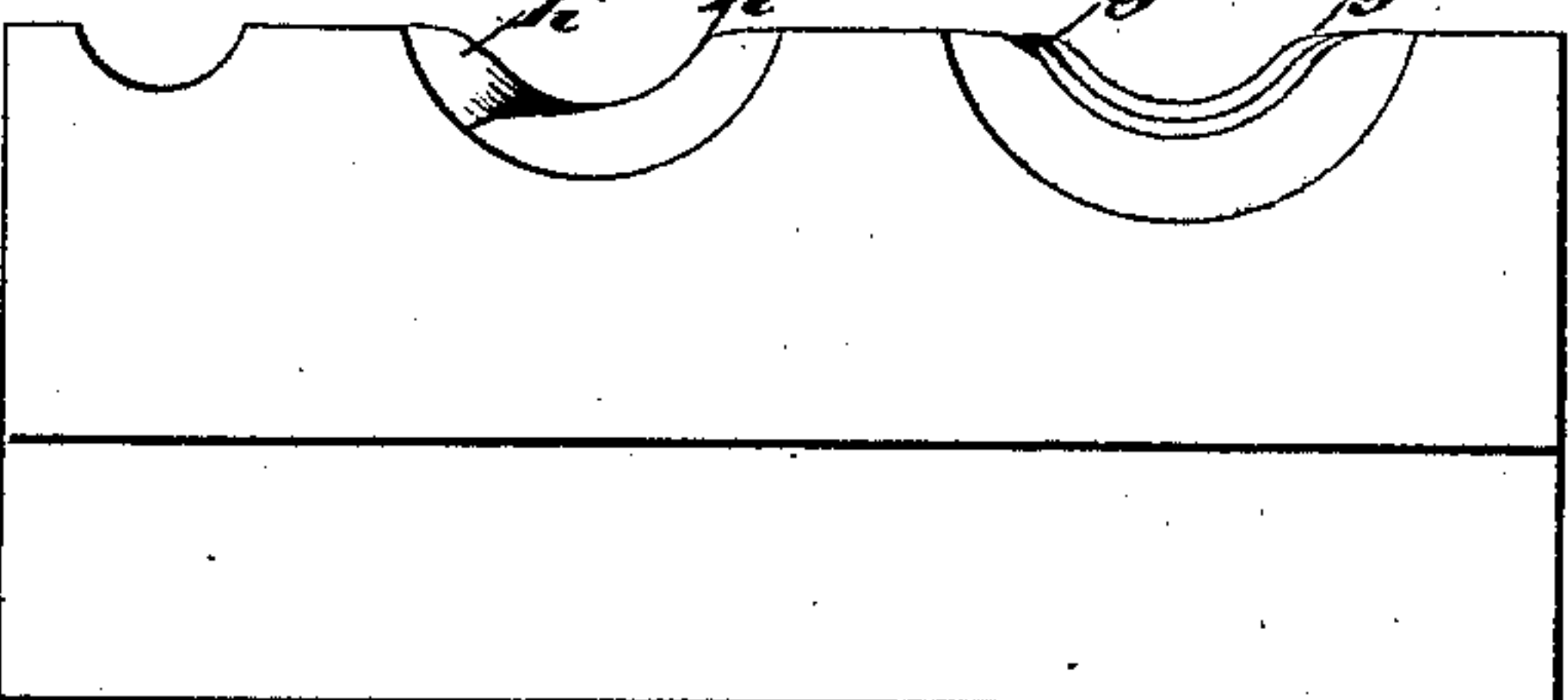


Fig. 6.

Witnesses:

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DIE FOR SWAGING SCREWS.

SPECIFICATION forming part of Letters Patent No. 338,276, dated March 23, 1886.

Application filed January 5, 1885. Serial No. 152,094. (No model.)

To all whom it may concern:

Be it known that I, BURR A. KENNEDY, of the town of Lake View, in the county of Cook and State of Illinois, have invented certain
5 new and useful Improvements in Dies for Forging Screws, of which the following is a full description, reference being had to the accompanying drawings.

The object of this invention is to make the
15 forging of screw-threads practical as distinguished from those made by cutting out the grooves, as with dies.

As shown, my method of forging is better adapted to the making of what is known as
15 the "half-V thread;" but any other can be formed by proper adaptation of the dies.

In the drawings, Figure 1 shows the blank from which the form of screw shown in Fig. 2 is forged. Fig. 3 is a perspective view of the
20 operating parts of an ordinary trip-hammer to which my dies are attached. Fig. 4 is a face view of the upper die, and Fig. 5 is a face view of the lower die. Fig. 6 is an end view of the lower die. Fig. 7 shows a simple form
25 of screw used for piano-stools, for the production of which the method and dies here shown are well adapted.

A is the helve of the trip-hammer.

A' is the upper die-block.

30 A² is the upper die.

B is the anvil-block.

