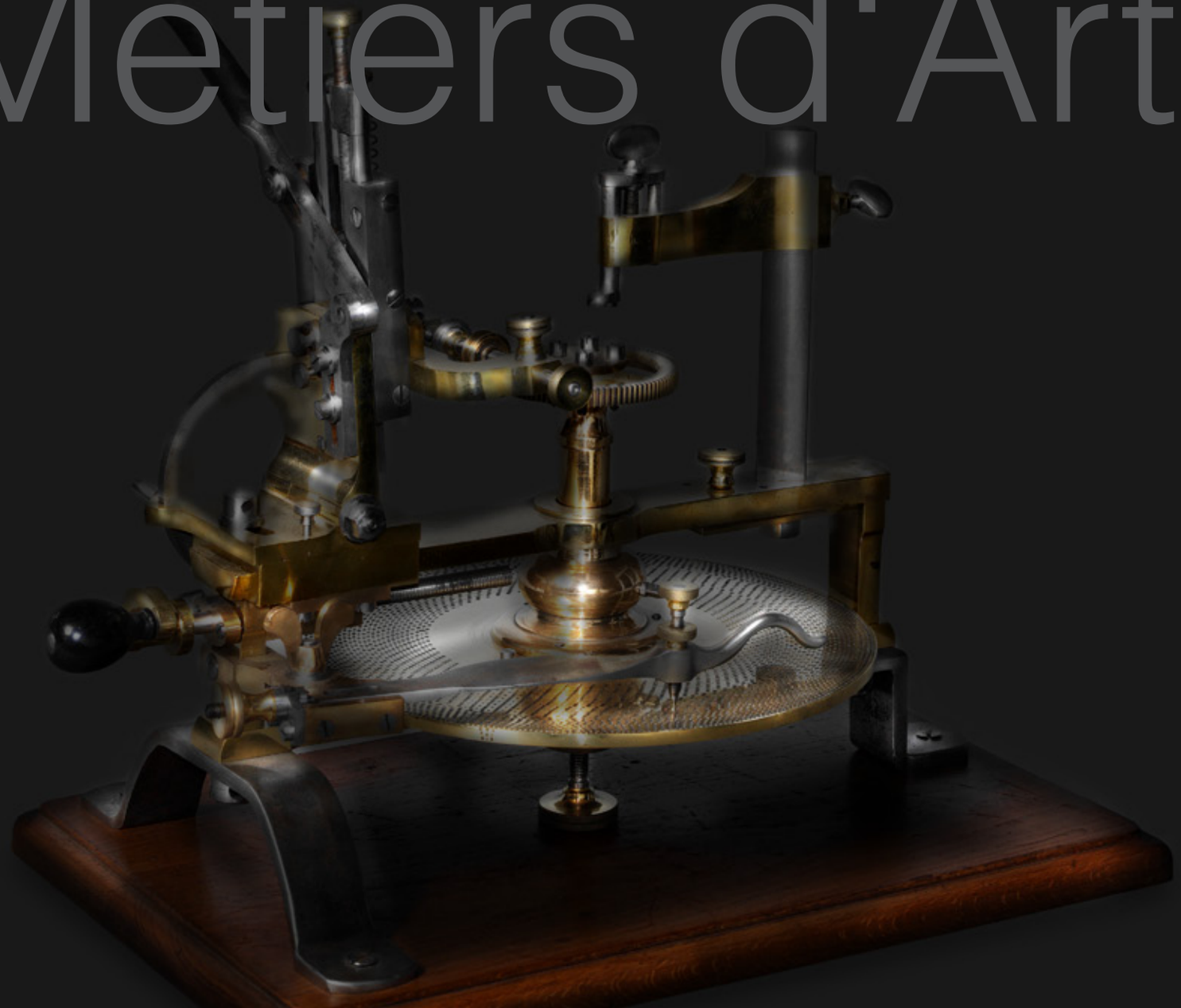
Métiers d‘Art



700 Years of Watchmaking


Bern, Capital of Switzerland
bern
capital impressions

Foundation of the City 1191

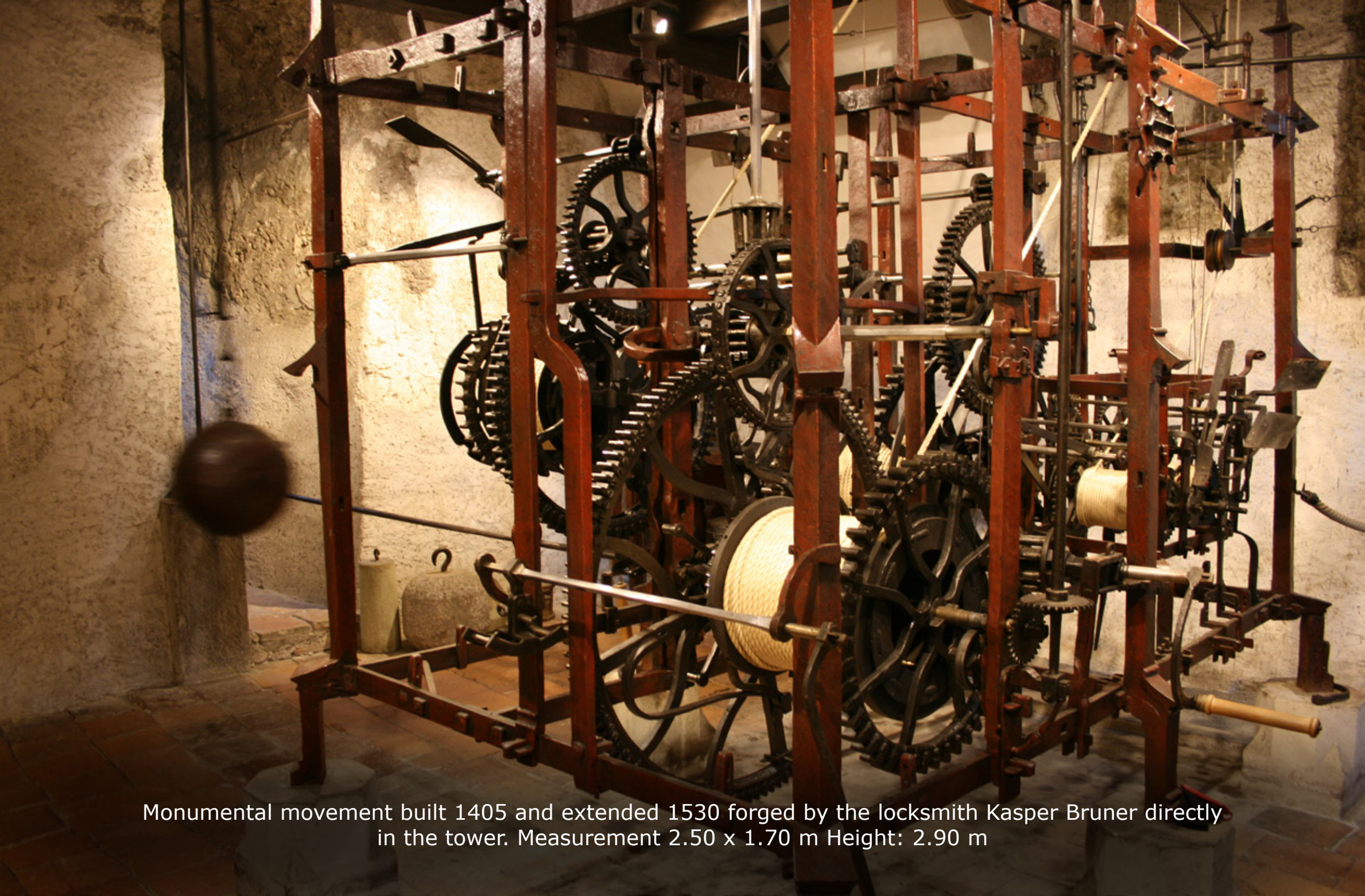
Bern Old Town - World Cultural Heritage

Famous Clocktower with the second oldest astronomical clock of the world, built in 1405

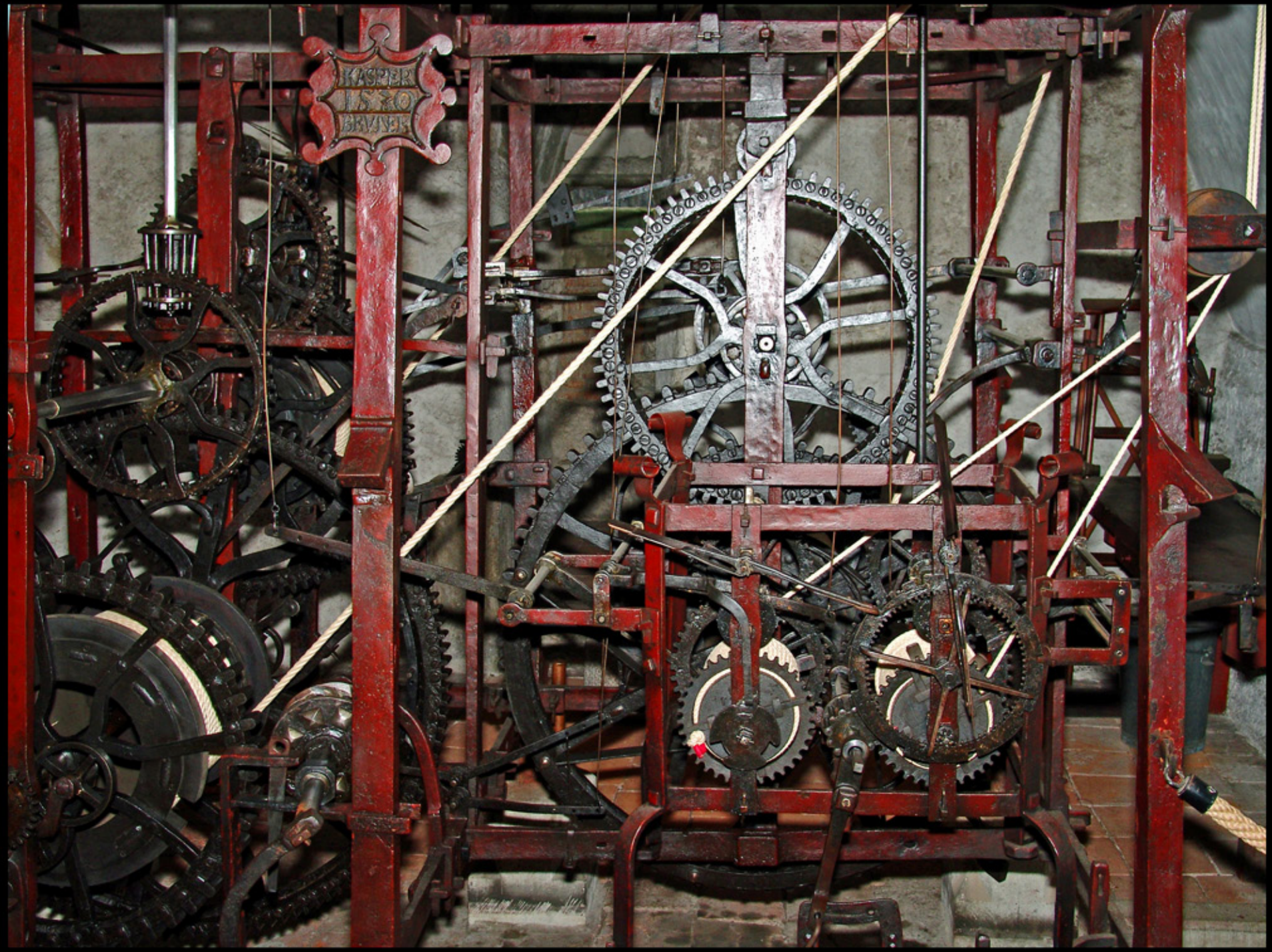
The ornate astronomical clock dial with its moving figures and carousel
Four minutes before the strokes announcing the change of hour, a cock crows,
the bear commences his rounds and the joker takes the liberty of announcing the hour in advance.


