G. KUHN.

SCREW MAKING MACHINE.

APPLICATION FILED MAR. 7, 1912.

1,052,066.

Patented Feb. 4, 1913.

2 SHEETS—SHEET 1.

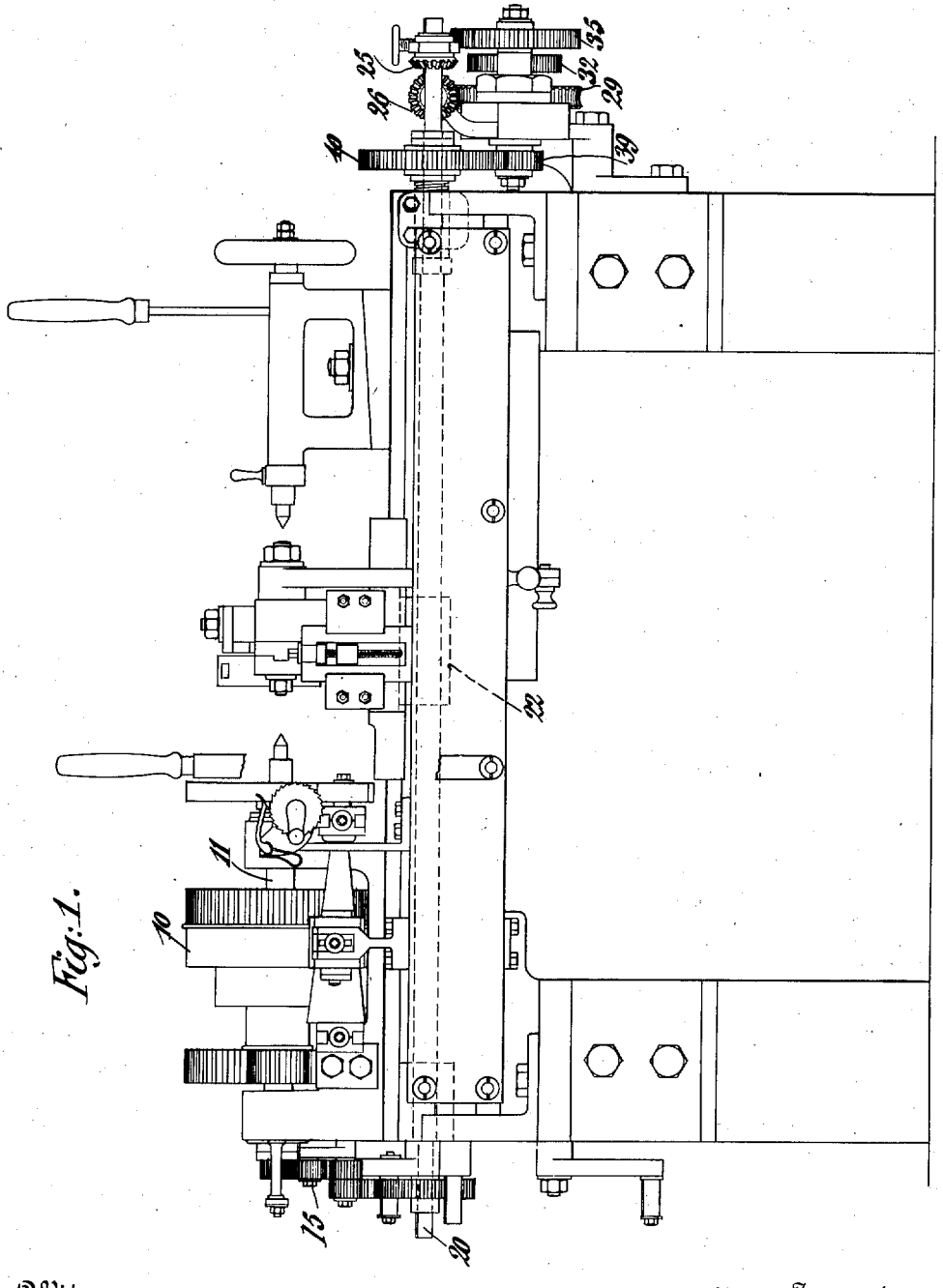

Fig. 1.