B' is the lower die-block, and B² the lower die. Each die is provided with a form or recess for roughly shaping the thread, and an-
35 other form or recess for finishing the thread.

C and C' are the two shaping-forms, which are of corresponding or complementary shape, and D D' the finishing-forms, which are also complementary. The shaping-forms C C' are
40 of semicircular form in cross-section, so that a circular opening is presented between them when they are closed together. Each of these forms is of diminishing size from the end at which the blank is received to the opposite
45 end at which the blank is delivered. The walls of these shaping-forms C C' are provided with screw-threads approximating in form and size, the threads being of the required scope, and their diameter at the smaller end being
50 very slightly greater than required on the finished screw. The heated bar or blank is

passed endwise between the dies while the hammer is in motion, being entered between the larger ends of the forms C C' and turned gradually forward. In this manner a screw-
55 thread is gradually beaten into the blank, the form and depth of the thread being gradually developed as the blank proceeds through the forms from the larger toward the smaller end. On emerging from the dies the screw presents
60 the appearance presented in Fig. 2, with a well formed but as yet unfinished thread thereon.

D D' are the finishing-forms, having internal threads of the size and depth correspond-
65 ing precisely with those of the screw to be produced. These finishing-forms are commonly of uniform diameter from end to end, with several threads or convolutions of a thread therein, as shown in the drawings, so
70 that the screw may be kept straight while being finished thereby. The rough screw, on leaving the forms C C', is subjected to the action of the forms D D', which serve to reduce it to the exact size and to give the threads
75 that accuracy and smoothness of finish which is necessary to its proper action when in use. It is preferred to have the roughened forms C C' and the finishing-forms D D' distinct from
80 each other, as shown in the drawings; but if preferred the finishing-forms may be arranged in line with and as continuations of the roughening-form, in which case the screw will be finished in a single passage between
85 the dies.

D and D' are the finishing-dies, being matrices formed with threads of size and depth exactly equal to the finished screw to be. This finishing-die is made of several threads in length,
90 so that as the screw passes through it is kept straight.

For the form of screw shown in Fig. 2 the blank shown in Fig. 1 is prepared. I prefer to make the stems *e* and *e'* of this blank of a size slightly less than the diameter of the screw
95 at the bottom of the threads. These stems may then be thrust between the dies, even while the hammer is in motion, and they form a guide to direct the thread, already roughly made, into the finishing-dies as it is pressed
100 forward and turned to screw it in. Were not some such provision made it would be very

difficult, if not impossible, to place the screw in the finishing-die without stopping the hammer.

In order that a screw like that shown in Fig. 7 may be made to enter the die while the hammer is in operation, the dies have an unthreaded space, f and f' , of diameter equal to that of the shank of the screw. Into this the end of the screw is laid, and as it is pressed forward and slowly rotated it is screwed into the die and smoothed. It is preferable to make the screw a little larger than the finishing-dies, so that the latter will have stock to work on, as this produces smoother work.

In coach-screws and other coarse screws the finishing-dies may not be required, the forming-dies being sufficient.

It is not necessary to make the finishing-dies (when they are used) in the same block; but I consider it best to so have them, as the whole operation of forming and finishing may be performed at the same operation.

In order to avoid the throwing out of fins on the work, I relieve the ends of the threads, as shown in Fig. 6, at g and g' and at h and h' .

In order that the first effect of the forming-die may act the more to throw the threads upward—that is, to make the metal fill the die rather than to draw the blank and thus lengthen it—I corner the threads 1, 2, and 3, so that they may have tendency but to crease the metal. This I find a necessity in some cases, and desirable in all.

What I claim is—

1. The herein-described method of forming screw-threads, consisting in passing the blank slowly in an endwise direction between a pair of converging dies, which are threaded internally and reduced in diameter from the re-

ceiving toward the delivery side, whereby the threads are gradually developed on the blank.

2. A pair of screw converging dies with complementary forms or cavities therein, said cavities diminishing in size from the receiving toward the delivery side of the dies, and provided with internal threads of increasing size from the receiving toward the delivery side, whereby each portion of the thread upon the blank may be gradually developed as it is presented to the developing portions of the die-thread.

3. As an improvement in the art of forging screw-threads, the method consisting in first passing the blank between tapering internally-threaded forming-surfaces, and subsequently between forming-surfaces of smaller internal diameter having threads of constant form and size therein.

4. Complementary screw-forging dies provided with tapering internally-threaded forms or cavities to produce the crude thread, and the finishing-form of smaller internal diameter threaded in exact conformity to the required screw.

5. The complementary dies for finishing screw-threads, having the internal forms or unthreaded recesses, F F' , of semicircular section and uniform diameter, and the internal threads of uniform size throughout their entire length, whereby said dies are adapted to finish the threads for use and at the same time to maintain the screw in a perfectly straight condition.

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Witnesses:

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