Tierkreis
Zodiac
Mondzeiger
Lunar dial
Wochentag
Day of the week
Stundenhand
Hour hand
Rete
Rete
Time of day
Tageszeit
Calendar dial
Datumsring
Planisphere: night, dawn, daylight
Planisphäre: Nacht, Dämmerung, Tag
Temporal hours
Temporalstunden

Hans van Thann strikes the bells and kicks his legs when the cock crows.



Monumental movement built 1405 and extended 1530 forged by the locksmith Kasper Bruner directly in the tower. Measurement 2.50 x 1.70 m Height: 2.90 m


KASPER
1530

Let there be light and God divided the light from the darkness
Dial for 12 hours and minutes built and added to the tower in 1608

Renaissance Table and Tabernacle Clocks

15th to early 17th century

Shortly after the first tower clocks have been built and the spring driven movement has been invented in 1430, skilled watchmakers have continuously reduced the size of the movement for being used in table clocks.

The most significant center of watchmaking at that time was Nuremberg Germany

Actaeon Clock

CK (Conrad Kreizer I), Germany, decorations after Virgil Solis, circa 1570

Very important and equally rare gilt brass circular horizontal table clock embossed with the Story of Actaeon, in the style of the Orpheus Clocks, with 24-hour striking and an early single hand stackfreed brass movement.

In the second and third quarters of the 16th century, a small group of extraordinary horizontal table clocks were created. Today they are called the Orpheus Clocks, after the decorations around their sides. There are eleven of them known, not all complete, not all entirely original, but all are spectacular. Two are square, nine are circular. A book devoted just to them was published in 1972.

Our clock is a smaller version of the Orpheus clocks. The decoration is similar, using the same technique and the same mythological motif taken from Ovid's *Metamorphoses*. Elements of the composition, in this and the Orpheus clocks, are taken from the same Virgil Solis sixteenth-century illustrations to *Metamorphoses*.

There are eleven known Orpheus clocks but only one Actaeon: this one!

In ancient Greek myth, Actaeon wandered away from his hunting party and stumbled onto a sacred grotto with a bubbling spring in which the chaste, virginal goddess of the hunt, Artemis, was bathing with her handmaiden nymphs. Artemis was outraged to have been seen naked by a mortal man.

In punishment for his violation, the goddess turned him into a stag, splashing water on him as she spoke the words of her curse. Actaeon first sprouted horns from his forehead before Artemis completed his transformation into a deer and placed a panicked fear in his heart. Actaeon fled and soon encountered his hunting party, who could not see him as anything but a deer. The dogs chased him until he was too tired to run any further; as he fell to his knees, he was killed by the dogs, with his companions cheering them on.

Detail of the Maker's mark on the back plate

Condition
Case:very good, gilding very good, minimal wear, a few (original) stress cracks in the cast
Dial: very good
Hand: very good, possibly later, re-blued
Movement: very good

Estimate
EUR 80.000 - 120.000

View of the front

View of the striking dial

An almost identical clock was chosen for an official portrait of young Cosimo de Medici, future Grand Duke of Tuscany, painted circa 1604 by Tiberio Titi.

The clock is unusual in that it is stackfreed equalized, has a double-anchor foliot instead of the more common circular type, and has a C-shaped double-adjustable bristle regulator instead of the common straight one.

In the Maximilian Museum in Augsburg there is a tower-form table clock from the end of the 1500s punched with very similar looking punches, both for the maker's initials, as well as the town mark. The marks used to wear out and had to be replaced; thus it is common to find slightly different marks for the same maker. It is the only other clock we know of bearing the same marks.

This form of movement was used in Germany at the turn of the 16th and the 17th centuries. It was used either with fusee or stackfreed (ex., by master MB from Munich in the Time Museum, Inv. 2930).

The foliot, a pivoted rod with weights on the ends of each arm, has often been suggested as the device that was the first to be employed as a controlling device for the escapement. In fact, both foliot and balance were developed simultaneously. The earliest drawing of a clock that has survived, by Dondi, circa 1365, shows balance as a controlling element. It appears they were used alternately, some makers preferring foliot, some balance.

Detail of Cosimo de Medici portrait

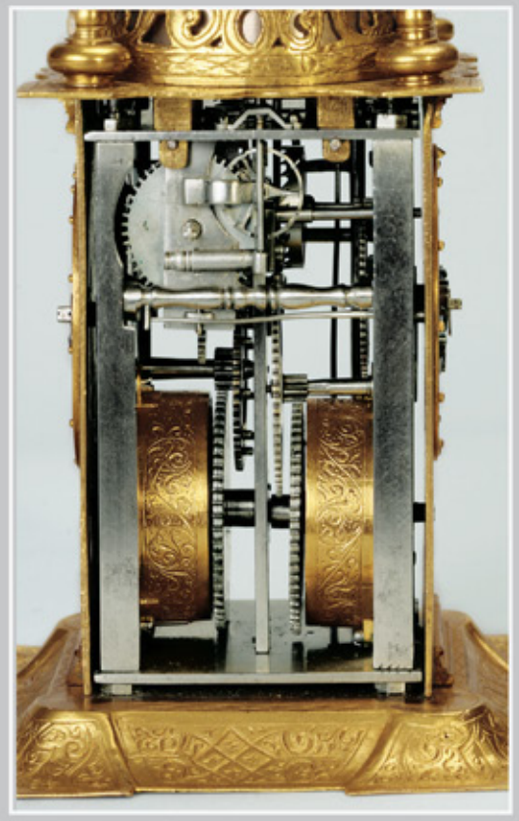
Initials "MM"
(attributed to Michael Müller),
Augsburg, circa 1590

An important and extremely rare gilt brass tower-form alarm table clock striking hours, with single hand stackfreed steel movement with foliot.

Condition
Case: very good
Dials: very good
Hands: very good, possibly later, re-blued
Movement: very good for age, clean, minimal rust pits, missing alarm hammer

Estimate
EUR 15.000 - 20.000

Cosimo de Medici, 1604, by Tiberio Titi



Side view of movement

Maker's mark

Augsburg punch mark

Top view of movement with foliot

Front view of movement with stackfreed

Signed
Punched with Augsburg mark and maker's mark inside the right case panel.

Maker's Biography
Abeler lists the MM mark as belonging to an unknown Augsburg master, with an example dating from the end of the 1500s in the Maximilian Museum, Augsburg.

He lists Michael Müller as having been born in Breslau (now Wroclaw, Poland) in 1540, becoming independent on January 18, 1568, and dying in 1594. He is the only listed Augsburg clockmaker from the end of the 16th century with the initials "MM" working on small clocks.

Dimensions
Height 17 cm (with finial), base 12 cm x 12 cm, body 7.3 cm x 7.3 cm.

Functions
Hour striking, alarm, hours, striking indication dial, night reading.

Case
Ornate gilt brass and gilt copper, covered in decorative arabesque engravings, with a pierced interlace patterned dome at the top covering the bell; a tall finial is positioned at the top of the dome, while slightly shorter matching finials are positioned at each of the four corners surrounding the dome; rounded columns attached to each corner of the case are ornamented with acanthus leaves and masks; draping base engraved with a foliate pattern, unusual bayonet fixing of the dome to the body.

Dial
Applied gilt brass ring with Roman hours and half-hour star markers and inner quarter divisions, innermost 24-hour scale with German Zs for the 2s, outermost night touch knobs, 12-hour gilt brass alarm disk in the center with Arabic numerals, correcting pin-hole for the striking at 10; striking dial on the back with Arabic numerals and night knobs, corrected through the pin-hole in the main dial.

Hand
Single steel ranseur.

Movement
Two-tier vertical four-post steel cage (10 x 6.1 x 6.1 cm), square posts, all steel except fixed barrels for striking as well as the going trains in gilt brass engraved with scrolling and the brass striking fly, stackfreed for the going train, two-wheel verge-type alarm train with going barrel, set in the striking tier (missing hammer), verge escapement, foliot with C-shaped weights, C-shaped hog's bristle regulator with two bristles, regulating arm extending to the right panel, S-shaped steel cock, hour wheel driven from four-pin lantern pinion filed from the extension of the second wheel.

Side view

Striking dial

Attributed to Nikolaus Schmidt the Elder, Augsburg, circa 1600

Exceedingly rare elaborate gilt brass and gilt copper tower-form table clock striking hours, with alarm, early minute hand, and a brass movement.

A virtually identical clock was depicted in the 1650 painting *The Knight's Dream* by Antonio de Pereda.

An almost identical clock, no doubt cast from the same mold, is in the Philadelphia Museum of Art. The museum attributes the clock to Nikolaus Schmidt, the elder. We will not argue with the museum. For a remarkable automaton clock by Schmidt, see Lot 42.

Maker's Biography

Nikolaus Schmidt, the elder, was born around 1550 at Wiltz in Luxembourg and later moved to Augsburg, where he became a master on March 3, 1576, having married Katharina, a daughter of an established Augsburg's clockmaker Hans Fronmüller, on February 12 of that year. She died three years later.

Schmidt remarried to Susanne Gloninger, with whom he had three sons, all clockmakers:

1. Georg (1580-1630), became a master in 1608 and, interestingly, the same year, married the widow of his father's first brother-in-law, Hans Fronmiller, the younger;

2. Nikolaus the younger (ab. 1582 - ab. 1637) became a master on May 17, 1620. His son, Hans Ulrich (ab. 1622 - ab. 1680) continued the family tradition and became a master clockmaker in 1648;

3. Carl (ab. 1586-ab. 1635) became a master in 1614, six years before his older brother.

In 1586, a Nikolaus Smith the elder became foreman of the Augsburg Smiths' Guild. He died circa 1625. Clocks made by Nikolaus Schmidt, include an elephant automaton clock, on loan to the Bayerisches Nationalmuseum, Munich; a table clock in the Historisches Museum, Basel; an octagonal table clock in the Beyer Clock & Watch Museum, Zurich; a tower-form table clock in the Philadelphia Museum of Art; a tower-form clock in the Metropolitan Museum of Art in New York City; and a Madonna and Child figure clock, also in the Metropolitan Museum of Art.

The Knight's Dream, 1650 by Antonio de Perrera (Real Academia de San Fernando, Madrid)

View of the front

View of the striking dial

Andreas Stahel, Augsburg, circa 1600

Exceptionally rare gilt copper astronomical table clock striking hours and quarters, with date, phases of the moon and its age, diagram of planetary aspects, and early minute hand, on a wooden base.