Witnesses:
John Montagh
L. J. Murphy

Inventor
Gottfried Kuhn
By his Attorneys
Howell & Haines

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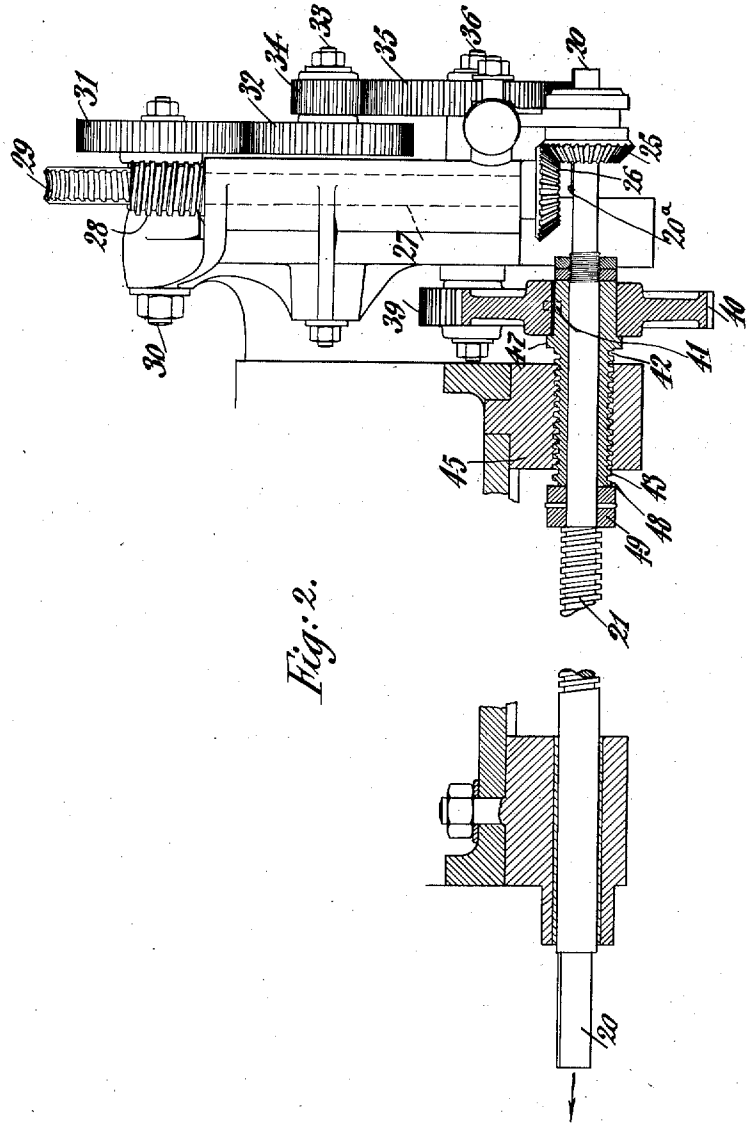

Fig. 2.

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UNITED STATES PATENT OFFICE.

GOTTFRIED KUHN, OF NEW YORK, N. Y.

SCREW-MAKING MACHINE.

1,052,066. Specification of Letters Patent. Patented Feb. 4, 1913.

Application filed March 7, 1912. Serial No. 682,143.

To all whom it may concern:

Be it known that I, GOTTFRIED KUHN, a citizen of the Confederation of Switzerland, and a resident of New York city, borough of Manhattan, county and State of New York, have invented certain new and useful Improvements in Screw-Making Machines, of which the following is a specification.

This invention relates to improvements in screw-making machines and has for its object to provide a machine by means of which the screw-threads may be given a correct pitch.

Hitherto it has been found that in providing the screws with their threads or providing the sockets (nuts) with screw-threads, these screw-threads would, when the metal was hardened, cause the screws to be shrunk so as to take the threads out of their true normal. When this results the screw-threads of the part which has been heated and shrunk, will not mesh with the threads on the other part with which they are intended to mesh, (which part has not been heated) and for this reason, it was necessary to finish up the screw-threads by extra mechanism.

A specific object of the invention is to so make the screw-threads that on the hardening of the same they will correspond to the true or normal pitch and hence the companion screw-threads will truly engage therewith.

For this purpose my invention consists of means for moving the slide carrying the cutting-tool at its normal rate of speed, and means connected therewith and coöperating therewith for giving the lead-screw and slide an additional movement so as to cause the screw-threads to be shaped out of their normal, so that on hardening they will be in normal position.

In the accompanying drawings, Figure 1 is a side-elevation of a screw-cutting lathe provided with my improvement, and Fig. 2 is a detail vertical section showing the means for giving the slide the increased movement contemplated by my invention.

Similar letters of reference indicate corresponding parts throughout the several figures of the drawings.