There are several different punch marks "AS" found on German Renaissance clocks. Fortunately, the one on this clock is quite distinctive, with a small cross below the initials. An identical mark is found on another clock from the same period, and that clock happens to have the Augsburg pinecone town punch. We went through all the Augsburg makers (thanks to the compilation assembled by Jürgen Abeler) with initials AS and found only one candidate: Andreas Stahel. There is one Abraham Schuster listed as active in the second half of the 16th century, but he is too early, and we do not know anything about him. The owner of this mark was so good that we definitely would know more about him—and we know plenty about Stahel.

This is a very interesting and rare clock that was considered important enough to try, at some point in the past, to convert it to a modern escapement, which can be converted back. The clock is important and was made by a very skillful maker. The other clock we mentioned with the identical punch mark is a magnificent automaton clock with Cupid in a chariot pulled by two goats.

This clock features an aspect diagram – the small disk in the center of the dial. It was used by astrologers to determine if the relative positions of different planets (including the Sun and the Moon) were favorable. It has been believed for millennia that the planet configurations play a role in the affairs of people on Earth.

Aspect is measured by the angle along the ecliptic. The most powerful aspect is Conjunction (a circle with a short bar to the upper right), then Opposition (two circles connected by a short bar), Trine (triangle) responsible for harmony, Sextile (a star), and Square. It is an elaborate theory according to which couples planned when to conceive a child, kings decided when to have a battle, etc.

Signed
Punched with the maker's mark "AS" with small cross below, in a shield, on the back plate.

Maker's mark on the back plate

Condition
Case: very good, slight wear to the gilt
Dial: very good
Hands: missing
Movement: the balance and escape wheel are missing, there are modifications and losses to the back plate, the striking train is intact with missing connection to the dial, and there is no hour bell

Estimate
EUR 8.000 - 12.000


View of the front

View of the right side

Southern Germany, 1575

Important early gilt brass Memento Mori tower-form table clock striking hours, with alarm and a single hand steel movement.

"Hodie Mihi, Cras Tibi", engraved on the dial, is a Latin Memento Mori motto, "Today Me, Tomorrow You", reminding the viewer that eventually Death comes for us all.

Signed
Dial plate.

Dimensions
Height 20 cm, base 12 x 12 cm, body 7 x 7 cm.

Functions
Hour striking, alarm, hours, striking indication dial.

Case
Rectangular, gilt brass with ornate attached corner columns, overall decorative engravings include reclining male figure on front, regal woman on one side, regal man on other side, floral and leafy engravings on back; bell surmounted by fluted bulb finial and four long draping leaves, with gilt brass straps curving over bell and terminating in tight coils at the corners of the case top; standing on a dark wood base, alarm side panel with striking correction aperture, with four gilt brass bun feet, left panel with striking correction pinhole with protruding pin.

Dial
Applied gilt brass, Roman hours, star half-hour divisions, inner quarter hour divisions, center with gilt brass revolving alarm disk with Arabic hours with German Zs for the 2s; reverse with striking dial directly on the plate, with Arabic hours.

Hand
Blued steel beetle.

Movement
Two-tier vertical four-post cage (9.7 x 5.4 x 5.4 cm), all steel except for newer barrels, fusees, and alarm train, square (in cross-section) posts, fusee and guts on both trains, verge escapement, two-arm balance with hog's bristle regulator protruding to the left side of the case, two-wheel verge-type alarm set in the going train tier.

View of the striking dial

Condition
Case: very good, possibly re-gilded
Dials: very good
Hands: very good, possibly later
Movement: very good, back to balance and hog's bristle regulator, restorations

Estimate
EUR 15.000 - 20.000

The Third Labor of Hercules, Center Europe, dated 1575

Extremely important gilt brass horizontal alarm table clock with six-hour striking and a single hand.

This clock is unusual in its construction and decoration. The movement, with brass plates and iron works, is more in the French than German style; however, the French did not use Z for 2, as was done in some of the German-influenced territories. The 24-hour scale is mixed: it has some regular 2s and some Zs, indicating moderate German influence. The plate decoration, with direct engraving on the plate, is also not German. There are more unusual characteristics, such as going barrel for the striking, versus fixed barrel in most of the German clocks, pillars mounted via stepped nuts, and the shape of the set-up click. Finally, noticing that the clock has six-hour striking, used predominately in Italy, we come to the conclusion that the clock probably was made near Italy, perhaps in the southwestern part of Switzerland or in the northern part of Italy, where some German clockmakers had settled during the 16th century and where other German makers finished and sold their products (for more on that see lot 14).

The decorations on the case depict Hercules hunting Diana's sacred deer. As one of his Twelve Labors, Hercules was challenged to capture a deer with golden antlers and bring it, alive, to Mycenae. After a long hunt, Hercules finally managed to wound his prey with an arrow. However, the stag was sacred to the goddess Diana, who appeared before Hercules full of wrath. The hero was able to persuade her that his cause was just, and she allowed him to leave with his prey.

Signed
Dated on the case, on the sacrifice panel, under the fire.

Exhibited
L'antico splendore dell' orologeria italiana dal XV al XVIII secolo, Trent (Northern Italy), June 25 – November 6, 2005, Cat. N° 95.

Published in
La misura del tempo, Italy, 2005, page 407.

Dimensions
Height 8.6 cm (with feet), width 14.8 cm, depth 14.5 cm

Functions
Six-hour striking, alarm, hours night reading.

View of the right side

Condition
Case: very good
Dial: very good
Hand: very good
Movement: very good, bell screw probably later

Estimate
EUR 20.000 - 30.000

Detail of the engraving of the Third Labor of Hercules

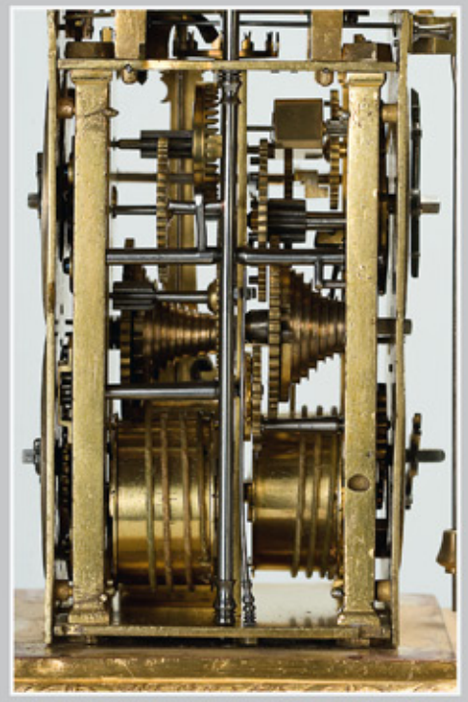
Case
Rectangular, gilt brass, overall arabesque and foliate patterns, tall ranseur finials, two-stepped square cupola housing the bell in the lower part pierced and engraved in foliate pattern, upper part engraved with foliate pattern, supporting square dome engraved with tile pattern, top finial depicting Saint Barbara holding a palm frond and the tower, symbols of her martyrdom, sliding side panels with attached corner columns, with decoration matching that of the dial plate, one with center engraved with coat of arms with letters "R.G.Z." and "Z.G.V.O.", the other with flower bouquet and striking correction pin hole, ogee base chiseled with stylized foliate pattern and wild strawberries, ball feet.

Dial
Gilt bronze plate with applied silvered pewter ring with Roman hours, quarter-hour track and 24-hour scale from 13 to 24 with Zs for the 2s, inner revolving gilt bronze alarm disk with Arabic hours with center engraved with stylized foliate; below, phases of the moon and Arabic moon's age, also with Zs, the reverse with silvered pewter striking dial with Arabic hours and, below, pewter days of the week dial with French day names.

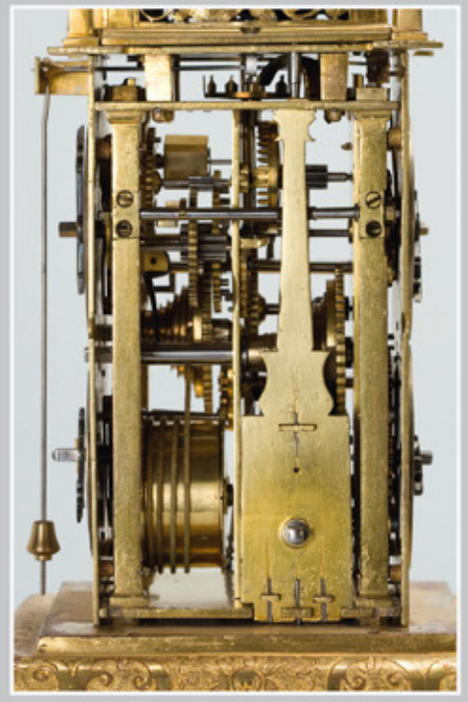
Hand
Blued steel elaborate ranseur.

Movement
Two-tier, vertical gilt brass cage with four square posts (13 x 6 x 6 cm), all wheels gilt brass, fusee and gut for going as well as the striking trains, verge-type alarm with open spring, set in the going train tier, dead-beat verge-type escapement with short pendulum.

Coat of Arms on clock and the original Coat of Arm



View of the right side of the movement



View of the left side of the movement

View of the engraving of the two sides

Beginning in 1548, automata gained a new group of wealthy admirers from the Ottoman Empire. This was the first year of the annual "Tribute to the Sublime Gate" by the Holy Roman Emperor to avoid Turkish invasion. The tribute was given in the form of gold, money and luxury goods, including clocks and automata, which became one of the favorites of the rich Ottoman customers, with whom many of them ended up.

View of the movement with the dial

View of the case

View of the engravings of the left and the right sides

View of the striking dial

View of the front

Although finials of different shapes are well known, ones with automata are rare. This animated "St. George Slaying the Dragon" is one of a handful of clocks with animated finials: Actaeon, by an Augsburg maker, from the Time Museum (dated 1630), inv. No. 3532, and two others.
A similar clock appears in a 1615 portrait of Melchiori Klesel, archbishop of Vienna.

Dimensions
Height 33 cm, width 17.5 cm, depth 17.5 cm (base).

Functions
Automaton, hour striking, quarter striking, alarm, hours.

Case
Rectangular gilt brass, automaton finial of Saint George on top of canopy which rises to a point and houses the bell, which is surrounded by flat colonnade surmounted by ring of finials, finials in corners; glazed sides with centered drop finials, fluted corner pilasters, ogee base and molding with embossed arabesque patterns, four lion feet.

Dial
Silver with Roman numerals, *fleur-de-lis* half-hour markers, center with revolving silver alarm disk with Arabic numerals with German Zs for the 2s, below setting dial with Roman quarters, back with silver hour striking dial with Arabic numerals, and below quarter striking with Roman numerals, setting pin-hole below 10.

Hand
Blued steel *fleur-de-lis*.

Movement
Two-tier vertical four-post cage (14 x 6 x 6 cm), gilt brass, fusee and chain for both trains, pull alarm, verge escapement, two-arm steel balance with hog bristle regulator.