Referring to the drawings, Figure 1 shows a side-view of a lathe which is provided with the operating pulley 10 over which the usual belt passes, and with the other parts usually found on special tools. The lathe is provided at one side with a transmission gearing 15 which transmits motion from the lathe spindle 11 to the lead-screw 20 which is provided with a thread 21 engaging a corresponding thread in the slide 22. By the rotation of the lead-screw by means of the transmission gearing 15, the slide is moved at its normal rate of speed in one direction of its movement. All this is well known.

In Fig. 2 the improvements are shown which means convert the rotary movement of the lead-screw into a rectilinear movement. For this purpose the lead-screw 20 is provided with a beveled gear 25 meshing with a beveled gear 26 secured on a shaft 27 to the other end of which a worm 28 is secured. The lead-screw 20 is connected with the bevel gear 26 by a key 20^a or otherwise in such a manner that both will be compelled to rotate together yet the lead-screw may slide lengthwise in the gear 26 which is held against longitudinal movement. The worm 28 engages with a worm-gear 29 on a shaft 30 to which is secured the gear wheel 31 meshing with a second gear wheel 32. A shaft 33 supports the gear wheel 32 and on the shaft 33 is fixed a pinion 34 which engages with a gear 35 on a shaft 36. The shaft 36 has secured thereto a second gear wheel 39 which meshes with a gear 40 connected by means of the key 41 to the rotatable sleeve 42 which is provided with screw-threads 43 engaging corresponding screw-threads in the fixed member 45 forming part of the frame of the machine. The threaded portion 43 of the sleeve 42 has an extended portion 47 at one end and at the other end an extended portion 48 engaging a collar 49 secured to the lead-screw 20. These extending portions 47 and 48 limit the movement of the sleeve in either direction. The gear wheel 40 is movable laterally relatively to the gear wheel 39 and by the rotation of the various transmission gears, the gear wheel 40 is rotated so as to cause the screw-threads 43 meshing in the fixed part 45 to move therein and cause the gear 40 to move laterally relatively to the gear 39. This lateral movement in either direction gives the lead-screw 20 a lengthwise movement in the corresponding direction and the speed of transmission of the various gearing and the pitch of the threads 43 are so arranged that the cutting-tool carried by the slide 22 is shifted laterally in a direction corresponding to the movement given by the normal rotation of the lead-screw so that thereby a differential

action takes place which gives the threads an additional pitch.

The apparatus shown may be applied to any lathe.

By means of this differential action the screw-threads of the work which is being operated upon are shifted out of the normal pitch to such an extent that on the heating of the same and consequent cooling the pitch that will result thereby will be entirely normal and thereby be capable of being meshed with any other normal pitch, corresponding to the feed obtained by the screw part 21 of the lead-screw alone, without any longitudinal movement of the lead-screw.

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

1. In a lathe for cutting screw-threads, a slide adapted to carry the tool, a rotatable lead-screw for said slide, a sleeve mounted to turn on said lead-screw but held to move lengthwise therewith, said sleeve having a screw-threaded connection with a stationary part, a driving wheel held to turn with the lead-screw, and power-transmitting mechanism for rotating said wheel and the sleeve at the same time, and located between said wheel and sleeve.

2. In a lathe for cutting screw-threads, a slide adapted to carry the tool, a rotatable lead-screw for said slide, a sleeve mounted to turn on said lead-screw but held to move lengthwise therewith, said sleeve having a screw-threaded connection with a stationary part, a driving-wheel held to turn with the lead-screw but held against axial movement, said lead-screw being arranged to slide lengthwise in said driving-wheel, and mechanism for rotating said wheel and the sleeve at the same time.

In testimony, that I claim the foregoing as my invention, I have signed my name in presence of two subscribing witnesses.

GOTTFRIED KUHN.

Witnesses:
JOHN MURTAGH,
L. M. DORMAN.

Correction in Letters Patent No. 1,052,066.

It is hereby certified that in Letters Patent No. 1,052,066, granted February 4, 1913, upon the application of Gottfried Kuhn, of New York, N. Y., for an improvement in "Screw-Making Machines," an error appears in the printed specification requiring correction as follows: Page 1, lines 73 and 76, for the reference-numeral "26" read *25;* and that the proper corrections have been made in the files and records of the Patent Office and are hereby made in said Letters Patent.

Signed and sealed this 1st day of April, A. D., 1913.

[SEAL.]

C. C. BILLINGS,
Acting Commissioner of Patents.

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