Condition
Case: very good, slight wear to the gilt, mysterious dummy quarter dial
Dials: very good
Hands: very good, later, re-blued
Movement: very good, going train gut deteriorated

Estimate
EUR 20.000 - 30.000

Germany, circa 1630

Exceptionally rare "Saint George Slaying the Dragon" gilt brass and gilt copper automaton alarm table clock striking hours.

Detail of St. George Slying the Dragon

Melchiori Klesel, 1615, by Aegidius Sadeler II

The Dove Automaton

Johann Ott Halleicher, Augsburg,
circa 1640

Important, one of only two known, gilt brass, wood and horn, Dove automaton clock striking hours and quarters.

The dove flutters its tail every quarter for as many times as the quarter strikes; when the hour strikes, it flaps its wings and opens and closes its beak as many times as the hour strikes.

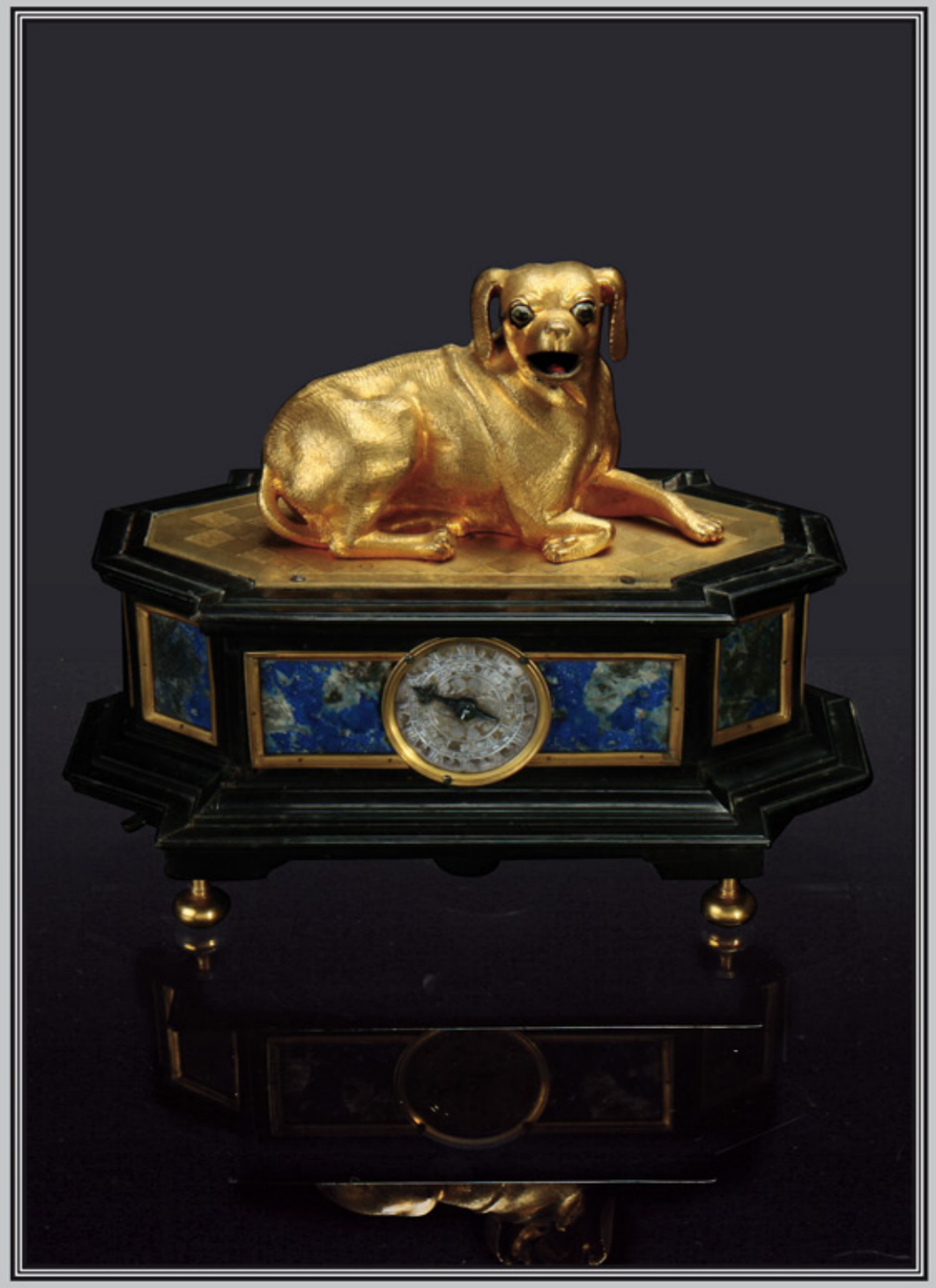
There is only one other clock with an automaton dove known, also made by Johann Ott Halleicher, included in the Smithsonian's "German Clocks and Automata 1550-1650" exhibit in 1980. However, as Klaus Maurice noted in the exhibition catalogue, "The wooden case and the trains have been repaired several times and alterations have been made. For that reason it is not clear to what extent Hallaicher ... devised the present form of the clock." Our clock, which is virtually identical, with the exception of the horn columns (the other has wooden columns) and the direction in which the dove is positioned, and which is in remarkably original condition, resolves Mr. Maurice's question.

The dove is frequently depicted in art. In Christianity, it can symbolize several things: the Holy Spirit; peace, often of a departed soul; or the hope of Resurrection. The symbolism is derived from the story of Noah and the Flood. After the flood waters receded, Noah sent out a dove to find a sign of dry land. The dove returned carrying a fresh olive branch in her beak, letting Noah know that the deluge was over and life could begin again.

Condition
Case: very good, a few cracks to the bone
Dial: very good
Hands: very good, possibly later
Movement: very good

Estimate
EUR 20.000 - 30.000

View of the maker's signature



THE DOG

Augsburg, circa 1625

An important and rare, gilt brass and lapis lazuli on ebony, Dog Automaton figure clock, striking hours, with single hand.

The fascination with artificial life goes backs to antiquity. Homer, in the 8th century BC, mentioned mechanically driven creatures. His story of Icarus flying with artificial wings survived to the present day. The advancement of mechanics, in particular of the mechanical clock during the Renaissance, brought the creativity in simulating life to a new level. The Germans were masters of it. Peter Ramus (1515-1572) wrote a poetical story about a flying wooden eagle and an iron fly constructed in the laboratories of Nuremberg by the famous mathematician Regiomontanus to greet the Emperor.

The automated dogs, doves, lions, and horse riders in this collection are built in the same spirit, to impress emperors, princes and a few wealthy elite. They are the beginnings of modern mechanization, the first steps on our way to creating a perfect robot.

They are very rare, no more than perhaps a hundred of them are still in existence, mostly in museums.

We know of eleven reclining dog clocks and one sitting dog clock:

1. Adler Planetarium
2. This one
3. Formerly in the Wuppertal Historisches Uhrenmuseum, lot no. 1 in this sale
4. Formerly in the Time Museum, with later rectangular base
5. Flagg Collection
6. Another one in the Flagg Collection
7. Dresden Mathematisch-Physikalischer Salon
8. Herzog-Anton Ulrich Museum, Braunschweig
9. Private California Collection
10. Italian Collection, exhibited at La Misura del Tempo as No. 126
11. Formerly in the Vicomte Charles de Noailles Collection, Paris
12. Sitting dog, escapement converted to pendulum (formerly in a German private collection)

The automaton has a provision for a cord to extend outside the case for moving the dog's mouth without activating the striking, possibly for children. The cord is not presently installed, but the provision is intact.

Condition
Case: very good for its age, all intact, some wear to the gilt, small repairs to the wood, mostly in the joint areas, missing back plate
Dial: very good, possibly later
Hand: good, possibly later
Movement: very good

Estimate
EUR 20.000 - 30.000

King Philip II of Spain, 1628, by Rubens (Prado Museum)

Renaissance pocket watches

15th to early 17th century

Pocket watches evolved from clock-watches, called „Nuremberg eggs“, worn on chains around the neck.

The first „pocket watch“ is attributed to Peter Henlein Nuremberg Germany.
He has built the first known spring driven movement of the size to fit a portable watch in 1505

Until middle of 17th century watches run with only the hour hand


Jo. Charton
Freeft.


Jo. Charton
Freeft.




Henry Artaud


Retard
Avance

Age of Discovery - Perfectinon of Timekeeping

John Harrison (1693 - 1776) - Carpender
Inventor of the Marine Chronometer 1773

John Harrison - wooden tower clock

John Harrison - H1

„Ship Watch“ H4 - Lost 5.1 seconds during a 14 month voyage from London to Jamaica
Diameter 13.50 cm

Captain James Cook used K1, a copy of H4 - the price at that time was 30% of ship‘s cost

Classic highly precise Marine Chronometer by Swiss Ferdinand Berthoud à Paris (1727 – 1807)

1699 - British ships arrived in China.

1711 - establishment of the first commercial base in Guangzhou

Montre Chinoise

Around 1800, William Ilbery, a British watchmaker arrived in Macau with a collection of watches
He opened a new market for a new species of watches - the so called „Montre Chinoise“

Swiss Watchmaking

Geneva, Switzerland became center and leading manufacturer and exporter of watches for China

Appreciated for their movement and case making, metiers d‘Art engraving, enamel and miniature painting, stone and pearl setting

Most renown makers: Edouard Bovet, Edouard Juvet, Pierre-Jacquet Droz, Couvoisier

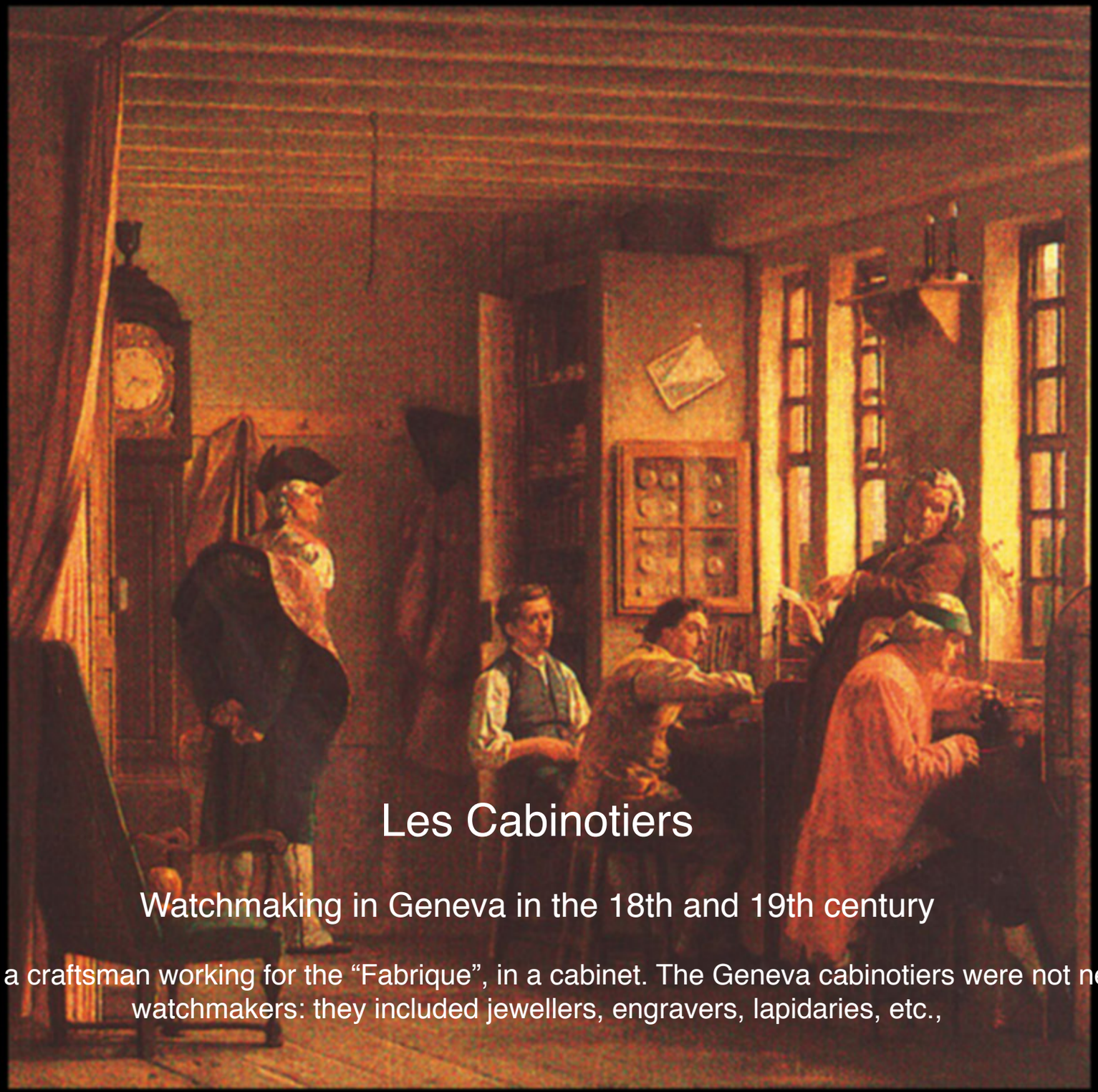
Within 200 years, far more than 1‘000‘000 watches have been made for and sold to China

Every watch took around a half a year to be finished, some even years


BOVET FLEURIER


VAUCHER Fs. FLEURIER

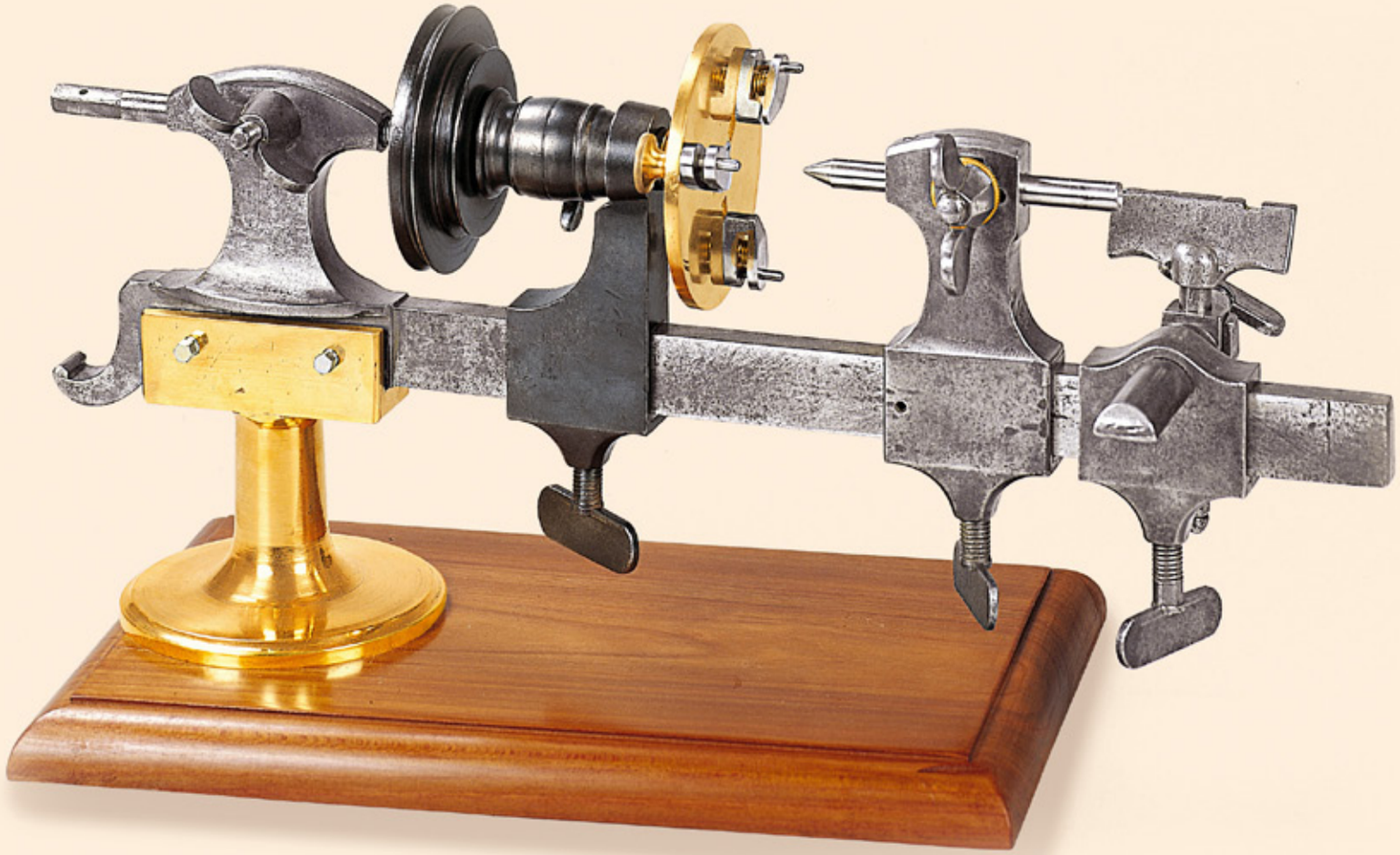

JUVET & FLEURIER

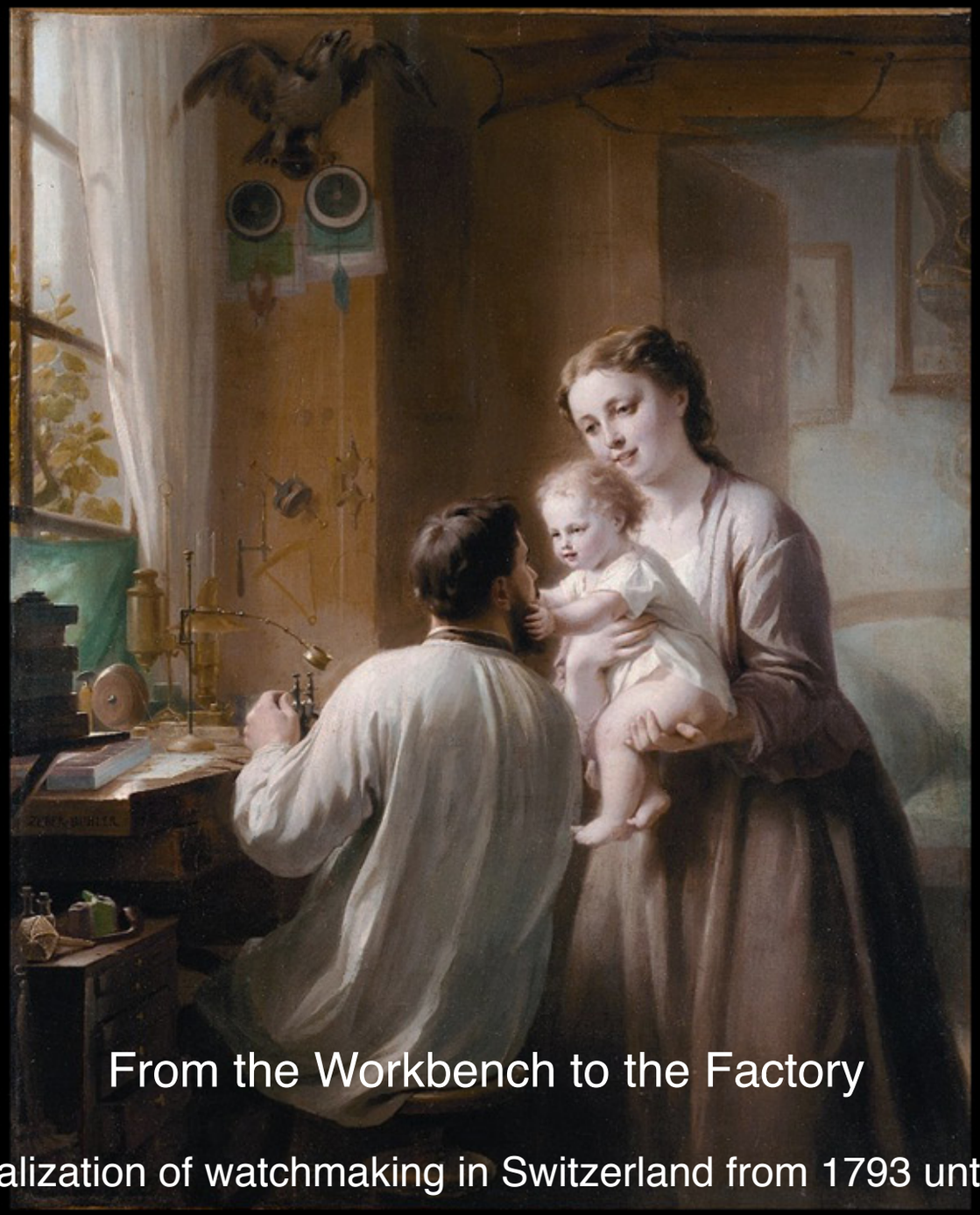


Les Cabinotiers

Watchmaking in Geneva in the 18th and 19th century

At Geneva, a craftsman working for the “Fabrique”, in a cabinet. The Geneva cabinotiers were not necessarily watchmakers: they included jewellers, engravers, lapidaries, etc.,





From the Workbench to the Factory

Industrialization of watchmaking in Switzerland from 1793 until today

In 1841, Georges-Auguste Leschot began working with a pantograph at Vacheron Constantin.
It used a matrix or pattern to mill identical and interchangable watch plates and bridges.

Vacheron Constantin
Most complicated watch

Completed in 1934 this 12 complication watch features:

Minute repeater
Grande Sonnerie
Petite Sonnerie
Split Seconds Chronograph
Day
Date
Month
Leap year indicator
Perpetual Calendar
Moonphase
Alarm
Power reserve for going train and sonnerie


The Swiss Jura
Birth place of industrialized watchmaking

Fabrique d'Horlogerie

FONTAINEMELON

Marque de Fabrique déposée

1793 the Humbert-Droz brothers and the watchmakers Banguerel-dit-Perrenoud formed a partnership to set up a factory producing movement blanks at Fontainemelon,
The factory was mechanised, powered initially by oxen, then by steam and finally by electricity.

Fontainemelon Movement 1

Swiss patent, CH 51482, for a „Mécanisme de remontage et de mise à l‘heure“
(a mechanism for winding the watch and setting the hands by stem or „keyless“ mechanism)
was granted to Fabrique d‘Horlogerie de Fontainemelon in 1911
In 1913 the annual production quantity reached 1‘000‘00 movements.

Fontainemelon Ebauche Caliber 96

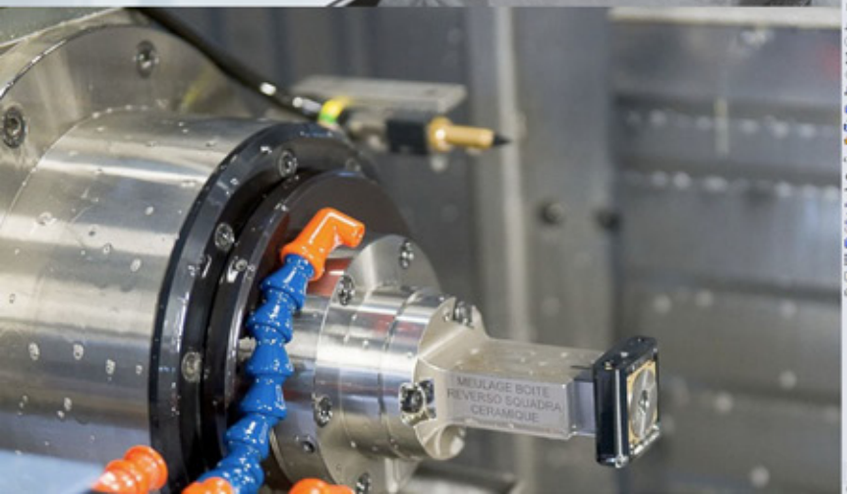
Hand-winding 11.5‘“, 17 Jewels, 18‘000A/h, 48 hours reserve
Manufactured 1955 to 1975 in a total number of 900‘000 pieces

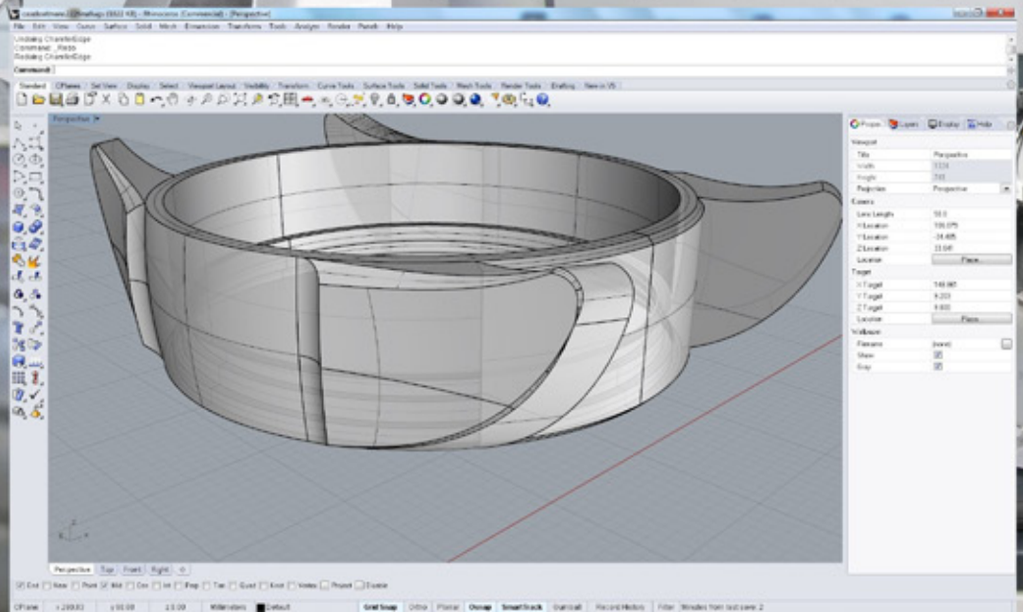
A. Schild Ebauche Caliber AS 1703

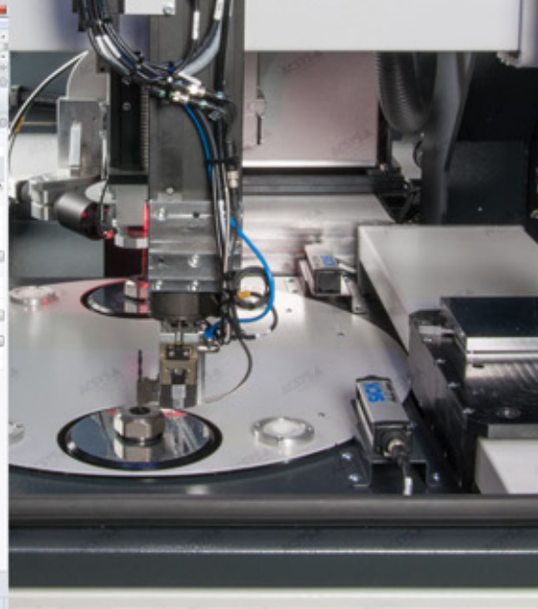
Swiss type self-winding wrist watch movement

1955 - Completely industrialized and interchangeable

Watchmaking today

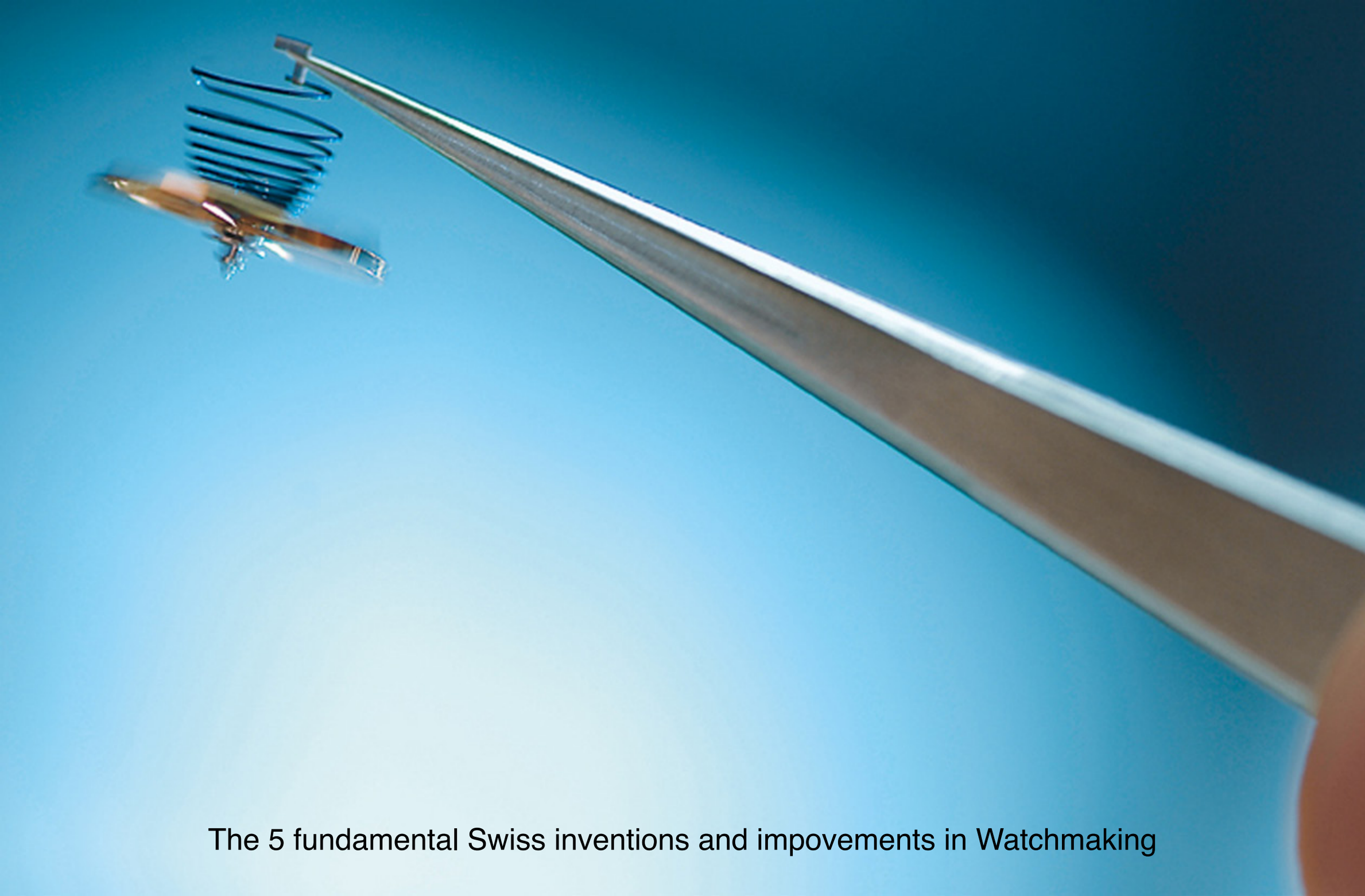

MEULAGE BOITE
REVERSO SQUADRA
CERAMIQUE



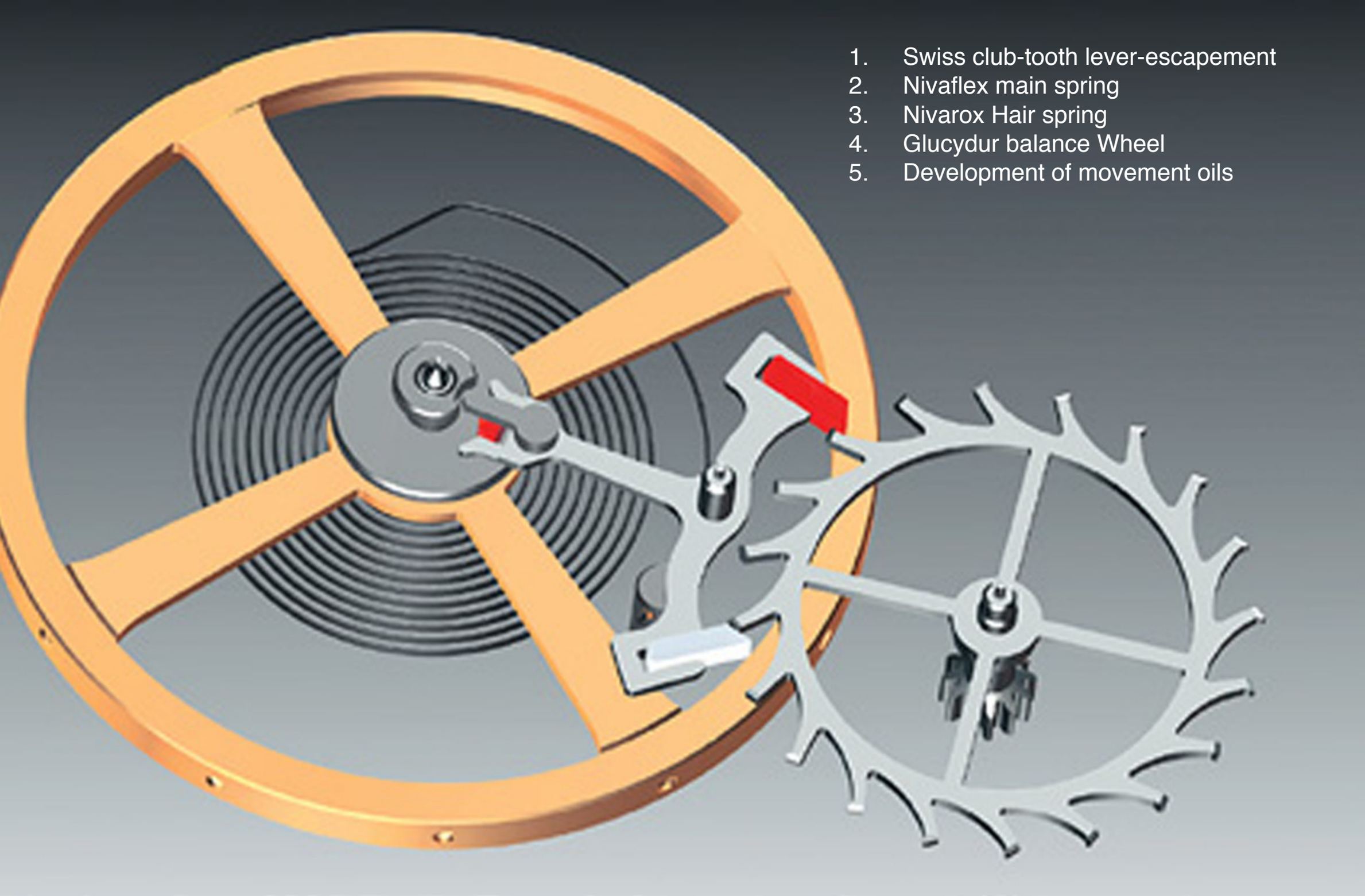


2000 - Highly finished Swiss type wrist watch movement - CNC machined and hand finished

2013 - mass produced complicated movement completely CNC machined and machine finished

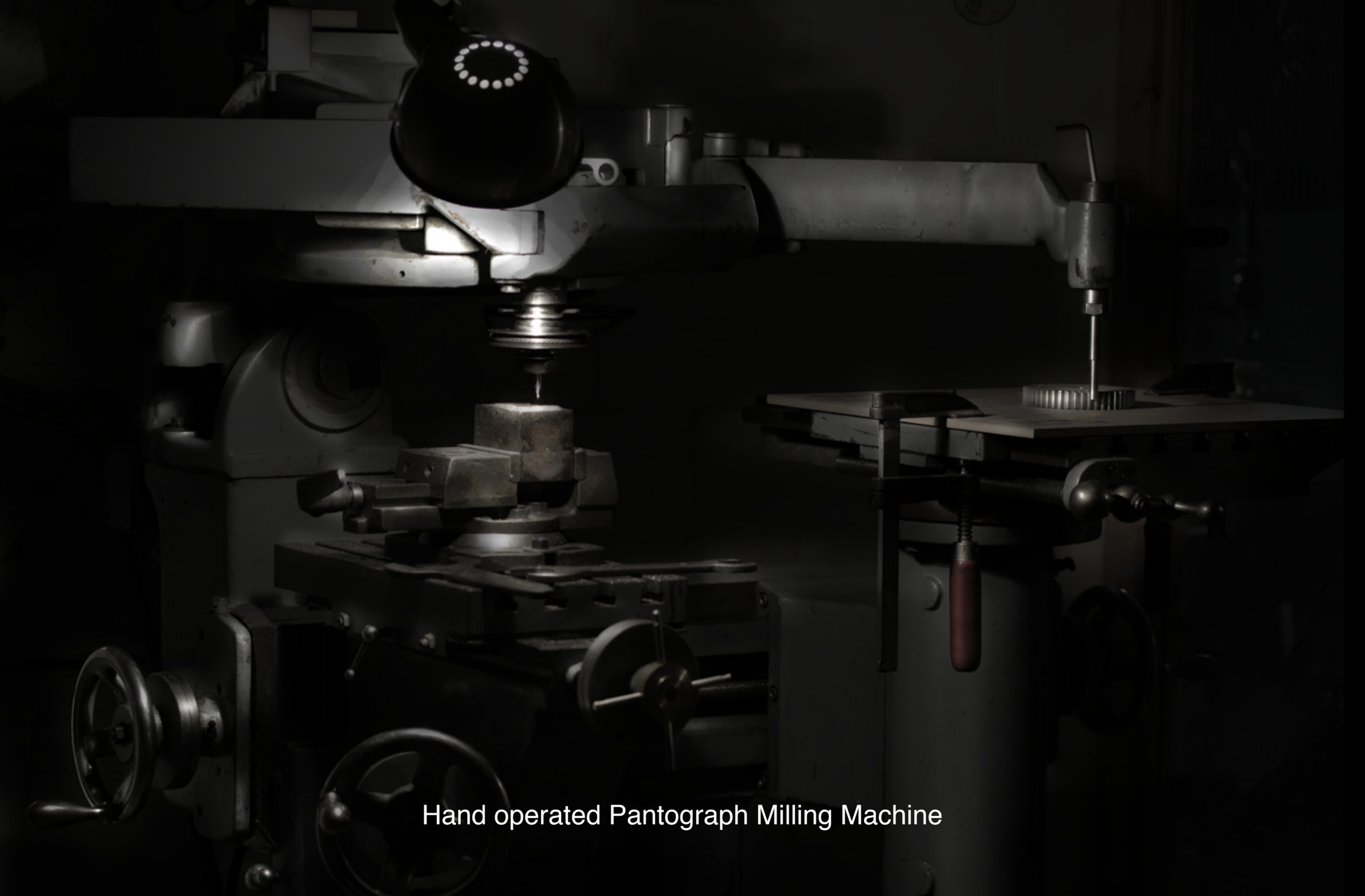


The 5 fundamental Swiss inventions and impovements in Watchmaking


1. Swiss club-tooth lever-escapement
2. Nivaflex main spring
3. Nivarox Hair spring
4. Glucydur balance Wheel
5. Development of movement oils

Back to the Roots - The Bespoke Timepieces

Impressions from the Angular Momentum & Manu Propria Atelier



Hand operated Pantograph Milling Machine

Wheel cutting on Pantograph

Hand operated Machines

Hand operated Vices and rotating Chuck

Case turning on the lathe

Working place for chasing & repousse

Engraving working place

Pliers

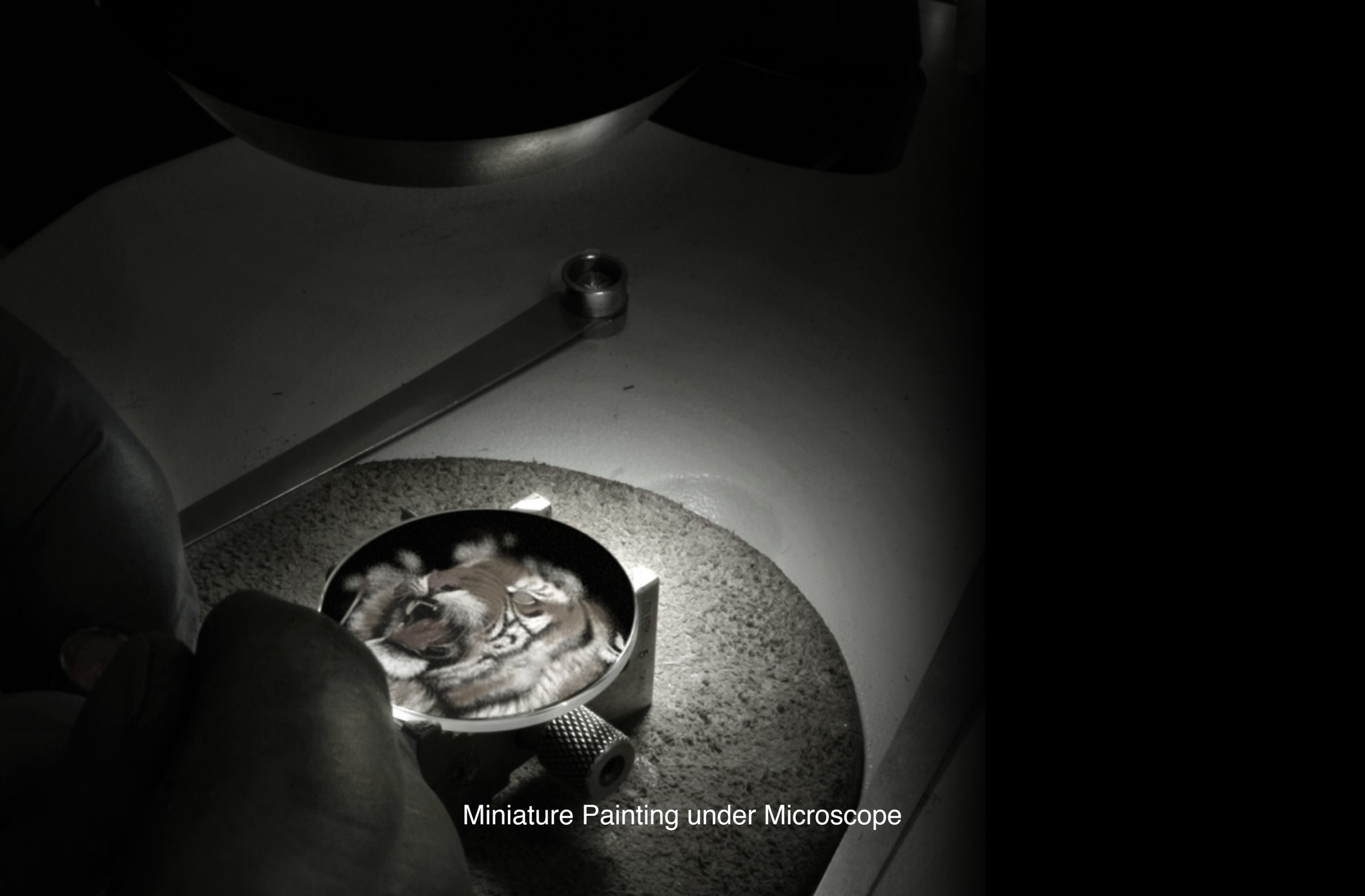

Hand made Files

Historical Pad printing Machine

Pad printed Disks à Souscription

Movement working place

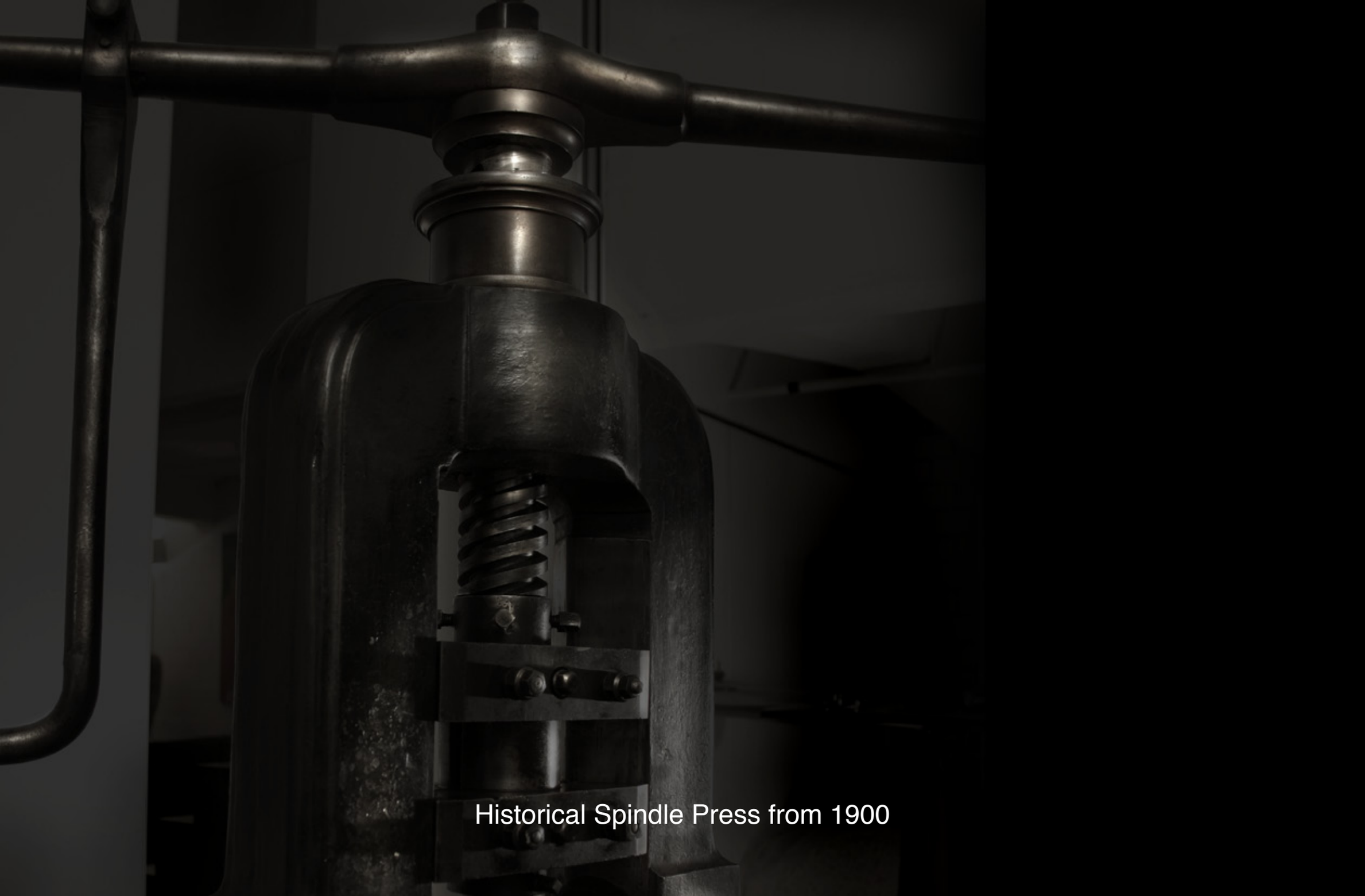
Jacot Tool



Miniature Painting under Microscope

Miniature Paintings

Hand made modules for Digital Time Display à Souscription



Historical Spindle Press from 1900

Enamel Furnace

Urushi - Japan Lacquer Dials

Métiers d'Art

15 Years - Angular Momentum & Manu Propria

Métiers d'Art

Manu Propria
„with my own hand"

„15 years ago, I founded Angular Momentum & Manu Propria with the vision to create and manufacture beautiful handmade timepieces, made under inclusion of old technologies and traditional craft with the premise that no single part is made by CNC machines, not depending to suppliers and all working steps from case making to the artwork done with my own hands (Manu Propria)".

Uniqueness

True luxury is about an understanding of craftmanship, exclusivity and quality. These elements are key to my creations and each and every watch I make remains true to this ethos.

Such commitment has been a cornerstone of my philosophy since the foundation of Angular Momentum & Manu Propria in 1989, as a creator and manufacturer of bespoke and custom made timepieces for private collectors.

Today my work is recognized for its exclusivity, its creativity and for its exceptional standards of artistry.

My work is unique by virtue of its approach from the very beginning. All my creations are one-of-a-king pieces. I devote myself to every single piece with passion and enthusiasm and it is a truly magical moment each time I see a completed dial, medallion and watch which is ideeply satisfying.

Indeed it is this dedication to hand craftmanship and to individual design that ensures that every creation is truly unique. As a result each timepiece takes time to evolve, meaning production capacity is obviously limited.

Métiers d'Art

Verre Églomisé - Miniature Painting

Reverse painting-on-glass, a uniquely difficult and skillful art.

The invention of this new techniqie calls for a blend of passion and precision, patience and ingenuity. Successfully applying it to watchmaking and jewllery implies combining this expertise with keen creativity without restraining the latter. Such an alliance is based on solid foundation and a temporal dimension that is not always perceptible at first glance and which deserves to be explained in detail. This reverse painting, as églomisé is known in English, which is done here backwards on the back side of the sapphire crystal, is a unique, rare, and difficult art that is new to the horological scene.

What makes this particular technique so difficult is the sequence of paint application necessary to achieve it successfully. The resulting painting is actually seen in reverse from the front, so the pigments must be applied opposite to the intended effect, requiring a great deal of imagination, patience, and skill most especially when the painting involves an entire palette of colors.

The technique of Verre Églomisé miniature painting on the reverse of saphire watch crystals has been developed by Martin Pauli in 2004. The technique bases on Aqua Regia oil and pure color pigments. The miniatures made by Martin Pauli are considered some of the finest available on the market today.

Métiers d‘Art

Engraving, Repoussé, Uchi-Dashi

All metal works are executed in my ateliers. I use many different techniques such as classic Engraving, Repoussé, Chasing and Uchi-Dashi a distinctly Japanese process that blurs the distinctions between what is commonly known as Metal „sinking“ and metal „raising“.

Métiers d'Art

Shining Urushi Lacquer

The deep, shiny luster of black or dark red lacquerware, often gorgeously decorated with gold and silver or inlaid with mother-of-pearl, is a Japanese handicraft form that has long fascinated the world. No other application style can match the deep hues and smoothness of Japanese lacquer (urushi in Japanese). Lacquerware stands as one of the most distinctive forms of Japanese beauty.

Martin Pauli is the only Swiss artisan applying this exceptional art and craft to watchmaking in his atelier in Switzerland. The applied works enclose a wide range of techniques, among them „Takamaki-e" high relief, „Kawari-Nuri" experimental lacquer and „Tamamushi-Nuri" jewel beetle wing mosaic which have never been introduced before to watchmaking

Métiers d‘Art

Sparkling Diamonds

Brilliance is an essential attribute of a beautiful diamond and has 2 components; brightness and contrast. Bright diamonds return lots of light from the surroundings back to a „face up" an observer. If light from above leaks out the back of a diamond, naturally it has less brightness. But light that enters and leaves in the face up direction is wasted because your head blocks the lights. Diamonds that are too deep or very shallow do this -they have areas that act like a mirror back to the viewer; they return less light and so they have less brightness.

To be brilliant, a diamond needs more than just brightness. Consider the contrast of a chess board, although it has only 1/2 the light return of a sheet of white paper, it appears brighter, especially when it is moved because it „scintillates".

Fire or dispersed light appears as flashes of rainbow colors. You see more fire in darker environments like restaurants that have just a few point light sources or just a flickering candle. Fire is also a result of a diamond's symmetry and proportions. There are several factors that greatly influence the amount of fire a diamond produces such as star facet length, lower girdle facet length, pavilion angle, facet junctions, the angle at which light enters the diamond, and the angle of the light rays as they exit the diamond.

Taken into consideration these aspects, Martin Pauli has developed a new technique of applying sparkling diamonds and diamond powder on the reverse of the watch sapphire crystal or watch dial.

Métiers d‘Art

Watch Cases

All watch parts, cases, crowns, hands, artworks are executed by myself in the atelier in Bern by hand and hand operated machines.

A wide range of metals and alloys can be chosen and have been used for case making: All colors of Gold, Platinum, Palladium, Silver, Stainless Steel, Damascus Steel, Iron, Bronze, Brass, German Silver, Shibuichi, Shakudo and Zirconium metal.

Métiers d'Art

Watch Movements

All Angular Momentum & Manu Propria timepieces are fit with historical New-Old-Stock movements manufactured between 1950 and 1975 in the „golden Era" of watchmaking by companies like FHF (Fabrique d'Horlogerie Fontainmelon) AS (Adolf Schild SA), Unitas SA which have been merged to the today's ETA SA in the 1980s during the so called „quartz crisis".

The FHF and AS movements are - though 50 to 70 years old - of excellent quality. Some say even better than today's mass produced movements. All movements have never been used before and are completely overworked, decorated and if necessary modified by myself in the atelier in Bern.

Métiers d'Art

à Souscription

Digital Time Display by Revolving-Disk-System

The main advantage of having a miniature painting on the reverse of the watch crystal with an aperture for digital time display is, that there are no watch hands disturbing the miniature picture. Verre Églomisé timepieces show the time digitally through an aperture, by an hour disk à „Souscription" with hour, quarter hour and 5-minute indexes and optionally with a minute disk.

This method is an alternative time reading system without hour and minute hand.

„Cockoo“- Japan lacquer high relief work and Guilloche à Main

„Kurokoi“ - Urushi Japan lacquer high relief work and Guilloche à Main, diamonds

„Sparrows“ - Urushi Japan lacquer high relief work and Guilloche à Main, diamond dust

„Kagamibuta“ - Urushi Japan lacquer high relief work

„Tsugaru-nuri“ - Urushi Japan lacquer work experimental lacquer technique

„Chinkin“ - Urushi Japan lacquer work engraved and gild

„Bori“ - Urushi Japan lacquer work engraved

„Tamamushi“ - Urushi Japan lacquer work Jewel Beetle wing mosaic

„Plume“ - Urushi Japan lacquer work diamond set Plume on basket ground

„Purple Bamboo Groove“ - Engraved work

„Peony“ - Engraved work

„Hidden Snake“ - Engraved and carved work, diamonds, rubies, jade

„Poetic Interworld“ - High relief Japan lacquer, mother of pearl

„Stars and Moon“ - Japan lacquer and diamonds

„Belle Epoque“ - Japan lacquer and diamonds

„Oriental Blossoms“ - Gold, Japan lacquer and diamonds

„Oriental Blossom Time Cushion“ - Gold, diamonds, sapphire

„Blue Tiger“ - Verre Églomisé Miniature Pigment Painting

„Red Baby Tiger“ - Verre Églomisé Miniature Pigment Painting, diamonds

„Black Panther“ - Verre Églomisé Miniature Pigment Painting

„Camaieu Rouge“ - Verre Églomisé Miniature Pigment Painting

„BouquetBouquet“ - Verre Églomisé Miniature Pigment Painting

„The Kiss“ - Verre Églomisé Miniature Pigment Painting

„Portrait of an Arabian King“ - Verre Églomisé Miniature Pigment Painting

„Portrait of an Arabian Crown Prince“ - Verre Églomisé Miniature Pigment Painting

„Furious Horse“ - Verre Églomisé Miniature Pigment Painting

Not only for the Watch Dandy

Le Detroit

A limited Edition Timepiece of La Bibliotheque du Temps

The Three Pearls of South East Asia

Penang - Singapore - Malacca